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Performance Standards

. . . a technique
for controlling land use



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FOREWORD

This special report is one of a series being developed under the Oregon State University Extension Land Resource Management Program, directed by James R. Pease.* The series will examine various land use control techniques available to the planner as supplements or alternatives to zoning for implementing plans.

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ABSTRACT

Traditionally, public control of land use has been dominated by use zoning and lot dimension requirements. The use of performance standards approaches the problem of controlling land use from a different angle. Performance standards are based on measurements of the effects or performance of land use activities. Performance criteria include emissions, traffic generation, development intensity, visual performance, economic impact, and performance related to land capability. Neighborhood characteristics and environmental carrying capacity are base levels for setting performance standards. Experiences with performance approaches to land use control in six communities are briefly reviewed. Advantages and disadvantages to the performance approach are discussed.

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INTRODUCTION

Zoning is seriously ill and its physicians - the planners - are mainly to blame. We have unnecessarily prolonged the existence of a land use control device conceived in another era when the true and frightening complexity of urban life was barely appreciated. We have, through heroic efforts and with massive doses of legislative remedies, managed to preserve what was once a lusty infant not only past the retirement age but well into senility. What is called for is legal euthanasia, a respectful requiem, and a search for a new legislative substitute sturdy enough to survive in the modern urban world.¹

John W. Reps
Pomeroy Memorial Lecture:
Requiem for Zoning

Since 1926 when the U.S. Supreme Court upheld the general principle of zoning in *Euclid vs. Ambler Realty Company*,² plan implementation in Oregon, as elsewhere, has been dominated by the two workhorses of land use control - zoning and subdivision control. Most jurisdictions have used the more or less standard classification of districts on the basis of use categories and lot dimensions, supplemented by a variance and conditional use permit procedure. Modifications and refinements have been made over the years to adapt to changing conditions and new forms of development, but, overall, traditional zoning has been a remarkably resilient and lasting land use control technique.

In recent years, however, certain economic, legal, political, and conceptual problems with the traditional zoning framework have motivated an investigation of a number of alternative land use

control techniques. It is becoming increasingly apparent that the planner must have available a variety of techniques and be prepared to apply the appropriate combination to his particular planning situation.

One regulatory technique which many planners are looking at is performance zoning or the use of performance standards as a partial alternative to use lists and lot dimension requirements. The objective of this paper is to review the limited experiences to date with the use of performance standards in zoning and to evaluate some of the advantages and disadvantages inherent in the technique.

EUCLIDEAN ZONING VS. PERFORMANCE ZONING

Euclidean zoning typically relies on a list of specific uses to define what activities may be permitted in the various zones. Generally, commercial, industrial, and residential uses are clearly separated, with further breakdowns within these categories for differing density and quality of development. Performance zoning approaches the problem of separating potentially incompatible land uses from a different angle. As the expression implies, with performance standards, the planner looks at effect rather than use. As long as industrial, commercial, or residential activities can meet certain standards in regard to operation, environmental impact, and appearance, such uses can be permitted in any part of the community. A performance-based bylaw might retain zones but they would be

based, at least in part, on performance levels dictated by neighborhood or environmental characteristics rather than on use categories. The teeth of the performance approach are the standards which define impact and levels of performance which are required in the various zones.

The use of performance standards as land use controls requires clear planning objectives and a good data base. A frequent criticism of Euclidean zoning is that although, in theory, zoning is in accordance with policies in the comprehensive plan, in practice, Euclidean zoning is quite generally formulated in accordance with existing land use and property values. Zones may be arbitrarily determined and not reflect accurately either data on the community or long-term community objectives. The preparation of performance standards requires a community to look at specific elements of the social, economic, and physical environment to determine what levels of performance are to be required. The objectives and policies upon which performance standards are based need to be clearly stated and they need to be consistent with existing social and physical conditions and potential development pressures. Where possible, the objectives need to be quantifiable and adequate data needs to be maintained so that compliance with the standards can be measured.

The use of performance standards is not a radical departure from accepted uses of police power in this country. The principle behind performance standards is well established in the law of

nuisances which goes back beyond the advent of zoning.³ Many environmental laws such as the Clean Air Amendments of 1970 set forth "standards of performance" for particular types of emissions or impacts.⁴ Performance standards have been used by urban planners to differentiate light, medium, and heavy industries and to maintain ceilings on environmental impacts within industrial use zones. Some "conditional use" clauses also incorporate smatterings of performance requirements. However, the use of performance standards to control land use on a community-wide basis is a relatively new concept. Only a few communities have attempted to dispense totally with use restrictions and lot dimension requirements in favor of zones defined by performance levels.

DEFINITION OF PERFORMANCE STANDARDS

Because the concept of performance standards is relatively new to land use planning there is little experience to fall back on and much confusion among planners about what constitutes a performance standard. Although there is no single definition which has universal acceptance, Dennis O'Harrow, a pioneer of industrial zoning performance standards, has suggested the following description:

The ideal zoning performance standard will substitute a quantitative measurement of an effect for a qualitative description of that effect that we have used in the past. It will not use the terms "limited," "substantial," "objectionable," "offensive." Instead, it will establish definite measurements with standardized instruments to determine whether the effects of a particular use are within predetermined limits, and therefore permissible in a particular zone.⁵

The key words in this description are "quantitative" and "effect". To qualify as a performance standard a regulation must involve measurement. Secondly, what is being measured must be an effect or impact of a particular activity. It is important to distinguish performance standards from other types of standards which frequently appear in zoning bylaws and subdivision and building codes. Two types of regulation sometimes confused with performance standards but which are not true performance standards are subjective standards, or so-called "primitive standards", and specification standards.

Subjective standards are generally more like policy statements than quantifiable standards. A subjective standard might relate to performance in a vague way but it fails to be specific enough to administer without making discretionary judgements. The classic form for a subjective standard is "....and any other use that is not objectionable because of the emission of dust, odor, noise, excessive vibration or other nuisance." The problem with this type of standard is that there is no quantitative basis for determining what constitutes an objectionable level of emission or nuisance. To be a performance standard a requirement concerning emissions has to be specific. For example, permissible sound levels should be stated in terms of decibels and distance from the source. Dust levels should be tied down to particle size, particle type, and rate of emission over a certain period of time. In other words, the example quoted above is not a performance standard because the planning administrator or enforcement officer has no quantifiable

guidelines to tell him what is objectionable. The intent of the law is clear but it is difficult to enforce.

