

The Association between Prescriptive Land Use Regulation and Higher House Prices: *Literature Review on Smart Growth, Growth Management, Livability, Urban Containment and Compact City Policy*

It is a fundamental principle, that all things being equal, that limiting the supply of a good or service is likely to lead to higher prices. This is a particularly important relationship in housing, because of the adoption of much stronger land use regulations ("prescriptive land use regulation") around the world. Generally, research associates higher house prices with the implementation and enforcement of stronger land use regulations.

Prescriptive land use regulations include measures such as urban growth boundaries, large areas declared off-limits to development, building moratoria, population limits, unit construction limits, expensive unprecedented impact fees, excessively large minimum lot sizes and other restrictive strategies. Prescriptive land use regulation allows development only prescribed under strict conditions that are consistent with stringent land use plans and policies.

These policies are referred to as "smart growth," (also called "livability," "compact development," "urban containment," and in Australia, "urban consolidation"). Smart growth generally places restrictions on the supply of new housing and are associated with higher house prices and a reduced volume of house construction.

The alternative to prescriptive land use regulation is ***responsive land use regulation***, which allows development to respond to the market as reflected in the preferences of people and businesses (and subject to reasonable environmental and health regulation).

Empirical Research

Considerable econometric and other empirical research has examined the association between prescriptive land use policies and higher house prices. The research overwhelmingly indicates that stronger land use regulation is associated with higher house prices. Moreover, even comparatively modest house price differentials can have a significant effect on a community and its inhabitants. Brookings Institution economist Anthony Downs (1994, p. 36) notes that even a modest 10 percent increase in house prices makes it impossible for four percent of household to purchase a home, and concludes such an effect to be "socially significant."

One literature review lists more than 25 studies over a period of 30 years, all of which indicate a potential for association between stringent land-use regulation and higher house prices (Quigley and Rosenthal 2005).¹ The extent to which house price increases are associated with land use regulation varies. Research has associated as much as 90 percent of average overall house price

¹ This count is limited to research involving prescriptive land use regulation.

increases with prescriptive land use regulation (Eicher 2008b), with house price differentials of up to 54 percent and new house price differentials of up to 61 percent (Downs 1992).

This document provides a representative review of the research on prescriptive land use regulation and its association with higher house prices. The research is divided into the following sections:

- (1) Price Research by Central and Reserve Banks and International Organizations
- (2) Academic Price Research
- (3) Research on Price Volatility and Speculation
- (4) Research Cited to Refute the Association
- (5) The Principle of Competitive Land Supply
- (6) Research on the Housing Bubble and Prescriptive Land Use Regulation
- (7) Research on Prescriptive Regulation and Metropolitan Economies

(1) Price Research by Central and Reserve Banks and International Organizations

The association between prescriptive land use regulation and higher house price has been examined by a number of economists associated with national central and reserve banks and international organizations.

Barker: United Kingdom government reports by Kate Barker (2004 and 2006), then a member of the Monetary Policy Committee of the Bank of England, blamed that nation's loss of housing affordability on its prescriptive land use policies under the Town and Country Planning Act of 1947 (The *Barker Report*).

Grimes: A New Zealand government report by Arthur Grimes (2007), Chairman of the Board of the Reserve Bank of New Zealand blamed the loss of housing affordability in the nation's largest urban area, Auckland, on prescriptive land use policies. In another report, Grimes (2025 Taskforce 2009) found that per-acre prices just inside Auckland's urban growth boundary were 10 times that of comparable land on the other side of the urban growth boundary.

Stevens: Reserve Bank of Australia Governor Glenn Stevens told a parliamentary committee that "An increase in state government zoning regulations is a significant factor driving up the cost of housing." He also noted the increase in local and state government levies on new developments as a driver of higher housing prices.

In a 2011 parliamentary committee appearance, Governor Stevens (Stevens 2011) said:

How is it that a country of our size—we are not short of land—cannot add to the dwelling stock for the marginal new entrant more cheaply than we seem to be able to do? I cannot get past that basic question. But—without denying that interest rates have an effect on the

housing market, obviously—it seems to me that this goes to a whole group of things on supply, zoning, transportation, infrastructure et cetera.

He added a note of caution:

There is a very big inequality between generations that is building up. I think that is a social problem as much as an economic one.

MacFarlane: In 2006, Governor of the Reserve Bank of Australia (that nation's central bank) testified about the impacts of prescriptive land use policies on house prices:

Why has the price of an entry-level new home gone up as much as it has? Why is it not like it was in 1951 when my parents moved to East Bentleigh, which was the fringe of Melbourne at that stage, and where they were able to buy a block of land very cheaply and put a house on it very cheaply? Why is that not the case now? I think it is pretty apparent now that reluctance to release new land plus the new approach whereby the purchaser has to pay for all the services up front - the sewerage, the roads, the footpaths and all that sort of stuff, has enormously increased the price of the new, entry-level home.

The reference to reluctance to release new land refers to the practice of Australian land use authorities to allow insufficient amounts of land to be developed to maintain the competitive land supply, while "paying for services up front" refers to the practice of requiring excessive development impact fees as a condition of building new houses.

Brash: Former Reserve Bank of New Zealand Governor Donald Brash (2008) wrote that *the affordability of housing is overwhelmingly a function of just one thing, the extent to which governments place artificial restrictions on the supply of residential land.*

Federal Reserve Bank of Dallas: An analysis by the Federal Reserve Bank of Dallas (2008) notes the association between metropolitan area house price increases in the 2000-2006 housing bubble and the presence of prescriptive land use regulation.

Demand for housing, driven by low interest rates and a growing economy, combined with supply restrictions—such as zoning laws, high permitting costs and “not in my backyard” regulations—to contribute to rapid price appreciation. ... low levels of construction in the face of strong demand contributed to significant price appreciation...

