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<https://escholarship.org/uc/item/9q06890j>

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Publication Date

1979

Peer reviewed

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Institute of Urban & Regional Development
University of California, Berkeley

Reprint No. 181

Reprinted from: *Policy Studies Journal*,
Volume 8, No.2, 1979, pp. 277-288.

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THE EFFECT OF LAND USE AND ENVIRONMENTAL REGULATIONS ON HOUSING COSTS

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ABSTRACT

This paper examines the effects of various land use and environmental regulations on land and housing markets. Seven widely used techniques for controlling residential development appear to generate four "direct" and two "indirect" inflationary impacts. Land use and environmental controls directly affect the supply and cost of residential land, shift the cost of public services forward to developers, and increase delay and compliance costs associated with project evaluation. Development controls may also inadvertently facilitate monopolistic behavior in the development industry and predispose developers to orient their projects to high income groups onto which they can more easily pass along higher costs. The paper concludes by offering several policies for reducing the inflationary effects of environmental regulations.

INTRODUCTION. During the late 1960's and early 1970's, awareness of the potential adverse environmental impacts of land conversion and the increased predilection for communities to control urban growth led to the proliferation of land use and environmental regulations. The revolution in land use control has occurred at all levels of government. Enactment of the National Environmental Protection Act (NEPA, 1969), increased involvement of state government in land use regulation (HUD, 1976), and widespread adoption of growth management programs and complex procedures for the review of local development proposals have radically altered the process of land use regulation.

Early reform of land use and environmental regulation went largely unchallenged. While concern was expressed by development and real estate interests, most groups welcomed increased government involvement, hoping it would effectively check the decline in environmental quality evident in many communities. Early opposition to increased regulation focused mainly on the economic development and labor market effects of development restrictions. Initially, little concern was expressed for the potential of increased regulation to generate significant inflationary impacts.

Use of complex environmental and growth management programs has escalated enormously in the past five years. For example, a 1972 study identified eight communities actively engaged in growth management (ASPO, 1972). A 1977 ASPO publication identified over 100 communities that have implemented growth management programs (Godschalk, et al., 1977). In 1973, Petaluma was the only community in the San Francisco Bay Area attempting to control growth. A 1975 state survey of local planning activity identified over 30 communities in the Bay Area attempting to control residential development (O.P.R., 1975). As more communities adopted growth management programs nationwide, attention began to focus on the potential inflationary effects of land use and environmental regulations. By 1978, the inflationary effects of development restrictions were outlined in two federal studies: the General Accounting Office's "Why Are the New Housing Prices So High, How Are They Influenced by Government

Regulations and Can Prices Be Reduced?" (GAO, 1978), and the U.S. Department of Housing and Urban Development report of its Task Force on Housing Costs (HUD, 1978). The HUD report, while stopping short of recommending federal standards for land use control, indicated that over-regulation of residential development was widespread and adds significant unnecessary costs to housing construction. Since 1978, numerous studies have reported on the effects of excessive and complex environmental regulations.¹

Although it is unlikely that the federal government will move to restrict the scope of local land use regulation, pressure for wholesale reform is mounting. During the next several years, land planners can expect increased opposition to development controls and local and national initiatives for regulatory reform. As pressure for reform grows, research assessing the nature and magnitude of the inflationary effects of land use control is urgently needed. Little research has attempted to systematically identify the range of effects generated by environmental regulation. Available research has focused on particular land use control techniques--zoning for example, and has not attempted to examine the combined impact of simultaneously administered land use and environmental controls. Subsequent sections of this paper discuss the range of inflationary effects, and where available, present estimates of the costs of land use control. The paper concludes by indicating which land use control techniques are likely to be most inflationary, and suggests needed reforms.

HOUSING COST EFFECTS OF LAND USE AND ENVIRONMENTAL REGULATION. Communities use a variety of measures to control the location, character and amount of residential development. Traditionally, community-wide land use plans, zoning and subdivision ordinances and building codes have been used to regulate development. As more sophisticated regulations were developed, communities augmented traditional programs with impact assessment procedures, multiple permit systems, growth management timing ordinances, impact fees and taxes, and urban limit line designations. Not only have these additions made the regulatory process more complex, they have introduced numerous effects which lead directly or indirectly to housing-cost inflation.

Examination of seven widely used land use and environmental regulations has identified four direct and two indirect types of inflationary effects.² Presented in Table 1, these effects are best considered as generic, their relative impact on housing costs depends largely on the level and character of housing demand, the proximity of regulated communities to other jurisdictions, and the degree of restrictiveness cumulatively generated by local land policies.

