



Demographia Residential Land & Regulation Cost Index: 2010

Ratings for 11 United States
Metropolitan Markets

Contents

Summary

Annex II: Land Use Regulation: Background

Annex II: Methodology



DEMOGRAPHIA RESIDENTIAL LAND & REGULATION COST INDEX: 2010

Summary

In recent decades, an unprecedented variation has developed in the price of new tract housing on the fringe of US metropolitan markets. Nearly all of this difference is in costs other than site preparation and construction, which indicates rising land and regulation costs.

The first annual *Demographia Residential Land & Regulation Cost Index* estimates the price of land and regulation for new entry level houses compared to the historic norm in 11 metropolitan regions. Metropolitan regions in which land and regulation costs remain at or below normal have a *Demographia Residential Land & Regulation Cost Index* of 1.0 (see "calculation," below), while those with land and regulation costs above normal will have an *Index* above 1.0.

The *Demographia Residential Land & Regulation Cost Index* estimates the extent to which more restrictive land regulation has added to the cost of new housing in the included metropolitan regions. For example, Minneapolis-St. Paul has a *Demographia Residential Land & Regulation Cost Index* of 2.4 (see Figure 1), indicating that land and regulation costs are 2.4times the historic norm for that metropolitan region. It is estimated that more restrictive land use regulation has added from nearly \$30,000 (in Minneapolis-St. Paul) to more than \$220,000 (In San Diego) to the price of a new home.

Demographia Land & Regulation Cost Index NEW DETACHED HOUSING: 2010

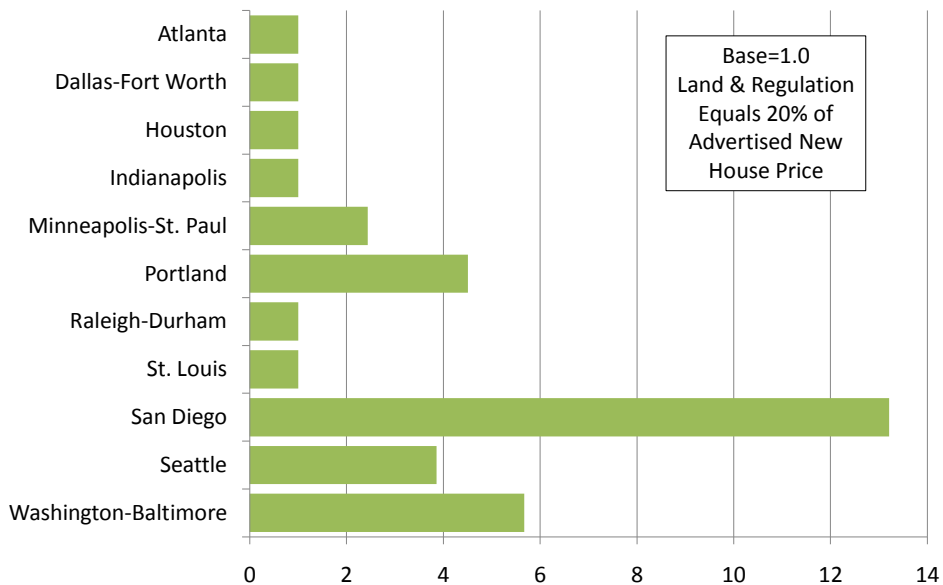


Figure 1

- Six metropolitan markets have a *Demographia Residential Land & Regulation Cost Index* of 1.0 for detached housing, indicating that non-construction costs remain within the historic industry norm (Atlanta, Dallas-Fort Worth, Houston, Indianapolis, Raleigh-Durham and St. Louis). Each of three metropolitan markets have less restrictive land use regulation.
- The other five metropolitan markets exhibit *Demographia Residential Land and Regulation Cost Indexes* of from 2.4 in Minneapolis-St. Paul to 13.2 in San Diego. The *Land and Regulation Cost Index* was 3.9 in Seattle, 4.5 in Portland and 5.7 in Washington-Baltimore. Each of these metropolitan markets has more restrictive land use regulation.

More restrictive land use regulation is variously referred to as "smart growth," "growth management" and other terms. More restrictive land use regulation is estimated to have added from nearly \$30,000 (in Minneapolis-St. Paul) to more than \$220,000 (In San Diego) to the price of a new home. The association between more restrictive land use regulation and higher house prices is summarized in *Annex I: Land Use Regulation: Background*.

Introduction

For decades, tract house construction costs on the urban fringe in the United States have represented 80% or more of the advertised house price. The balance of 20% or less has been for land and regulation costs¹ and will be referred to as the "land and regulation cost ratio." In metropolitan markets with less restrictive land use regulation, the historic 20% or less land price ratio remains in place.² The *Demographia Residential Land & Regulation Cost Index* assumes a 20% expected land and regulation ratio.

In some metropolitan markets, however, house prices have increased substantially more rapidly than in the rest of the nation. The greater increase in house prices and escalation of land costs above the historic 20% land and regulation cost ratio has [occurred in metropolitan markets](#) that have implemented more restrictive land use regulations. Urban growth boundaries, limits on the number of houses that can be built, large lot zoning and excessive development impact fees are examples of land use regulation strategies that increase the cost of land for building houses. These land cost increases are not the result of more rapidly rising construction costs or underlying land costs factors (See Annex I: Land Use Regulation: Background).

[Economic research](#) has associated rising residential land costs with more restrictive land use regulations (see Box: More Restrictive Land Use Regulations and Higher House Prices. Table 1 indicates some of the more important price increasing impacts of more restrictive land use regulation.

| Table 1 More Restrictive Land Use Regulation: Factors that Can Drive House Prices Higher | |
|--|---|
| 1.. | Increases underlying land costs |
| 2.. | Increases planning and development costs |
| 3.. | Raises financing costs |
| 4.. | Encourages more expensive houses. |
| 5.. | Increases construction costs |
| 6.. | Encourages concentration of market power and land banking |
| 7.. | Encourages land and housing speculation |

¹ The land and regulatory cost is the price paid by a home builder to purchase a "finished" lot for construction. This is a lot that has the necessary infrastructure installed and has regulatory approval.

² The *Demographia Residential Land & Regulation Cost Index* assumes a 20% land and regulation ratio, which produces smaller (more conservative) *Index* values than are indicated by some of the evidence. See Annex II-Methodology.

More restrictive land use regulation also creates obstacles to people buying houses, requiring them to devote more money to housing than necessary and increases their vulnerability to losses in the event of a financial downturn. This exposes mortgage lenders to increased risks of loan defaults. Finally, more restrictive land use regulation makes residential land development more political, with the potential for political contributions to make decisions more arbitrary.

The first annual *Demographia Residential Land & Regulation Cost Index* estimates cost of land and regulation for new entry level houses compared to the historic norm in 11 metropolitan markets. Each of the metropolitan regions in which house prices have risen above normal have adopted more restrictive land use regulations. Conversely, in each of the metropolitan regions in which house prices have not risen above normal levels, there is less restrictive land use regulation. During much of the Post-World War II era, all metropolitan markets had less restrictive land use regulations.

Additional Information

[Annex I: Land Use Regulation: Background](#)

[Annex II: Methodology](#)

Results: New Detached Houses

The overwhelming majority of new housing in the United States continues to be detached⁴ and is built near or on the urban fringe. For new detached homes, the *Demographia Residential Land & Regulation Cost Index* is 1.0 in six metropolitan markets (Atlanta, Dallas-Fort Worth, Houston, Indianapolis, Raleigh-Durham and St. Louis).⁵ This indicates that land use regulation is less restrictive and does not add more than normal to the price of new homes.

In the other five metropolitan markets, the land and regulation cost ratio has risen above 20%, resulting in a higher *Demographia Residential Land & Regulation Cost Index*. The *Demographia Residential Land & Regulation Cost Index* is 2.4 in Minneapolis-St. Paul, 3.9 in Seattle, 4.5 in Portland, 5.7 in Washington-Baltimore and 13.2 in San Diego. It is estimated that more restrictive land use regulation raises the price of the least expensive detached houses from nearly \$30,000 (in Minneapolis-St. Paul) to more than \$220,000 (in San Diego) than would be expected if these metropolitan markets had retained less restrictive land use regulation (Figure 4).