The analysis notes that in the responsive markets of Atlanta, Dallas-Fort Worth and Houston, flexibility with respect to housing supply spared those metropolitan areas the price increases that occurred in prescriptive markets.

... Atlanta, Dallas-Fort Worth and Houston “weathered the increased demand largely with new construction rather than price appreciation because of the ease of building new homes.

OECD (2005): A report by the Organization for Economic Cooperation and Development (OECD) provides further evidence of the association between prescriptive land use regulations and higher house prices. The OECD noted that

House prices can also be affected by other features that are particular to this market. Of note are restrictions on the availability of land for residential housing development that can constrain the responsiveness of supply. These would include tough zoning rules, cumbersome building regulations, slow administrative procedures, all of which would restrict the amount of developable land.

The report highlighted the experience of the United Kingdom, consistent with the conclusions of the *Barker Report* (above).

In the United Kingdom, complex and inefficient local zoning regulations and a slow authorisation process are among the reasons for the rigidity of housing supply, underlying both the trend rise of house prices and their high variability.

In the same report (OECD 2005, Box III.2, Page 211), OECD notes the substantial differences in housing affordability between US markets. The OECD associates more restrictive land use regulation with less affordable housing in California, New Jersey, Massachusetts, New Hampshire and the Washington DC area. The OECD also shows Texas (which has responsive land use regulation) as having superior housing affordability.

OECD (2011): A recent review of international housing markets by OECD noted that: "Poorly managed housing markets played a key role in triggering the recent global financial crisis and may be slowing the recovery" OECD expressed concern about planning regulations that drive up prices lead to greater price volatility, and recommended that nations: "Increase responsiveness of new housing supply to market demand" and noted further than nations "should reassess licensing procedures that limit new housing starts and reconsider land-use regulations that unduly prevent development. More responsive supply can limit price volatility, excessive price increases and encourage labour mobility." This advice was particularly directed at the United Kingdom and Australia, which are dominated by stringent land use regulation.

World Bank: World Bank Economist Steven K. Mayo (1997) indicated that "house prices in enabling cities with stricter regulatory policies have risen in relative terms some 30 to 60 percent over a 15-year period." He further noted "Relative shifts in housing costs are in some cases equivalent to doubling potential residents' combined federal and state income tax, creating powerful disincentives for moving and for the functioning of labor markets These and similar findings suggest that systematic policy mistakes have been made, that their costs have been high, and that it is time for a general change in thinking about the aims and instruments of land and housing policy."

(2) Academic House Price and Housing Supply Research

There has also been considerable academic research on the association between prescriptive land use regulation and higher house prices.

Hall, Thomas, Gracey & Drewett: Perhaps the earliest evaluation of a prescriptive land use regulation was in the two volume *The Containment of Urban England*, which was a five year project by a team of academics led by urbanologist Sir Peter Hall (1973) of University College, London. The subject of this early 1970s work was the housing market as it had evolved since the

enactment of the Town and Country Planning Act in 1947. Hall and his colleagues find that "perhaps the biggest single factor of the 1947 planning system is that it failed to check the price and land prices which is probably the largest and most potent element of Britain's postwar inflation." The results are characterized as being inconsistent "with the objective of providing cheap owner occupied housing." Moreover, Hall, et al note that the planning system has imposed the greatest burdens on lower income households

Fischel: Stronger land use regulation was implemented in California in the 1970s through court decisions and administrative actions. William Fischel of Dartmouth University (Fischel 1995, 218-225) notes that until 1970 California house prices were similar to those in the rest of the nation. Fischel indicates that in 1970, California median house prices relative to median family incomes were 29 percent higher than in the rest of the nation. By the end of the decade, California house prices had escalated to more than 75 percent higher in relation to incomes of this in the rest of the nation and by 1990 the difference had expanded to approximately 120 percent.

Fischel looks at potential causes for the divergence of California house prices from those in the rest of the nation. He finds that there was little difference in the trend of construction costs between California and the nation and notes that the housing price "explosion" is not "explained at all by construction costs.

Fischel then notes that one of the most important elements of demand that might be expected to increase house prices, incomes that were rising faster than the rest of the nation did not occur.

Fischel agrees that the quality of life in California is perceived to be better than in much of the rest of the nation, yet finds that no evidence that the California advantage had expanded during the 1970s, when the house price difference expanded. He suggests that it would have been more likely to expect the large increases to have occurred before 1970, when, according to Fischel, the amenity differential between California and the rest of the nation was greater. Other research that has examined amenity differences between California and the rest of the nation has generally not included land use regulation differences in econometric specifications.²

Fischel also notes that the 1970s were a relatively slow growth decade in California, which removes another demand side impact it could have been expected to influence house prices upward. He also notes that California's property tax limitation (Proposition 13), which was enacted in 1978, came after the most significant house price increases.

Finally, Fischel finds that land for development is plentiful, eliminating the scarcity of land as a factor that had should have driven house prices upward.

Eicher: Theo Eicher of the University of Washington (2008b) developed an econometric analysis of house price increases in 250 municipalities around the nation between 1989 and 2006. He divides the factors into two broad categories. Demand factors include the increase in

² See, for example, Costa and Kahn (2003), who find substantial amenity advantages reflected in the increase in house prices in San Francisco compared to Chicago from 1970 to 1990. Their econometric specification, however, did not include the impact of the land use regulatory increase over the period, which according to Fischel and others was associated with substantial price escalation in California relative to the rest of the nation.

household income, the increase in population and the increase in population density. Supply factors include various regulatory measures. House prices are normalized for inflation. In an examination of five municipalities in the state of Washington, Eicher associates approximately 90 percent of the increase in house prices to land-use regulatory factors both in a sample of five Washington municipalities. In an earlier working paper, Eicher's data also indicates that approximately 87 percent of house price increases in 250 US municipalities was associated with more stringent land use regulation (Eicher 2008a).