Subjective standards are not without value. They may serve a useful purpose by setting forth the community's goals and the intent of the bylaws. However, users of this type of standard should recognize its limitation in regard to being subjective and difficult to administer without involved hearings.

Specification standards can be viewed as a second type of standards. From an enforcement point-of-view they have advantages over subjective standards. However, they are not performance standards because they do not deal directly with the effect or impact of a particular activity.

Most zoning ordinances consist of specifications such as use designations, set back requirements, density restrictions, and other design requirements which can be stated in measurable units. Specification standards state how a development is to be laid out or how a building is to be constructed. A familiar example of a specification standard is the requirement that single family residences have certain size side yards. This is a specification standard because it specifies a minimum acceptable width which can be measured and enforced. But, it is not a performance standard because it refers to site design rather than to performance or effect. It doesn't say that the side yard should perform the functions of assuring adequate light and air to the neighbors, serving as a

fire barrier, and providing a sound buffer. Performance standards should set forth permissible decibel levels at the property line, restrict buildings from casting shadows over portions of a neighbor's property and, perhaps, require a certain distance between structures. How a developer or builder met the performance standards would be up to him. The law would not specify what the design should be.

The distinction between specifications and performance standards should be kept in mind. There is a tendency in some planning literature to expand the definition of performance standards to include what are actually specifications. This interpretation misses the point in regard to how performance standards can best be used. Performance standards are applied to effects rather than to structural or design features. An important reason for using performance standards is to get away from inflexible specifications which dictate use and design.

The term "performance zoning" is merely an application of performance standards to a zoning context. Performance zoning implies a continuance of districting but the criteria for establishing districts and regulating land use within districts is based primarily on performance rather than on use or design specifications. In other words, a performance zone is defined by a list of permitted impacts as opposed to a list of permitted uses. The cumulative impact of all the performance standards established for a particular district is to control the quality and character of development which comes into the district.

Although the theoretical distinctions between subjective standards, specifications, and performance standards are important, in practice

it is often difficult to separate the various types of controls. In addition, it is likely that a single ordinance might contain examples of all three types of controls. While performance standards have some clear advantages over traditional controls for some types of impacts, there are other design and impact factors which might be better controlled by the use of subjective standards or specifications. Furthermore, there may be administrative reasons for going with subjective standards or specifications rather than using performance standards which often require some expertise to administer. In this regard, performance zoning is not an "all or nothing" proposition. The term loosely refers to an ordinance which, at least in part, looks at performance criteria for decision making. This does not mean that such an ordinance would have no subjective standards or specifications.

PERFORMANCE CRITERIA

One of the advantages of performance zoning is that the types and intensities of impact regulated by the performance standards can reflect a particular community's character better than standard use restrictions and design specifications. The performance criteria that one community uses to control land use may not be the same as the criteria used by another community. Also, within one community a variety of performance criteria may be used to reflect different districts or neighborhoods. This section highlights some of the types of impact which can be regulated by performance standards. One community would not necessarily want to use all of the criteria suggested in this paper. The selection

of performance standards should be guided by objectives and policies set forth in the comprehensive plan.

Environmental Pollution

The regulation of the location and intensity of pollution generating industries is the form of performance zoning with which planners are most familiar.⁶ Industrial performance standards set ceilings for different types of industrial nuisances for one or more zones. The types of impacts typically controlled by industrial performance standards include noise, particulate matter, toxic materials, and smoke. These nuisances are relatively easy to measure and there is general agreement on the levels of degradation which can be permitted. Furthermore, separating industries which are pollution generators from residences or other uses is a popular and easily defensible type of regulation. Regulation of these types of impacts clearly falls under the legal umbrella of "public health, safety, and welfare" and is therefore not likely to be challenged on jurisdictional grounds.

There are two methods for the establishment of pollution standards: (1) ambient standards and (2) fixed emission standards. With the ambient standards approach, the community determines the level of a particular environmental contaminant that it will tolerate in various districts or zones within the community. The community then establishes the performance standards which will insure that these levels are not exceeded. Ambient standards are based on the effects of particular contaminants on human health, vegetation and livestock, visibility and so forth.

The alternate route to formulating performance standards is the establishment of emission standards which arbitrarily set fixed levels of emission that are permitted from each source. With emission standards, the starting point is the source of emissions rather than the ambient level. A source control usually takes the form of an emission rate. For example, a limitation might be placed on the amount and size of particulate matter released from a stack per unit time. The required emission rate would remain fixed regardless of ambient levels.

Ambient standards are the more logical of the two approaches to regulating environmental pollution. They are based on community goals and more directly reflect the levels of environmental degradation which are tolerable within the framework of the comprehensive plan. Emission rate controls, however, are advantageous in that they more specifically state to the potential offender the exact amount of nuisance that will be permitted. They also have the advantage of applying equally to all development in the district. With ambient standards there is a "first come, first serve" effect in that as the ambient quality is increasingly modified by each additional source, the standards applied to each new source necessarily vary. There is also the technical problem of setting source standards which equate with desired levels of ambient pollution. In regard to cost and administration, emission rates based only on source levels are often a more realistic approach to standard formulation for communities. On a regional scale or where

large staffs with environmental engineering capabilities are available, ambient levels are a more desirable basis for regulation.

Traffic Generation

Other types of impact which are well suited to performance-based regulation are nuisances associated with traffic. In most residential neighborhoods traffic is the single most significant determinant of community character and is therefore the most important performance attribute to control. Traffic performance regulation involves measuring the performance of fixed activities in regard to their traffic generation potentials or traffic attraction potentials. A simple example of a traffic-generation performance standard for a residential district appears in the model zoning bylaw prepared for Franklin County, Massachusetts.

It reads:

Sec 22.22 Traffic. Uses likely to generate more than 25 auto trips per day per acre both to and from the premises.. shall be allowed only if directly serviced by an arterial or collector street (name street).⁷

This standard is accompanied by traffic generation statistics so that activities which conform can be identified prior to construction.

Tables of expected traffic attraction have been developed to a fairly sophisticated level. The Average Weekday Traffic (AWDT), which is based on a 24 hour total of trips to and from a study site from Monday through Friday, is used as the measurement standard.