The metropolitan markets with more restrictive regulation have an average *Demographia Residential Land & Regulation Cost Index* of 5.9 for detached housing, while the metropolitan markets with less restrictive regulation average 1.0 (see Figure 1 and Table 2).

Results: New Attached Houses

Attached housing (duplexes, townhouses and low rise condominiums) continues to account for a relatively small share of new owned housing. Moreover, a larger share of attached housing is built in "infill" areas, farther from the urban fringe, where land costs tend to be higher. This higher cost land limited the number of attached houses with costs low enough to be used in the survey. There was sufficient data for detached housing for purposes of this study in five of the metropolitan markets.

⁴ In 2006, more than 85% of new single family houses sold in the United States were detached, according to Bureau of the Census data. Detached housing represents approximately 62% of all US housing units (including multi-unit dwellings).

⁵ In each of the metropolitan markets with less restrictive regulation, the estimated construction costs were more than 80% of the house price (by using a 20% land and regulation ratio, the house construction cost was capped at 80% of the house price. See Annex II: Methodology).

St. Louis and Houston have a The *Demographia Residential Land & Regulation Cost Index* of 1.00. The land and regulation cost ratio is higher in the three other metropolitan markets. The *Demographia Residential Land & Regulation Cost Index* for attached housing is 2.4 in Minneapolis-St. Paul, 5.7 in Washington-Baltimore and 7.7 in San Diego. In each of these metropolitan markets, more restrictive land use regulations have been adopted, while St. Louis and Houston have less restrictive land use regulation (see Figure 2 and Table 2).

More restrictive land use regulation is estimated to have added from nearly \$20,000 to the price of the less expensive duplexes, townhouses and low-rise condominiums in Minneapolis-St. Paul to more than \$125,000 in San Diego (see Figure 5).

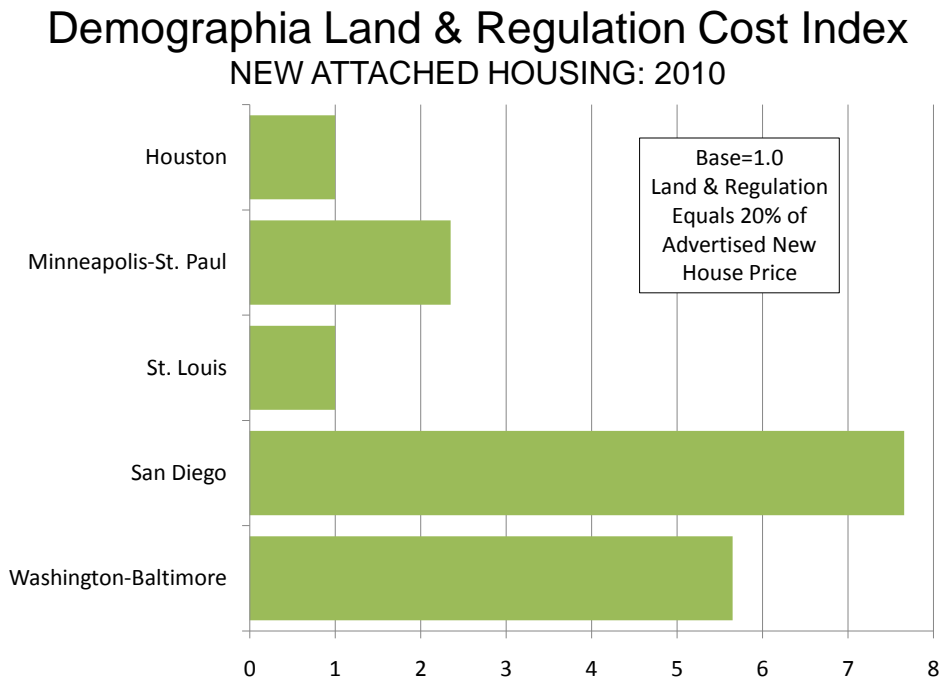


Figure 2

Significance and Uses of the *Demographia Residential Land & Regulation Cost Index*

There is increasing concern about declining housing affordability across the nation. Even after the deflation of the housing bubble, house prices in some metropolitan markets remain well above pre-bubble prices and historic affordability standards. This is illustrated by the "front-end ratio," borrowing standard, which has required mortgage payments, taxes and insurance to not exceed 28% of gross incomes. Mortgage payments alone continue to exceed 28% of gross household income for median priced houses in some metropolitan markets. Rising house prices are likely to result in lower home ownership levels in the longer run.

The *Demographia Residential Land & Regulation Cost Index* estimates the extent to which new house prices have been increased by regulatory influences. The *Demographia Residential Land & Regulation Cost Index* can be useful to:

- State and local public officials, for which the *Demographia Residential Land & Regulation Cost Index* can assist in evaluating the potential housing affordability impacts of proposed regulations, whether more restrictive or less restrictive.

- Corporate relocation and recruitment departments, for which the *Demographia Residential Land & Regulation Cost Index* can assist in identifying locations with lower costs of living and superior housing affordability, which is important in decisions about facility location and expansion decisions and in developing compensation packages.
- Regional and local civic organizations (such as chambers of commerce) and government economic development departments, for which the *Demographia Residential Land & Regulation Cost Index* can assist in identifying metropolitan housing affordability advantages or an imperative to relax land use regulations to improve housing opportunity.
- Households, for whom the *Demographia Residential Land & Regulation Cost Index* can highlight the potential to improve their quality of life by obtaining better housing value.
- Young adults, for whom the *Demographia Residential Land & Regulation Cost Index* can assist in career decisions in identifying metropolitan markets where home ownership can eventually or more quickly be achieved.

Housing Affordability: Through the Bubble and Bust

The housing affordability of the included metropolitan markets is illustrated by land use regulatory category in Figure 3. The Figure indicates the National Association of Home Builders-Wells Fargo Housing Opportunity Index for 1995, the peak of the bubble and early 2010, showing the percentage of households able to afford the median priced house. Similar affordability measures can be reviewed in the [Annual Demographia International Housing Affordability Survey](#).⁶

Future Editions

The 11 metropolitan regions included in the initial *Demographia Residential Land & Regulation Cost Index* were selected to provide a geographical and regulatory balance and because they had sufficient data from which to develop the Index. Additional areas will be added in future editions, with the intention of including all metropolitan regions with more than 1,000,000 population.

Additional metropolitan regions will be included in future editions of the *Demographia Residential Land & Regulation Cost Index*.

Calculation

The *Demographia Residential Land & Regulation Cost Index* is calculated by dividing the estimated land and regulation cost in a metropolitan region by the "normal" cost. The normal cost of land and regulation is 25% of the house construction cost, less the cost of site infrastructure construction. In a metropolitan region with normal land and regulation costs, the cost of the house will be 80% of the total house price, while the cost of the land and regulation will be 20% of the total house price. Any house price above 125% of the house construction cost is attributed to excess land and regulation cost (Figure 4). Additional calculation notes will be found in [Annex II: Methodology](#).

⁶ The 7th Annual Demographia International Housing Affordability Survey rates housing affordability in more than 270 metropolitan markets in 6 nations. The most recent data is for the third quarter of 2009. The next edition will be released in the first quarter of 2011.