Gyourko and Summers: Gyourko and Anita Summers (2006) of the University of Pennsylvania analyzed land use regulation in the Philadelphia metropolitan area and found that larger lot price increases are associated with more extensive land use regulation. They further found that association between more stringent land use regulation and higher lot prices was stronger than the association between land scarcity (population density) and higher lot prices. More restrictive land use regulation was associated with at least 70 percent higher relative areas with less stringent regulation. This finding that the demand variable of population density was less robustly associated with higher house prices than regulation is parallel to the Eicher findings, above.

Malpezzi: Stephen Malpezzi (1996) of the University of Wisconsin examined house prices in 56 metropolitan areas using an econometric analysis to identify the impacts of various degrees of regulation. This analysis indicates a 51 percent house price premium in the highly regulated metropolitan areas. Moreover, he finds that building permits in such areas tend to be approximately 40 percent lower than would have been expected.

Brueckner: Jan Brueckner (2007) of the University of California, Irvine suggests that an urban area with an urban growth boundary (UGB) will tend to have higher housing costs and says that "Unless there are offsetting benefits, a UGB land-use intervention that makes consumers less well off." Brueckner's review of the economic literature

...points to a potential pitfall in government land use interventions. Well-meaning interventions that cause land use outcomes to diverge substantially for free market outcomes run the risk of generating net social losses. The problem is that the expected benefits from large interventions may be swamped by unanticipated losses, which may be overlooked by government officials with an incomplete understanding of the operation of real estate markets.

Glaeser and Gyourko: Edward Glaeser of Harvard University and Joseph Gyourko of the University of Pennsylvania (2002) compare house prices to the cost of construction of houses and find, through an econometric analysis, that the differential between replacement costs and house plus land costs are greater where there is stronger land use regulation. They noted:

America does not uniformly face a housing affordability crisis. In the majority of places, land costs are low (or at least reasonable) and housing prices are close to (or below) the costs of new construction. In the places where housing is quite expensive, zoning restrictions appear to have created these high prices.

Saks: In an econometric analysis, Raven Saks (2005) of the Federal Reserve Board finds that in an equal demand shock "places with more regulation "experience a 17 percent smaller expansion of the housing stock and almost double the increase in housing prices."

Katz and Rosen: In an econometric analysis, Kenneth Katz of Harvard University and Lawrence Rosen (1987) of the University of California, Berkeley found that growth control measures "appear to have had a substantial impact on housing prices." In an examination of San Francisco Bay Area municipalities, they found that jurisdictions with growth control measures had house prices between 17 and 38 percent higher than where there were no such measures.

Cheshire: In an analysis and compendium of research on the association between stronger land use regulation and higher house prices, Paul Cheshire (2009) of the London School of Economics concluded that prescriptive land use regulation (which he refers to as urban containment) is incompatible with housing affordability and price stability.

Angel: Princeton University and New York University Professor Shlomo Angel (and co-author with Steven Mayo of the United Nations and World Bank housing indicators program) said:

Enabling mortgage finance and subsidy policies, for example, can increase the demand for housing, while heavy-handed regulations and infrastructure shortages can constrain supply. The overall result can be a shortage of housing, accompanied by high prices and low affordability for all. If, on the other hand, supply-side policies are enabling, then housing supply may be able to expand quickly to meet demand, with the result that higher demand will result in more housing at affordable prices.

Hilbur and Robert-Nicoud: Christian Hilber of the London School of Economics and Frederic Robert-Nicoud of the University of Geneva conclude that land use regulations "impose --- via increasing housing costs --- an enormous gross cost on households" in an econometric analysis of US metropolitan areas. They also associate stronger land use regulation with a "highly significant" reduction in the growth rate of housing supply.

Guidry, Shilling and Sirmans: Krisandra Guidry, James Shilling, and C.F. Sirmans (1991) found that finished residential lot prices in the "most restrictive" markets was more than \$50,700, but only \$23,800 in "least-restrictive" markets (cited in Nelson, et al).

Downs: Anthony Downs (1992) examined the effects of growth management plans in San Diego and associated higher prices of existing homes of 54 percent and new homes of 61 percent in a period of three years. Downs (2000) also reviewed the experience of Portland's urban growth boundary and found an association with higher house prices in some year and not in others. His review was performed before the substantial house price escalation that occurred after 2000. Downs also notes that the mere establishment of an urban growth boundary is not associated with higher house prices, but that if the urban growth boundary is tightly drawn and strongly enforced in an environment of strong demand, an association with higher house prices can be expected.

Green, Malpezzi and Mayo: Richard Green of the University of Wisconsin, Malpezzi and Mayo (2005) performed an econometric analysis of 44 US metropolitan areas and found that heavily regulated metropolitan areas "always" had constricted housing supplies (low elasticities). In

reviewing research in which economists have attempted to establish indexes of regulatory restrictiveness,

Green and Malpezzi: In reviewing research in which economists have attempted to establish indexes of regulatory restrictiveness, Green and Malpezzi (2003) say that *regardless of the index used, increased levels of regulations bring about higher house prices*. Their own model indicates a strong association between more restrictive land-use regulations, higher house prices, higher rents, and diminished home building. Finally, Green and Malpezzi indicate that more restrictive regulations "increase costs, often without corresponding benefits."

Glaeser, Sheutz and Ward: Edward Glaeser, Jenny Shuetz and Bryce Ward (2006) also show that the prescriptive planning recommended strategy of large lot or rural zoning can be associated with substantially higher house prices, by excessive consumption of land available for development. The researchers found that Boston's house prices had been inflated 60 percent by such planning induced scarcity.