AWDT studies have demonstrated that the major source of variation in trip generation is use, although other factors such as income level, car ownership and special attraction features can cause variation within one use category.⁸ Average trip generation potentials for various uses have been computed on the basis of AWDT. For example, a hardware store can be expected to attract a daily total of 100 trips per 1,000 square feet of floor area or a hospital would attract 640 trips per day for 100 beds.⁹ In some cases, more significant statistics might be the number of trips generated at peak hours or the percent of trips at peak hours. These statistics are available for most uses.

One way of incorporating traffic attraction data into a land use control is to prohibit outright uses which can be expected to attract certain levels of traffic. Another technique which builds in more flexibility is to relate traffic generation to minimum lot size. In effect, the Franklin County Ordinance cited above does this by relating auto trip generation to acreage. A hardware store which generates 300 trips per day would be required to occupy 12 acres unless it is directly serviced by an arterial or collector street. In other words, the ordinance does not prohibit any use, but it does have the effect of maintaining a low level of traffic by limiting the number of activities which can be built on a particular street. Furthermore, if the street in question is already fully built up and twelve acres are not available, it would be impossible for the hardware store to be established.

Floor Area Ratio

Building intensity is another type of criterion which can be written into the form of performance standards.¹⁰ The standard measurement of building intensity is floor-area-ratio (FAR). The greater the floor area in relation to lot size the higher the building intensity. For example, a one-acre site with a building having 21,780 square feet of floor area has a floor area ratio of 0.5. The same building on a two-acre lot would have a floor area ratio of 0.25. On the other hand, this same building on half an acre would have a floor area ratio of 1.0.

Density and building intensity are not the same but there is some correlation between the two. Typical residential areas with 1/4 acre minimum lots have floor area ratios of about 0.1. In residential areas with 16 units to the acre the floor area ratio is about 0.4. Central business districts may have floor area ratios well over 1.0.¹¹ However, except in neighborhoods with extremely high building intensity, floor area ratios do not give a clear indication of community character. For example, both shopping centers and medium density residential neighborhoods have roughly comparable floor area ratios. By themselves, standards limiting the floor area ratio are not adequate replacements for density and use restrictions, but, used in conjunction with standards regarding trip generation, nuisance qualities and other criteria, they can effectively maintain the character of a community.

Standards setting maximum floor area ratios have the advantage over density restrictions of prohibiting the grossly out-of-character development from occurring in close proximity to other structures without imposing use restrictions or design specifications. If a developer wants to build a large building in a low floor area ratio zone he may, but it would have to be on a very large lot which would serve to buffer it from other structures. The use of floor area ratios as a performance standard is a way of getting at the difficulty of permitting clustering without complicated discretionary rulings. A developer is automatically permitted to build at any density so long as enough land is maintained in open space to meet the ratio.

An interesting hybrid index of community character using a combination of car trip intensity and floor area ratios has been developed by Jacob Kaminsky.¹² Called the development intensity level index, the Kaminsky model incorporates trade-off values for traffic generation and building intensity. In other words, an activity which has a relatively large FAR but attracts little traffic would receive the same index rating as an activity with a lower FAR but higher traffic attraction values. The trade-off values developed by Kaminsky can be computed by a simple formula or with a matrix.

Landscape Area Ratio

In terms of preserving the visual character of a neighborhood a factor more significant than building bulk (i.e., floor area) might be the relationship of man-made surfaces to natural surfaces.¹³ Ideally, standards relating to surface ratios would look at both vertical and horizontal surfaces from a multitude of angles. The horizontal surfaces would include paving and landscaping. The vertical surfaces would include walls and plant surfaces. There are, however, difficulties in quantifying vertical surfaces with any degree of accuracy. As an alternative, only horizontal surfaces or landscaped area ratios are used as an index of surface character. As a performance standard this is a step down from looking at total effect but it is a necessary compromise for the sake of arriving at a quantifiable indicator of visual performance. Standards setting forth landscape area ratios are relatively easy to administer and are a good way of preserving urban open space for its visual values.

Aesthetics

The regulation of aesthetics in a broader context than landscape ratios is an area of performance evaluation not easily subjected to quantification. Unlike other impacts such as noise, traffic generation, or building intensity, there are no standard measurements for aesthetics in its purest sense.¹⁴

There appears to be two general approaches which communities have taken toward attempting to control the aesthetic impact of various land uses. First are controls which are aimed at either eliminating, moderating, or stipulating conditions on one element of the visual impression. Examples of this type of control are billboard and sign ordinances. Another example of single-factor aesthetic controls is a set of requirements regarding exterior design which require all buildings to be built of brick or stone or some other material which maintains the character of the neighborhood. Standards setting forth specifications for exterior design are commonly used to preserve the character of historical districts.

Although in some literature these types of controls are referred to as aesthetic performance standards, they are technically specification standards. The measure of compliance is not the visual effect but the degree to which the fixed specifications are met.

The second approach to aesthetic regulation involves an evaluation of overall visual impact by a design review board or other body with discretionary powers. This type of regulation more closely approaches being a performance standard in that total visual effect is the quality being evaluated. In regard to the requirement that a performance standard be a quantitative standard, visual impressions are unlike noise or other emissions which can be measured by a piece of equipment. Since the only machine which can evaluate aesthetic quality is the human eye and mind, quantification in the technical

sense is not possible. However, design review is a procedure for evaluating visual impact which can be structured into as near a scientific approach to aesthetic evaluation as possible given available technology. Most design review boards are composed of professional architects, builders, and designers who are experienced in evaluating design on the basis of blueprints and renderings.

Although ultimately subjective, design review boards have been used successfully to insure a minimum level of aesthetic quality. Design review has not always been successful in promoting beautiful development but it is generally able to eliminate proposed development which is ugly, disfiguring, blatant, or not in keeping with the pleasing appearance of nearby buildings. In short, it prohibits that which is offensive to most people.