Housing Affordability: Bubble & Burst

11 METROPOLITAN REGIONS IN THE INDEX

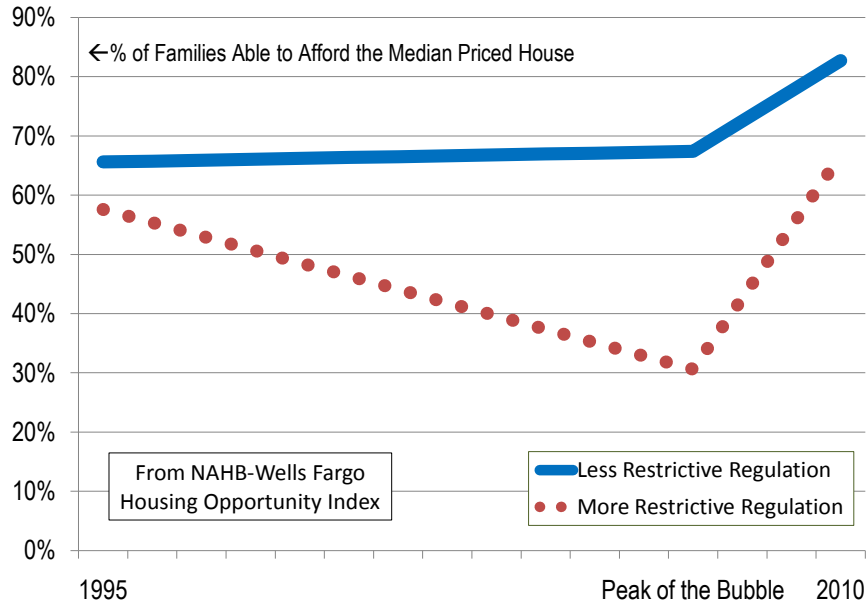


Figure 3

Residential Land & Regulation Index

CALCULATION EXAMPLES

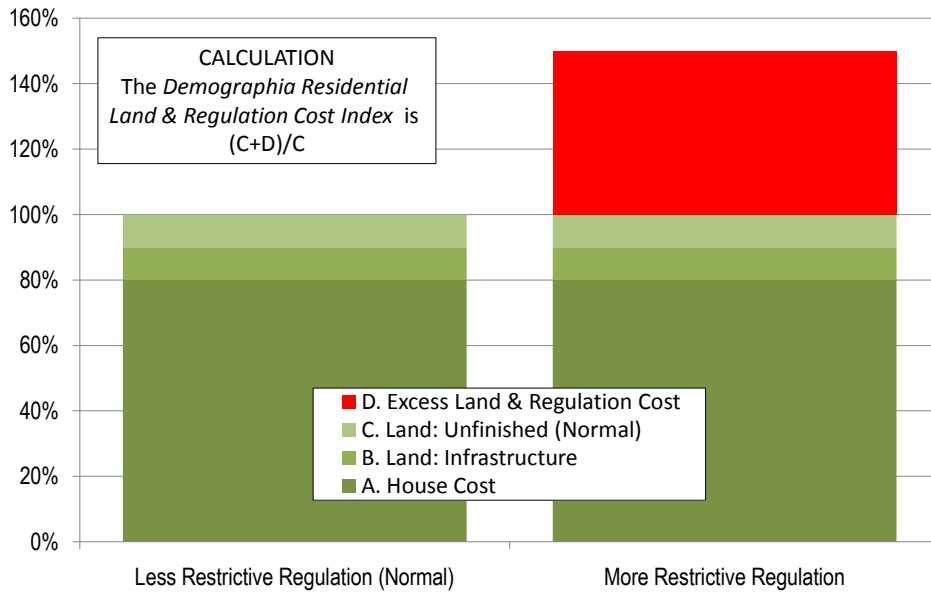


Figure 4

Box

More Restrictive Land Use Regulations and Higher House Prices

More restrictive land use regulation raises land and related costs directly, by rationing the supply of land relative to demand and by imposing excessive development impact fees.

More restrictive land use regulations can also increase house prices in less direct ways, such as by complicating the land development process, which can drive smaller developers out of business, lessen competition between developers and thus raise land costs. This can, in turn, lead to concentration of developable parcel ownership (oligopoly) by small groups of developers, who purchase the limited supply to ensure that they have future inventories to sell to home builders (out of fear that land regulating agencies will not permit sufficient new land to be opened for development, as has been noted in Australia). This practice, known as "land banking" can lead to even higher prices as the large land holders slow development of their parcels, seeking to ensure longer term returns on investment.

By making land more scarce, more restrictive land use regulation can make it more difficult to build housing on larger tracts of land, which increases prices by reducing economies of scale. As a result, the high-volume home building industry is forced more toward custom building, which is inherently more costly (a phenomenon that more restrictive land use regulation has induced in New Zealand). The higher land costs can induce builders to build more expensive houses to maintain reasonable lot price to house price ratios to obtain project financing as well as to maintain returns on investment.

These direct and indirect consequences of more restrictive land use regulation can increase the price of land, thereby increasing the price of houses.

For more information see: [Annex I: Land Use Regulation: Background](#)

Additional Information

Land Use Regulation: [Annex I: Land Use Regulation: Background](#)
Methodology: [Annex II: Methodology Notes](#)

Summary of Economic Research
[More Restrictive Land Use Regulation and Housing Affordability Losses: The Association](#)

Table 2
Demographia Residential Land & Regulation Cost Index: New 2,150 Square Foot Detached House

| | (1) Excess Land & Regulation Cost (Note) | (2) Expected Raw Land and Regulation Cost | (3) Gross Actual Land and Regulation Cost (1 + 2) | (4) <i>Demographia Residential Land & Regulation Cost Index (3/2)</i> | Land Regulation Category |
|----------------------|---|--|---|--|-----------------------------|
| Metropolitan Market | | | | | |
| Atlanta | \$0 | \$16,100 | \$16,100 | 1.0 | Less Restrictive |
| Dallas-Fort Worth | \$0 | \$14,500 | \$14,500 | 1.0 | Less Restrictive |
| Houston | \$0 | \$13,200 | \$13,200 | 1.0 | Less Restrictive |
| Indianapolis | \$0 | \$13,900 | \$13,900 | 1.0 | Less Restrictive |
| Minneapolis-St. Paul | \$28,700 | \$20,000 | \$48,700 | 2.4 | More Restrictive |
| Portland | \$59,300 | \$16,900 | \$76,200 | 4.5 | More Restrictive |
| Raleigh-Durham | \$0 | \$16,000 | \$16,000 | 1.0 | Less Restrictive |
| St. Louis | \$0 | \$16,900 | \$16,900 | 1.0 | Less Restrictive |
| San Diego | \$221,000 | \$18,100 | \$239,100 | 13.2 | More Restrictive |
| Seattle | \$51,400 | \$18,000 | \$69,400 | 3.9 | More Restrictive |
| Washington-Baltimore | \$74,700 | \$16,000 | \$90,700 | 5.7 | More Restrictive |
| Weighted Averages | | | | | |
| Overall | \$39,600 | \$16,300 | \$55,900 | 3.4 | |
| Less Restrictive | \$0 | \$15,100 | \$15,100 | 1.0 | |
| More Restrictive | \$87,000 | \$17,800 | \$104,800 | 5.9 | |

The *Demographia Residential Land & Regulation Cost Index* estimates the extent to which more restrictive land use regulation adds to the price of the least expensive new homes in the same metropolitan markets.

Table 3
Demographia Residential Land & Regulation Cost Index: New 1,500 Square Foot Attached House

| | (1) Excess Land & Regulation Cost (Note) | (2) Expected Raw Land and Regulation Cost | (3) Gross Actual Land and Regulation Cost (1 + 2) | (4) <i>Demographia Residential Land & Regulation Cost Index (3/2)</i> | Land Regulation Category |
|----------------------|---|--|---|--|-----------------------------|
| Metropolitan Market | | | | | |
| Houston | \$0 | \$11,900 | \$11,900 | 1.0 | Less Restrictive |
| Minneapolis-St. Paul | \$19,100 | \$14,100 | \$33,200 | 2.4 | More Restrictive |
| St. Louis | \$0 | \$15,600 | \$15,600 | 1.0 | Less Restrictive |
| San Diego | \$125,900 | \$18,900 | \$144,800 | 7.7 | More Restrictive |
| Washington-Baltimore | \$54,900 | \$11,800 | \$66,700 | 5.7 | More Restrictive |
| Weighted Averages | | | | | |
| Overall | \$40,000 | \$14,500 | \$54,400 | 3.8 | |
| Less Restrictive | \$0 | \$13,800 | \$13,800 | 1.0 | |
| More Restrictive | \$66,600 | \$14,900 | \$81,600 | 5.5 | |

The *Demographia Residential Land & Regulation Cost Index* estimates the extent to which more restrictive land use regulation adds to the price of the least expensive new homes in the same metropolitan markets.