Direct Effects. Restrictions on the supply of land and the permissible level of residential development intensity greatly affect land costs. As Ohls, Weisberg and White have illustrated, zoning regulations, if they restrict the supply of land available for development below that which would be normally exchanged in the market, operate to increase land cost (Ohls, Weisberg, White, 1974). The supply of residentially zoned land is often limited when communities attempt to maintain environmental quality or fiscal position by designating land for open space or agricultural use or for more fiscally desirable

TABLE 1
DIRECT AND INDIRECT EFFECTS OF ENVIRONMENTAL
CONTROLS ON HOUSING COSTS

	Land Use Controls Most Likely to Generate Effect
Direct Effects:	
1. Increase in land costs	Zoning: urban limit lines; density constraints; growth management timing ordinances; and permit programs.
2. Increase in lot preparation costs	Subdivision requirements; growth management timing ordinances; dedication requirements.
3. Shifting development costs from public to project	Capital budgeting programs, fees and development charges, dedication requirement, subdivision requirements.
4. Administrative and delay costs	All land use controls to some extent. Costs increase with the relative complexity of the regulation.
Indirect Effects:	
1. Facilitating Monopoly Power	Controls that restrict the number of developers operating in communities will allow builders to charge excess housing prices. Regulations act as barriers to market entry --reducing competition in the housing market.
2. Market Reorientation	Restrictions on development often force developers to reorient their projects to higher-income customers.

commercial or industrial use. Stull has shown that communities which shift land to employment generating use can expect residential land prices to increase³ as the supply of residential land is reduced and as increased employment raises the demand for residential land (Stull, 1974).

Direct empirical estimates of the inflationary effects of zoning or other land use control induced land supply constraints are not widely available. One study has simulated the effect of land use policy effects for the London, Ontario land market (Davies, 1977). Using a model developed for the London area, Davies examined the effect of two hypothetical municipal actions that increased the supply of lots. For 1967, Davies increased the supply of lots by 250 units, about 11 per cent. The simulation results suggest a lot price reduction of about \$200/lot. The price fall is about 4.5 percent. A second simulation experiment for 1973 indicates that the same absolute increase in

lots (250) generates a \$244/lot decrease in prices. In this experiment, the lot increase represents a 15 percent addition to the stock of lots and a 3.4 percent decrease in lot prices. The difference in price-effects for the two periods suggests that supply changes vary and depend on overall market conditions. While in both cases the effect on lot price is significant, the effect on house prices is minimal, changing by less than one percent.

Estimates of the effect of zoning and land use control determined land supply on housing prices are available, and reasonably approximate the impact of land supply constraints. Using housing price and land use data for suburban Boston communities, Stull tested the relationship between land use control and housing price. After controlling for accessibility, housing stock characteristics and the quality of public services, Stull found that housing prices were lower in communities with greater proportions of vacant land (Stull, 1975). An analysis of suburban communities in Alameda and Contra Costa Counties California, found that housing prices were inversely related to the supply of vacant land available for development (Dowall, 1979a).

Witte's estimate of the price elasticity of residential sites provides an indirect empirical estimate of the potential price effect of land supply restrictions (Witte, 1977). Relying on various parameter estimates, she estimates the price elasticity of residential sites to be -0.7. This inelastic demand will generate lot price increases if supply is restricted. For example, if we assume that market adjustments occur through price and not quantity changes (reasonable for the short-run), a community that reduces its supply of lots by 20 percent can expect lot prices to increase by 14 percent.

In addition to reducing the supply of residentially developable land, zoning acts to restrict the intensity of development. Large minimum lot size requirements increase the floor price of residential lots. While large lot zoning reduces the per acre price of raw land, the reduction in price is often offset by higher land requirements. Interpolating from Peterson's empirically determined land price gradients for Fairfax County, Virginia illustrates the potential cost effect of large lot zoning. At a distance of ten miles from the urban center, Peterson found that large parcels zoned 1/2, 1, 2, and 10 units per acre were selling for \$5,800, \$7,900, \$13,700, and \$32,000 per acre respectively. Converting these per acre prices to per lot prices, the per lot prices implied by the 1/2, 1, 2, and 10 units per acre zoning are: \$11,600, \$7,900, \$6,850, and \$3,200 respectively (Peterson, 1974).