It should be noted that even though design review has been used as a land use control in this country for over forty years, review boards and other bodies with discretionary powers have often concentrated on such matters as the provision of amenities and the protection of the natural environment as opposed to looking at the total visual impact. The reason for the hesitancy of many administrative and quasi-judicial bodies to address aesthetics is the court's failure in the past to sustain purely aesthetic controls.¹⁵ Judicial rejection of aesthetic controls set forth the position that while public health, safety, and welfare submit to reasonable definition, aesthetic considerations vary greatly within the wide

variations of taste and culture. However, in recent years the courts have expanded their interpretation of the police power to include certain aesthetic values as well as other values such as happiness, enjoyment, and mental health.¹⁶ This action opens the way for design review boards to evaluate directly the attractiveness or visual performance of a proposed development as opposed to looking only at more easily defined factors.

Social and Economic Impact

Social and economic performance are also types of impacts which various activities have on the surrounding community. As with physical impacts, such as pollution or traffic generation, socio-economic impacts can be measured and regulated by performance-based ordinances. Projected demand on community facilities and services is frequently a socio-economic standard applied to larger developments. Included in this category are impact on schools, utility needs, road usage, and requirements for police and fire protection, parks, and hospitals. The tax revenues which the community expects to gain from a proposed project are also part of the total fiscal impact. The overall evaluation of fiscal performance needs to balance costs to the community against expected tax revenues.

The idea of a performance evaluation in regard to fiscal considerations has been actively promoted by the Philadelphia consulting firm of Rahenkamp, Sachs, Wells & Associates Inc. Rahenkamp

calls the system of land use control based on fiscal and other performance evaluations "impact zoning" which he describes as follows:

Simply put, impact zoning replaces arbitrary density restrictions with a realistic before-the-fact assessment of how a proposed project will affect the community. More specifically, it analyzes and correlates the effects of four key parameters:

1. The growth rate of the community as it relates to the present populations, the available land, and the growth rate of the surrounding region.
2. The community's infrastructure - sewers, water, roads, etc.
3. The economic picture - what the new project will cost the community in services vs. what it will return in the form of tax revenues.
4. Natural determinants, or the project's impact on the environment of its site and surrounding areas.¹⁷

Impact zoning is essentially a performance-based land use control. However, it differs from the use of performance standards in that it is a discretionary approach implying trade-offs and negotiation. Normally, performance zoning is a form of the police power which is subject to negotiation only when exceptions are granted through an appeals or court procedure. Impact zoning is akin to the current use of "conditional use" clauses in that the planner or the hearings officer has the discretionary power to determine if certain conditions are met. What is unique about impact zoning is that a framework is provided for weighing various

performance attributes of a proposed development in a systems context. The developer has the opportunity to tailor the design to fit the current needs and characteristics of the community. The final zoning decision is then based on the project's impact on the community as opposed to how well it meets certain fixed conditions or specifications.

The impact zoning model proposed by Rahenkamp applies only to large residential developments. The criteria applied to these developments are applied on top of other land use controls--either use zones or performance zones. The evaluation framework is used to grant exceptions to existing density restrictions.

Another example of the use of socio-economic performance criteria is found in an ordinance proposed by the Marin County, California planning department for a residential development review board which grants "points" to developers for meeting certain social and economic conditions.¹⁸ Categories for which points are given include providing low and medium income housing, providing units for elderly people, students and large families, building where utilities and public services exist or are planned, and for providing open space. A developer can acquire the requisite special permits by accumulating a certain number of points. The categories for which the developer receives points can vary from project to project. As with the Rahenkamp impact zoning model, the Marin County ordinance applies only to large-scale developments and is applied on top of other regulation.

Land Capacity

One of the most desirable, but also the most difficult, types of performance standards to implement are standards based on environmental impact in relation to land capability. Land capability standards relate to such factors as erosion potential, soil limitations in regard to subsurface sewage disposal, protection of groundwater supplies, and flood hazards. In order to develop standards tied to land capability a planner needs to have a good data base and clear planning objectives. For example, if a community wishes to develop performance standards for hillside development in order to avoid surface erosion or mass wasting, the planner needs to know the causes of hillside erosion and to be able to quantify the effect of development in regard to the hillside's capacity for certain types of land use.

Frequently land capability ordinances are written in a form of subjective standard which do not specify how the effect is to be measured. For example, a "performance standard" for Gay Head, Massachusetts reads:

The use will not cause continued erosion of the land or increased surface drainage from the lot.¹⁹

This is an extremely difficult measure to enforce. It is adequate statement of policy, but as it is written there is no way for a planner or developer to determine whether or not a prospective development will be in compliance. The ordinance could be made enforceable by requiring a soils scientist or a geologist to certify

that the site can support the proposed construction without erosion or drainage problems. Another way to make the ordinance enforceable would be to stipulate soil types or slope conditions which may not sustain development or, if development is to occur, what conditions must be met. For example, only structures attached to bedrock might be permitted or removal of over a certain percentage of the ground cover would be prohibited.

A good example of a very simple performance standard relating to land capability is the section on lot dimensional requirements in the model ordinance prepared for Franklin County, Massachusetts.²⁰ The ordinance sets forth lot dimensional requirements on the basis of the presence of utilities and the soils limitations for on-site disposal of sewage effluents. The determination of soil limitation classes comes from the U.S.D.A. Franklin County Soils Survey. As an example of how the ordinance works, where public water and public sewerage are present and there are no soils limitations the minimum lot size is 10,000 square feet. Where public water and public sewerage are absent and there are slight to moderate soils limitations the minimum lot size is 40,000. Where utilities are absent and there are severe soils limitations the minimum lot size is 80,000 square feet.

The use of performance standards such as the Franklin County standards has some clear advantages over the manner in which the environment, particularly critical areas, is handled by Euclidean zoning. Euclidean zoning is not "environmentally sensitive."

In other words, a single Euclidean zone may encompass a variety of environmental conditions but there are not provisions for reflecting these variations in the requirements. The result is that Euclidean zones usually either underprotect or overprotect. Performance standards, on the other hand, fit the land resource. As long as the development does not perform in a manner detrimental to the resource, the land potential for development can be maximized. What needs protection is protected and, conversely, development is permitted to the extent that the land is capable of sustaining the land use.

EXPERIENCE WITH PERFORMANCE ZONING

The use of performance standards and the related technique of impact zoning are relatively untested forms of land use control. Although there is considerable literature advocating performance-based controls and a high level of interest among planners in the use of these techniques for community-wide plan implementation, experience has been limited largely to the regulation of industry in large cities. According to available data only a handful of cities and counties have attempted substituting performance criteria for use zones throughout the community.