Estimated Land & Regulation Costs

NEW DETACHED HOUSING: 2010

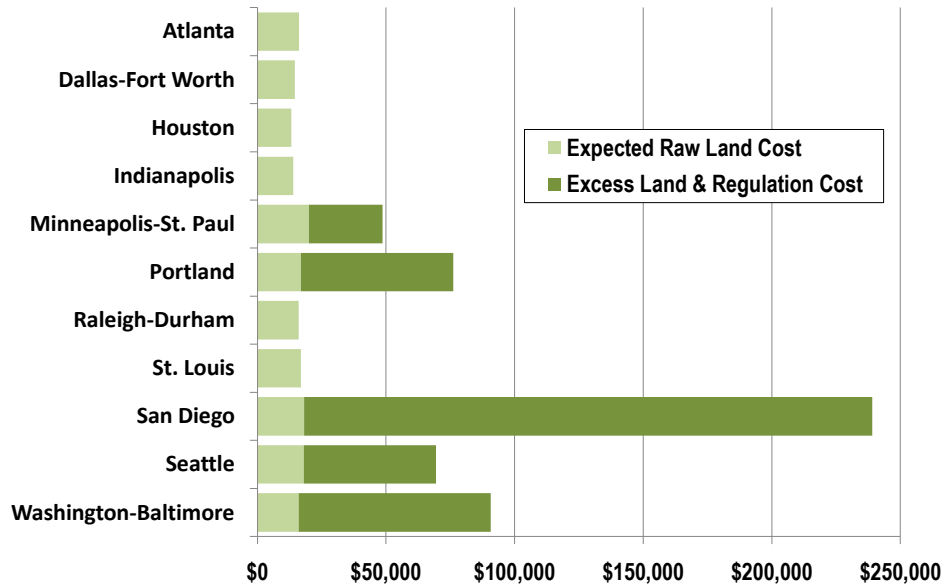


Figure 5

Estimated Land & Regulation Costs

NEW ATTACHED HOUSING: 2010

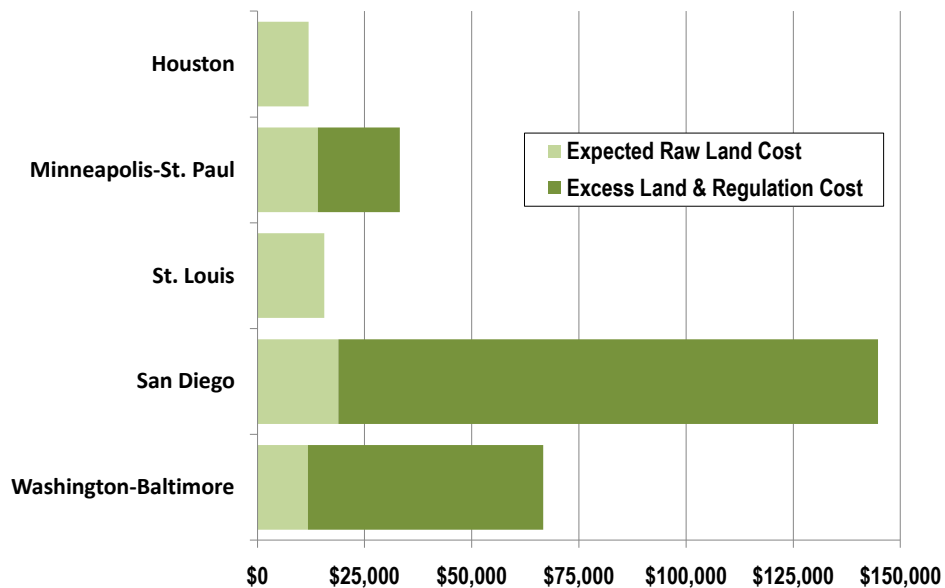


Figure 6



DEMOGRAPHIA RESIDENTIAL LAND & REGULATION COST INDEX: 2010

Annex I: Land Use Regulation: Background

The Rise in Home Ownership

Home ownership increased markedly in the 15 years following World War II, from a pre-war level of 44% in 1940 to 62% in 1960. It reached 65% in the middle 1990s, and rose to 69% at the peak of the housing bubble.¹

Homes became affordable to more US households after World War II because (1) substantial improvements were made in construction productivity² (2) new houses were built on inexpensive land on the urban fringe and (3) programs, such as 30-year fixed rate mortgages and government guaranteed loan programs (such as FHA and VA) that made mortgage finance more readily affordable and available. Nearly all of the new housing in US metropolitan areas continues to be built on the urban fringe, principally because underlying land prices tend to be lower there.

Moreover, during the past six decades, house construction costs have been comparatively inexpensive and risen only modestly. While there have been differences between metropolitan markets, they have been relatively small and the differences have changed little. Between 1970 and 2007, the construction costs in the five more restrictively regulated metropolitan markets have risen 3% more than in the less restrictively regulated markets.³

However, significant restrictions on land have been imposed in some metropolitan markets, which has materially raised the price of new houses and seriously eroded housing affordability.

The Historic Land and Regulation Ratio

For at least five decades, the cost of land and related regulation for new tract houses accounted for 20% or less of the total new house price. This land and regulation ratio is evident in early 1970s United States Bureau of the Census housing data and, according to data from industry sources and interviews with industry experts and remains at this historic norm in many US metropolitan markets. The *Demographia Residential Land & Regulation Cost Index* assumes a 20% land and regulation ratio.

¹ Some analysts have predicted that the home ownership rate will fall back to approximately the more sustainable 65% rate that preceded the housing bubble. See, for example: Ronald D. Utt, *The President's Worrisome Narrative to Discourage Homeownership*, Heritage Foundation, 2010.
<http://www.heritage.org/Research/Reports/2010/08/The-Presidents-Worrisome-Narrative-to-Discourage-Homeownership>.

² The early post-World War II advances in home building productivity were referred to as "assembly line" or production (as opposed to custom) building. The most important early example was the pioneering Levittown community on New York's Long Island. See: <http://web1.fandm.edu/levittown/one/e.html>.

³ Estimated from R. S. Means (*Square Foot Costs*) locational factors 1970 to 2007.

More Restrictive Land Use Regulation

However, in the 1970s, house prices in some metropolitan markets began to escalate substantially relative to prices elsewhere. This was not the result of differing house construction cost trends. The principal difference is in the cost of land. In virtually all of these more expensive metropolitan markets, more restrictive land use regulations have been adopted, which [economic research](#) associates with higher house prices.⁴

These more rapidly escalating land costs appeared in California first, as overall house prices rose well above historic price to income standards and above prices in the rest of the nation.

William Fischel of Dartmouth University has associated the larger increase in California housing prices with its stronger land use regulation. Fischel found that the rise in California housing prices after 1970 relative to the nation could not be explained by factors such as higher construction cost increases, population growth, quality of life, amenities, the state's property tax reform initiative (Proposition 13), land supply or water issues.⁵

These higher land and related regulation costs spread to other metropolitan markets where more restrictive land use regulations were adopted, both during the 1990s and the housing bubble that followed.⁶ However, [in many metropolitan markets](#), less restrictive regulation remained in place and the land and regulation ratio has remained at 20% or less. Meanwhile, the similarity of underlying land costs between metropolitan markets with more and less restrictive land use regulation is illustrated by the small variation in agricultural land.⁷

More restrictive land use policies have been adopted principally to limit or stop the expansion (pejoratively called "urban sprawl") of urban areas, which results from population growth and the desire of a more affluent society to live in larger and detached houses on larger lots. The result of more restrictive land use regulation can be to seriously interfere with, or even to eliminate the historic urban fringe market that has accommodated much of that housing and population growth.⁸

⁴ This has been an international trend, with one of the most severe examples being Australia. In the last 10 to 25 years, [house prices have risen at double to triple the rate of household incomes](#) in virtually all areas, as more restrictive land use policies have been adopted throughout the nation. See the *Annual Demographia International Housing Affordability Survey* series (<http://www.demographia.com/dhi.pdf>).

⁵ Fischel, p. 218-252.

⁶ More restrictive land use regulation is not always associated with higher house prices. For example, Portland, Oregon's more restrictive land use regulations appear to have had little, if any impact before 1990, because they did not restrict land supply sufficiently to materially raise its price. That changed in the 1990s, when planning officials declined to expand the urban growth boundary sufficiently to retain housing affordability.

⁷ Between 1969 and 2007 the increase in the metropolitan market with the highest value agricultural land (San Diego) was less than \$1,100 per building lot more than that of the metropolitan market with the lowest value agricultural land (Houston). Calculated from acreage and value data in US Department of Agriculture 1969 and 2007 Census of Agriculture. This figure is less than the \$4,900 difference in expected raw land cost between the two metropolitan regions.