In addition to zoning, other regulations act to restrict land supply and raise land costs. Urban limit lines restrict development to serviced areas. Several communities have implemented limit lines: Boulder, Colorado; Montgomery County, Maryland; Brooklyn Park, Minnesota; and Salem, Oregon. Urban limit lines depress land prices of parcels located outside developable areas and increase prices of developable parcels. In a study of Brooklyn Park, Gleeson estimated that two-thirds of the variation in land price was the result of urban limit line designations. As of 1976, the estimated land price differential was \$1,463 per acre. Unfortunately, Gleeson was not able to estimate the overall inflationary impact of the imposition of the limit lines (Gleeson, 1978).

Growth management timing ordinances also contribute to higher land costs. By restricting the amount of residential development per year, control over the pace of construction restricts the amount of land annually developed. Since project location plays a major role in determining community impacts, growth management allocation systems limit the supply of land likely to receive development permission. Parcels likely to receive approval will sell at higher prices.

A second type of direct cost-effect of land use and environmental regulation is the increase in the cost of lot preparation and subdivision design. Over the years standards for subdivision design have substantially increased. While generally improving the quality of residential environments, these regulations add significant costs to land development. Numerous regulations act to drive up costs. Growth management has a similar effect. Since all growth management systems competitively rank development proposals according to a variety of locational and design criteria, developers are willing to provide costly amenities in order to obtain development approval. For example, the Boulder, Colorado Residential Allocation System awards 30 of its possible 100 points to projects that provide open space, extensive landscaping, bike paths, bus shelters, off-street parking, lighting, and other design amenities (Boulder, 1977).

Empirical estimates of the effect of increased subdivision requirements are widely available. In a 1976 study of Jacksonville, Florida, the Urban Land Institute found that changes in water system design and street width requirements added, in constant 1976 dollars, \$830 to per lot development costs (ULI, 1977). In a study for the Kaiser Commission, Burns and Mittelbach estimated that excessive subdivision and zoning requirements added 2-4 percent to the price of new housing (1968). While it is difficult to differentiate between necessary and excessive subdivision requirements, available evidence suggests that significant cost reduction can be obtained by reducing subdivision standards.

A third direct cost-effect of land use and environmental regulation is generated by local government efforts to shift public service costs of development on to new projects. Traditionally, communities have shouldered the public service costs of new residential development. Recently, communities have imposed substantial fees and taxes and land and infrastructure dedication requirements on new development. As communities become more conscious of the fiscal impacts of land development, efforts to shift costs on to developers will increase.⁴ In the wake of Proposition 13, this trend has become acute. A recent survey of California communities revealed alarming increases in development fees and taxes (O.P.R., 1979). For example, the City of Vallejo, California charges the following fees and taxes for a three bedroom house: Park Dedication Tax--\$275; Water Facilities Tax--\$380; Sewer Hookup Fee--\$710; Storm Drain Fee--\$200; Capital Improvement Tax--\$275; School Mitigation Tax--\$435; Bridge Construction Development Tax--\$500; these charges total \$2,775 (Stone, 1978). In other California cities, charges go as high as \$5000 per unit.

Requirements for dedication of land for school and park sites and for moderate income housing also add significant costs to project development. A study of Edmonton, Alberta estimated that the land

dedication requirements for moderate income housing added \$243 in per unit costs (Cook, 1977).

As in the case of subdivision requirements, it is difficult to determine when these fees and charges become excessive. Charges that reflect the actual cost of providing services to new development are reasonable and desirable. However, in many instances efforts to shift costs appear to be excessive--revenues are used to provide services which benefit the general community.

The fourth direct effect of land use and environmental regulation results from administrative delays associated with regulatory compliance. With the widespread use of environmental and fiscal impact assessment and development permit systems, the time required to obtain development approval has increased tremendously in the past ten years. A national survey of the length of the approval process found that in 1970, 72 percent of the developers interviewed obtained permission in seven months or less. Ninety-seven percent obtained approval in one year or less. In 1975, only 15 percent of these same respondents obtained permits in less than seven months. Only 42 percent obtained development permission in one year or less (Seidel, 1978). A study of the costs of delay in the Houston area estimated that time requirements increased from an average of 22 months during the 1966-70 period to 27 months for the 1974-77 period. For projects requiring the establishment of municipal utility districts time requirements increased from 23 to 36 months (Rice, 1978).

