Applying the Basic Principles of Cognitive Science to the Standard State Zoning Enabling Act

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APPPLYING THE BASIC PRINCIPLES OF COGNITIVE SCIENCE TO THE STANDARD STATE ZONING ENABLING ACT

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Cognitive Science studies cognition by examining problem-solving, establishing general conceptual tools and guidelines by which novices may become experts. Available to problem-solvers of all disciplines, including legislators, these tools offer a means for evaluating legislation. For example, by using these tools to assess the problem-solving effort in Euclidean zoning as embodied in the Standard State Zoning Enabling Act, it becomes clear that this Act could be improved in several ways: first, by shifting more of the decision-making power to those with the most experience; and, second, by mitigating the electoral and judicial constraints upon these decision-makers. These steps will ensure that Euclidean zoning, as a problem-solving process with distinct phases, represents an effective problem-solving effort.

INTRODUCTION

Euclidean zoning "envisions the specification of determined geographic areas separated according to zoning districts with the uses permitted in each district set forth in the ordinances."1 Many writers criticize Euclidean zoning.2 Some, for example, argue that racism and elitism initially motivated—and presently perpetuate—Euclidean zoning.3 Others criticize Euclidean zoning's inflexibility, arguing that it can work inequitable hardships on individual property owners.4 Yet other critics respond that the incorporation of too much flexibility into Euclidean zoning leads to discretionary abuse by administrators

* Managing Editor, BOSTON COLLEGE ENVIRONMENTAL AFFAIRS LAW REVIEW, 1999-2000. This article is dedicated to Mutti, in response to her countless newspaper clippings.


3 See Kosman, supra note 2, at 60.

4 See JESSE DUKEMINIER & JAMES E. KRIER, PROPERTY 1021 (3d ed. 1993).

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and the favoring of certain property-owners over others. Finally, some question the efficacy of Euclidean zoning, asking whether it fixes the problem to which it was addressed. One approach to answering this question involves ascertaining whether zoning has produced a desirable state of affairs. This Note adopts an alternative approach, which asks whether Euclidean zoning, as a problem-solving process with distinct phases, represents an effective problem-solving effort. Cognitive Science offers the tools for such analysis.

Cognitive Science studies cognition by examining problem-solving, seeking to understand what constitutes effective cognition by first understanding what constitutes effective problem-solving. This study involves, among other methods, the identification of what makes effective problem-solvers or "experts" effective and, conversely, the identification of what makes ineffective problem-solvers or "novices" ineffective. By identifying the mistakes typically made by novices—and avoided by experts—Cognitive Science seeks not merely to understand how novices differ from experts, but to establish general conceptual tools and guidelines by which novices may become experts. These conceptual tools are available to problem-solvers of all disciplines, including legislators who, after all, are essentially elected problem-solvers. By considering the conceptual tools provided by Cognitive Science, legislators may avoid enacting ineffective legisla-

5 See DUKEMINIER & KRIER, supra note 4, at 1047 (citing L.A. TIMES article reporting a Los Angeles city councilman's voting four times in one month to permit more extensive development).
7 See KUNSTLER, supra note 2, at 109-49; JACOBS, supra note 2, at 222-69 passim.
9 Cognitive Science is alternatively described as the study of decision-making. See Blasi, supra note 8, at 318. This Note alternates between the expressions problem-solving and problem-solvers and decision-making and decision-makers.
10 See id. Blasi's paper is meant to assist in reconstructing the practice and education of novice lawyers "who will eventually become better than [experts] are now." Id. at 317.
11 See id. Blasi's paper is meant to assist in reconstructing the practice and education of novice lawyers "who will eventually become better than [experts] are now." Id. at 317.
12 See Blasi, supra note 8, at 342-43 (stating that empirical investigation has turned out data exploitable by Cognitive Science in areas as diverse as "Soviet agricultural policy, the sentencing of defendants by magistrates, the diagnosis of illness by physicians, financial planning for retirement, and the analysis of business problems" [citations omitted]); see generally DÖRNER, supra note 8 (adopting computer simulations to mimic the actions of complex systems, Dörner tests subjects who act as, among other things, mayors and factory managers, in order to identify what constitutes effective problem-solving).
tion and regulation, i.e., legislation or regulation which does not remedy the problem to which it was addressed.

Section I of this Note sets out the general tools and concepts Cognitive Science uses to analyze problem-solving. Section II considers Euclidean zoning as a problem-solving effort, identifying both the initial goal of zoning and its current status as embodied in the Standard State Zone Enabling Act.13 Section III evaluates the problem-

13 AMERICAN LAW INST., STANDARD STATE ZONING ENABLING ACT, reprinted in MODEL LAND DEV. CODE 210 (Tent. Draft No. 1, 1968) [hereinafter STANDARD ACT]. The central sections of the Standard Act provide as follows:

Section 1. Grant of Power—Empowers municipalities to "regulate and restrict the height, number of stories, and size of buildings and other structures, the percentage of lot that may be occupied, the size of yards, courts, and other open spaces, the density of population, and the location and use of buildings, structures, and land for trade, industry, residence or other purposes." Id. at 212-14.

Section 2. Districts—Permits division of municipalities into districts (zones) of appropriate number, shape, and area, and provides that regulations may vary from district to district. See id. at 214.

Section 3. Purposes in View—Requires that regulations be "made in accordance with a comprehensive plan and designed to lessen congestion in the streets; to secure safety from fire, panic, and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to facilitate the adequate provision of transportation, water, sewerage, schools, parks, and other public requirements. Such regulations shall be made with reasonable consideration, among other things, to the character of the district and its peculiar suitability for particular uses, and with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout [the] municipality." Id. at 214-15.

Section 4. Method of Procedure—Requires the enactment of procedures by which to establish, enforce, and change regulations. See id. at 215.

Section 5. Changes—Permits modification and repeal of regulations. See id. at 216-17.

Section 6. Zoning Commission—Requires appointment of a zoning commission to recommend district boundaries and regulations. See id. at 217.

Section 7. Board of Adjustment—Authorizes appointment of a board of adjustment to hear appeals and make special exceptions to regulations "in appropriate cases and subject to appropriate conditions and safeguards . . . ," and also to permit "such variance from the terms of the ordinance as will not be contrary to the public interest, where, owing to special conditions, a literal enforcement of the provisions of the ordinance will result in unnecessary hardship, and so that the spirit of the ordinance shall be observed and substantial justice done." Id. at 218-20.

Section 8. Enforcement and Remedies—Declares that violations of regulations shall be misdemeanors punishable by fine or imprisonment; civil penalties are also authorized. See id. at 220-21.
solving effort embodied in Euclidean zoning, using the conceptual tools and guidelines provided by Cognitive Science to identify how Euclidean zoning deviates from an optimal problem-solving effort. Finally, Section IV suggests ways to improve the problem-solving effort in Euclidean zoning as embodied in the Standard Act.

I. COGNITIVE SCIENCE

Cognitive Science defines a problem as "any situation in which the current state of affairs varies from the desired state of affairs, when there is no obvious way to reach the desired state." Cognitive Science focuses on problems as a means to understand problem-solvers and, more specifically, the processes that make for effective problem-solving. Analyzing how effective problem-solvers deal with problems illuminates common errors in problem-solving.

A. Problem-solving Principles

Cognitive scientists typically divide problem-solving efforts into distinct phases, evaluating each phase on its own terms to identify the most effective course of action at each phase. The phases can be summarized as follows:

- formulation of goals;
- formulation of models and gathering of information;
- prediction and extrapolation;
- planning of actions, decision making, and execution of actions;

Section 9. Conflict with Other Laws—Provides that in instances of conflict between zoning regulations and other laws controlling land use, the more stringent shall apply.

See id. at 221.

14 See Blasi, supra note 8, at 331. Blasi's preface to his article is equally applicable here. He notes that "despite the proliferation of interdisciplinary 'law and' movements, there is as yet no defined discourse about the application of Cognitive Science to lawyering practice." Id. at 320-21. This is no less true of legislative or administrative practice. As Blasi notes: "[a] substantial part of this essay is thus necessarily spent in bringing to an audience of lawyers and legal academics a subset of concepts and findings of Cognitive Science in a form that would doubtless seem extraordinarily oversimplified to an audience of cognitive scientists." Id. at 321.

15 See DÖRNER, supra note 8, at 7-10.

16 See id. passim.

17 See id. at 43, 49, 71, 153; Blasi, supra note 8, at 328.
of actions and revision of strategy.\textsuperscript{18}

As some have noted, stated abstractly, these phases do little more than warn, "Think before you act."\textsuperscript{19} By contrasting the conduct of an expert facing an extremely complex problem, however, with that of a novice at each of these problem-solving phases, the utility of these phases becomes evident.\textsuperscript{20}

1. Formulation of Goals

Given the Cognitive Science definition of a problem—any situation in which the current state of affairs varies from the desired state of affairs, when there is no obvious way to reach the desired state—a decision-maker must decide first what state of affairs she desires.\textsuperscript{21} In Cognitive Science terms, the decision-maker must formulate a goal.\textsuperscript{22} Cognitive scientists categorize goals into the following groups: positive or negative; general or specific; clear or unclear; simple or multiple; and implicit or explicit.\textsuperscript{23}

Whether a goal is positive or negative depends on how a decision-maker construes the desired state.\textsuperscript{24} Positive goals involve working towards a desirable state and are generally stated as an affirmative desire to achieve \( x \), the desired state of affairs.\textsuperscript{25} Negative goals, in turn, involve an attempt to correct or prevent a deficient state of affairs and are generally stated as an affirmative desire to achieve something other than \( x \), the deficient current or inevitable state of affairs.\textsuperscript{26} To see that a decision-maker can construe a goal either positively or negatively, consider the site of a toxic waste spill; insofar as the goal in cleaning such a spill is to achieve a certain level of toxicity, the goal is

\textsuperscript{18} See Dörner, supra note 8, at 43; Blasi, supra note 8, at 328. While Blasi's phases differ slightly in terminology from Dörner's, the processes are essentially the same. For example, Blasi sets out the phases as: (1) identifying and diagnosing the problem; (2) generating alternative solutions and strategies; (3) developing a plan of action; (4) implementing the plan; and, (5) keeping the planning process open to new information and ideas. See id. at 328.

\textsuperscript{19} See Blasi, supra note 8, at 328.

\textsuperscript{20} See Dörner, supra note 8, at 21–27 (contrasting the problem-solving traits of effective problem-solving test subjects with ineffective problem-solving test subjects).

\textsuperscript{21} See id. at 43, 49; Blasi, supra note 8, at 328, 331.

\textsuperscript{22} See Dörner, supra note 8, at 43, 49; Blasi, supra note 8, at 328, 331. Blasi does not specifically use the term goal; rather, he discusses the identification of the problem and the generation of a solution. See Blasi, supra note 8, at 328, 331.

\textsuperscript{23} See Dörner, supra note 8, at 49–52.

\textsuperscript{24} See id. at 49–50.

\textsuperscript{25} See id. at 50.