⁸ For an encyclopedic examination of more restrictive land use policies, see Robert W. Burchell, George Lowenstein, William R. Dolphin, Catherine C. Galley, Anthony Downs, Samuel Seskin, and Terry Moore, *Costs of Sprawl—2000*. Washington, DC: Transportation Research Board, 2002. There are numerous additional references favoring more restrictive land use regulation available on the internet, given the near monopoly of such views in the urban planning community. For critiques of more restrictive land use policies see Robert Bruegmann, *Sprawl: A Compact History*, University of Chicago Press, 2005; William T. Bogart, *Don't Call It Sprawl: Metropolitan Structure in the 21st Century*, Cambridge University Press 2006; Randal O'Toole, *The Best-Laid Plans: How Government Planning Harms Your Quality of Life, Your Pocketbook, and Your Future*, Cato Institute 2007; Wendell Cox, *War on the Dream: How Anti-Sprawl Policy Threatens the Quality of Life*, Iuniverse, 2006

The price escalation in the higher priced metropolitan markets has been associated in [economic research](#) with more restrictive land use regulations (non-traditional land use regulation), such as restrictions on where new housing can be built, and substantially higher fees, which ultimately are reflected in the price of the new homes paid by buyers.

How More Restrictive Land Use Regulation Raises House Prices

More restrictive land use regulation can raise the price of housing in a number of ways (Table I-1).

- (1) **Increases Underlying Land Costs:** Regulations such as urban growth boundaries and other smart growth land rationing devices can reduce the land available for building. This reduction in land supply occurs while there is no reduction in demand. All things being equal, where supply of a good or service is constrained, prices are likely to rise. Buyers bid up the price of the more scarce land, which eventually makes the price of houses higher.
- (2) **Increases Planning and Development Costs:** More restrictive land use regulation can increase the costs of obtaining planning permission to develop land and build houses, such as by requiring additional studies, the hiring of expensive consultants and the imposition of expensive development impact fees.⁹
- (3) **Raises Financing Costs:** More restrictive land use regulations can lengthen the time that is required to purchase land, gain planning permission and build houses. This longer time tends to impose higher financing costs on developers and builders, which are inevitably included in house prices.
- (4) **Encourages More Expensive Houses:** As the underlying cost of land (including regulation) increases, the price of the housing built upon it is likely to increase. This is because lending institutions tend to resist financing the construction of less expensive houses on expensive land. Moreover, this tendency to substitute more expensive houses on more expensive land occurs because there is less land on which to build. It is similar to the market behavior that might be expected in the automobile industry if there were severe limits on the number of cars that could be produced. Manufacturers would be inclined to build the most expensive cars and few less expensive cars.
- (5) **Increases Construction Costs:** By making land more scarce, more restrictive land use regulation can make it more difficult to build housing on larger tracts of land, which can make home building less efficient by increasing the cost per square foot of construction. As a result, the home building industry is forced away from high volume building and more toward custom building, which is inherently more costly.
- (6) **Encourages Market Concentration and Land Banking:** The more costly regulatory environment makes it more difficult for smaller developers and home builders to remain in business. This is likely to lead to higher levels of market concentration (fewer companies) and less competition, which, all things being equal, leads to higher prices.

The smaller number of developers are often virtually forced into buying up as much of the limited land supply as possible to ensure that they have future inventories to sell to home builders (out of

⁹ Generally, residential land developers are responsible for installing and financing on-site infrastructure, such as streets, sewers and water mains and storm water systems. The cost of these improvements is included in the lot price paid by home builders and in the ultimate house price paid by buyers.

fear that land regulating agencies will not permit sufficient new land to be opened for development, as has been noted in Australia). This practice, known as "land banking" can lead to even higher prices as the large land holders "drip release" (slow) development of their parcels, seeking to ensure longer term returns on investment. This would not be possible where there is more competition, such as in metropolitan markets with less restrictive land regulation.

(7) Encourages Land & Housing Speculation: These price increasing impacts of more restrictive land use regulation encourage investors to buy houses to make quick profits. This higher extent of speculative activity in more restrictively regulated markets has been identified in the economic literature.¹⁰ Moreover, it was evident during the US housing in some more restrictively regulated markets, where house prices doubled or tripled relative to incomes, which was unprecedented.

The higher costs may not be limited to these items. Smaller builders and developers can be forced out of the market because of their more modest financial resources, which tends to reduce competition and can lead to higher land and housing costs.

| Table I-1 More Restrictive Land Use Regulation: Factors that Can Drive House Prices Higher | |
|--|---|
| 1.. | Increases underlying land costs |
| 2.. | Increases planning and development costs |
| 3.. | Raises financing costs |
| 4.. | Encourages more expensive houses. |
| 5.. | Increases construction costs |
| 6.. | Encourages concentration of market power and land banking |
| 7.. | Encourages land and housing speculation |

Housing Affordability Concerns

There has been increasing concern across the nation about a loss in housing affordability. Even after the bursting of the housing bubble, house prices [remain above pre-housing bubble prices](#) and historic affordability standards in many metropolitan markets, such as in Portland, San Diego, Seattle and Washington, DC in this report.

Differences in housing costs account for most of the cost of living differences among the nation's metropolitan markets. In addition, higher cost metropolitan markets have [generally lost substantial numbers](#) of residents to lower cost areas

In this environment, housing affordability concerns are likely to intensify, as households face potentially higher tax burdens to finance rising federal, state and local expenditures, higher energy and transportation costs due to proposals to reduce greenhouse gas emissions and an economy that may grow less quickly in the future.

| |
|---|
| <p>For Additional Information See Research Summary: More Restrictive Land Use Regulation and Housing Affordability</p> |
|---|

¹⁰ Edward L. Glaeser and Joseph Gyourko, *Rethinking Federal Housing Policy: How to Make Housing Plentiful and Affordable* (American Enterprise Institute, 2008), p.78.

Land Use Regulation Categories

The *Demographia Residential Land & Regulation Cost Index* uses two land use categories:

Less Restrictive Land Use Regulation: Less restrictive land use regulation allows new housing to be built in areas where there is sufficient customer demand (as evidenced by the ability of home builders to produce houses that customers buy). Development must comply with fundamental environmental and infrastructure regulation. Less restrictive land use regulation was virtually universal in the United States until the 1970s and remains in place in many metropolitan markets.

More Restrictive Land Use Regulation: More restrictive land use regulation imposes significant barriers to house construction, especially prohibitions on physically developable land, limits on the number of houses allowed to be built (moratoria or ceilings) and high development impact fees. These strategies are referred to by various terms, such as "growth management," "smart growth," "compact cities policies" and "urban containment."

The *Demographia* land use categories are summarized by surveyed metropolitan market in Table I-1. For reference, the table also shows the general land use regulation categories [developed by the Brookings Institution](#). As is noted above, the less restrictive land use regulation (or the Brookings Institution "traditional" and "Texas" land use regulation categories) are associated with lower land costs and thus lower house prices.

| Metropolitan Market | Demographia | Brookings |
|--|---|-----------|
| Atlanta | 1 | 1.1 |
| Dallas-Fort Worth | 1 | 1.2 |
| Houston | 1 | 1.2 |
| Indianapolis | 1 | 1.1 |
| Minneapolis-St. Paul | 2 | 1.1 & 2.1 |
| Portland | 2 | 2.2 |
| Raleigh | 1 | 1.1 |
| St. Louis-Durham | 1 | 1.1 |
| San Diego | 2 | 2.2 |
| Seattle | 2 | 2.2 |
| Washington-Baltimore | 2 | 1.1 & 2.2 |
| Land Use Regulation Categories | | |
| Demographia (Metropolitan Market Based) | Brookings Institution (County Based) ¹¹ | |
| 1 - Less restrictive | 1.1 Traditional 1.2 Texas Category | |
| 2 - More restrictive | 2.1 Exclusion 2.2 Reform | |

More Restrictive Land Use Regulation Policies

More restrictive land use regulation policies are listed in Table I-2. This list includes policies most likely to raise house prices, such as designating large tracts of developable land as off-limits, limits on home building and high development or impact fees.

¹¹ The Brookings Institution classification also has a another category "high density," which includes counties based upon their openness to higher density housing. This is a dimension not measured by the *Demographia* typology and the Brookings "high density" metropolitan markets are classified as either "less restrictive" or "more restrictive."