Krugman: Nobel Laureate economist Paul Krugman (2005 and 2006) of Princeton University and the *The New York Times* noted that the house price bubble had been limited to metropolitan areas with strong land use regulation. In a later article, Krugman cited the relationship between the more liberal land use regulation of Texas and its lower cost of living:

For this much is true about Texas: It has, for many decades, had much faster population growth than the rest of America — about twice as fast since 1990. Several factors underlie this rapid population growth: a high birth rate, immigration from Mexico, and inward migration of Americans from other states, who are attracted to Texas by its warm weather and low cost of living, low housing costs in particular.

And just to be clear, there's nothing wrong with a low cost of living. In particular, there's a good case to be made that zoning policies in many states unnecessarily restrict the supply of housing, and that this is one area where Texas does in fact do something right.

(3) Research on Price Volatility and Speculation

In addition to the association between prescriptive land use regulation and higher house prices, economic research has indicated an association between greater price volatility and prescriptive land use regulation as well as an association between more intense speculation and prescriptive land use regulation.

Federal Reserve Bank of Dallas: The Federal Reserve Bank of Dallas (2008) associates the rising prices from prescriptive land use regulation with higher levels of real estate speculation, which drives prices even higher.

These price increases then fed off themselves. Rising prices—whether for gold, corn or houses—often foster a bubble mentality, contributing to speculative demand.

Prescriptive land use regulation is also associated with more volatile prices. Prescriptive land use regulation brings more chaotic "boom and bust" cycles to housing markets.

Glaeser and Gyourko: This is noted by Glaeser and Gyourko (2008), who summarize the findings of a number of studies:

Recent research also indicates that house prices are more volatile, not just higher, in tightly regulated markets.

...price bubbles are more likely to form in tightly regulated places, because the inelastic supply conditions that are created in part from strict local land-use regulation are an important factor in supporting ever larger price increases whenever demand is increasing.

They further show that in the house price booms of the 1980s and 1990s "price increases were much higher in markets that were more supply constrained." Thus, prescriptive land use regulations converts more modest price bubbles into more severe price bubbles.

Finally, they note that housing bubbles generally do not occur in responsive markets.

It is more difficult for house prices to become too disconnected from their fundamental production costs in lightly regulated markets because significant new supply quickly dampens prices, thereby busting any illusions market participants might have about the potential for ever larger price increases.

Malpezzi and Wachter: Malpezzi and Susan Wachter (2005) of the University of Pennsylvania conclude that speculation is largely limited to where there are significant supply constraints. They conclude that "the effects of speculation appear to be dominated by the effect of the price elasticity of supply. In fact, the largest effects of speculation are only observed when supply is inelastic."

Malpezzi: In his analysis of Korean housing markets, Malpezzi (2005) notes that "speculation is more a symptom than a cause of a poorly performing housing market.

Haughwout, Donghoon, Tracy and van der Klaauw: Andrew Haughwout, Donghoon Lee, Joseph Tracy and Wilbert van der Klaauw (2011) of the Federal Reserve Bank of New York show that speculative activity was much greater in California, Florida, Arizona and Nevada (which they label the "bubble states") than elsewhere during the housing bubble. According to the researchers, this greater speculative activity in these markets made the market more instable because unlike owner-occupiers, investors are far more likely to default on mortgage loans.

(4) Research Cited to Refute the Association

Proponents of prescriptive land use regulation have generally contended that it is not associated with higher house prices. Research is cited to support this position is described below.

Nelson, Pendall, Dawson and Knapp: The work of Arthur Nelson, Rolph Pendall, Casey Dawson and Gerrit Knapp (2008) for the Brookings Institution has been frequently cited by advocates of smart growth to demonstrate that house prices are not associated with stronger land use regulation. As economist Theo Eicher notes, "even cursory reading of the executive summary reveals" that the conclusions of the paper do not deny such an association" (Eicher

2008b). Further, Connerly (2007) shows that 32 of the economic studies cited by Nelson, et. al, indicate an association between stronger regulation and higher house prices.

In fact, Nelson et al find such an association urban growth boundaries and higher house prices in California.

However, even well-intentioned growth management programs ... can accommodate too little growth and result in higher housing prices. This is arguably what happened in parts of California where growth boundaries were drawn so tightly without accommodating other housing needs

Nelson, et al find no association between Portland's strong urban growth boundary and house price increases. However, there is evidence to the contrary, including the Downs finding of some association in some years before 2000 (Downs 2002). Moreover, later data (Section 5) indicates that Portland house prices had escalated strongly relative to prices in more responsive markets (obviously, this information was not available to Nelson, et. al at the time).

Two studies cited by Nelson, et al found mixed results that support the Nelson, et al "design" hypothesis (Landis 1986 and Lowry and Ferguson 1992), by finding that house price escalation was associated with more rigid prescriptive land use policies. Each study found an association in a metropolitan area with a more rigid urban growth boundary, but not in a comparison metropolitan area in which an urban containment device was less rigid or less rigidly enforced.

This is consistent with the Nelson, et al conclusion that more restrictive land use regulation can lead to higher prices:

“... the housing price effects of growth management policies depend heavily on how they are designed and implemented. (emphasis in original) If the policies tend to restrict land supplies, then housing price increases are expected.”

The Nelson, et al point about regulatory flexibility and densification is confirmed by the experience in Portland, Las Vegas and Phoenix where urban growth barriers had little association with house prices when there was a significant amount of developable land available. However, as the available land within the barriers declined, the association between the availability of land and higher housing prices became evident (Cox 2011a).

Association with Higher Prices Conceded: Even so, in *The Costs of Sprawl---2000*, (Burchell, et al 2002) which is largely sympathetic to prescriptive land use regulation, the authors note the potential for the first seven of their top ten strategies to increase house prices. *The Costs of Sprawl---2000* was published by the Transportation Research Board, a unit of the National Academies of the United States (Table).