\textsuperscript{26} See id.
positive.\textsuperscript{27} Insofar as the goal is to achieve something other than the present level of toxicity, the goal is negative.\textsuperscript{28} Positive goals require clear and definite articulation.\textsuperscript{29} Addressing the toxic waste site with a positive goal will require a decision-maker to identify exactly what state she would like to achieve.\textsuperscript{30} Conversely, negative goals tend to be vague and ill-defined.\textsuperscript{31} Explained in terms of what state the problem-solver desires, negative goals do not specify a desired state other than to say that the present state is not it.\textsuperscript{32} Though the decision to construe a goal positively or negatively seems a merely academic exercise, generally, the clearer a decision-maker defines her goal the more likely it will be achieved.\textsuperscript{33} Positive goals tend to be clearer than negative goals and, therefore, are more likely to be realized.\textsuperscript{34}

Another useful classification of goals concerns whether they are general or specific.\textsuperscript{35} Cognitive Science categorizes a goal as general where determining whether it has been achieved requires the examination of only a few criteria or a single criterion.\textsuperscript{36} For example, checkmating an opponent's king in the game of chess represents a general goal.\textsuperscript{37} A chessplayer may checkmate an opponent in a vast number of ways.\textsuperscript{38} Still, checkmating necessitates satisfying one criterion, namely, checkmating the king.\textsuperscript{39} Consider again the toxic waste example noted earlier. Even if a decision-maker were to articulate a desired level of toxicity, a goal to clean the site represents a general goal since the decision-maker need satisfy only one criterion.\textsuperscript{40} Conversely, Cognitive science categorizes a goal as specific where determining whether it has been achieved requires the examination of a number of criteria.\textsuperscript{41} Consider, for example, the goal of the federal Clean Air Act to reach, among other things, levels of pollution which do not

\textsuperscript{27} See id.
\textsuperscript{28} See Dörner, supra note 8, at 50.
\textsuperscript{29} See id.
\textsuperscript{30} See id.
\textsuperscript{31} See id.
\textsuperscript{32} See id.
\textsuperscript{33} See Dörner, supra note 8, at 50.
\textsuperscript{34} See id.
\textsuperscript{35} See id.
\textsuperscript{36} See id.
\textsuperscript{37} See id.
\textsuperscript{38} See Dörner, supra note 8, at 50.
\textsuperscript{39} See id.
\textsuperscript{40} See id.
\textsuperscript{41} See id.
pose health risks.\textsuperscript{42} Determining whether the Clean Air Act has reached its goal, then, requires asking, \textit{inter alia}, whether each of the levels specified for these five pollutants has been reached.\textsuperscript{43} The distinction between general and specific goals warrants notice because the specification of a general goal does little to clarify how this goal will be achieved; specific goals, on the other hand, force a decision-maker to consider the various criteria she must meet to achieve this goal.\textsuperscript{44} As with positive and negative goals, the more specifically a decision-maker defines her goal, the more likely she will achieve it.\textsuperscript{45} Decision-makers, therefore, will more likely achieve specific goals than general goals.\textsuperscript{46}

The distinction between clear and unclear goals bears a close relation to that between general and specific goals.\textsuperscript{47} Cognitive Science categorizes both general and specific goals as clear goals; both types of goals offer some criterion or criteria by which to determine decisively whether the goal has been met.\textsuperscript{48}

In contrast, unclear goals offer no clear criteria to determine whether the goal has been met.\textsuperscript{49} Consider, for example, the Supreme Court's holding that Euclidean zoning is permissible insofar as its goal is to protect the health, safety, and welfare of the community.\textsuperscript{50} Granted, a decision-maker could describe the goal of a given instance of zoning as an attempt to protect the health, safety, and welfare of

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\textsuperscript{42} See 42 U.S.C. §§ 7401-7671 (1994). The specific levels for these pollutants—sulfur dioxide, nitrogen dioxide, suspended particulates, carbon monoxide, ozone, and lead—are set at a "harm based" level because the mandated quality levels are set by reference to ambient levels of pollutants that would limit harm to human health and the environment to acceptable levels. See id. § 7409. Notably, while the Act initially looks to harm as a guide to determine acceptable levels of pollution, seeming to recognize that the avoidance of harm is a negative and general goal, the primary mechanism through which the Act ultimately takes effect for hazardous air pollutants is based on technology. See id.; see also ZYG-MUNT J.B. PLATER, ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW, AND SOCIETY 442, 446 (2d ed. 1998). The specification of a specific level of technology as a goal—in this case the maximum available control technology (MACT)—represents, in Cognitive Science terms, a positive, specific goal. See id.; DÖRNER, supra note 8, at 50.

\textsuperscript{43} See 42 U.S.C. §§ 7401-7671; DÖRNER, supra note 8, at 50.

\textsuperscript{44} See DÖRNER, supra note 8, at 50. That is, had the Clean Air Act stipulated nothing more than that the air must be clean, and had not specified specific levels for various pollutants, it would not be clear when the air would count as clean enough. See 42 U.S.C. §§ 7401-7671; DÖRNER, supra note 8, at 50.

\textsuperscript{45} See DÖRNER, supra note 8, at 50.

\textsuperscript{46} See id.

\textsuperscript{47} See id.

\textsuperscript{48} See id. at 50-51.

\textsuperscript{49} See id. at 51.

\textsuperscript{50} See discussion infra Section II.C.4.
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the community. But this goal provides no guide for determining whether zoning has, in fact, protected the community since there is no straightforward procedure for determining whether such protection is present. Consider again the Clean Air Act’s specific standards for sulfur dioxide, nitrogen dioxide, suspended particulates, carbon monoxide, ozone, and lead. Determining whether a given pollutant level has been met is simple. Determining whether a given pollutant standard sufficiently protects the health, safety, and welfare of the community is not so simple. Based on the Cognitive Science hypothesis that a decision-maker will more likely achieve clearly articulated goals, unclear goals are even less susceptible to being achieved than general goals.

As the discussion of specific goals suggests, a goal may actually comprise a number of other goals, which in Cognitive Science terms represents the difference between simple and multiple goals. For example, the Clean Air Act has, as an overarching simple goal, clean air. As a means to achieve this overarching goal, EPA has established a number of sub-goals, including that concentrations of the pollutants described above be reduced to specified levels.

Finally, cognitive scientists distinguish between explicit and implicit goals. A conscious decision to reach a specific state represents an explicit goal. Often, however, a decision-maker does not consciously formulate all the goals she would like to achieve or maintain. A goal that a decision-maker would categorize as part of the desired state of affairs were she to consider it exemplifies an implicit goal. Consider, for example, the EPA’s approval of methyl tertiary

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51 See Dörner, supra note 8, at 50; discussion infra Section II.C.4. Instances of zoning include the granting of special exceptions and variances, as well as allowing cluster zoning, PUDs, and contract or conditional zoning. See discussion infra Section III.C.2.
52 See Dörner, supra note 8, at 50.
54 See id. To be sure, EPA sets the acceptable levels of these pollutants by considering health impacts. See id. Nevertheless, EPA’s specification of the levels which will not endanger the community’s health represents a shift from a fairly unclear goal to a clear goal. See id.
55 See discussion infra Section II.C.4.
56 See Dörner, supra note 8, at 51.
57 See id. at 51.
59 See id. § 7403(g).
60 See Dörner, supra note 8, at 52.
61 See id.
62 See id.
63 See id.
butyl ether (MTBE), a fuel additive used in reformulated gasolines (RFG). RFGs are employed in most U.S. urban areas during the winter months to reduce air pollution. At the time of their introduction, RFGs were hailed as the painless, technology-fix alternative to changing driving behavior to reduce mobile source-emissions. MTBE, however, apparently has the capacity to contaminate wells when released in extremely small amounts, and was implicated in several well contamination cases in Maine, Massachusetts, and California. Here, in addition to its explicit goal of air pollution reduction, the EPA certainly would acknowledge an implicit goal not to worsen water conditions. In short, decision-makers must be careful to avoid dwelling so intently on the problems they have, to prevent overlooking those they do not yet have.

Cognitive Science thus indicates that decision-makers should obey the following general principles when formulating goals. Where possible, decision-makers should state goals positively, not negatively. They should formulate specific—not general—goals, which implies, of course, that they should formulate clear rather than unclear goals. Finally, decision-makers should strive to make implicit goals explicit.

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65 See id.
66 See id.
67 See id. MTBE has been detected in 23 public water supplies in Massachusetts and the US Geological Survey has reported finding MTBE in 20 percent of the wells it has monitored in areas using RFGs. See id.
68 In fairness, EPA does have an explicit goal not only not to worsen water conditions, but to improve them, under statutes such as the Clean Water Act and the Safe Drinking Water Act. See 33 U.S.C. §§ 1251–1387 (1994); 42 U.S.C. § 300(f)-(j) (18) (1994). Still, the point is that in formulating goals, a decisionmaker must not ignore implicit goals. See DÖRNER, supra note 8, at 52. This is especially true for a regulatory agency as diverse in its regulatory scope as EPA. If, in enacting each of these statutes—i.e. goals—Congress and EPA do not at least consider the possible impacts on other realms, inconsistent goals will emerge. See id. at 57.
69 See DÖRNER, supra note 8, at 52.
70 See id. at 50–52.
71 See id. at 50.
72 See id.
73 See id. at 52.
2. Formulation of Models and Gathering of Information

After formulating a goal, a decision-maker must understand the current, undesirable state of affairs confronting her.\(^74\) Experienced decision-makers solve problems effectively, in large part because of their sophisticated comprehension of the complex systems confronting them.\(^75\) That they are experienced implies that sophisticated comprehension requires prolonged exposure to a given system; understanding some general principles of complex systems, however, facilitates this process.\(^76\)

Cognitive Science defines a system as a “network of many variables in causal relationships to one another.”\(^77\) Complex systems contain many interrelated variables.\(^78\) Further, a system of variables interrelates if action that affects or is meant to affect one element of the system also always affects other elements.\(^79\) This guarantees that an action aimed at one variable will have side effects and long-term repercussions.\(^80\) Identifying all the variables within a system may be difficult since some of these may be “intransparent” or invisible.\(^81\) Complex systems, however, involve more than a multiplicity of interrelated variables; the nature of the relations between these variables likewise introduces complexity to the system.\(^82\) Generally, these interrelationships can be grouped into the categories of positive feedback, negative feedback, buffering, critical variables, and indicator variables.\(^83\)

In a relationship regulated by positive feedback, an increase in a given variable produces a further increase in that same variable.\(^84\) Conversely, a decline in that variable produces a further decline.\(^85\) For example, animal and plant populations are to some extent regulated by positive feedback since the larger a population is, the more likely it

\(^74\) See Dörner, supra note 8, at 74 (observing that “it is usually wise when correcting a deficiency to consider it within the context of its system.”).
\(^75\) See Blasi, supra note 8, at 342.
\(^76\) See Dörner, supra note 8, at 74.
\(^77\) See id. at 73.
\(^78\) See id. at 38.
\(^79\) See id.
\(^80\) See id.
\(^81\) See Dörner, supra note 8, at 40.
\(^82\) See id. at 74.
\(^83\) See id.
\(^84\) See id.
\(^85\) See id.
is to continue growing. Positive feedback tends to undermine the stability of a system and a system in which many variables are regulated by positive feedback can easily go awry.

In a relationship regulated by negative feedback, an increase in a given variable produces a decrease in another variable and vice versa. This kind of relationship tends to perpetuate the status quo, maintaining equilibrium in a system. Consider, for example, the relationship of wolves and rabbits in an animal population. An increase in rabbits produces an increase in wolves. This, in turn, produces a decline in rabbits, which in turn produces a decline in wolves.

A system incorporating many variables governed by negative feedback is a well-buffered system. Such systems can absorb numerous disturbances without becoming unstable. Aldo Leopold’s description of the “biotic pyramid” represents one such well-buffered system:

Plants absorb energy from the sun. This energy flows through a circuit called the biota, which may be represented by a pyramid consisting of layers. The bottom layer is the soil. A plant layer rests on the soil, an insect layer on the plants, a bird and rodent layer on the insects, and so on up through various animal groups to the apex layer, which consists of the larger carnivores.

The velocity and character of the upward flow of energy depend on the complex structure of the plant and animal community, much as the upward flow of sap in a tree depends on its complex cellular organization. This interdependence between the complex structure of the land and its smooth functioning as an energy unit is one of its basic attributes.