There is no dispute about the likelihood of higher house prices where there is more restrictive land use regulation; the only question is *how much* higher. [This point](#) was made by the Hispanic oriented Tomas Rivera Policy Institute:

*While there is little agreement on the magnitude of the effect of growth controls on home prices, an increase is always the result.*¹²

¹² Lopez-Aqueres, Waldo, Joelle Skaga and Tadeusz Kugler (2002). *Housing California's Latino Population in the 21st Century: The Challenge Ahead*. Los Angeles, CA: The Tomas Rivera Policy Institute, http://www.trpi.org/PDFs/housing_ca_latinos.pdf

| Table I-2 More Restrictive Land Use Regulation: Policies With Potential to Increase Land Costs and House Prices | | |
|---|--|---|
| # | Policy | Potential to Increase Housing Prices (and Source) |
| 1 | URBAN CONTAINMENT | |
| 1-A | Regional Urban Growth Boundaries | YES per <i>Costs of Sprawl -- 2000</i> |
| 1-B | Local Urban Growth Boundaries | YES per <i>Costs of Sprawl -- 2000</i> |
| 1-C | Regional Urban Service Districts | YES per <i>Costs of Sprawl -- 2000</i> |
| 1-D | Local Urban Service Districts | YES per <i>Costs of Sprawl -- 2000</i> |
| 1-E | Restrictions on Physically Developable Land | YES per <i>Costs of Sprawl -- 2000</i> |
| 1-F | Infill Quotas | YES per <i>Demographia</i> (Note 1) |
| 2 | LARGE-LOT ZONING IN URBAN FRINGE & RURAL AREAS | YES per <i>Costs of Sprawl -- 2000</i> |
| 3 | GEOGRAPHICAL GROWTH STEERING | YES per <i>Demographia</i> (Note 2) |
| 3-A | State Aid Contingent on Local Growth Zones | YES per <i>Costs of Sprawl -- 2000</i> |
| 3-B | Excessive Public Facility Requirement Ordinances | YES per <i>Demographia</i> (Note 3) |
| 4 | HOUSE BUILDING MORATORIA OR LIMITS | YES per <i>Demographia</i> (Note 4) |
| 5 | HIGH DEVELOPMENT FEES & EXACTIONS | YES per <i>Costs of Sprawl -- 2000</i> |
| 6 | MANDATORY REGIONAL OR COUNTY PLANNING | LIKELY per <i>Demographia</i> (Note 5) |
| <p>Source: Policies 1, 2, 3, 5 from Table 15.4 Costs of Sprawl--2000</p> <p>Note 1-F: Infill quotas force more development into infill areas, which increases infill land prices, while increasing the price of urban fringe land by rationing new development.</p> <p>Note 2: Policy #2 has the potential to increase housing prices because it would require implementation of policies #1-A, 1-B, 1-C, 1-D, 1-E or 1-F, each of which have the potential to increase housing prices.</p> <p>Note 3: Policy 3-B (sometimes called "adequate public facility ordinances") can be used to force new housing into growth areas or areas that are already developed and can result in the imposition of "virtual" urban growth boundaries by severely limiting the land that can be developed, raising its cost and that of housing.</p> <p>Note 4: Policy #4 increases house prices by rationing new houses.</p> <p>Note 5: Policy #6 is likely to increase house prices because of the propensity of planning professionals to favor more restrictive land use regulations.</p> | | |

Metropolitan market Land Use Information

The land use regulation categories and principal strategies are summarized in Table I-3. Additional explanatory notes follow the table.

Dallas-Fort Worth: Dallas-Fort Worth is a less restrictively regulated metropolitan market. As a less restrictively regulated market, there continues to be an abundance of comparatively inexpensive detached (tract) housing on the urban fringe.

Houston: Houston is a less restrictively regulated metropolitan market. As a less restrictively regulated market, there continues to be an abundance of comparatively inexpensive detached (tract) housing on the urban fringe.

Indianapolis: Indianapolis is a less restrictively regulated metropolitan market. As a less restrictively regulated market, there continues to be an abundance of comparatively inexpensive detached (tract) housing on the urban fringe.

| Metropolitan Market | Regulatory Category | 1. Urban Containment | 2. Large Lot Zoning | 3. Geographical Growth Steering | 4. Moratoria or Limits | 5. High Impact Fees | 6. Mandatory Regional Planning |
|----------------------|---------------------|----------------------|---------------------|---------------------------------|------------------------|---------------------|--------------------------------|
| Atlanta | Less Restrictive | | | | | | |
| Dallas-Fort Worth | Less Restrictive | | | | | | |
| Houston | Less Restrictive | | | | | | |
| Indianapolis | Less Restrictive | | | | | | |
| Minneapolis-St. Paul | More Restrictive | • | • | | | • | • |
| Portland | More Restrictive | • | | | | • | • |
| Raleigh-Durham | Less Restrictive | | | | | | |
| St. Louis | Less Restrictive | | | | | | |
| San Diego | More Restrictive | • | | | | • | |
| Seattle | More Restrictive | • | | | | • | • |
| Washington-Baltimore | More Restrictive | • | | • | • | • | |

Minneapolis-St. Paul: Minneapolis-St. Paul is a more restrictively regulated metropolitan market. However, restrictive land use regulations have been relaxed somewhat in recent years. The metropolitan market's urban growth boundary¹³ has been more liberally administered than in metropolitan markets like Portland and San Diego, especially since the appointment of a metropolitan land use agency board less opposed to lower cost housing on the urban fringe.¹⁴ This appears to have moderated land costs. There is a considerable amount of new tract housing available on the urban fringe, though it is somewhat more expensive than would be expected in less restrictively regulated metropolitan markets.

Portland: Portland is a more restrictively regulated metropolitan market. There is less new tract housing available on the urban fringe in the Oregon portion of the metropolitan area than would be expected in an area of this population. It also tends to be comparatively expensive. Lower cost new tract housing is principally available in the Washington part of the metropolitan area (Clark and Skamania counties), however, it is also more expensive than would be expected in less restrictively regulated markets.

Raleigh-Durham: Raleigh-Durham is a less restrictively regulated metropolitan market. As a less restrictively regulated market, there continues to be an abundance of comparatively inexpensive detached (tract) housing on the urban fringe.

St. Louis: St. Louis is a less restrictively regulated metropolitan market. As a less restrictively regulated market, there continues to be an abundance of comparatively inexpensive detached (tract) housing on the urban fringe.

San Diego: San Diego is a more restrictively regulated metropolitan market. There is virtually no low priced detached tract housing in the San Diego metropolitan market. New housing is considerably more affordable in "southwest California," which is largely delineated by the Temecula urban area in the Riverside-San Bernardino metropolitan area. Thus, affordable new housing has been driven nearly 60 miles from the San Diego downtown area and 25 miles from the northern fringe of the San Diego urban area.

¹³ In Minneapolis-St. Paul, the urban growth boundary is a municipal service boundary.

¹⁴ See <http://www.metrocouncil.org/about/facts/MUSAfacts.pdf>.

The effect of Temecula's more affordable housing (which is still expensive relative to less restrictive markets such as Atlanta, Indianapolis and the other such markets in this *Index*) is not reflected in the *Demographia Residential Land & Regulation Cost Index* for San Diego because it is outside the metropolitan market. This greater dispersion of lower cost housing substantially increases commuting distances and fuel usage. In the longer run, it could weaken the San Diego metropolitan market, as businesses locate closer to growing areas. This phenomenon has occurred with suburban expansion and has been cited as an important factor in keeping traffic congestion manageable in suburban areas.¹⁵ As California's strong new land use regulation act (Senate Bill 375), house price increases could accelerate even more in the San Diego metropolitan market (and across the state).

Seattle: Seattle is a more restrictively regulated metropolitan market. There is less new tract housing available on the urban fringe than would be expected in a metropolitan region of Seattle's size. The lowest priced new tract housing appears to be on the urban fringe in southern Pierce County and the northern fringe in Snohomish County, and tends to be comparatively expensive.

Washington-Baltimore: Washington-Baltimore is the combination of the Washington and Baltimore metropolitan statistical areas.¹⁶ Washington-Baltimore is a more restrictively regulated metropolitan market. There is new tract detached housing on the extreme periphery of this metropolitan region (well beyond the urban fringe), especially in Jefferson County, West Virginia and the counties to the south, such as Stafford and Spotsylvania in Virginia. Overall, however, Washington-Baltimore's new tract housing tends to be more costly than would be expected in a less restrictively regulated metropolitan market.