Erroneous Claim: Smart Growth Reduces House Prices: *The Costs of Sprawl---2000* (Burchell, et al 2002) predicted that from 2000 to 2025 house prices in markets with smart growth would experience house price declines relative to markets without smart growth. Even after the bursting of the housing bubble, median house prices in the prescriptive markets have risen \$68,000 relative to prices in responsive markets (Cox 2011c),

The Issue: How Much Does Prescriptive Land Use Regulation Raise Prices? Thus, the proponents of prescriptive land use regulation both deny and admit that smart growth strategies increase housing prices. These households tend to have lower incomes than home owning households. The Tomas Rivera Policy Institute (Lopez-Aquerez, Skaga and Kugler 2002), a Latino research organization expressed concern about the extent to which California's prescriptive land use regulation was interfering with Latino home ownership opportunities:

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

(5) The Principle of Competitive Land Supply

Economist Anthony Downs of the Brookings Institution has indicated the importance of maintaining the "principle of competitive land supply" (Downs 1994, p. 38). Downs notes:

If a locality limits to certain sites the land that can be developed within a given period, it confers a preferred market position on those sites. In economists' terminology, any such limitation shifts the demand curve for developable land upward and to the left, raising land prices. If the limitation is stringent enough, it may also confirm a monopolistic powers on the owners of those sites, permitting them to raising land prices substantially.

This is illustrated by the experience of Portland, Las Vegas and Phoenix (Cox 2011a).

Portland: Severe house price escalation occurred in Portland after the regional land use authority (Metro) failed to expand the urban growth boundary sufficiently to handle demand. Phillips and Goodstein (2000) cited research by Metro indicating that residential land at the edge, but inside the urban growth boundary averaged nearly seven times the value per acre of residential land just beyond the urban growth boundary (Phillips and Goodstein 2000). Later research Portland indicated that land on which development is permitted inside the urban growth boundary tended to be 10 times as valuable per acre as land immediately outside the urban growth boundary, on which development was not permitted (Mildner 2009). The author's more recent examination of all developable parcels in Portland's Washington County indicated that the difference had increased to 11 times (Cox 2011a).³

In 1980, the urban growth boundary encompassed an area equal to 23 percent of urban footprint.⁴ By 1990, this had fallen to 12 percent, and then to six percent by 1995. By 2000, the land inside the urban growth boundary was less than one percent relative to the urban footprint.

³ The selection criteria included only undeveloped properties of 5 or more acres and unfinished (without on-site infrastructure). Research conducted based upon Internet information in February 2010. Property along 25 miles of the urban growth boundary from Cedar Hills to Hillsboro to southwest Beaverton was included in the analysis.

⁴ The urban footprint plus the land inside the urban growth boundary equaled 123 percent of the urban footprint. Urban area in Oregon (part of the urban area is in Washington). Calculated from US Census Bureau and Metro data.

Table 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 (Burchell, et al).</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>		

As the available land inside the urban growth boundary diminished, Portland experienced the largest housing affordability loss among major metropolitan areas during the 1990s (Cox 2002). By the end of the 1990s, the gap between the urban growth boundary and the urban area (reflective of developable land on the fringe) had dropped by more than 95 percent from 1980 (Cox 2011a), as Metro (the regional land use agency) had failed to provide expansions sufficient to meet the demand. For the first time since World War II, Portland house prices exceeded a 3.0 Median Multiple (median house price divided by median household income)⁵ and by the peak of the bubble (2007) Portland house prices had escalated a further 90 percent relative to household incomes, to 5.4. Before the middle 1990s, Portland's housing affordability had been similar to that of responsive housing markets. From 1980 to 1995, Portland's Median Multiple averaged 2.5, just below the average of the responsive markets, at 2.6. The highest Median Multiple in Portland during that period was in 1994, at 3.1. The highest responsive market Median Multiple

⁵ This broadly utilized indicator of housing affordability has generally been 3.0 or below in responsive markets in the United States (which included all markets before 1970). Additional details on the Median Multiple will be found in the *7th Annual Demographia International Housing Affordability Survey*, pp 1 & 7. <http://www.demographia.com/dhi.pdf>

over the same period was 2.8, which Portland had equaled or exceeded in only one year until 1994.

Moreover, it is possible that Portland's house price increases were moderated by the more liberal land use regulations in the portion of the metropolitan area in the state of Washington (This includes the municipality of Vancouver as well as Clark and Skamania counties).

Portland's house price escalation continued into the 2000s, as house prices escalated during the bubble to a 5.4 Median Multiple in 2007, 70 percent above the responsive market average of 3.2. As of 2010, Portland house prices remained 50 percent above the responsive market Median Multiple.⁶

Las Vegas and Phoenix: The effects of a loss of a competitive land supply is illustrated by Las Vegas and Phoenix. Similarly, there are *virtual urban growth boundaries* in Las Vegas and Phoenix. These development constraints are defined by surrounding government owned land, some of which has been sold through auctions intended to *maximize* revenues. While this approach makes commercial sense, it *maximized* land prices and ultimately reduced housing affordability.

During the 1990s and 2000s, Las Vegas was the fastest growing metropolitan area with a population above 1,000,000 in the United States. Despite the strong demand, house prices had remained near historic norms through 2002.

The competitive supply of land was being depleted by the continuing growth and much of the new land had to be purchased from the federal government at auction.

Substantial escalation (approximately 85%) occurred in house prices from 2002 to 2006. Coincidentally, over the same period, federal government land auctions prices for urban fringe land rose from \$50,000 per acre in 2001-2, to \$229,000 in 2003-4 and \$284,000 at the peak of the housing bubble in 2005-2006 (Cox 2010a).

In the Phoenix urban area, state auction prices rose nearly as much as in Las Vegas, as the competitive land supply had been depleted. This coincided with substantial house price increases (Cox 2010b).