When a change occurs in one part of the circuit, many other parts must adjust themselves to it. Change does not necessarily obstruct or divert the flow of energy; evolution is a long series of self-induced changes, the net result of which

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86 See Dörner, supra note 8, at 74.
87 See id.
88 See id.
89 See id.
90 See id. at 74–75.
91 See Dörner, supra note 8, at 75.
92 See id.
has been to elaborate the flow mechanism and to lengthen the circuit.\textsuperscript{93}

While relationships of positive and negative feedback represent a qualitative aspect to the relationship between a pair of variables, namely, how the variables affect one another, the relationship between variables within a complex system also manifests a quantitative aspect; some variables stand in such relationships to more variables than others.\textsuperscript{94} Cognitive scientists use the term "critical variable" for variables which interact mutually with a large number of other variables since altering such variables exerts a major influence on the status of the entire system.\textsuperscript{95} Variables which depend on many other variables while themselves exerting very little influence on the system are called "indicator variables."\textsuperscript{96} Such variables provide important clues that help in assessing the overall status of a system.\textsuperscript{97} As some have noted "[l]ike the canaries that were carried into coal mines ... endangered species can be vivid living indicators of important human concerns. Endangered birdlife revealed the danger of DDT and other pesticides to humans."\textsuperscript{98} Indicator variables come in a variety of strengths; an indicator is weak when it causally relates to its system in an attenuated manner so that a number of other factors plausibly could be affecting the variable.\textsuperscript{99}

Generally, inexperienced decision-makers, then, do not understand these general principles of systems, failing to comprehend the positive and negative feedback relationships which manifest changes in critical variables and send signals through indicator variables.\textsuperscript{100} Besides grasping these general principles, a decision-maker must understand the particulars of the system confronting her.\textsuperscript{101} How can she quickly discern which variables are critical and which are indicators?

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\textsuperscript{93} Aldo Leopold, A Sand County Almanac 214–20 (1948); see Rachel Carson, Silent Spring 54–57 (1962).
\textsuperscript{94} See Dörner, supra note 8, at 75.
\textsuperscript{95} See id.
\textsuperscript{96} See id.
\textsuperscript{97} See id.
\textsuperscript{98} See Plater, et al., supra note 42, at 692–93 (observing that "[i]n the snail darter case, when Justices, reporters or TVA’s minions asked, ‘What good is the snail darter?’ the citizens responded that it was a sensitive physical and legal barometer of the highly specific qualities of its habitat ...”); see also Zygmunt J.B. Plater, The Embattled Social Utilities of the Endangered Species Act—a Noah Presumption, and a Caution against Pulling Gas Masks on the Canaries in the Coal Mine, 27 Env’t. Law 845 (1997).
\textsuperscript{99} See Dörner, supra note 8, at 83.
\textsuperscript{100} See id. at 71–73, 75.
\textsuperscript{101} See id. at 79.
Likewise, how can she quickly discern whether a given relationship represents positive or negative feedback? Cognitive Science suggests a number of time-saving methods.  

Analogical reasoning represents one of the more effective tools in coming to grips with the particulars of a given system. Such reasoning involves comparisons between variables at an abstract level. Consider, for example, the use of canaries in coal mines noted above. Contemplated at the level of species, humans and canaries differ radically from one another. Still, both fall under the more general category of animal. The recognition that a novel variable—a canary—falls under the same category as a previously encountered variable—a human being—allows decision-makers to form hypotheses regarding the former variable based on knowledge of the latter. The recognition that the canary represents an indicator variable for an ecosystem’s health (or our own) exemplifies analogical reasoning, namely, the hypothesis that, as animals, our health will be affected by the same sorts of variables that will adversely affect another animal, the canary. Analogical reasoning, then, allows decision-makers to compare individual variables on a conceptual level and to form hypotheses concerning newly encountered variables on the basis of experience regarding other variables.

Ultimately, problem-solving requires the development of a comprehensive understanding of a system. Analogical reasoning facilitates such understanding by allowing the formation of hypotheses about the relation of variables within the system. As with goal setting, hypotheses come in a variety of forms, some of which are generally more effective than others. One common ineffective hypothesis arises where a decision-maker facing an undesirable state of affairs in a complex system sets forth a single hypothesis to explain the entire system. For example, some critics of Euclidean zoning argue that it

102 See id. at 76–78.
103 See id. at 76–77.
104 See Dörner, supra note 8, at 76–77.
105 See id. While analogical reasoning involves considering a newly encountered variable at a more abstract, conceptual level, another short-cut to understanding a system involves moving to a more particularized level of understanding. See id. at 77. This knowledge of the constituent elements of a system can provide insights into the structure of that system. See id.
106 See id. at 74, 79.
107 See id. at 77.
108 See id. at 50–52, 89–91.
109 See Dörner, supra note 8, at 89–90.
underlies the majority of today's social problems including exorbitant commuter costs and feelings of alienation, if not psychosis, among teenagers.\footnote{See KUNSTLER, supra note 2, at 54–55, 67–70.} Granted, reducing complex systems to a focus on a single variable conserves decision-making resources.\footnote{See DÖRNER, supra note 8, at 90.} These reductive hypotheses, however, tend to ignore many of the other central variables in a given system, as well as the many feedback loops in such systems.\footnote{See id. As cognitive scientists have noted, rejecting previously held reductive hypotheses is not as simple as one might think because their simplistic explanations for what goes on in the world account not only for their popularity, but also their persistence. See id. at 91. When a problem-solver's hypothesis yields what she believes to be the structure of a system, she will be reluctant to abandon her hypothesis where doing so will return her to an undifferentiated system of interacting variables linked in no immediately obvious hierarchy. See id. at 92. Such a lack of differentiation produces uncertainty, which, in turn, produces fear, entrenching the reductive hypothesis. See id. Decision-makers, therefore, avoid reductive hypotheses only when they are willing to change these hypotheses in response to conflicting or anomalous evidence. See id.}

This process of analogical reasoning and hypothesizing, therefore, enables a decision-maker to understand the particulars of a given system.\footnote{See DÖRNER, supra note 8, at 76–78.} The internalization of such understanding yields what Cognitive Science calls "schemata" (the plural of "schema"), or "models of the world" which "embody prototypical expectations about objects, situations, and actions."\footnote{See id. at 337.} Like any model, a schema represents the relevant characteristics of that upon which it is modeled.\footnote{See Blasi, supra note 8, at 336–37.} Experience weeds out the irrelevant features.\footnote{See Blasi, supra note 8, at 343.} For example, a newcomer to chess sees only a variety of wooden pieces upon a flat playing board. A more experienced player might see a board with pieces moved out of initial position. An even more experienced player might recognize an opening, say, a Queen's Gambit. A chess grandmaster viewing the board might see all these things and more, such as a checkmate in five moves. While the board has not changed, experience provides a model for experts on which to base expectations, a model which literally alters how they perceive the board.\footnote{See id. at 343–44.}

Thus, expertise involves the ability to match problem patterns with stored problem schemata, and to detect and remember patterns in a complex set of phenomena that are essentially invisible to nov-
Cognitive Science suggests that inexperienced decision-makers can develop understanding more quickly by (1) consciously choosing to understand the system in terms of the general principles of complex systems, and (2) reasoning analogically and forming hypotheses to understand the relations of the specific variables within this system.119

3. Prediction and Extrapolation

Having formulated a goal and developed an understanding of the system, a decision-maker may predict effectively how the system will respond to remedies.120 Predicting how actions will affect a given system requires extrapolating from the current state, limiting focus on a notable feature and inferring a trend regarding this feature.121 Consider, for example, the decision to mine for gold by the Placer method.122 Placer mining is one of the four basic methods for mining metal ore, involving alluvial or glacial deposits of loose gravel, sand, soil, clay, or mud called "placers."123 Once a placer miner has excavated the gold-bearing material or "paydirt" from a placer deposit, he

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118 See id.

119 See Dörner, supra note 8, at 72-79. A question remains, however, as to when sufficient information concerning a given system has been gathered; in exceptionally complex systems, a decision-maker conceivably could gather information interminably, refining hypotheses about how the variables in the system interact. See id. at 78, 79. Generally, in the face of time constraints, ineffective, novice decision-makers will be less likely to gather information in the early phases of decision-making and will be more eager to act; effective, novice decision-makers, in contrast, will be more likely to gather information and less likely to act. See id. at 103. The initial inference, then, seems to be that a novice decision-maker should err on the side of more, rather than less, information. See id. Granted, this provides little help. Moreover, in the absence of time constraints, the tendencies of effective and ineffective novice decision-makers transpose, with the former tending to gather less information before acting; the latter, in turn, tend to gather too much information, leading to uncertainty and the desire for more information, yielding yet more uncertainty, a vicious circle which inhibits the decision-making process. See id. at 104. Finally, while expert decision-makers tend to act more quickly than novices in routine situations, in non-routine situations, novices tend to act more quickly than experts. See Blasi, supra note 8, at 344-45. Although it may be unsettling to realize that no amount of experience will provide an a priori answer as to how much information must be gathered before a decision-maker should execute a plan, effective decision-making requires decision-makers to revise hypotheses and correct actions. See Dörner, supra note 8, at 43, 78; Blasi, supra note 8, at 328.

120 See Dörner, supra note 8, at 43; Blasi, supra note 8, at 328.

121 See Dörner, supra note 8, at 109.

122 See Rybachek v. EPA, 904 F.2d 1276, 1282 (9th Cir. 1990).

123 See id.
will separate it from the other materials in the paydirt by a gravity-separation process known as “sluicing.”¹²⁴ In such a process:

a miner places the ore in an on-site washing plant . . . which has small submerged dams . . . attached to its bottom. He causes water to be run over the paydirt in the sluice box; when the heavier materials fall, they are caught by the [dams]. The lighter sand, dirt, and clay particles are left suspended in the wastewater released from the sluice box.

Placer mining typically is conducted directly in streambeds . . . . The water usually enters the sluice box through gravity . . . . At some point after the process described above, the water in the sluice box is discharged. The discharges from placer mining can have aesthetic and water-quality impacts on waters both in the immediate vicinity and downstream. Toxic metals, including arsenic, cadmium, lead, zinc, and copper, have been found in higher concentration in streams where mining occurs than in non-mining streams.¹²⁵

In order to avoid such consequences, a miner considering sluicing a river would hypothesize as to the effect of water flow on toxic level metals in the stream.¹²⁶ Once the interrelation of these variables is understood, a decision-maker can predict reliably how an increase in water-flow will affect such levels.¹²⁷ This prediction will require extrapolating from the current state the effects that water flow has on toxic metal levels, followed by a prediction as to the consequences of an increase in water flow.¹²⁸ Understanding a system as a dynamic process, as opposed to a fixed state, allows extrapolation as to how the system will look in the future if left to itself and facilitates predictions regarding how the system will react to externally imposed actions.¹²⁹

4. Planning of Actions, Decision-Making, and Execution of Actions

During the planning phase, decision-makers develop chains of proposed action which comprise three elements: a condition element,

¹²⁴ See id.
¹²⁵ See id.
¹²⁶ See id.
¹²⁷ See Rybachek, 904 F.2d at 1282.
¹²⁸ See id. at 1282, 1289. Notably, EPA’s determination of BMP recognizes that such considerations are feasible, both technologically and economically, for those in the business. See id. at 1286–87.
¹²⁹ See Dörner, supra note 8, at 79.
an action element, and a result element.\textsuperscript{130} For example, in an ideal articulation of planning, a decision-maker will posit: "given such and such conditions, I could take this action and achieve that result."\textsuperscript{131}

Cognitive Science suggests a number of planning methods.\textsuperscript{132} Where a chain of proposed action, for example, involves a plethora of actions and intervening results, one effective method of planning consists of starting from the desired state and positing backwards, a process called "reverse planning."\textsuperscript{133} Still, a decision-maker can plan her actions completely only rarely and in relatively uninteresting areas, whether in forward or reverse.\textsuperscript{134} Decision-makers typically encounter extremely complicated problems, involving many unforeseeable factors. Planning generally requires a decision-maker to focus on a limited portion of reality, what Cognitive Science calls the "problem sector," to determine the possible effects she can have there.\textsuperscript{135} Consequently, in the majority of cases, narrowing the problem sector will allow more effective problem-solving.\textsuperscript{136} For instance, a decision-maker can focus on what actions she will choose and, in a procedure known as "hill climbing," consider only those actions that promise a step toward the goal.\textsuperscript{137} Consider, for example, the process of Brownfielding.\textsuperscript{138} EPA recognized that its current practices regarding toxic spills were not deterring spills, but were engendering large areas of abandoned brownfields.\textsuperscript{139} Consequently, EPA entered into contracts with the owners of contaminated property and prospective purchasers exonerating them from any future environmental liability at the site and obligating the EPA not to sue the purchaser for any existing contamination.\textsuperscript{140} While its decision to allow moderate cleaning attempts will not guarantee greenfields, it is nevertheless a step in the right direction.\textsuperscript{141}