The only systematic survey of communities in regard to the use and value of performance standards was conducted by the American Society of Planning Officials (ASPO) in late 1970.²¹ ASPO circulated

a questionnaire to 270 city and county Planning Advisory Service subscribers. Approximately 165 responses were received. Of the respondents, 31 per cent indicated that they regulated industry by performance standards in their zoning ordinances. Nineteen per cent applied performance standards to commercial uses and fifteen per cent applied them to residential uses.

The report of the ASPO survey failed to indicate whether performance standards were used to differentiate zones or whether the standards were merely ceilings on environmental degradation which applied equally to all districts. Furthermore, the authors of the survey found considerable confusion among respondents as to what constitutes a performance standard. The following qualification was included in the report:

However, reviewing the actual provisions of the communities' zoning ordinances suggest that these figures should be approached skeptically. Though performance standards in zoning are usually defined as 'quantitative measures of environmental effects', apparently, this definition is not universally applied. In some cases the respondents indicated they had performance standards when there were references to neither quantitative measurements nor to effects.²²

Although a systematic sampling technique was not employed in gathering data for this paper, in the process of research over fifty city and county planning departments were questioned in regard to the use of performance criteria. For the most part, the planning departments contacted represent some of the more

innovative and better staffed departments in the country. The results of these inquiries were not unlike those found by ASPO. Although many planners responded to the inquiries with interest, there was little evidence that performance zoning has gained much momentum since 1970 in regard to implementation. However, a number of planning departments and consulting firms have prepared planning models and model ordinances based on performance criteria. The following section highlights a few performance-based ordinances, some of which are only in the drawing board stage or undergoing phased implementation.

Franklin County, Massachusetts

One of the most complete performance-based model ordinances is the system prepared for Franklin County by the Boston consulting firm, Philip B. Herr and Associates.²³ The model ordinance is for review and use by the twenty towns comprising the county. As it is written, each town is comprised of a single zone. The ordinance can be administered by town selectmen, a zoning agent, or the building inspector. No building can be erected or externally altered without a permit issued by the appropriate body or officer. All permits are conditional upon meeting the performance criteria which include standards for traffic generation, noise, sewage flow, and proximity to other structures.

The performance of various activities is tied to the performance capabilities of locations. For example, traffic generation standards

are specific to the type, and in some cases the individual, street or road, and specifications for lot size are related to the availability of public sewage and water and soils limitations.

This ordinance is a relatively pure performance regulation in that use lists are abandoned and all activities are required to conform to performance standards. Some of the standards are, technically, specifications but the basis for the requirement is performance-oriented.

Gay Head, Massachusetts

The Gay Head performance-zoning bylaw was developed subsequent to and was partially modeled after the Franklin County model ordinance. Traditional uses, such as single family homes, public buildings, fishing, and agriculture are allowed anywhere. All other uses, including commerce and industry, must meet the following performance standards in order to receive the necessary special permit:

1. The use cannot be likely to generate more auto trips both to and from the premises at the busiest hour of a normal operating day than is given by the number 10 multiplied by the number of acres contained in the lot. The estimation of likely auto traffic will be based on current available experience with the type and size of the use in question.
2. Space for off-street parking will be provided which is at least twice the floor area of all structures on the lot, and this parking arrangement will require no backing out onto the public right of way.
3. All outdoor parking, storage, loading, and service areas will be screened from the view of the public roads and from adjacent residences.

4. There will be no odor, dust, fumes, glare or flashing light which is perceptible without instruments more than 200 feet from the boundaries of the lot in question, except for warning devices, construction or maintenance work or other special circumstances.
5. The use will not cause continued erosion of the land or increased surface drainage from the lot.
6. No pollution of the water or the air will result which is greater than that caused by a use which is allowed without a special permit.
7. No temporary or mobile structures not otherwise permitted under this bylaw will be used or stored, except if incidental to a fair, a special event or a construction project, and then only if for no more than 60 days.
8. Where possible, the site design will preserve and enhance existing trees over 12 inch caliper, water courses, hills, and other natural features, as well as vistas, ocean views, and historic locations, and will minimize the intrusion into the character of existing development.²⁴

These standards have the advantage of being simple and readily understandable. However, several of the standards are "primitive" standards and appear to present enforcement problems (Nos. 6 and 7). Several other standards are specifications which are basically no different from those found in traditional zoning ordinances.

Knoxville, Tennessee

The model zoning ordinance developed by the private consulting firm, OMNIPLAN, for Knoxville differs from the Franklin County model in that it contains both performance zones and traditional use zones.²⁵ The performance standards apply only to a general residential/

commercial zone. "Restricted districts" are provided for certain activities and structures which cannot conform with the performance standards and should not, therefore, be located adjacent to complying activities. More than one restricted district may be established to allow for different types of deviations from the performance standards. Another non-performance zone is the control district" which is established in order to achieve a specific goal in a defined area which requires protection or regulation beyond the performance standards. Floodplains or conservation corridors would be examples of lands that would comprise control districts.

The performance conditions set forth for the performance zone cover noise, odors, lighting, offensive areas (e.g., waste receptacles, utility equipment, service entrances and so forth), landscaping, parking, fire hazard, flooding, smoke, toxic and noxious materials, glare and heat, dust, radiation hazard, and water pollution. The emphasis in this ordinance appears to be protection of public health and protection from common nuisances. Conspicuously lacking from this ordinance are performance standards designed to influence community character such as traffic generation or building intensity standards.

Chicago, Illinois

The 1957 Comprehensive Amendment to the Chicago Zoning Ordinance is in part an industrial performance ordinance based primarily on

the criteria set forth by O'Harrow: noise, glare and heat, odor, smoke, particulate matter, toxic matter, fire hazard, and vibration.²⁶ At the time of its inception, this ordinance was unique and somewhat revolutionary in that it relied on performance criteria to separate different zones.

Traditionally, light, moderate and heavy industrial zones are based exclusively on use classifications. Theoretically, all uses with particularly obnoxious byproducts are covered by the use list for the heavy industry zone. At the other end of the industrial spectrum, those manufacturing uses not offensive to neighboring property by reason of the emission of noise, odors and fumes are permitted in the light industry zone. In place of cumbersome and often inadequate use lists, the Chicago ordinance established three manufacturing districts which are distinguished, with minor exceptions, not on the basis of specified uses but on the basis of standards of performance which, if met, permit almost any industrial use to go into any district. The fact that performance criteria are used as the reason for assigning activities to particular zones qualifies the Chicago ordinance as a performance zoning ordinance, as opposed to an ordinance which uses performance standards only as a ceiling for emission rates.