Across the Urban Growth Boundary Land Value Differences: As noted above with respect to Portland, the urban growth boundaries and similar regulatory restrictions have been associated with significant differences in the value of virtually adjacent undeveloped lands depending on the potential for planning permission. Without an urban growth boundary, it would be expected that land on both sides of an urban growth boundary would have similar values.

New Zealand: As noted above, Grimes found that land prices across Auckland, New Zealand's urban growth boundary varied significantly. Land prices per acre just inside the urban growth boundary averaged 10 times the prices per acre of comparable land just outside the urban growth boundary (Grimes 2009).

⁶ Calculated from US Census Bureau and National Association of Realtors data.

United Kingdom: A variety of value differentials between land on which development is permitted or not permitted has been identified in the United Kingdom. Cheshire has found cases in which agricultural land could increase in value 700 times when rezoned for residential development in Southeast England (Cheshire 2010). Timothy Leunig of the London School of Economics founded differentials of 500 times in the London area (Leunig 2007). The Barker report contains data indicating that differentials average 250 times outside the London area (Barker 2006).

When Competitive Land Supply is Lost: Failing the Nelson et al Test: The land price differentials and house price trends indicated in Auckland, England, Portland, Las Vegas and Phoenix provide strong indication that a competitive land supply probably has not been maintained. In each case, the test suggested by Nelson et al, seems to have been failed. The competitive land supply was not maintained, as the policies tended to "restrict land supplies." The housing price increases that Nelson et al. "expected" have in fact happened.

(6) Research on the Housing Bubble and Prescriptive Land Use Regulation

The research also indicates that prescriptive land use regulation is associated with intensified housing bubbles.

Glaeser and Gyourko: As noted above, Glaeser and Gyourko showed that in the house price booms of the 1980s and 1990s "price increases were much higher in markets that were more supply constrained" (Glaeser and Gyourko 2008).

Sowell: Thomas Sowell of the Hoover Institution associated smart growth regulation with the extraordinary run-up in prices in some markets and noted that where smart growth had been resisted, "home prices remained reasonable despite rising incomes and population (Sowell 2007)."

He commented on further in *The Housing Boom and Bust*:

It is very doubtful if many in academic communities who have campaigned zealously for land use restrictions under any of the heady and lofty labels used for these restrictions, have any idea that they are in any way responsible for the dire financial conditions in the country today or for the hundreds of thousands of workers who have lost their jobs.

Later research by this author indicates that when more the profligate mortgage loan policies were implemented during the US housing bubble, metropolitan areas that had adopted prescriptive land use policies lacked the resilient land markets that would have allowed the greater demand to be accommodated without inordinate increases in house prices. These resulting price increases were unprecedented and led to the intensive mortgage losses than precipitated the international financial crisis (Cox 2008 and 2011).

Finally, a recent review of international housing markets cited above by OECD (2011) noted that: "Poorly managed housing markets played a key role in triggering the recent global financial crisis and may be slowing the recovery"

(7) Research on Prescriptive Regulation and Metropolitan Economies

Econometric research also suggests an association between slower economic growth and prescriptive land use regulation.

Saks: Raven Saks (Saks 2005) examines the relationship between house prices, housing supply and employment growth in metropolitan areas in the United States between 1980 and 2000. The resulting econometric analysis finds that where housing supply is more constrained by regulations, employment growth is likely to be less than expected. The annual differential is estimated at a reduction of 0.2 percent per one percent of growth (a 20 percent reduction in the annual growth rate)

Nandwa and Ogura: Boaz Nandwa of the University of Dubai and Laudo Ogura (2010) of Grand Valley State University perform an econometric analysis of US metropolitan areas to identify any Association between economic productivity and strict land-use controls. They find that metropolitan areas with strict land-use regulation tend to have an annual productivity increase of 0.6 percent less than would be expected with less stringent regulation.

Vermeulen and Van Ommeren: Wouter Vermeulen of the Netherlands Bureau of Economic Analysis and Jos Van Ommeren (2008) of VU University (Amsterdam) performed an econometric analysis that associated the slower employment growth of the Randstad (the largest metropolitan region in the Netherlands, consisting of Amsterdam, Rotterdam, the Hague and other municipalities) compared with surrounding regions with the housing supply limitations attributable to stronger land use regulation.

Mayo and Angel: Stephen K. Mayo and Shlomo Angel (1993, 108) cite research associating higher unemployment rates in the north of England and Scotland with the UK's more restrictive land use regulations.

REFERENCES

2025 Task Force (2009), *The \$64,000 Question: Closing the Income Gap with Australia by 2025*, New Zealand Government, <http://www.2025taskforce.govt.nz/pdfs/2025tf-1streport-nov09.pdf>.

Angel, Shlomo, *Housing Policy Matters: A Global Analysis*, Oxford University Press, 2000, p. 19).

Barker, Kate (2004). *Review of Housing Supply: Delivering Stability: Securing Our Future Housing Needs: Final Report—Recommendations*. Norwich, England: Her Majesty's Stationery Office. www.hm-treasury.gov.uk/consultations_and_legislation/barker/consult_barker_index.cfm,

Barker, Kate (2006), *Barker Review of Land Use Planning*, http://www.hm-treasury.gov.uk/media/4EB/AF/barker_finalreport051206.pdf.

Brash, Donald (2008), "Introduction to the 4th Annual Demographia International Housing Affordability Survey," <http://www.demographia.com/dhi.pdf>.

Brueckner, J. K., (2007), "Government Land-Use Interventions: An Economic Analysis," 4th Urban Research Symposium, World Bank, Washington, D.C.

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.