\textsuperscript{130} See id. at 154.
\textsuperscript{131} Id.
\textsuperscript{132} See id. at 155, 157-60.
\textsuperscript{133} See id. at 155; see also Blasi, supra note 8, at 345. Consider, for example, a fairly popular children's game where participants must navigate a maze drawn on paper by drawing a line from the start of the maze to its exit. One reliable approach to navigating such mazes involves starting at the exit and working backwards to the beginning.
\textsuperscript{134} See Dörner, supra note 8, at 157.
\textsuperscript{135} See id.
\textsuperscript{136} See id.
\textsuperscript{137} See id.; see also Blasi, supra note 8, at 334.
\textsuperscript{138} See Plater, supra note 42, at 921.
\textsuperscript{139} See id.
\textsuperscript{140} See id. at 922.
\textsuperscript{141} See id.; see also Dörner, supra note 8, at 157.
Alternatively, a decision-maker can focus on what goals she wants to reach and, perhaps by using reverse decision-making, develop strong intermediate goals.\textsuperscript{142} The constant worry that a chosen goal may be reachable from either the current state (in forward planning) or the desired state (in reverse planning) but not both states suggests a strategy based on what Cognitive Science calls “diversity-efficiency:” decision makers should prefer goals which offer more options over those which offer fewer options.\textsuperscript{143} In chess, for example, experienced players generally prefer courses of action which place pawns or control on the center four squares of the board since this allows efficient movement in multiple directions.\textsuperscript{144} Finally, decision-makers can attempt to narrow their problem sector by selecting actions on the basis of their frequency of success in the past.\textsuperscript{145}

Not all of these problem sector narrowing strategies, however, apply in all situations.\textsuperscript{146} Reverse planning, for example, works poorly or not at all when the goals identified by the decision-maker are not clear.\textsuperscript{147} Hill climbing’s focus on actions rather than results indicates that it should be used only when there is almost complete uncertainty about the structure of the problem sector; otherwise, the focus should be on results, i.e., intermediate goals.\textsuperscript{148}

Finally, in planning, decision-makers must be careful lest they fall into the dangerous habit of choosing an action solely because it worked in the past, a practice known as “methodism.”\textsuperscript{149} This can lead to ignoring relevant variables in the current state and thus inhibit solution.\textsuperscript{150} Essentially, methodism focuses on the action and result elements of planning while discounting the condition element.\textsuperscript{151} While discounting the condition element will facilitate planning, it will also lead to problems during execution.\textsuperscript{152} For instance, some critics of Euclidean zoning argue that antiquated notions of a happy, peaceful home on the edge of a frontier motivate the desire to have homes

\textsuperscript{142} See Dörner, supra note 8, at 158; Blasi, supra note 8, at 334.
\textsuperscript{143} See id.
\textsuperscript{144} See id.
\textsuperscript{145} See id.
\textsuperscript{146} See id.
\textsuperscript{147} See id.
\textsuperscript{148} See Dörner, supra note 8, at 158.
\textsuperscript{149} See id.
\textsuperscript{150} See id. at 170–72.
\textsuperscript{151} See id. at 167–68.
\textsuperscript{152} See id. at 167.
separated from neighbors and other urban conditions. This discounts present conditions, ignores differences between the present and the past, and assumes that what produced happiness in the past—a home separated from neighbors and urban conditions—will continue to produce happiness in the future.

Conversely, attempting to narrow the problem sector field may over-narrow the focus and, consequently, a decision-maker occasionally can more effectively navigate a problem sector by expanding the problem sector. One expansion method, "free experimentation," mandates that decision-makers consider all options, not merely those that appear to lead to the ultimate goal. Alternatively, decision-makers can simply identify the features common to the previous ineffective approaches and pare away these unsuccessful features when developing new strategies.

5. Review of Effects of Actions and Revision of Strategy

Having proceeded through the first four phases of problem solving, decision-makers must ascertain whether a given goal has been reached. If not, principles of effective decision-making require that the previous four steps be considered in light of their consequences. Frequently, however, decision-makers avoid considering the consequences of their actions, engaging in what has been called "ballistic behavior," where decision-makers treat their actions like cannonballs by assuming them to be completely out of their control once launched. Effective decision-makers, in contrast, constantly gauge the efficacy of their actions, correcting for deviations—in a sense, guiding the action to its goal.

153 See KUNSTLER, supra note 2, at 28–31. Kunstler also argues that the desire to have a manor, as exemplified in plantation homes in the South, likewise motivates the current zoning practice of sprawling out residences. See id. at 30.
154 See id. at 33.
155 See DÖRNER, supra note 8, at 159–60.
156 See id. at 159.
157 See id.
158 See id. at 177.
159 See id. at 43, 177; see also Blasi, supra note 8, at 328.
160 See DÖRNER, supra note 8, at 178.
161 See id.
II. AN ATTEMPT AT PROBLEM-SOLVING: ZONING

Understanding the decision-making process which led to the development of zoning requires consideration of the status of zoning immediately before and following *Euclid v. Ambler Realty Co.*, the United States Supreme Court's first decision upholding the constitutionality of zoning. 162 This requires an understanding of precisely what problem the Court thought zoning would address, which in turn requires a modicum of background information as well as a detailed discussion of the arguments presented to the Court. While there have been many zoning cases since *Euclid*, this Note will focus only on cases which are relevant from a problem-solving perspective, i.e., which represent a substantial variation from, or novel supplement to, either the goals identified in *Euclid*, or to the problem-solving plan established at that time.

A. Before Euclid

Prior to the 1900s, the bodies of doctrine on servitudes and nuisance represented the primary control over land use. 163 Immediately prior to *Euclid*, a majority of state high courts had considered and upheld some form of zoning ordinance. 164 These decisions typically justified zoning by broadly interpreting the state's police power to protect property owners from the threats of urban expansion. 165 More specifically, property owners, especially those owning single-family homes, needed protection from the negative attributes of the encroaching cities, such as noise, congestion, and apartment houses, elements implying the presence of large numbers of people. 166 Since

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162 See 272 U.S. 365 (1926). Both this case and the subject of zoning in general have been analyzed so frequently, in fact, that some have felt that "[w]riting about zoning in the 1990s . . . raises the question of what a person can productively add to the topic." Kosman, *supra* note 2, at 60.


164 See *Edward D. Landels, Zoning: An Analysis of Its Purposes and Its Legal Sanctions*, 17 A.B.A. J. 163, 163 (1931) (arguing that zoning's primary purpose is to protect value of property and utility of owner).


166 See, e.g., *Miller*, 234 P. at 383; *Burns*, 149 N.E. at 788; *Ware*, 214 P. at 101; *Houghton*, 204 N.W. at 570; *Twin City Bldg.*, 176 N.W. at 161; *Wulfsohn*, 150 N.E. at 122.
protecting against the threat of haphazard growth required a municipal police power whose reach could adjust to changing conditions and challenges, a considerably elastic police power developed.\textsuperscript{167} Though previously unjustified, the municipal police power allowed protecting against such growth.\textsuperscript{168}

Theoretically, this approach balanced the individual's right to private property against the collective property right of the community.\textsuperscript{169} In the decade before \textit{Euclid}, most courts hearing zoning challenges held in favor of the community.\textsuperscript{170} Zoning, then, was meant to address threats to property rights.\textsuperscript{171}

\section*{B. \textit{Euclid}'s Beginnings in District Court}

Before 1922, the Village of \textit{Euclid}, Ohio, resisted annexation by Cleveland, and remained a "single-family, middle-class residential suburb."\textsuperscript{172} In 1922, the Village Council, which specifically dubbed \textit{Euclid} a "residential suburb,"\textsuperscript{173} passed a modern zoning ordinance to "preserve the present character of the Village." Ambler Realty

\begin{itemize}
\item \textsuperscript{167} See, e.g., Miller, 234 P. at 383; Ware, 214 P. at 101; Houghton, 204 N.W. at 570; Twin City Bldg., 176 N.W. at 161; Wulfsohn, 150 N.E. at 122.
\item \textsuperscript{168} See, e.g., Miller, 234 P. at 383-84; Beery, 204 N.W. at 570; Twin City Bldg., 176 N.W. at 161; see also Spector v. Building Inspector, 145 N.E. 265, 267 (Mass. 1924) (discussing the "problems" that Milton sought to avoid).
\item \textsuperscript{169} See Burns, 149 N.E. at 788; City of Des Moines v. Manhattan Oil Co., 184 N.W. 829, 829 (Iowa 1921); Wulfsohn, 150 N.E. at 124. Some have argued that this dichotomy between the property rights of the individual and the community entirely ignored the claims of a third group, those effectively excluded from a community or its most desirable neighborhoods by the operation of a zoning ordinance. See, e.g., Kosman, supra note 2, at 87. Still, there is a notable exception to this dichotomizing tendency in the dissenting opinion filed by Chief Justice Brown of the Minnesota Supreme Court, which did take into account these third-party interests. See Twin City Bldg., 176 N.W. at 163-64 (Brown, C.J., dissenting).
\item \textsuperscript{170} See Burns, 149 N.E. at 788; Manhattan Oil, 184 N.W. at 829; Wulfsohn, 150 N.E. at 124. But see Willison v. Cooke, 130 P. 828 (Colo. 1913) (holding that, in such context, individual rights would prevail).
\item \textsuperscript{171} Some have argued that there were grounds for some alternative form of zoning, for example, the equal distribution of people within a municipality's residential districts or the preservation of the opportunity to live in a community or district of one's choice. See Kosman, supra note 2, at 87.
\item \textsuperscript{173} See Arthur V.N. Brooks, \textit{The Office File Box-Emanations from the Battlefield}, in ZONING AND THE AMERICAN DREAM, supra note 73, at 25 n.10 (quoting from the preamble to the \textit{Euclid} zoning ordinance).
\item \textsuperscript{174} Id. at 6 (quoting from the preamble to the \textit{Euclid} zoning ordinance). According to William Randle, \textit{Euclid}’s ordinance grew directly out of the East Cleveland ordinance. See Randle, supra note 172, at 40.
\end{itemize}
Company (Ambler) owned undeveloped land in Euclid near the eastern border of Cleveland. This land was south of the Nickel Plate Railway and north of Euclid Avenue. Due to the Village's zoning ordinance, Ambler could only use the first 150 feet of land for single-family dwellings; the next 470 feet for two-family dwellings; and the next 130 feet for apartment buildings. Ambler could use the remainder of the tract for industrial and manufacturing purposes. Moreover, "[m]any additional restrictions [were] imposed as to the height of any and all kinds of buildings, as to the lot area which may be built on and which must be left free, and as to the set-back distances from street and lot lines."

When Ambler brought suit challenging the validity of these ordinances, the district court struck down Euclid's zoning ordinance because it exceeded the municipality's police power—it did not promote the public peace, order, morals, or safety. Consequently, the court found that the ordinance amounted to a taking of Ambler's

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176 See id. at 309.
177 See id.
178 See id.
179 Id.
180 See Euclid, 297 F. at 314, 316, 317. The district court held:

Obviously, police power is not susceptible of exact definition. It would be more difficult, even if it were not unwise, to attempt a more exact definition than has been given. And yet there is a wide difference between the power of eminent domain and the police power; and it is not true that the public welfare is a justification for the taking of private property for the general good. . . . A law or ordinance passed under the guise of the police power which invades private property as above defined can be sustained only when it has a real and substantial relation to the maintenance and preservation of the public peace, public order, public morals, or public safety. The courts never hesitate to look through the false pretense to the substance.