New York, New York

The Urban Design Council's 1973 recommendations for improving the quality of New York's residences comprise a performance-approach

to residential zoning.²⁷ The report of the Urban Design Council proposes an approach to residential zoning that transcends traditional lot and amenity specifications. In order to put up a new residential building, a developer has to earn a sufficient number of quality impact points by complying with performance standards in four areas: Neighborhood impact, recreation space, security and safety, and apartment layout. For twenty-two of the thirty-seven areas for which points can be granted, a minimum level of compliance is specified; extra points would be gained by going beyond that minimum. The degree of compliance with the other fifteen elements would be left to the judgement of the developer.

Most of the thirty-seven elements of the point system are performance standards. For example, the goal of one of the elements in regard to neighborhood impacts is to maximize sunlight in open space. The following performance standard implements the goal:

All outdoor space should receive sunlight between
9 a.m. and 3 p.m. during the Winter Solstice.
Sunlight is measured as follows:

Measure amount of square feet of outdoor
space receiving sunlight at 9 a.m., 12
Noon and 3 p.m. during the Winter Solstice.
Divide by three to find the average.²⁸

Another good example of a performance standard in the Urban Design Council report is the requirement relating to creating visual privacy in ground floor apartments. The standard reads:

All apartment rooms, excluding kitchens, which have a floor elevation less than 7'-0" above the nearest sidewalk elevation and have windows with views of semi-private and/or public space shall be visually private.

-A "visually private" room is one in which direct eye contact is not possible between a person standing in a room, four feet behind a window and a person standing 15'-0" in front of the window in semi-public or public space.

-Eye level is 5'-0"²⁹

Other planning objectives which are implemented by performance standards in the Urban Design Council report include the maintenance of neighborhood scale by matching new and existing setbacks, the provision of landscaped open space and landscaped buffer zones, the visual separation of parking space, and the use of crime-reduction design features. The outstanding feature of this report is the degree to which the performance standards are put in quantifiable terms and are hence more easily enforced.

Duxbury, Massachusetts

The Development Impact Model developed by Rahenkamp, Sachs, Wells and Associates, Inc. for Duxbury is a model for negotiating with developers for projects that conform to the town's goals as described by optimum performance standards.³⁰ The model sets forth two levels of land use control - a minimum base level and a negotiable optimum position. The minimum base level is, with some adjustments, the town's former legal controls which in Duxbury are minimum lots of 40,000 square feet with commercial development further limited to specific commercial zones. The optimum position is defined by a series of performance standards. By complying with the performance

standards a developer may gain exception from the density requirements set forth in the minimum base level requirements. The performance standards cover the effect of any proposed development on four major components: 1) the natural environment including drainage patterns, water sources and significant features of the landscape; 2) the man-made systems of the town including its road network, public water system, and existing neighborhoods; 3) the growth rate of the town; 4) the fiscal situation including both school and municipal revenues and expenditures.

The idea of flexible or negotiable performance standards differs considerably from the original idea of performance zoning suggested by O'Harrow.³¹ O'Harrow viewed performance standards as minimum base levels for which compliance is absolutely required. In Duxbury, a developer would not have to comply with any of the performance standards if he is in conformance with the density requirements set forth as the minimum base level. However, the density requirements are fairly restrictive and most development proposed for Duxbury is for high density. The new law permits such developments if they are of high quality. The principal criteria for decision-making is switched from density to quality as measured by the development's projected performance.

EVALUATION OF PERFORMANCE-APPROACHES

To date, there is not enough experience with the various forms of performance zoning to make a scientific assessment of its utility.

As a planning concept, performance zoning has some definite advantages over Euclidean zoning. On the other hand, there are some procedural problems having to do with administration and enforcement which substantially limit the feasibility of some performance approaches. Without systematic case studies of several communities using performance standards over a period of time much of the discussion of advantages and disadvantages must be conjectural.

Advantages

Flexibility

One of the clearest advantages of a performance approach to land use control is that it permits flexibility in terms of both the type of activity located in a particular neighborhood and the design or site plan of an activity. In regard to locational flexibility, the intent of zoning since its inception has been the separation of incompatible uses. The problem of incompatibility of various land uses was clearly stated by Justice Sutherland in the decision in Euclid v. Ambler. Justice Sutherland wrote:

Thus the question whether the power exists to forbid the erection of a building of a particular kind or for a particular use, like the question whether a particular thing is a nuisance, is to be determined, not by an abstract consideration of the building or of a thing considered apart, but by considering it in connection with the circumstances and the locality....A nuisance may be merely a right thing in the wrong place - like a pig in the parlor instead of the barnyard.³²

The "pig in the parlor" analogy has been the guiding concept behind zoning since the 1920's. The criteria used in Euclidean zoning to differentiate the parlor from the barnyard have been use or use classifications and, in general, this type of zoning has been successful in keeping the pig out of the parlor. However, success in separating uses has not been without drawbacks. One of the primary problems is the loss of diversity within neighborhoods. Euclidean zoning separates houses from stores and places of employment. It also separates one type of housing from another. This often results in a "sameness" and loss of exciting variation within communities. Most residential neighborhoods offer very little choice as to type of housing. There is also a loss of amenity and convenience as exemplified by the unavailability of the corner store in residential areas.

Performance standards are one way of allowing the mixing of uses while protecting property values and neighborhood characteristics. The basic idea behind the use of performance standards is that as long as any activity conforms to the performance standards it is permitted anywhere in the community. Within the context of Euclid, performance standards provide different criteria for separating the pig from the parlor. With performance standards, planners look more critically at each prospective development to determine whether or not it would make a good neighbor on the basis of its predicted performance rather than its use classification. Although this does

not necessarily guarantee mixed uses, performance zoning allows a flexibility in siting which is precluded by Euclidean zoning. Presumably, the removal of use restrictions would allow the dictates of the market to foster better integration of various housing types, commerce, and industry.