Unnecessary delays in the development review process generate several economic costs. Delays result in increased land holding and overhead costs, development loan interest costs, exposure to inflation, and opportunity costs of tying-up capital. Costs also depend on when in the development review process the delay occurs. Several estimates of delay costs are available. In Houston 1977 monthly constant dollar estimates of per unit delay costs were determined according to the phase in which delay occurs. For early project tie-ups, costs were estimated to be between \$57 and \$85 per unit per month. For project application related delays, costs range between \$76 and \$112. For delays in the subdivision development phase, costs were estimated to run between \$80 and \$121 (Rice, 1978). The overall cost of increased delays in the development review process in Houston was estimated to add between \$388 and \$596 to the per/unit cost of housing. In California, delays associated with California Environmental Quality Act compliance were estimated to add between 4 and 7 percent to the selling price of new units (Environmental Analysis Systems, Inc., 1975). In Hawaii, estimates of delay costs range between \$323 and \$538 per unit per month (Hawaii Coastal Zone Management Program, 1978). In Edmonton, Alberta, monthly delay costs were estimated to add between \$700 and \$900 to the costs of new units (Cook, 1977).

Another impact of complex development control procedures is the cost of compliance. Preparation of detailed environmental and fiscal impact assessments add significant costs. Muller and James estimate that the per unit cost of EIR preparation and mitigation are between \$100 and \$200 (1975). As the availability of land declines in rapidly growing urban areas, the costs of environmental review procedures are likely to increase as developers attempt to develop more environmentally sensitive areas.

Proliferation of complex review procedures, increased citizen involvement in land use regulation and growing pressure for the development of sensitive land will increase the costs of environmental compliance and lengthen the regulatory process.

Indirect Effects. In addition to the direct cost-effects of land use and environmental regulations, community control of residential development often, one, confers significant monopoly power on developers, and, two, alters marketing and pricing decisions. Monopoly power allows developers to charge excess prices for housing. Increased production costs often force developers to reorient residential projects to high income markets. Both of these effects are the result of the cumulative impact of land use control.

Regulation establishes monopoly power in a variety of ways. By restricting the supply of land available for development, the potential for market entry and increased competition is reduced. If the supply of land is greatly reduced, housing producers may be better able to set housing prices above competitive levels. For example, in Edmonton, Cook found substantial market concentration among developers operating in the city's six restricted development areas. The four largest developers supplied 64 percent of the single-family lots produced between September, 1973 and August, 1976. Closer inspection of the six city designated development areas indicates that each is controlled by one developer (Cook 1977).

Land use and environmental regulations that rely on complex administrative procedures act as barriers to market entry. If the level of complexity is great, potential developers will be reluctant to enter local markets. The costs of adjusting to new and unknown administrative programs is high. Developers who have established good working relationships with local planners are more likely to obtain development permission. For example, Hall found that companies which were large and locally based had the highest success rate in obtaining Industrial Development Certificates (1973). Developers that successfully shepherd projects through the review process can charge monopoly prices for units as long as local procedures effectively block increased competition. A study of two San Jose, California developers found that after holding constant for increases in labor, materials, and land costs, and increased public requirements and housing quality, between 1967 and 1976, the two developers increased their gross profits (in constant 1976 dollars) by between 158 and 231 percent. The researchers concluded that these excess profits were partially the result of constrained housing supply and the exercise of monopoly power (ULI, 1977).

Another way local development policy reduces competition is by shifting public service costs on to developers. While in high demand areas these costs can be easily passed forward to the consumer, increased front-end costs make it more difficult and expensive to obtain capital financing. Cook estimates that Edmonton's decision to shift the financing of services on to the developer added \$7,800 to per-unit front-end financing costs (Cook, 1977). Typically, capital markets discriminate against small firms. As front-end costs increase, it will become more difficult for smaller developers to remain competitive.

The second type of indirect effect of environmental regulations is the reorientation of residential projects. The previous discussion of monopoly power suggested that developers may increase prices in excess of increased costs due to limited competition. There is, however, another reason for raising prices. Often developers find that if they raise price to offset increased costs, the marketability of projects declines. Therefore, developers shift the orientation of projects to high-income consumers. Since profit is the result of per-unit net revenue times the quantity of units sold, a shift in the design of the project to fewer higher priced units will often result in higher profits. Development restrictions that limit residential density and increase production costs often force developers to scrap plans to produce high volume projects and build exclusive high-priced projects. Routinely, land use controls act to reduce the number of units produced to a level well below allowable limits as developers reorient their restricted projects to exclusive low density developments.⁵

CONCLUSIONS AND POLICY DIRECTIONS. This article has reviewed the available evidence on the effects of land use and environmental regulations on land and housing markets. While the lack of comprehensive empirical evidence and the importance of local housing market conditions and development policies makes it impossible to precisely gauge the cumulative effects of community development controls, available evidence suggests that inflationary impacts may be substantial in many areas. The actual magnitude of impacts appears to depend on the degree to which specific regulations restrict land supply and generate production and delay costs.