Id. at 314.
property without just compensation.\textsuperscript{181} Even as it rendered its holding, the district court foresaw that the matter would not stop there.\textsuperscript{182}

C. Euclid’s Move to the Supreme Court

1. Euclid’s Brief: The Collective Good of the Community

On appeal, Euclid relied on the increasing popularity of zoning and the similarity of its ordinance to the judicially-sanctioned ordinances of other states.\textsuperscript{183} More specifically, Euclid concentrated on the comprehensive benefits of zoning in general, not the specific zoning ordinance it had passed.\textsuperscript{184} Euclid construed the “basic question” to be “whether there be a constitutional power to enact such ordinances as the one in question” and provided an exhaustive review of case law showing that courts were increasingly recognizing the zoning authority of municipalities.\textsuperscript{185}

Euclid also argued that its zoning ordinance promoted the general welfare by positively affecting property values.\textsuperscript{186} Thus, Euclid’s zoning ordinance benefited the community as a whole.\textsuperscript{187} More specifically, the Village focused on the benefits to the community engendered by separating residential and industrial uses.\textsuperscript{188} Also, it ar-

\textsuperscript{181} See id. at 312, 317. The court concluded:

The plain truth is that the true object of the ordinance in question is to place all the property in an undeveloped area of 16 square miles in a straight jacket. The purpose to be accomplished is really to regulate the mode of living of persons who may hereinafter inhabit it. In the last analysis, the result to be accomplished is to classify the population and segregate them according to their income or situation in life.

\textit{Id.} at 316.

\textsuperscript{182} See id. at 308 (commenting that “[t]his case is obviously destined to go higher”).

\textsuperscript{183} See \textit{Euclid}, 272 U.S. at 389.

\textsuperscript{184} See id. \textit{passim}.

\textsuperscript{185} Brief and Argument for Appellant, \textit{reprinted} in 24 \textit{LANDMARK BRIEFS AND ARGUMENTS OF THE SUPREME COURT OF THE UNITED STATES} 411, 501–09 (Philip B. Kurland & Gerhard Casper eds., 1975) [hereinafter Appellant Documents, 24 \textit{LANDMARK BRIEFS AND ARGUMENTS}].

\textsuperscript{186} See id. at 483–94.

\textsuperscript{187} See id. at 483.

\textsuperscript{188} See id. at 483–85. The appellant argued:

Under zoning, the territory is opened to the shop keeper or to the store-keeper only when and only as public consideration and general welfare and as the general trend dictate and the necessary enactment would naturally be noted only when the residence district becomes obsolete or has grown to be worn out or when it presents a situation where the general welfare would be better served if trades or factories or other uses were allowed to come in.
gued that zoning increased the feasibility of building thoroughfares and promoted the “greater public welfare” of the “American home.” In short, zoning ordinances protected “the American People and American Principles” by protecting districts comprising single-family dwellings from the harm of encroaching commercial uses. For Euclid, zoning mitigated change, and helped maintain what the Village’s residents valued in America, ensuring that everyone in Euclid had a home with a yard, that children would have safer and happier upbringings, and that streets would be cleaner.


While Euclid focused on the good of the community via the benefits of zoning ordinances in general, Ambler concentrated on using its land for commercial purposes and the specific shortcomings of the ordinance. Focusing on individual property rights, Ambler argued that its land’s value would be greater if used for business or industrial purposes rather than residential purposes. Attempting to counter Euclid’s claim that the ordinance enhanced the general welfare, Ambler argued that enabling it to build as it wished to bring

Id. at 486.

189 See Appellant Documents, 24 LANDMARK BRIEFS AND ARGUMENTS at 485–90.

190 Id. at 490.

191 See id. at 490–91. As Euclid’s brief stated:

[M]odern tendencies are rapidly destroying and undermining the continuance of separate and individual homes and residences.
The best minds of America are exhorting Congress and the States to do all that is possible in order to stem and prevent this tendency. As each city grows, there are proportionately less families living in houses than in apartments and tenements and above stores. The bulwark and the stamina of this country has always been credited and conceded to the home owning tendencies of the American People.

Id.

192 See id. at 490–94.

193 See Brief and Argument for Appellee, 24 LANDMARK BRIEFS AND ARGUMENTS 565, 565 [hereinafter Appellee Documents, 24 LANDMARK BRIEFS AND ARGUMENTS].

194 See id. at 608–09 (citing Ambler Realty Co. v. Village of Euclid, 297 F. 307, 309 (N.D. Ohio 1924), rev’d, 272 U.S. 365 (1926)).

195 See id. at 592. The appellee argued:

How can it be said that this Ordinance is addressed to any of the well-known objects of the police power under such circumstances, for the Ordinance does not attempt to protect residences from the proximity of industrial undertakings, but only to protect certain sections of land from being occupied by both uses. This section conclusively shows that the Ordinance is not designed to protect the health, safety and comfort of the public.
jobs and money into Euclid would promote the community’s general welfare. Ambler, then, attempted to construe the general welfare in terms of economic development—insofar as restricting property to residential development thwarts such development, the general welfare suffers.

Ambler further argued that, even if protecting the residential district did further the general welfare, Euclid’s ordinance protected only a portion of the community’s welfare. In the most restrictive residential district, Ambler argued, corner lot sizes must be at least 4000 square feet, while the least restrictive district permitted lots as small as 700 square feet. Ambler said such restrictions were irrational since what would suffice for a family in one section of the Village should be adequate for the entire Village. Ambler also noted that those living in districts with larger minimum lot sizes would be “more prosperously environed” and in “a superior economic ostentation” than those in districts with smaller minimum lot sizes, implying a class-based motive for the zoning ordinance. Further, Ambler argued, Euclid’s zoning ordinance was irrational insofar as it was intended to benefit the community at large, yet granted the most protection to districts with the fewest residents and the most single-family homes. Pointing out that under Euclid’s ordinance the greatest

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196 See id. at 610–12.
197 Appellees contended that the ordinance “imposes upon the general welfare the burden of having the business and industry of the Village of Euclid and the City of Cleveland diverted to less favorable and less available lands in order to maintain the favorable character for certain residence property ... [t]his property in the interest of the public welfare, should be devoted to those industrial uses for which it is needed and most appropriate.” Id. at 611.
198 See Appellee Documents, 24 LANDMARK BRIEFS AND ARGUMENTS at 587–97.
199 See id. at 593.
200 See id. The appellee argued:

Manifestly, if the health, safety and comfort of a family require 5,000 square feet of lot area in one part of the Village of Euclid they require it in all parts of the Village. Conversely, if the health, safety and comfort of a family are adequately provided for by a minimum of 700 square feet of lot area in any part of the Village of Euclid, the same minimum will serve the same purpose in every part of the Village.

201 See id.
202 See id. at 646–49. The appellee challenged the Village’s use of its “police power”:

The ordinance is declared to be in fulfillment of a desire of the citizens of the village to “preserve the present character of said village” and to provide “for the general welfare of the citizens thereof,” which may or may not be for
minimum lot size districts had the fewest residents, Ambler noted that "[t]he lots on which the fewest people live are required to have the largest free area for light and air while those in which the most people live have minimum requirements for ventilation and light."\textsuperscript{203} Finally, Ambler discussed what it believed to be the real motivation for Euclid's zoning ordinance, the protection of those wealthy enough to afford living in Euclid's exclusive residence districts.\textsuperscript{204} Ambler concluded by warning that the power to zone "is not the power merely to negative dangerous or anti-social uses, but the power affirmatively to select among admittedly harmless uses those which the political power deems the most popular and to prohibit all others."\textsuperscript{205}

3. An Amicus Brief: The Good of City Planners?

In addition to the briefs filed on behalf of Euclid and Ambler, Alfred Bettman filed an amicus curiae brief on behalf of, \textit{inter alia}, the National Conference on City Planning, writing "to discuss solely the question of the constitutionality of [modern] comprehensive zoning," and to urge the Court to affirm its constitutionality.\textsuperscript{206} Bettman argued that zoning "represent[ed] a pressing need in growing American cities and urban regions," such that the Court should uphold any

\begin{quote}
the general welfare, as that term is properly used; that is to say, the general welfare which is the basis of the police power does not necessarily mean the particular local and private welfare of the people, or of some of the people, resident within the accidental political limits of the village. The general welfare which recognizes the Village of Euclid as merely a constituent element of our general society and expects it to share the burdens, as it enjoys the benefits common to that society, is the general welfare upon which the police power rests.
\textit{Id.} at 646.
\end{quote}

\textsuperscript{203} Appellee Documents, \textit{24 LANDMARK BRIEFS AND ARGUMENTS} at 648.

\textsuperscript{204} See \textit{id}. Appellee argued:

\begin{quote}
[F]rom [the "most healthful and desirable" residence districts] all are excluded except those who are able to maintain the more costly establishments of single family residences. . . . No apartment house or two-family house can be erected in [these districts], and yet the men, women and children who, for reasons of convenience or necessity, live in apartment houses or in the more restricted surroundings of two-family residences are of all others most in need of the refreshing access to the lake or the better air of the wooded upland.
\textit{Id.} at 648–49.
\end{quote}

\textsuperscript{205} \textit{Id.} at 652.

\textsuperscript{206} See Brief on Behalf of the National Conference on City Planning, The Ohio State Conference on City Planning, The National Housing Association, and The Massachusetts Federation of Town Planning Boards, Euclid (No. 31), \textit{24 LANDMARK BRIEFS AND ARGUMENTS} 763, 763 [hereinafter Amicus Brief, \textit{24 LANDMARK BRIEFS AND ARGUMENTS}].
“true” zoning ordinance. Further, Bettman urged the Court, zoning ordinances should be found constitutional where the goal is to prevent “excessive gathering of human beings within a designated space,” and to prevent developments that might “have a detrimental effect upon the public health, safety, convenience, morals and welfare.”

Notably, Bettman argued that, while zoning “aim[ed] to improve the good order of the cities,” it was not meant to function in terms of aesthetics. Rather, zoning was meant to promote “those beneficial effects upon health and morals which come from living in orderly and decent surroundings.” He predicted that without zoning, communities inevitably would devolve into “blighted districts whose general conditions are more promotive of sickness and delinquency.” Like Euclid, Bettman focused on the promotion of residential values claiming that through zoning, “the building of homes is promoted,” and the environment “stabilized”; after all, “[n]o person who believes in homes and healthful home surroundings can fail to believe in the stabilized residential environment.”

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207 See id. at 767. A “true” zoning ordinance was defined as an ordinance featuring “a comprehensive distribution of the whole or a major portion of the territory of the community among all the necessary uses of every kind, each with appropriate standards of height and occupancy, all worked out as a community plan for the promotion of the common health, safety and welfare.” Id. at 763.

208 See id. at 787.

209 See id. at 789.

210 See Amicus Brief, 24 LANDMARK BRIEFS AND ARGUMENTS at 791.

211 Id. Bettman continued, in language which the Court itself may have adopted, see infra note 229, as follows:

[T]he man who seeks to place the home for his children in an orderly neighborhood, with some open space and light and fresh air and quiet, is not motivated so much by considerations of taste or beauty as by the assumption that his children are likely to grow mentally, physically and morally more healthful in such a neighborhood than in a disorderly, noisy, slovenly, blighted and slum-like district. This assumption is indubitably correct.

Id. As Bettman further articulated:

“Own your own home” is a slogan based on this realization of the advantages, in the way of health, which come from the home which has a surrounding or environment of sunlight, air, quiet, and cleanliness. Parents prefer to bring up children in such environment, not for any snobbish or aesthetic reasons, but because it promotes the health, mental, moral and physical, of the children.

Id. at 794.

212 Id. at 796.

213 Id. at 797.
Approving of cases rejecting challenges to zoning ordinances which excluded apartment houses from "exclusively single-family home districts," Bettman argued that apartment houses did not warrant the same protection as single-family homes. Further, he quoted a study that suggested that preferential treatment should be given to single-family homes over apartment houses and other uses. The growth of zoning, as well as its increasing acceptance by state supreme courts, Bettman argued, warranted affirmation by the United States Supreme Court.