In regard to design flexibility the replacement of lot restrictions, set backs, and other dimensional specifications by performance standards permits greater variation and imagination in design. With performance standards, clustering and other design innovations which generally present problems to zoning administrators can be permitted without the use of special exceptions. Often excellence in new design or technology is thwarted or delayed by specification standards set forth in zoning ordinances and building codes.

In the case of both locational flexibility and design flexibility, the performance approach does not imply a lowering of standards but rather addresses the standards directly to the aspects of performance which need to be controlled. The "toughness" of the standards can vary from community to community.

Incentive

Another potential advantage of performance zoning is that performance bylaws can be written in a form which is an incentive to better development. Performance incentives are explicitly written into the proposed New York residential zone ordinance and the Duxbury

law. However, incentives to better performance are also implicit in the Franklin County, Knoxville, and Chicago ordinances in that if an industry or any other type of development can meet the performance standards it will have a wider variety of sites to choose from and a better chance of securing necessary permits. A byproduct of strict use zoning, especially in regard to industrial zones, has been to create either very "bad" neighborhoods, or in regard to single-family residences, to create very "good" neighborhoods. Since industry is required by ordinance to locate only in industrial zones where it does not have to be a "good neighbor" there is often little incentive for industry to clean up its processes or improve its appearance beyond the legal minimum. With performance standards, industry can be induced to adopt the newest techniques for controlling nuisance generation and improving its appearance. This does not mean that a warehouse has to look like a country club. Performance zoning merely states that if the owners of the warehouse want to landscape and take other improvement measures they can have a greater range of possible sites. The same principle can be applied to mobile home parks, multi-family housing developments, or commercial activities.

Rationale

Perhaps the most important aspect of performance zoning is that it is a rational approach to land use control. With performance

standards the criteria for land use decisions are set forth in the requirements. Much of the popular objection to zoning derives from the fact that many zoning ordinances appear to be arbitrary regulations which do not have a stated rational basis. Frequently the lines on a zoning map are merely inherited from earlier maps and generations of arbitrary decisions are encrusted in successive revisions. Performance standards are one method of freeing land use controls from arbitrary zoning. Because the rationale for the standards is explicit in the performance ordinances, there should be a higher level of public acceptance for this type of control.

A corollary to having rational land use controls is having legally defensible controls. Although the constitutionality of zoning has been firmly established by the Supreme Court and upheld by subsequent decisions, objections to particular zoning actions as arbitrary or capricious are frequently supported by the courts. Many planners are beginning to sense a degree of uncertainty as to how well their zoning laws can hold up under judicial or quasi-judicial scrutiny. Much of the impetus for a different approach to controls comes from the need for more legally defensible bases for regulation. Actions such as the recent Oregon Supreme Court decision in Fasano v. Washington County,³³ which attached added significance to having defensible criteria for zone changes, has made particularly imperative the need for more rational types of land use controls. Although the problems of insufficient bases for administrative or quasi-judicial decision making would not necessarily be avoided with the use of performance standards, the process of writing out the criteria for zonation would presumably make land use controls more defensible in the eyes of both the courts and the public.

Administration

Although difficulty with administration and enforcement is one of the greatest obstacles to the use of performance standards, there are certain aspects of zoning administration which may be simplified by performance zoning. Because of the lack of flexibility built into most zoning bylaws, elaborate and costly discretionary devices have been attached to the body of zoning law. These include traditional granting of variances and special exceptions as well as a plethora of new discretionary devices such as special-use zones, special-use permits, and floating zones. The legal intricacies of many of the devices which have been attached to zoning have complicated the procedure to the point where it is beyond the comprehension of the public. Performance standards have the potential of cutting through much of the red tape presently associated with zoning. By allowing greater flexibility, fewer exceptions to the control will be required. Furthermore, where discretionary judgement is required, performance standards can provide a framework for evaluating the merits of allowing exceptions, as in the Duxbury model.

A factor closely related to administrative simplicity is time loss and cost to the developer. To date, there has not been a complete analysis of cost to the developer of using a performance-approach to zoning or the granting of special permits, but there appears to be the potential for considerable savings, if the time

involved in securing permits can be reduced. This should be a strong selling point in regard to gaining developers' support for a performance-approach.

Disadvantages

Administration

The most serious drawbacks to the use of performance standards are associated with administration and the limits of available technology. The ASPO survey of communities using performance standards indicated that administration was the primary cause of dissatisfaction with performance standards.³⁴ Presumably, these difficulties may be an important reason why the concept has not had more widespread application.

The chief difficulty in regard to administration is that many types of performance standards go far beyond the training of the average zoning administrator. Enforcement prior to construction--which is obviously the most important stage at which to enforce the standards--requires the administrator to read blueprints or plans and accurately predict from them the impact of a proposed development. Enforcement after construction requires monitoring equipment and the expertise to use it. At present, few small or medium-size planning staffs have staff capabilities adequate for performance zoning. Even some of the larger communities which have used industrial performance standards have relied extensively on

outside consultants.³⁵ However, the problem of the lack of local expertise is being mitigated by the heightened interest of federal and state agencies in assisting local planners.

Another administrative limiting factor is time. Euclidean zoning, at least in theory, has the advantage of being administratively simple. Basically, a use or design either meets the standards or doesn't meet the standards. Usually this judgement can be made from the planning office without on-site inspection or calling in outside expertise. Performance standards, on the other hand, require closer site-related investigation which is unavoidably time-consuming. However, the time savings in administration of Euclidean zoning may be lost if the planning decision ultimately ends up in an appeals hearing or court. The extra administrative burden involved in the initial application of performance standards may, in the long run, be time-saving if it avoids appeals.

Technical

The availability of technical data may ultimately be a limiting factor on how far performance standards may go. This problem exists particularly in regard to standards related to a locational base or carrying capacity of the land resource. In order to establish a performance standard related to carrying capacity it is necessary to know how much of a given use a piece of land can sustain. Carrying capacity studies are a relatively new concept in planning

and very few communities have an adequate data base for performance standards based on carrying capacity.