The land use regulations in the Washington-Baltimore metropolitan market have driven the most affordable new tract housing to well beyond the urban fringe and outside the metropolitan market. This includes counties beyond the metropolitan market in south-central Pennsylvania, Virginia, West Virginia and the Maryland Eastern Shore. The result of the more restrictive land use regulation has thus been to create what is sometimes called "leap frog" development and to cause housing and other development to expand more than would have been the case with less restrictive land use regulation. Because these counties are outside the metropolitan market, their more affordable housing is not reflected in the *Demographia Land & Regulation Cost Index* for Washington-Baltimore.

¹⁵ See, for example, Peter Gordon and Harry W. Richardson, "Are Compact Cities a Desirable Planning Goal?" *APA Journal*, Winter 1997. www-agecon.ag.ohio-state.edu/class/aede680/irwin/pdf/88.pdf.

¹⁶ This is not to be confused with the somewhat larger Washington-Baltimore combined statistical area.



DEMOGRAPHIA RESIDENTIAL LAND & REGULATION COST INDEX: 2010

Annex II: Methodology

Summary: The *Demographia Residential Land & Regulation Cost Index* estimates the extent to which more restrictive land use regulation has increased the price of new housing in 11 metropolitan markets, based upon the historic norm that the non-construction costs of new housing (land and regulation) does not exceed 20% of the house and land price.

Period Covered: The period covered is January through June 2010.

Houses Included: New detached homes, attached homes (townhouses and duplexes) and low-rise condominium (non-elevator) buildings are included. Houses in gated, golf course and age restricted communities are excluded. The detached survey includes housing from 1,500 to 2,999 square feet. The attached survey includes houses from 1,000 square feet to 2,499 square feet.

New House Database: A new house database was developed of new house offerings by national, regional and local builders, using internet sites and published metropolitan home guides.

Metropolitan Markets: The houses in the new house database are the respective metropolitan statistical areas [as defined by](#) the Office of Management and Budget (OMB) as of January 1, 2010, with two exceptions. Washington-Baltimore and Raleigh-Durham are combined because they are more representative of their respective housing markets than the individual metropolitan areas. Because of these differing definitions, the term "metropolitan market" is used.

Land & Regulation Cost Ratio: A land and regulation cost ratio of 20% is assumed under less restrictive land use regulation. This means that the house construction is estimated to be 80% or less of the advertised house price (which includes land).¹

There is no comprehensive source for the land and regulation ratio. *Demographia* based this estimate for less restrictively regulated metropolitan markets on data from multiple years and metropolitan markets from privileged industry sources and on interviews with industry experts. This data used in this examination indicated that the actual land and regulation ratio in such markets has tended to be approximately 17.5%, with a standard deviation of 2.2%, while interviewees generally cited the 20% ratio. The *Demographia Residential Land & Regulation Cost Index* assumes a 20% land and regulation ratio, which produces smaller (more conservative) *Index* values.

Finished Land: Land to which on-site infrastructure (local streets, curbs, sewer and water lines and connections) has been added and is ready for house building. Typically finished land is purchased by a land developer, who arranges for the on-site infrastructure and sells the land to a home builder.

¹ The sale of house and land in a single package is typical in the United States, but not, for example, in Australia and some European nations.

On Site Infrastructure (Finishing) Cost: On site infrastructure costs were estimated at 50% of the expected finished land cost.² There is no standardized database for such information.

Expected Finished Land and Regulation Cost: The cost of finished land that would be expected in a less restrictively regulated market. The *Demographia Residential Land & Regulation Cost Index* assumes this figure to equal 25% of the expected construction cost.³

Expected Raw Land and Regulation Cost: The expected finished land and regulation cost minus the cost of on-site infrastructure. The expected raw land and regulation cost is the base from which the *Demographia Residential Land & Regulation Cost Index* is calculated for each metropolitan market.

Expected House Construction Cost: House construction costs are estimated using a model based upon cost factors⁴ for house characteristic⁵ from R. S. Means *Square Foot Costs* and *Residential Square Foot Costs: 2010*.⁶ These cost estimates include all home builder costs, such as labor, materials, transportation financing and overheads. The cost estimates were then adjusted to account for these factors.

1. The cost estimates were adjusted to account for the lower square footage costs reported in the Bureau of the Census data (2008).

2. The maximum construction cost was assumed to be 80% of the advertised house price, consistent with the 20% land and regulation cost ratio. This maximum is necessary because in metropolitan markets with the lowest house prices, use of the *R.S. Means* factors can produce house cost estimates that exceed the price of the house and land combined. In markets where the land and regulation cost ratio exceeded the 20% norm, square footage cost estimates were placed at the highest house construction cost (locational adjusted) observed in metropolitan markets with the 20% land and regulation cost ratio to replicate the more competitive conditions that would be expected with less restrictive land use regulation.

The differential metropolitan market construction costs were adjusted based upon the midpoint of the R. S. Means and Craftsman geographical location factors.⁷ Construction finance costs were added.

House Size Standardization: The resulting data was standardized at 2,150 square feet for detached housing and 1,500 square feet for attached housing. These figures represent the approximate average house sizes in the new house database.⁸

² Based upon discussions with home builders and developers and <http://www.michaelcarliner.com/files/HE0303-MS-Cost.pdf> Housing Economics (NAHB) March 2003.

³ Calculation: Land and regulation cost divided by house construction cost (20% divided by 80% equals 25%).

⁴ Estimated from data in *Means Contractors Pricing Guide Residential Square Foot Costs: 2010*, R. S. Means (http://www.contractor-books.com/RS/Means_Contr_Pricing_Resi_SqFt.htm). The mid-points between economy houses and average houses was used in the calculations.

⁵ Such as square footage, number of bathrooms, size of garage as indicated in the new house offerings as identified for use in the *Demographia Residential Land & Regulation Index*.

⁶ A review of Craftsman cost estimates indicated general consistency with the R. S. Means cost estimates. See: "Building-Cost.net," Craftsman Book Company (<http://www.building-cost.net>).

⁷ There are substantial differences between the R. S. Means and Craftsman geographical factors (both of which provide locational factors at the "zip code" level. The average of the two sources is used. Calculated from data in *Means Contractors Pricing Guide Residential Square Foot Costs: 2010*, R. S. Means (http://www.contractor-books.com/RS/Means_Contr_Pricing_Resi_SqFt.htm) and "Building-Cost.net," Craftsman Book Company (<http://www.building-cost.net>).

⁸ These figures compare to Bureau of the Census data for new housing as follows (2008). Detached houses averaged 2,564 square feet, with a median of 2,317. Attached houses averaged 1,932 square feet, with a median of 1,794.

Lot size: Lot sizes vary and lot size information is typically not provided by the sources used in developing the new house database. As a result, lot size is not considered in the *Demographia Residential Land & Regulation Cost Index*. However a review of satellite photographs shows that new detached tract houses are being built on a variety of lot sizes (regardless of land regulation category), as indicated in Table II-1.

Calculation of the Index: The calculation methodology for the *Demographia Residential Land & Regulation Cost Index* is summarized in Table II-2 and Figure 1.

Sensitivity Analysis

As is noted above, there is variation in the actual land and regulation ratios in less restrictively regulated metropolitan markets, however there is no comprehensive database containing with this information. The *Demographia Residential Land & Regulation Cost Index* values were analyzed to estimate the effect of differing land and regulation ratio assumptions. A range of potential land development ratios were estimated from data obtained from less restrictively regulated metropolitan markets over a period of more than one decade. If a 17.4% land and development ratio is assumed (the average calculated from the review of available data), the *Demographia Residential Land & Regulation Cost Index* for more restrictive markets would rise from 5.9 to 6.8. At a higher 22.5% land and development ratio, the *Demographia Residential Land & Regulation Cost Index* for more restrictive markets would fall from 5.9 to 4.8. There would be no change in the *Index* values for the less restrictively regulated markets.