4. The Court's Holding: The Good of the Community over the Good of the Individual

The Supreme Court ultimately upheld the constitutionality of modern zoning, holding that it was an acceptable use of the police power because it shielded untainted municipalities from problems that would harm their general welfare. Moreover, the Court encouraged the creation of residential districts, effectively ensuring their preservation by approving the use of the police power to zone out all commercial and business uses, including apartment houses and similar multiple family dwellings. In upholding the constitutionality of zoning, the Court found that changes in American society in the early 20th century necessitated zoning and that apartment buildings were as vile as Bettman had suggested.

In considering the changes to the country, the Court noted that as the country became larger and more complex, municipalities needed the power to control development within their borders and to

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214 Id. at 776; see also id. at 776–80.
215 See Amicus Brief, 24 LANDMARK BRIEFS AND ARGUMENTS at 801. Bettman wrote:

Different classes of business and industries are segregated to districts adapted to their needs. Apartments and double houses are allotted to other territories while areas for single houses are always provided. The desirability of zoning laws in suburbs of large cities seems to be proven by the experience of many home communities where it has been tried. Retail business, manufacturing and nuisances are not allowed to creep into residential districts, destroying home values and undermining the elements of permanency and exclusiveness, which make residential districts desirable.

Id. (citation omitted).
216 See id. at 767, 777–80.
217 See Euclid, 272 U.S. at 386–87.
218 See id. at 390–91.
219 See id. at 386–87, 394.
protect themselves against growth and change. The Court concluded that while certain larger municipalities like Cleveland already displayed the adverse effects of rapid growth, smaller municipalities like Euclid which had not experienced such growth effects needed the power to protect themselves from such effects. In contrasting Euclid with Cleveland, the Court observed that:

the village, though physically a suburb of Cleveland, is politically a separate municipality; with powers of its own and authority to govern itself as it sees fit within the limits of the organic law of its creation and the State and Federal Constitutions. Its governing authorities, presumably representing a majority of its inhabitants and voicing their will, have determined, not that industrial development shall cease at its boundaries, but that the course of such development shall proceed within definitely fixed lines.

Euclid needed zoning authority to avoid the threat of development posed by Cleveland and to “divert an industrial flow from the course which it would follow, to the injury of the residential public if left alone, to another course where such injury will be obviated.”

Where apartments were concerned, the Court viewed them as much of a threat to detached dwellings as Cleveland was to Euclid. While detached dwellings attracted upstanding citizens, apartment buildings attracted congestion, noise and danger to those living in detached dwellings. The Court concluded that “[u]nder these circumstances, apartment houses, which in a different environment would be not only entirely unobjectionable but highly desirable, come

220 See id. at 386–87. The Court explained:

Building zone laws are of modern origin. They began in this country about 25 years ago. Until recent years, urban life was comparatively simple; but with the great increase and concentration of population, problems have developed, and constantly are developing, which require, and will continue to require, additional restrictions in respect of the use and occupation of private lands in urban communities. Regulations, the wisdom, necessity and validity of which, as applied to existing conditions, are so apparent that they are now uniformly sustained, a century ago, or even half a century ago, probably would have been rejected as arbitrary and oppressive.

221 See Euclid, 272 U.S. at 389, 391, 394.
222 See id. at 389.
223 See id. at 390.
224 See id. at 394.
225 See id.
very near to being nuisances." 226 Consequently, the Court found that "home" dwellers needed the protection of the police power. 227

The Court gave little notice to Ambler's arguments regarding the property rights of individual property holders, despite their prominence in the district court's decision. 228 The conjunction of the threat of apartment buildings and the need to protect Euclid and its residents guaranteed that the property rights of the community clearly outweighed the claim of any individual property owner. 229 While the Court did consider individual property owners, it focused on the residential property holders who would be threatened by commercial or business uses. 2210 Residential use districts could not tolerate commercial development. 2231 The Court reasoned that:

the segregation of residential, business and industrial buildings . . . will increase the safety and security of home life; greatly tend to prevent street accidents, especially to children, by reducing the traffic and resulting confusion in residential sections; decrease noise and other conditions which produce or intensify nervous disorder; preserve a more favorable environment in which to rear children . . . 2232

Thus, allowing Ambler to develop its property in any manner other than residential would imperil Euclid. 2233

C. Zoning Since Euclid

Assessing whether the goals formulated in Euclid have been achieved requires identifying the zoning plan then implemented as well as its effects. 22234 Since this plan has undergone a variety of permutations, these developments likewise warrant consideration. 2235

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226 Euclid, 272 U.S. at 394-95.
227 See id. at 394. The police power, while not explicitly mentioned, is implicit here. See id.
229 See Euclid, 272 U.S. at 389.
230 See id. at 389-90. Such uses include apartment housing. See id.
231 See id. at 394.
232 Id.
233 See id.
234 See DUKEMINIER & KRIER, supra note 4, at 1005.
235 See id.
1. The Initial General Structure

a. The Comprehensive Plan

Regarding comprehensive planning's connection to zoning, a leading author on modern property and zoning law has observed that while there will undoubtedly be variations between the Zoning plans adopted by various cities, most zoning plans look to the Standard State Zone Enabling Act [the Standard Act], which was adopted at one time or another in all 50 states and is still in effect (with alterations) in many of them.236

Section 3 of the Standard Act states that zoning regulations shall be "in accordance with a comprehensive plan."237 Such plans set out the local government's objectives and standards for development, comprising maps, charts, and descriptive text and showing general boundaries of height; area, bulk, and use zones as well as the location of, inter alia, streets, bridges, parks, and public buildings.238 Courts, however, have generally not required that a plan be written in a document separate from the zoning ordinance itself.239 Some courts have even gone so far as to hold that the subsequent amending of zoning regulations implicitly and automatically changes the plan on which they are based.240 Furthermore, even when a formal, written plan exists, zoning regulations which are inconsistent with it are not necessarily invalid.241

236 Id. A few states—most notably California, New Jersey, and Pennsylvania—have in recent years enacted tailor-made statutes that depart significantly from the STANDARD ACT. See supra note 13; DUKEMINIER & KRIER, supra note 4, at 1005. Even these examples, however, reflect the Standard Act's continuing influence. See DUKEMINIER & KRIER, supra note 4, at 1005.

237 STANDARD ACT, supra note 13.

238 See DUKEMINIER & KRIER, supra note 4, at 1007. "This plan is based on surveys and studies of the city's present situation and future needs, the idea being to anticipate change and promote harmonious development. To require some sort of master plan and regulations 'in accordance' with it, as enabling legislation typically does, reflects the view that zoning itself is but a means of giving effect to a larger planning enterprise that has led to formulation of the comprehensive plan." Id.

239 See Ward v. Montgomery Township, 147 A.2d 248, 252 (N.J. 1959) (holding that "[t]he zoning ordinance itself may bespeak the scheme; there need be no extrinsic guide").


241 See Town of Bedford v. Village of Mt. Kisco, 306 N.E.2d 155, 159 (N.Y. 1973) (holding that "[w]hat is mandated is that there be comprehensiveness of planning, rather than..."
b. Implementing the Plan: Zoning Ordinances and Subdivision Controls

As Euclid and the comments directly above note, zoning ordinances represent a set of regulations enacted by the local legislative body which local officials enforce. They typically specify how designated areas may be used, the "types and sizes of structures that may be built within those areas, and the placement of the structures (set-backs, sidelots, and so forth)." The ordinances commonly specify minimum lot size and floor space requirements for residential dwellings and contain controls on advertising with regard to commercial zones. Moreover, they often contain special districts, with their own peculiar structural restrictions, for airports, floodplains, and areas of historical importance.

Review by local officials of plans for proposed developments represents the primary enforcement mechanism for zoning regulations. Local officials grant permits for new construction or remodeling only if proposals conform to the applicable zoning restrictions. Consequently, denying a building permit or certificate of occupancy represents the chief means for enforcing zoning regulations. Alternatively, private citizens may play a role in enforcing such regulations by complaining to local officials that zoning laws are not being enforced. If local officials do not heed these complaints, property owners injured as a result of this nonenforcement may sue for an injunction or for mandamus against the passive officials. Generally, cities have an administrative body such as a board of adjustment or zoning appeals to review the decisions of local officials and to grant exceptions of one sort or another in special cases. Typically, however, these boards are not empowered to amend the zoning ordi-

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special interest, irrational ad hocery. The obligation is support of comprehensive planning, not slavish servitude to any particular comprehensive plan. Indeed sound planning inherently calls for recognition of the dynamics of change.

242 See DUKEMINIER & KRIER, supra note 4, at 1009.
243 Id.
244 See id.
245 See id.
246 See id.
247 See DUKEMINIER & KRIER, supra note 4, at 1009.
248 See id. While many zoning ordinances provide criminal penalties for proceeding without appropriate approvals, orders of compliance are the more commonly used enforcement tool. See id.
249 See STANDARD ACT, supra note 13, § 7, at 218–20.
250 See DUKEMINIER & KRIER, supra note 4, at 1009–10.
251 See id. at 1010; see also STANDARD ACT, supra note 13, § 7, at 218–20.

nance. Actions of such boards as well as those of the local legislative body are subject to judicial review.

In addition to zoning ordinances, a comprehensive plan may be implemented by means of subdivision controls, ordinances which set out standards and procedures to govern the breaking up of tracts of land into lots for sale before or after development. Generally, such controls mandate the consideration of factors such as light and air, transportation flows, recreational needs, and water and sanitary facilities. The desire to ensure that necessary public services and public improvements will be provided before a proposal’s approval, in part, motivates subdivision regulation.

2. Working Flexibility into the Plan

By binding limited classes of uses into tightly drawn districts, Euclidean zoning can inflict inequitable hardships and promote inefficient patterns of landuse. Consequently, a number of methods for allowing flexibility into the process have developed. Whenever a Euclidean zone is established, there is a chance that some existing structures will not conform to this zone. Courts generally have held that property owners hold property in subordination to the right of reasonable regulation by the government, granting a presumption of validity to zoning. Courts have tempered this conclusion, however, with the recognition that property owners have a constitutionally guaranteed right to use property unfettered by governmental restrictions. Uses which violate a law or create a nuisance, however, as well as violations by the owner of covenants, restrictions, or easements, limit this right. This led to the introduction of a nonconforming

252 See DUKEMINIER & KRIER, supra note 4, at 1010; see also STANDARD ACT, supra note 13, § 7, at 218–20.
253 See DUKEMINIER & KRIER, supra note 4, at 1010.
254 See id.
255 See id.
256 See id.
257 See KUNSTLER, supra note 2, passim (arguing, inter alia, that Euclidean zoning has led to a lack of affordable housing); see also JACOBS, supra note 2, passim (arguing that such zoning inhibits socially and aesthetically desirable diversity).
258 See DUKEMINIER & KRIER, supra note 4, at 1021.
260 See id. at 191.
261 See id.
262 See id.
use exception whereby municipalities are seen to lack the power to change the nature of an existing lawful use of property. 263

The Standard Act offers property owners two avenues for introducing nonconforming structure into a Euclidean district: special exceptions and variances. 264 Section 7 authorizes the appointment of a board of adjustment that may “in appropriate cases and subject to appropriate conditions and safeguards, make special exceptions to the terms of the ordinance in harmony with its general purpose and intent . . . .” 265 Further, Section 7 allows the board to authorize “in specific cases such variances from the terms of the ordinance as will not be contrary to the public interest, where, owing to special conditions, a literal enforcement of the provisions of the ordinance will result in unnecessary hardship, and so that the spirit of the ordinance shall be observed and substantial justice done.” 266

Though they are often confused with one another, special exceptions and variances differ significantly. 267 Variances, on the one hand, represent administratively authorized departures from the terms of the zoning ordinance, granted in cases of unique and individual hardship, in which a strict application of the terms of the ordinance would be unconstitutional. 268 Local officials grant variances, then, to avoid an unfavorable holding on constitutionality. 269 Special exceptions, on the other hand, represent uses permitted by the ordinance in a district with which the use is not necessarily incompatible, but where it might cause harm if not watched. 270 Exceptions are authorized under conditions which ensure their compatibility with surrounding uses. 271 Generally, a use which is the subject of a special exception demands a large amount of land, may be public or semipublic in character, and might often be noxious or offensive. 272 Under the Standard Act, therefore, boards of adjustment may decide when to grant special exceptions and variances. 273 It should be noted, how-