Cheshire, Paul (2009), "Urban Containment, Housing Affordability, Price Stability - Irreconcilable Goals," <http://www.sjcapitalgroup.com/publications/Urban%20containment%20housing%20affordability%20and%20price%20stability.pdf>

Cheshire, Paul (2010) "Urban Land Markets and Policy Failures," http://www.bis.gov.uk/assets/bispartners/foresight/docs/land-use/luf_report/dis02_urban_land_market_and_policy_failures.pdf

Connerly, C. E., (2004), "Smart Growth" Opportunity or Threat for Affordable Housing?" Florida State University Working Paper, published (without tables) in *Incentives, Regulations and Plans: The Role of States and Nation-states in Smart Growth Planning* G. Knaap, H. A. Haccou, K. J. Clifton, J. W. Frece eds Edward Elgar Publishing (2007).

Costa, Dora L., and Matthew E. Kahn (2003), "The Rising Price of Nonmarket Goods," *American Economic Review* 93 2 (May), 227-232.

Cox, W. (2002), "Smart Growth and Housing Affordability," paper commissioned by the Millennial Housing Commission, <http://www.demographia.com/coxsg.pdf>.

Cox: W. (2010a), "Las Vegas Land Market Analysis," *Demographia*, <http://www.demographia.com/db-lvland.pdf>.

Cox: W. (2010b), "Phoenix Land Market Analysis," *Demographia*, <http://www.demographia.com/db-phxland.pdf>.

Cox W. (2011a), "Housing Constraints, Natural and Regulatory," *Econ Journal Watch*, January 2011. <http://econjwatch.org/issues/volume-8-issue-1-january-2011>.

Cox, W. (2011b), "The Housing Crash and Smart Growth," National Center for Policy Analysis, <http://www.ncpa.org/pdfs/st335.pdf>

Cox, Wendell (2011c), "Comparison of House Price Increases: 2000 to 2010," *Demographia*, <http://www.demographia.com/db-cosmg2010.pdf>.

Downs, A., (1992), "Satan or Savior: 1. Regulatory Barriers to Affordable Housing," *Journal of the American Planning Association*, 58, 4, pp. 419-22.

Downs, A, (1994), *New Visions for Metropolitan America*, Brookings Institution Press.

Downs, A., (2002), "Have Housing Prices Risen Faster in Portland Than Elsewhere," *Housing Policy Debate*, Vol 13 (1).

Eicher 2008a, "Municipal and Statewide Land Use Regulations and Housing Prices Across 250 Major US Cities," http://depts.washington.edu/teclass/landuse/housing_020408.pdf

Eicher 2008b, "Housing Prices and Land Use Regulations: A Study of 250 Major US Cities," <http://depts.washington.edu/teclass/landuse/Housing051608.pdf>.

Federal Reserve Bank of Dallas (2008). "Neither Boom nor Bust, How Houston's Housing Market Differs from Nations," *Houston Business*, <http://www.dallasfed.org/research/houston/2008/hb0801.pdf>

Fischel, William (1995), *Regulatory Takings, Law, Economics and Politics*, Cambridge, MA: Harvard University Press, 1995.

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

Glaeser, E. L., J. Gyourko and R. Saks, (2005), "Why Is Manhattan So Expensive? Regulation and the Rise in Housing Prices," *Journal of Law and Economics* 48, (2), pp. 331-369

Glaeser, E. L., J. Schuetz and B. Ward, (2006), "Regulation and the Rise of Housing Prices in Greater Boston," White Paper, Rappaport Institute Harvard University.

Gleeson, Michael E. 1979. "Effects of an Urban Growth Management System on Land Values." *Land Economics*. 55:3 (pp. 350-65).

Glickfeld, Madelyn, and Ned Levine. 1992. "Regional Growth . . . Local Reaction: The Enactment and Effects of Local Growth Control Measures in California." Cambridge: Lincoln Institute of Land Policy.

Green, Richard K., and Stephen Malpezzi (2003). *A Primer on U. S. Housing Markets and Housing Policy* (Urban Institute Press).

Green R. K., S. Malpezzi, and S. K. Mayo, (2005), "Metropolitan-Specific Estimates of the Price Elasticity of Supply of Housing, and Their Sources," *American Economic Review*, Vol. 95(2), pages 334-339. <http://www.bus.wisc.edu/realestate/documents/metro.pdf>.

Grimes, Arthur C., (2007), *Housing Supply in the Auckland Region*, Center for Housing Research Aotearoa New Zealand. <http://www.hnzc.co.nz/chr/pdfs/housing-supply-in-the-auckland-region-2000-2005.pdf>.

Guidry, K.A., J. D. Shilling, and C. F. Sirmans. (1991) "An Econometric Analysis of Variation in Urban Residential Land Prices and the Adoption of Land-Use Controls," Working paper. University of Wisconsin, Center for Urban Land Economics Research.

Gyourko, J and A. Summers, (2006), "Residential Land Use Regulation in the Philadelphia MSA," Wharton Working Papers. <http://real.wharton.upenn.edu/~gyourko/Working%20Papers/Working%20Papers%202006/Philadelphia%20paper%20revised%2012%2012%2006.pdf>

Hall, Peter, Ray Thomas, Harry Gracey and Roy Drewett (1973), *The Containment of Urban England*, George Allen & Unwin.

Andrew Haughwout, Donghoon Lee, Joseph Tracy and Wilbert van der Klaauw (2011). "Real Estate Investors, the Leverage Cycle, and the Housing Market Crisis," Federal Reserve Bank of New York, www.ny.frb.org/research/staff_reports/sr514.pdf.

Hilbur, Christian A. F. and Frederic Robert-Nicoud (2010), "On the Origins of Land Use Regulations: Theory and Evidence from US Metro Areas," http://personal.lse.ac.uk/hilber/hilber_wp/Hilber_RobertNicoud_2010_07.pdf

Katz L. and K. Rosen, (1987), "The Interjurisdictional Effects of Growth Controls on Housing Prices," *Journal of Law and Economics* Vol. XXX, No. 1, pp. 149-160

Knaap, Gerrit J., and Arthur C. Nelson. (1992). *The Regulated Landscape: Lessons on State Land Use Planning from Oregon*. Cambridge: Lincoln Institute of Land Policy.