Thus, assuming a higher land and regulation cost ratio (22.5%), the *Demographia Residential Land & Regulation Cost Index* for more restrictive markets would be approximately 20% lower, and at the lower assumption (17.4%), the *Index* would be approximately 15% higher (both for detached and attached new houses), as is indicated in Table II-3.

| | Minimum | Maximum | Average |
|-----------------------------|---------|---------|---------|
| Atlanta | 4 | 14 | 7 |
| Dallas-Fort Worth | 5 | 9 | 7 |
| Houston | 6 | 10 | 8 |
| Indianapolis | 3 | 8 | 5 |
| Minneapolis-St. Paul | 4 | 10 | 5 |
| Portland | 5 | 11 | 8 |
| Raleigh-Durham | 4 | 9 | 6 |
| St. Louis | 4 | 14 | 6 |
| Seattle | 5 | 10 | 8 |
| Washington-Baltimore | 3 | 7 | 5 |
| Average | 4 | 10 | 7 |
| Less Restrictive Regulation | | | 7 |
| More Restrictive Regulation | | | 7 |

Notes:
 (1) As observed and measured on satellite photographs. In many cases, the satellite photography was not recent enough to determine lot sizes.
 (2) Net acre (rather than "gross acre") is the actual lot size sold to the buyer. It does not include land that is dedicated to public use, such as streets or open space.

| Table II-2 Demographia Residential Land & Regulation Cost Index Summary of Calculation Methodology | |
|--|--|
| 1 | Start with advertised house sales price |
| 2 | Estimate the <i>expected house construction cost</i> from a model based upon RS Means data (adjusted for metropolitan market construction cost differences, using a composite of RS Means and Craftsman location factors) |
| 2A | If the estimated house construction cost is greater than 80% of the house price, the expected house construction cost is set at 80% of the house price. |
| 2B | If the estimated house construction cost is less than 80% of the house price, the <i>expected house construction cost</i> from #2 is used, with a competitive discount to the location adjusted rate found for the most expensive construction market in which the house construction cost in #2A is 80% of the house price. |
| 3 | Estimate the expected finished land and regulation cost. |
| 3A | If the expected house construction cost (#2) is 80% of the advertised sales price (#1), then the expected finished land and regulation cost is 20% of sales price (a land and regulation cost ratio of 20%). |
| 3B | If the expected house construction cost (#2) is less than 80% of the advertised sales price (#1), then the expected finished land and regulation cost is 25% of the house construction cost (which equals a land and regulation cost ratio of 20%). |
| 4 | Estimate the excess land and regulation cost (<i>Column 1, Tables 1 & 2</i>). This is the advertised sale price (#1) minus the expected house construction cost (#2) minus the expected land and regulation cost (#3). |
| 5 | Estimate the expected raw land and regulation cost (<i>Column 1, Tables 1 & 2</i>). The expected finished land and regulation cost (#3) is reduced by 50% for on-site infrastructure installation expenses. |
| 6 | Exclude houses on more costly land. |
| 7 | Calculate averages from the remaining houses |
| 8 | Calculate the total land and regulation cost (<i>Column 3, Tables 1 & 2</i>). This is the expected raw land and regulation cost (#5) plus the excess cost of land and regulation (#4) |
| 9 | Calculate the <i>Demographia Residential Land & Regulation Cost Index</i> . This is the total land and regulation cost (#8) divided by the expected land and regulation cost (#5). |

Residential Land & Regulation Index CALCULATION EXAMPLES

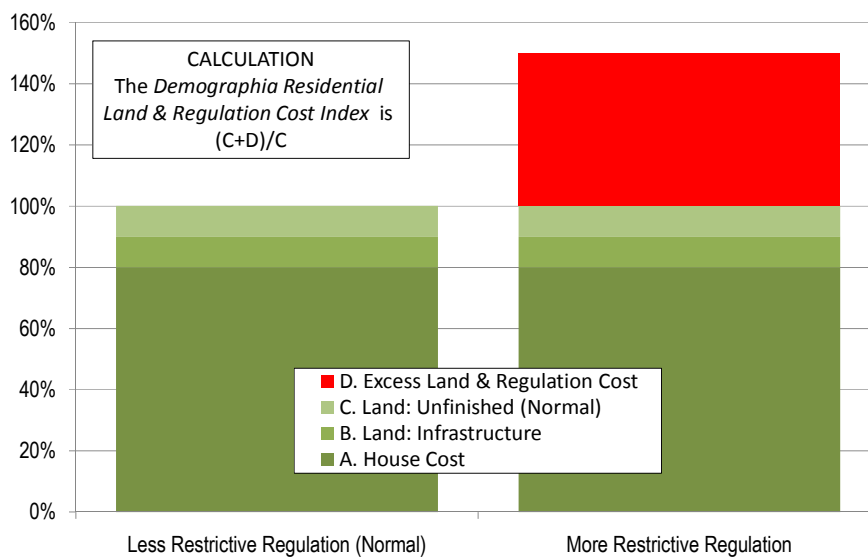


Figure 1

| Land & Regulation as a % of Advertised House (& Land) Price | | DETACHED HOUSING | | | ATTACHED HOUSING | | |
|---|------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | All Markets | Less Restrictive | More Restrictive | All Markets | Less Restrictive | More Restrictive |
| Scenario | Description | | | | | | |
| 15.2% | Average Minus 1 Standard Deviation | 4.4 | 1.0 | 7.8 | 4.8 | 1.0 | 7.1 |
| 17.4% | Average | 3.9 | 1.0 | 6.8 | 4.3 | 1.0 | 6.3 |
| 20.0% | Used in Index (Historic Norm) | 3.4 | 1.0 | 5.9 | 3.8 | 1.0 | 5.5 |
| 22.5% | High Sensitivity Analysis | 2.9 | 1.0 | 4.8 | 3.1 | 1.0 | 4.4 |

Base Data

Tables II-4 and II-5 contain base data used in the *Demographia Residential Land & Regulation Cost Index*.

| Metropolitan Market | Advertised House (& Land) Price | Expected House Construction Cost | Expected Finished Land & Regulation Cost | Exhibit: Expected Raw Land & Regulation Cost | Advertised Local Price per Square Foot of House |
|----------------------|---------------------------------|----------------------------------|--|--|---|
| Atlanta | \$161,000 | \$128,800 | \$32,200 | \$16,100 | \$75 |
| Dallas-Fort Worth | \$145,100 | \$116,100 | \$29,000 | \$14,500 | \$67 |
| Houston | \$131,600 | \$105,200 | \$26,400 | \$13,200 | \$61 |
| Indianapolis | \$138,700 | \$110,900 | \$27,800 | \$13,900 | \$65 |
| Minneapolis-St. Paul | \$228,800 | \$160,100 | \$40,000 | \$20,000 | \$106 |
| Portland | \$228,300 | \$135,200 | \$33,800 | \$16,900 | \$106 |
| Raleigh-Durham | \$160,200 | \$128,200 | \$32,000 | \$16,000 | \$75 |
| St. Louis | \$168,800 | \$135,000 | \$33,800 | \$16,900 | \$79 |
| San Diego | \$402,300 | \$145,100 | \$36,200 | \$18,100 | \$187 |
| Seattle | \$231,100 | \$143,700 | \$36,000 | \$18,000 | \$107 |
| Washington-Baltimore | \$234,900 | \$128,200 | \$32,000 | \$16,000 | \$109 |
| Average | \$202,800 | \$130,600 | \$32,700 | \$16,300 | \$94 |

Note: Advertised price per square foot is the total price of the house (including land). All house sizes are normalized to 2,150 square feet..

| Metropolitan Market | Advertised House (& Land) Price | Expected House Construction Cost | Expected Finished Land & Regulation Cost | Exhibit: Expected Raw Land & Regulation Cost | Advertised Local Price per Square Foot of House |
|----------------------|---------------------------------|----------------------------------|--|--|---|
| Houston | \$118,500 | \$94,700 | \$23,800 | \$11,900 | \$79 |
| Minneapolis-St. Paul | \$160,200 | \$112,900 | \$28,200 | \$14,100 | \$107 |
| St. Louis | \$156,200 | \$125,000 | \$31,200 | \$15,600 | \$104 |
| San Diego | \$314,700 | \$151,000 | \$37,800 | \$18,900 | \$210 |
| Washington-Baltimore | \$173,100 | \$94,600 | \$23,600 | \$11,800 | \$81 |
| Average | \$184,540 | \$115,640 | \$28,920 | \$14,460 | \$116 |

Note: Advertised price per square foot is the total price of the house (including land). All house sizes are normalized to 1,500 square feet..