263 See PA Northwestern Dists., 526 Pa. at 192.
264 See STANDARD ACT, supra note 13, § 7, at 218–20.
265 Id.
266 Id.
268 See id.
269 See id.
270 See id.
271 See id.
272 See Mandelker, supra note 267, at 62–63.
ever, that Courts have held extremely broad delegations of power, from state legislatures to boards of adjustment, unconstitutional.274

In addition to the flexibility provisions in § 7 of the Standard Act, the Zoning Commission set out in § 6 has the power to change zoning ordinances.275 Some courts, however, have limited this amendment power to changes that are consistent with the Comprehensive Plan.276 The worry that a board of adjustment will grant permission to use an "island" of land for a more intensive use than permitted on adjacent properties—a practice known as "spot zoning"—partially motivates this limitation.277

Property owners may pursue a number of other traditional flexibility options besides those within the Standard Act.278 For example, under the practice of contract rezoning, the property owner and the government enter into a reciprocal agreement.279 The owner promises to restrict the use of the property in exchange for the government's promise to rezone.280 Courts once regarded contract rezoning as illegal per se, which led to the label "conditional" to help avoid invalidity.281 Under this related practice of conditional rezoning, a property owner agrees to certain conditions as a prerequisite to zoning change, while the local government makes no commitments.282 Still, in some instances, courts consider conditional or contract rezoning per se invalid, motivated by concerns of piecemeal deterioration in the comprehensive plan and fear of abuse and favoritism.283 Courts, however, with few exceptions, increasingly have approved conditional rezoning, though particular applications can be invalidated.284

274 See generally Cope v. Inhabitants of Brunswick, 464 A.2d 223 (Me. 1983).
275 See STANDARD ACT, supra note 13, at 217.
276 See generally Fasano v. Board of County Comm'rs, 507 P.2d 23 (Or. 1973).
277 See DONALD G. HAGMAN & JULIAN C. JERGENSMEYER, URBAN PLANNING AND LAND DEVELOPMENT CONTROL LAW 168-69 (2d ed. 1986). Notably, "spot zoning is found invalid where some or all of the following factors are present: 1. a small parcel of land is singled out for special and privileged treatment; 2. the singling out is not in the public interest but only for the benefit of the landowner; 3. the action is not in accord with a comprehensive plan." Id.
278 See DUKEMINIER & KRIER, supra note 4, at 1046-50, 1055-56, 1063-64.
279 See id. at 1055.
280 See id.
281 See id.
282 See id.
283 See DUKEMINIER & KRIER, supra note 4, at 1055.
Property owners may pursue a number of relatively new, non-traditional flexibility options: floating zones, cluster zones, and planned unit developments (PUDs).\textsuperscript{285} In the practice of floating zones, a city defines a zone but reserves the decision about its location for the future.\textsuperscript{286} Generally, the city first creates a use district by an ordinance that specifies standards and criteria to govern the uses permitted in the zone.\textsuperscript{287} Then, at some later time, the city attaches the zone to a particular area through a zoning amendment, usually at a developer or property owner’s request.\textsuperscript{288} Such zones have been challenged on a number of grounds: failure to comply with a comprehensive plan, spot zoning, lack of authorization by enabling legislation, and unlawful delegation of legislative authority.\textsuperscript{289}

In cluster zoning, zoning officials permit developers to construct dwellings in a pattern not in compliance with the area restrictions of a zoning ordinance.\textsuperscript{290} While residences in such zones need not observe the usual frontage or setback regulations and side-yard or rear-yard requirements, overall population density does not exceed other residential areas since open spaces are preserved as an element of the cluster.\textsuperscript{291} In PUDs, on the other hand, zoning officials permit developers to construct dwellings in a pattern not in compliance with either the area or use restrictions of a zoning ordinance.\textsuperscript{292} Still, PUDs avoid the spot zoning problem by incorporating enough structures within the PUD which do conform to the comprehensive plan to balance against the differences of those that do not.\textsuperscript{293}

Developers may obtain permission for cluster zones and PUDs in a number of ways, e.g., where a board of adjustment issues a special exception, a planning board administers subdivision controls, or a legislature creates a floating zone, the most common approach.\textsuperscript{294} Courts have tolerated cluster zones and PUDs insofar as the relevant ordinance specifies adequate standards.\textsuperscript{295} As always, courts worry about failure to comply with a comprehensive plan, spot zoning, lack

\textsuperscript{285} See DUKEMINIER & KRIER, supra note 4, at 1063–64.
\textsuperscript{286} See id.
\textsuperscript{287} See id.
\textsuperscript{288} See id.
\textsuperscript{290} See DUKEMINIER & KRIER, supra note 4, at 1064.
\textsuperscript{291} See id.
\textsuperscript{292} See id. at 1065.
\textsuperscript{293} See id.
\textsuperscript{294} See id. at 1064.
\textsuperscript{295} See DUKEMINIER & KRIER, supra note 4, at 1065.
of authorization by enabling legislation, and unlawful delegation of legislative authority.296

III. EUCLIDEAN ZONING AS PROBLEM-SOLVING

Cognitive Science offers the tools for analyzing whether Euclidean zoning, as a problem-solving process with distinct phases, represents an effective problem-solving effort.297 An examination of the goal of Euclidean zoning as formulated in Euclid, and its current status as embodied in the Standard Act, permits an evaluation of this problem-solving effort.298 Discerning how Euclidean zoning deviates from an optimal problem-solving effort suggests ways to improve its problem-solving effort.299

That the goal of Euclidean zoning was formulated in Euclid and has been executed for nearly a century since, raises a preliminary question: Who is the decision-maker in such an enterprise? In actuality, Euclidean zoning represents a group effort involving state and local legislatures, administrators on zoning commissions and boards of appeal, the courts, and citizens.300 Presumably, administrative officials on the zoning commissions and boards of adjustment have the most experience with zoning issues.301 As will become evident, the tension between these groups—legislatures, administrators in the zoning commission and boards of appeal, the courts, and citizens—in virtue of the roles they each play in the problem-solving process represents an obstacle to effective decision-making.

A. The Goal of Euclidean Zoning

What is the goal of Euclidean zoning? While the Supreme Court in Euclid provided a starting point for a discussion of goals, the judicial branch is ill-suited to formulate specific goals.302 For example, the Court in Euclid generally held that zoning is permissible if it represents a valid use of the police power, i.e., when employed to protect the general health, safety, and welfare of the population.303 Conse-

296 See id.
297 See Dörner, supra note 8, passim.
298 See id.
299 See id.
300 See Standard Act, supra note 13, §§ 6, 7.
301 See id. This assumes that those who interact most frequently with those requesting permits will most frequently consider the status of zoning. See id.
302 See id.
quently, the protection of the general health, safety, and welfare of the community represents one possible formulation of the goal of Euclidean zoning.\footnote{504} While Euclidean zoning did and still does entertain the protection of the general health, safety, and welfare of the population, this formulation represents, in Cognitive Science terms, a negative, general, multiple, and unclear goal.\footnote{505} It represents a negative goal because it specifies only that the present state is not the desired state.\footnote{506} As noted above, such goals are not generally achieved since negatively defined goals are generally less clear than positively stated goals.\footnote{507} The more clearly a goal is stated, the more likely it will be achieved.\footnote{508}

Further, this formulation represents a general goal because determining whether it has been achieved requires the examination of only a few criteria: Have the health, safety, and welfare of the population been protected?\footnote{509} This again indicates a lack of clarity, decreasing the likelihood that such a goal will be achieved.\footnote{510} This goal of protecting the population's health, safety, and welfare is multiple, and while this in itself does not tend to make goals less likely to be realized, the individual goals constituting this multiplicity are themselves unclear: What will count as a protection of the population's health, safety, and welfare?\footnote{511}

The Supreme Court provides other possible formulations of the goal of Euclidean zoning in its various narrower holdings in \textit{Euclid}.\footnote{512} For example, the Court held that cities should be able to protect themselves from growth and change.\footnote{513} Like the goal to promote the health, safety, and welfare of the community, this formulation represents a general and negative goal.\footnote{514} Moreover, since a city presumably will want to allow beneficial growth and change and only prevent that which will harm the welfare, this formulation offers no greater level of specification over the initial formulation.\footnote{515} The Court's strenuous

\begin{footnotes}
\item 504 See id.
\item 505 See \textsc{Dörner}, supra note 8, at 50–51.
\item 506 See id. at 50.
\item 507 See id.
\item 508 See id.
\item 509 See id.
\item 510 See \textsc{Dörner}, supra note 8, at 50.
\item 511 See id. at 51.
\item 512 See generally \textsc{Euclid}, 272 U.S. at 365.
\item 513 See id. at 386–87.
\item 514 See \textsc{Dörner}, supra note 8, at 50.
\item 515 See id. at 50.
\end{footnotes}
denunciation of apartment houses represents perhaps the most narrow holding in *Euclid*—such buildings attract congestion, noise, and danger to those living in detached dwellings, and consequently, the goal of zoning is to prevent this.\(^{316}\) While this formulation offers more specificity, providing a number of criteria for determining whether it has been met, it says nothing about what will count as congestion, noise, or danger to those living in detached dwellings.\(^{317}\) Furthermore, it may still be interpreted as a negative goal, since it stipulates what to avoid rather than what to achieve.\(^{318}\)

This suggests the role which courts will play in problem-solving. The role of courts in judicial review is the adjudication of individual disputes where individual parties are named, and the relevant action has already occurred.\(^{319}\) Unlike legislation, court decisions generally do not have prospective effect.\(^{320}\) Given that goals are essentially prospective, the courts are ill-suited to formulate anything but the most general goals.\(^{321}\) In certain circumstances, however, court decisions do affect more than individualized parties in adjudications, for example, where a court finds legislation unconstitutional.\(^{322}\) Essentially, then, in cases such as *Euclid*, the role of judicial review in the overall process of problem-solving is to decide whether a given goal or solution—legislation or regulation—is constitutional. It is no surprise then that *Euclid* provides such general goals; these are the constitutional boundaries on the types of goals the legislature may set. In short, such holdings represent permission for legislatures to proceed and supply more specific and positive goals.

The legislative response to this permission is found in the Standard Act, which essentially represents a narrowing of the general goal provided, or more appropriately permitted, by the Court in *Euclid*.\(^{323}\) Enacted by state legislatures, the Standard Act delegates power to municipalities with an express goal

\(^{316}\) See *Euclid*, 272 U.S. at 394.

\(^{317}\) See id.

\(^{318}\) See id.; Dörner, supra note 8, at 50.


\(^{320}\) See id.

\(^{321}\) See Dörner, supra note 8, at 49.

\(^{322}\) See, e.g., I.N.S. v. Chadha, 462 U.S. 919 (1983) (holding that legislative action will only have legal effect where it satisfies the constitutional requirements of bicameralism and presentment, thereby invalidating a plethora of single house and joint resolutions).

\(^{323}\) See generally STANDARD ACT, supra note 13.
to lessen congestion in the streets; to secure safety from fire, panic, and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to facilitate the adequate provision of transportation, water, sewerage, schools, parks, and other public requirements.\textsuperscript{324}

In making such regulations, municipalities must reasonably consider, among other things, the character of the district and its peculiar suitability for particular uses, with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout the municipality.\textsuperscript{325} While this delegation does, in fact, narrow the goals provided by \textit{Euclid}, decisions of the Zoning Commission regarding district boundaries and zoning ordinances represent even more specific goals which narrow the goals provided to them even further. The same may be said of the granting of variances and special exceptions by boards of adjustment.\textsuperscript{326} Consequently, the formation of goals in zoning primarily occurs at the individualized level. The relationship, then, between state legislatures and municipal authorities such as zoning commissions and boards of appeal, is analogous to that between the Supreme Court in \textit{Euclid} and state legislatures: the former provides the latter with a general goal, granting the latter the authority to set more specific goals with which to reach this former goal.\textsuperscript{327}

On its face, this structure for goal formulation yields goals with a high likelihood of being achieved because the actions of municipal administrators will represent positive, specific and clear goals.\textsuperscript{328} Nevertheless, the goals identified by either a zoning commission or board

\textsuperscript{324} Id. § 3, at 214–15.