Of all development control techniques considered, growth management timing ordinances are likely to be the most inflationary. Since they act to restrict development to serviced areas, residential allocation systems reduce the supply of developable land. Land costs will increase as developers compete for parcels likely to earn development approval. In competing for development permission, growth management rationing systems encourage developers to provide high-cost amenities. This practice increases lot preparation costs and forces developers to reorient projects to high-income customers willing and able to pay for expensive amenities. Administrative costs of growth management programs are substantial. Since, projects must be ranked, development proposals are evaluated infrequently (usually once or twice a year). Evaluation criteria are complex, requiring detailed applications and preparation of costly reports. Most importantly, growth management systems inadvertently confer monopoly power on developers of approved projects. All of these factors suggest that in high-housing-demand areas, growth management regulations are likely to generate significant cost-effects.

Massive reductions in the supply of land, whether achieved through zoning or urban limit line designations can greatly affect land costs. If imposed broadly, downzoning and service area restrictions rival the inflationary impacts of growth management techniques. In addition to increasing the cost of land, land supply restrictions can confer enormous monopoly power on the owners of developable land.

Cost-shifting has probably the next most significant impact on housing cost. Recent post-proposition 13 experience in California reveals alarming increase in fees and taxes. If present fiscal trends continue, increased fees and taxes will contribute enormously to housing-cost inflation--possibly eclipsing the inflationary effects of other land use controls.

While receiving the widest attention in the literature, administrative and delay costs generate substantially lower costs than any of the above techniques. It is, however, the one area where efforts for reform are likely to be successful.

Recent trends in land use and environmental regulation suggest that communities are increasingly relying on growth management timing ordinances, urban limit line designations, downzoning, and cost shifting strategies. In the San Francisco Bay Area, 9 communities have adopted, and another 8 are considering growth management ordinances. Thirty-nine of the Area's 93 communities have downzoned significant portions of residentially zoned land, 23 communities have outlined urban service boundaries, and 68 communities have or are planning to increase development fees and charges (Dowall, 1979c). The supply effects of these local land use policies and programs are significant. Based on projections of residential development, the Bay Area will face extreme shortages of land in the next ten years. Between now and 1990, the projected demand for land will exceed the available supply by over 10,000 acres in both Alameda, and Santa Clara Counties (Dowall, 1979c). In the Bay Area, and possibly other growing metropolitan areas, the inflationary impacts of land shortage will become a significant public policy issue in the 1980's.

Policies for reducing the inflationary effects of local land use controls will be extremely difficult to implement. Historically, control over development has been viewed as a local responsibility. Proposals for reforming local zoning and land use control have been offered in the past, but few have been successfully adopted. It appears unlikely that communities will be willing to yield their power to zone or control development to regional or metropolitan governments. Consequently, instead of offering a set of proposals for radical government reform, the paper concludes by outlining a series of modest reforms aimed at making local communities more cognizant of the inflationary effects of local land use policies and recommends ways that the regulatory process can be modified.

Land Supply Monitoring: One of the most striking discoveries encountered in examining land use regulation was the total lack of land supply information. Most land planners have no estimate of local land supply or cost, or the ability to anticipate the impacts of changes in land use regulation. The monitoring of local land supply and cost is urgently needed. Land monitoring capabilities are needed to assess environmental policies and serve as the basis for balancing housing and environmental objectives.⁶

Regulatory Simplification: Overly complex and redundant procedures add unnecessary costs to development. Efforts to reduce delay and application costs must be made.

Reform of Subdivision Standards: Careful reassessment of subdivision standards is needed. There is much potential for standards reductions without compromising environmental quality.

Reform of Fees, Taxes and Dedication Requirements: Efforts to support public services through the use of development charges and dedications, while appropriate to cover the costs of new development, are increasingly being used to support the provision of community-wide services. Such abuses must be stopped.

Reform of land use and environmental regulation is likely to be difficult and politically contentious. The greatest potential for needed reform lies in the ability of land use and environmental planners to recognize the inflationary impacts of excessive regulation and make necessary reforms.

NOTES

¹For a review of these studies, see Dowall and Mingilton, 1979.

²The results of a detailed assessment of the effects of land use control on land and housing markets is contained in Dowall, 1979a.

³Increases in residential land prices depend on the relative impact of negative externalities generated by manufacturing land use.

⁴For an examination of why communities attempt to shift costs see Dowall, 1978.

⁵For a good discussion of project reorientation see, Frieden, 1979.

⁶A proposal for such a monitoring system is outlined in Dowall, 1979b.

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