Krugman, Paul (2005). "That Hissing Sound," *The New York Times*, August 8, 2005, <http://www.nytimes.com/2005/08/08/opinion/08krugman.html>

Krugman, Paul (2006) "No Bubble Trouble?" *The New York Times*, January 8, 2006 <http://select.nytimes.com/2006/01/02/opinion/02krugman.html>

Krugman, Paul (2011), *The Texas Unmiracle*, August 13, 2011.
<http://www.nytimes.com/2011/08/15/opinion/the-texas-unmiracle.html>

Landis, John D. (1986). "Land Regulation and the Price of New Housing." *Journal of the American Planning Association* (Winter) (pp. 9-21).

Leunig, Timothy (2007) "In My Back Yard: Unlocking the Planning System," *Centreforum*,
<http://www.centreforum.org/assets/pubs/in-my-back-yard.pdf>

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).

Lowry, Ira S., and Bruce W. Ferguson. (1992). *Development Regulation and Housing Affordability*. Washington, D.C.: Urban Land Institute.

MacFarlane, Ian (2006), Testimony, Reserve Bank of Australia Annual Report to the Parliamentary (House of Representatives) Standing Committee on Economics, Finance and Public Administration, 18 August 2006, Pages 26-27.
<http://www.aph.gov.au/hansard/reps/commtee/R9522.pdf>.

Malpezzi, S., (1996), "Housing Prices, Externalities, and Regulation in U.S. Metropolitan Areas," *Journal of Housing Research*, 7, (2): pp: 209-241.

Malpezzi, S. (2005). "Some International Perspectives on Affordable Housing and Possible Lessons for Korea, " *Housing Studies Review*.

Malpezzi Steven and Susan Wachter (2005), "The Role of Speculation in Real Estate Cycles." <http://www.bus.wisc.edu/realestate/documents/Speculation%20in%20Real%20Estate%20and%20Cycles%20June%2026%202002.pdf>

Mayo, Steven K., Effects of Land and Housing Policies on Market Performance, *Land Lines*., Lincoln Institute of Land Policy, May 1997,
http://www.lincolninst.edu/pubs/dl/480_linc_landlines%205.97.pdf.

Mayo, Steven K. and Shlomo Angel, *Housing: Enabling Markets to Work*, The International Bank for Reconstruction and Development, The World Bank.

Mildner, Gerald (2009), "Public Policy and Portland's Real Estate Market," *Quarterly and Urban Development Journal*,
http://pdx.edu/sites/www.pdx.edu.realestate/files/media_assets/quarterly_report/2010_1st/1Q10-4A-Mildner-UGB-1-31-10.pdf

Miller, Thomas I. (1986). "Must Growth Restrictions Eliminate Moderate-Priced Housing?" *Journal of the American Planning Association* (Summer) (pp. 319-25).

Nandwa, Boaz and Laudo Ogura (2010), "Do urban growth controls slow down regional economic growth?" http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1583646

http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID1583646_code558046.pdf?abstractid=

Nelson, Arthur C., Rolf Pendall, Casey J. Dawkins and Gerrit J. Knapp (2002), *The Link Between Growth Management and Housing Affordability: The Academic Evidence*, Brookings Institution. <http://www.brookings.edu/reports/2002/02housingaffordability.aspx>.

OECD (2005), "Recent House Price Developments: The Role of Fundamentals," *OECD Economic Outlook* 78, <http://www.oecd.org/dataoecd/41/56/35756053.pdf>

OECD (2011), "Economy: Well functioning housing markets are key for stability and growth" (News Release), January 19, 2011.
http://www.oecd.org/document/13/0,3746,en_21571361_44315115_46917325_1_1_1_1,00.html
1/20/2011

Phillips, J. and E. Goodstein, (2000), "Growth Management and Housing Prices: The Case of Portland, Oregon," *Contemporary Economic Policy*, 18(3):334-344.

Quigley, J. M., and L. Rosenthal, (2005), "The Effects of Land Use Regulation on the Price of Housing: What do We Know? What Can We Learn," *Cityscape*, 8, 69–138.

Richards, Anthony (2008), "Some Observations on the Cost of Housing in Australia," Reserve Bank of Australia, March 27, 2008.
<http://www.rba.gov.au/publications/bulletin/2008/apr/pdf/bu-0408-5.pdf>.

Saks, Raven (2005) *Job Creation and Housing Construction: Constraints on Employment Growth in Metropolitan Areas*, Joint Center for Housing Studies, Harvard University,
http://www.jchs.harvard.edu/publications/markets/w04-10_saks.pdf

Sowell, Thomas (2007), Subprime Poles, *National Review Online*, August 8 2007,
<http://www.nationalreview.com/articles/221794/subprime-pols/thomas-sowell#>.

Sowell, Thomas (2009), *The Housing Boom and Bust*, New York: Basic Books, 2009, p. 116.

Stevens, Glenn (2006), "RBA says land shortage driving house prices," *Adelaide Now*, 17 August 2007, <http://www.news.com.au/adelaidenow/story/0,22606,22260763-5005962,00.html>.

Stevens, Glenn (2011), Testimony, Reserve Bank of Australia Annual Report (2010) to the Parliamentary (House of Representatives) Standing Committee on Economics, 26 August 2011, Pages 18-19, <http://www.aph.gov.au/hansard/reps/commtee/r242.pdf>.

Vermeulen, Wouter and Jos Van Ommeren (2008) " Does Land Use Planning Shape Regional Economies?" <http://www.tinbergen.nl/discussionpapers/08004.pdf>

<http://www.demographia.com/db-dhi-econ.pdf>

2012.01.23