There is also a technical problem associated with measurement of impact. Some impacts require expensive equipment and expertise. For other types of impact, the available measurement techniques are highly subjective and do not satisfy O'Harrow's description of an ideal standard. For example, the Ringlemann Test for smoke, which is the standard measure of relative opacity of smokestack emissions, is nothing more than a visual comparison of smoke density from a stack to a density colored ring around a "peek hole" through which the tester views smoke and rates it from 0 to 5. Although the Ringlemann Test is the standard which appears in most performance ordinances, its adequacy and legality as a measure of emissions, particularly if they are related to public health, is questionable.³⁶

Legal

Closely related to the technical problem associated with performance zoning is the legitimacy of performance standards in the eyes of the courts. In general, courts have a fairly consistent history of acceptance of performance standards as a technique for controlling impacts. However, the acceptability of a particular performance standard ultimately rests on the reliability of the data and the degree to which the standards address questions of "public health, safety, and welfare". Accuracy of measurement and reasonableness of the conclusions drawn are the two criteria which need to be applied to a performance standard. Put another way:

The danger of overzealous adoption of a principle of performance standards based mainly on health and safety criteria into the area of welfare is a quantum jump. The lack of any comparable backup criteria in the latter will create potential for extremely abusive use of ill-founded standards.³⁷

The acceptance of performance standards as a land use control, which is really more a question of welfare than public health or safety, relates mainly to the degree that a standard can be traced back to the data source and the strength of the measurement. The conclusion to be drawn is that performance standards are not on safe ground where the measurement of the data base is highly subjective.

However, the question as to what extent performance standards can be used to regulate land use has not been fully addressed by the courts. The above call for caution in using performance standards to address issues of public welfare should not go unheeded, but, on the other hand, the trend of the courts appears to be toward granting increased powers of legislation in the area of general welfare. As early as 1954, the Supreme Court suggested greater parameters of the police power. In Berman v. Parker Justice Douglas stated:

The concept of public welfare is broad and inclusive... The values it represents are spiritual as well as physical, aesthetic as well as monetary. It is within the power of the legislature to determine that the community should be beautiful as well as healthy, spacious as well as clean, well balanced as well as carefully patrolled.³⁸

The interpretation drawn from Berman and subsequent judicial trends is that communities do have considerable latitude in the use of standards to control a broad spectrum of impacts which go beyond the qualifications of safety and public health.

Predictability

In addition to the potential operational and legal obstacles to performance zoning, there are some basic questions as to the effect on a community of performance zoning, as opposed to Euclidean zoning. One of the most apparent problems is the lack of predictability in terms of forecasting future patterns of growth. A Euclidean zoning map is a comforting picture of what the community will look like in the future, which is useful to both investors and public officials in the placement of facilities. Because any activity can locate anywhere so long as it meets the performance standards the predictive function of the zoning map is lost with performance zoning. However, the theoretical predictive function of the zoning map is often illusory because relatively few zone designations materialize over a long period of time. In this sense, the loss of zoning's predictive function is not a real loss.

Providing for Industry and Commerce

It is quite likely that some forms of industry and commerce will be unable to conform with performance standards adopted by

many communities. This could have unforeseen drawbacks from both a local and regional point-of-view. If provisions are too stringent, the local economic base can be jeopardized. Industry may be unwilling to bear the costs necessary for compliance. From a regional perspective, heavy industry needs to be located somewhere. If every community adopts the toughest possible performance standards, siting of essential industries and utilities could prove difficult.

Adequacy of Protection

Whether or not performance standards can protect communities and resources as well as Euclidean zoning is an unknown. In Duxbury, some of the opponents of the Rahenkamp model argued that by permitting developers to develop at higher densities the town would be yielding too much to the developers.³⁹ The old density restrictions, they argued, were more adequate than the performance standards for controlling growth. The same questioning could be applied to other types of performance standards. In other words, by allowing any type of development to occur anywhere, will the community be giving up control of its land? Performance-based ordinances need to be very carefully drawn up to insure that the protection they provide is adequate to the needs of the community.

SUMMARY

On the basis of the limited data available, the use of performance standards appears to be a feasible land use control technique.

Some of the advantages include:

- 1) Greater flexibility of land use without jeopardizing the public interest;
- 2) Rationalization of land use controls;
- 3) Greater latitude in design and site planning which allows less conventional types of development such as clustering;
- 4) Incentives to better performance;
- 5) Sounder legal foundation.

There are, however, many procedural and technical problems which need to be resolved before performance zoning can become operational on a wide scale. Experience to date is too limited to warrant unqualified advocacy of the performance approach. The state-of-the-art in regard to the use of performance standards in planning is at the point where what is needed is well monitored testing. The administrative, technical, and legal hurdles associated with performance zoning can only be surmised without well designed case studies. The objective of this paper has been to provide an overview of some of the exploratory experiences with the use of performance standards. Preliminary evidence indicates that performance zoning answers a number of the land use control problems confronting planners. Subsequent research should focus in detail on one or two communities which have taken a comprehensive approach to the use of performance standards in plan implementation. Issues which need to be addressed by additional research include effectiveness, public acceptance, legality, administrative feasibility, and cost to the community and to developers.

FOOTNOTES

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3. See generally Ralph Hirsch, "Measuring the Good Neighbor: A New Look at Performance Standards," Land Use Controls: A Quarterly Review. Volume 2, Number 2, 1968.
4. U.S. Congress, Public Law 91-604, "Clean Air Amendments of 1970," Section 111 (a) p. 8.
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6. See generally Marvin A. Salzenstein, Industrial Performance Standards, (Chicago: American Society of Planning Officials, 1971) PAS Report Number 272.
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8. Jacob Kaminsky, Environmental Characteristics Planning: An Alternative Approach to Physical Planning, (available from Regional Planning Council, Baltimore, MD, 1972), p. 10.
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11. Ibid, p. 10.
12. Ibid, p. 13.
13. Ibid, p. 39.
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16. *Berman v. Parker*, 348 United States 26 (1954). See also *Oregon City v. Hartke*, 240 Ore. 35 (1965) and *Reid v. Architectural Board of Review*, 192 N.E. 2d 74 (Ohio, 1963).
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21. Salzenstein, Industrial Performance Standards, p. 5.
22. Ibid., p. 5.
23. Herr & Associates, Performance Zoning II.
24. Lynch and Herr, "Performance Zoning; Gay Head, Massachusetts" p. 3.
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29. Ibid., p. 61.
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32. Euclid v. Ambler Realty Co., 272 U.S. 365 (1926).
33. Fasano v. County Commissioners of Washington County, OR, 507, p. 2d 23.
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