\textsuperscript{325} See \textit{id.}

\textsuperscript{326} Granted, it may not initially be clear that these individual \textit{x} \textit{1} decisions represent part of the goal formulation phase of problem solving, and not part of the implementation of the resulting plan. Still, insofar as the most general goal of \textit{Euclid} zoning as provided by the Supreme Court in \textit{Euclid} is to protect the health, safety and welfare of the population, every action taken in specific furtherance of this general goal may be alternatively described either as an implementation of this general goal or as a narrowing of this general goal. For example, the granting of a variance by a board of adjustment under the \textit{STANDARD ACT} ultimately represents an attempt to protect the health, safety and welfare of the population. Alternatively described, the board has set a more specific goal, namely, achieving some benefit—or avoiding some evil—which the variance achieves.

\textsuperscript{327} See \textit{Euclid}, 272 U.S. at 395; see \textit{generally STANDARD ACT, supra} note 13.

\textsuperscript{328} See \textit{Dörner}, \textit{supra} note 8, at 50–51.
of adjustment must conform to the general goals set out by the state legislature and the Supreme Court—goals must be constitutionally permissible.529 This division of labor introduces several obstacles to effective problem-solving insofar as those with the most exposure to the relevant system—members of the zoning commission and board of adjustment—are constrained by those with less exposure to this system. Since this issue arises in later phases of the problem-solving process, further discussion will be postponed.530

B. Model Formulation, Action, and Amendment in Euclidean Zoning

Like the goal formulation phase, the formulation of models and gathering of information phase of problem-solving involves a variety of institutional entities in the problem-solving process, namely, the state legislature as well as the zoning commission and the board of adjustment.531 Moreover, in both phases, the state legislature presents a subordinate body with either a general goal or model along with an authorization allowing the subordinate body either to set out more narrow goals, or to fill in gaps in the existing model.532 Likewise, the subordinate body is constrained in its ability to act inconsistently with this delegation because in much the same way that a board of adjustment may not act so as to harm the public—a violation of its delegated goal—it may not completely reject the model contemplated by the Standard Act.533

In short, whatever model was contemplated in the conception of the Standard Act, this model comes to those who are most familiar with this system, the zoning commission and the board of adjustment, in a prepackaged form.534 Further, this model is based on a fairly limited number of variables: use, population, height, etc.535 While changes implemented by the zoning commission may alter the comprehensive plan, the underlying model contemplated by the Standard Act, comprising elements such as use, population density, height of buildings, etc., may not be altered by anyone other than the state legislature.536

529 See Euclid, 272 U.S. at 389; see generally Standard Act, supra note 13.
530 See infra Section III.B-C.
531 See generally Standard Act, supra note 13.
533 See id., §§ 1–3, at 212–15.
535 See id., § 1, at 213.
The Standard Act deviates from optimal problem-solving at several points here. Those who are most familiar with the given system are constrained in their ability to affect radically the model given to them. Ideally, it is the problem-solver who is most familiar with the system at hand who forms the model for hypothesizing. Coming to understand such systems presumably requires considerable effort, as the discussion above regarding analogical reasoning and narrowing of the problem sector demonstrates. The factors considered in the Standard Act have changed little since Euclid. While it is possible that the model conceived at that time was sufficient, the process contemplated by the Standard Act renders it impossible for those most likely to discover some new nuance of this system to incorporate this element into the new model on their own. Rather, such an amendment of the Enabling Act requires legislation.

For example, some have suggested that Euclidean zoning has engendered suburban sprawl, which in turn has required an increase in automobile usage, leading in turn to an increase in air pollution. This increase in automobile usage spawned further suburban sprawl since the automobile allows suburbanites to move away from the sprawl and pollution. In essence, such arguments posit that automobile usage as well as suburban sprawl are regulated by positive feedback—an increase in either produces a further increase in that same variable. While Euclid as well as the Standard Act contemplated air pollution as well as population density as relevant variables, the discovery that such variables are governed by positive feedback is not incorporated into such a model.

Presumably, such novel relationships between variables occasionally will be discovered. Under the Standard Act, those most likely to make such discoveries must appeal for legislative amendment were they to consider the introduction of a zone not contemplated by a

337 See id. (stating that the legislature holds the power to amend, supplement, change, modify, or repeal the zoning regulation).
338 See Dörner, supra note 8, at 43. While Dörner never says this explicitly, it is clear from his discussion that there is one individual (or group of individuals) who undertakes each phase of the decision-making process. See id.
339 See Dörner, supra note 8, at 77.
341 See id.
342 See Kunstler, supra note 2, at 43, 64–65.
343 See id. at 65.
344 See Dörner, supra note 8, at 74.
345 See Standard Act, supra note 13, § 1, at 213.
comprehensive plan. Consider, for example, a proposal to deal with increasing auto pollution and traffic by creating a district based on automobile usage according to which only a certain amount of vehicles could be owned or operated per capita. A zoning commission probably would need legislative amendment to create such a district. On its face, this result may not appear problematic: If the problem represents enough of a problem to warrant such a district, the hurdle represented by needing to appeal to the legislature does not amount to much of a hurdle since the significance will suffice to persuade a legislature that it should amend the model. Additionally, as elected officials, a legislature is responsible to the public in a way in which members of a zoning commission or board of adjustment are not. The system, then, should be left as it is.

C. The Underlying Problem

The response that the legislature is elected—and therefore responsible to the public—while administrators are not, raises perhaps the most central issue in Euclidean zoning: the tension between allowing flexibility in zoning while at the same time avoiding abuse of discretion by government officials. From a decision-making perspective, the traditional dispute regarding flexibility takes on a novel form. Traditionally, discussions of flexibility in Euclidean zoning concern whether districts can be stretched—made less restrictive—to accommodate property owners. The issue of flexibility here concerns allowing those with the most expertise to make the decisions, both as to goal formulation as well as model formulation and, as will become evident, plan implementation. The flexibility at issue here will sometimes allow an expert to be even more restrictive in what uses she permits than traditional Euclidean zoning.

Likewise, the traditional notion of abuse of discretion typically involves a government official who exploits flexibility provisions in a way that harms, rather than enhances, the health, safety, and welfare of the population. Such decisions would surely displease an electorate, thus ensuring that the police power is not abused by anyone over whom the electorate has voting power. In the framework under con-

546 See id., § 5, at 216–17.
547 See id.
548 See DUKEMINIER, supra note 163, at 1009–10.
549 See id. at 1010–11.
550 See id. at 1008.
sideration, the expert decision-maker is trying to make a decision that would enhance the health, safety, or welfare of the population. Zoning which restricted automobile usage would not be an abuse of discretion under the traditional notion. Still, it would be unpopular with an electorate.\(^{351}\) Even when an action is taken for the good of the community as a whole, the individual community members may not want it.\(^{352}\) Such decisions are best left to experts who are insulated from the political process, a basic tenet of administrative law.\(^{353}\)

In the prediction and extrapolation phase of problem-solving, members of a zoning commission or board of adjustment are, in one sense, not burdened to the extent that they are in the model formulation stage because they are not limited in what inferences they may draw as to what effects a given course of action will have. They are, nevertheless, limited insofar as the model upon which they base these hypotheses is partially beyond their control since non-expert legislators provide it to them.\(^{354}\)

This constraint upon the expert decision-maker arises most forcibly at the implementation and final reviewing and revising phases of problem-solving.\(^{355}\) Granted, the zoning commission may recommend districts and zones; likewise, the board of adjustment may grant a variance or special exception. The zoning commission, however, only makes a recommendation; there is no guarantee it will be adopted. The power of the board of adjustment, in turn, in making special exceptions is limited insofar as such exceptions are possible only where expressly authorized by ordinances passed by the local legislature, since legislative attempts to provide boards of adjustment with broad delegations of power to grant exceptions have been held unconstitutional.\(^{356}\)

\(^{351}\) See id. at 58–61; see also Richard Lacayo, The Brawl Over Sprawl, Time, Mar. 22, 1999, at 48. Specifically, in a Time/CNN telephone poll of 1,024 adult Americans taken on January 20 and 21, 1999 by Yankelovich Partners Inc., participants were asked which is more important: (1) the ability of individuals to do what they want with land that they own; or (2) the ability of government to regulate development for the common good. See id. Sixty-nine percent of the participants chose the former over the latter. See id. Twenty-five percent of the participants chose the latter. See id.

\(^{352}\) See Lacayo, supra note 351, at 48.

\(^{353}\) See Administrative Law, supra note 321, at 29, 210–13.

\(^{354}\) See generally Standard Act, supra note 13.

\(^{355}\) It should be noted that, even if there were no new constraint on the ability of a zoning commission or board of adjustment to implement a plan, to the extent that they are limited in what goals they may set and what general systematic model they may conceive, their ability to plan and implement action is constrained. See id.

Finally, boards of adjustment are limited by the very nature of their appellate power. For example, the power to grant a variance under Section 7 of the Standard Act is constrained by the requirement that the variances be granted only in cases of unique and individual hardship. Moreover, both variances and special exceptions require that a property-owner approach a board of adjustment. The Board itself does not introduce these actions, but reacts to demands from individual property owners. This applies equally to cluster zones, PUDs, and conditional rezoning. Thus, most of the decisions made will arise only when a property owner—a representative of the marketplace—comes forward to make a request. As many have noted, the environmental consequences of granting the marketplace a central role in decision-making can be disastrous.

IV. SOLVING THE PROBLEM: MODERATING ELECTORAL AND JUDICIAL CONSTRAINTS

As noted above, the primary problem at every stage of the problem-solving effort represented in Euclidean zoning by the Standard Act is that those with the most expertise are constrained in the exercise of decision-making power. These constraints fall into two general categories which may be described as either electoral or judicial in nature. Electoral constraints are found when citizens are able to restrain effective problem-solving either by voting down measures or the officials who propose them. Judicial constraints, in turn, are found wherever courts are able to restrain effective problem-solving, e.g., in cases of judicial review. While neither constraint can or should be eliminated, it may nevertheless be possible to reduce their effect on the decision-making of those with the most experience, namely, zoning commissions and boards of adjustment.

One possibility for reducing constraints on the decision-making of those with the most experience would be to educate legislators, providing them with experience. The use of legislative committees presumably is motivated by the desire for certain members of a legislature to be especially knowledgeable regarding some specific subject

558 See STANDARD ACT, supra note 15, § 7, at 218.
559 See id.
560 See DUKEMINIER, supra note 163, at 1063-64.
561 See PLATER, supra note 42, at 57-60 (citing Sax, Property Rights and the Economy of Nature, 45 STANFORD L. REV. 1433 (1993)).
matter. It is unlikely, however, that even a portion of a given state or local legislature could devote sufficient time to such an endeavor. Moreover, this would not avoid the democratic constraints on passing unpopular, albeit necessary measures.

Another possibility for reducing the constraints on the decision-making of those with the most experience would be to delegate more power to those on zoning commissions. As noted, however, some courts have found broad delegations of power unconstitutional.362 There may, however, be a number of routes around this issue. At the federal level, concerns regarding overbroad delegations have been on the wane.363 The federal government's tendency to delegate broadly to administrative agencies—the expert decision-makers—indicates a recognition that broad delegations may be permissible in some instances. The federal government offers a delegation possibility in which broad powers are delegated, on the condition that whatever substantial decision is made will face an up or down vote from the legislature.364 Any judicial issues with the constitutionality of such a broad delegation, then, may be addressed by noting the attenuation in delegation concerns as well as the possibility that a complete delegation of power may yet allow legislative control over an abuse of discretion by the zoning commission or board of adjustment.

While such a broad delegation would minimize, within constitutional limits, the electoral constraints on decision-making, judicial constraints remain. There are two possibilities here. First, legislatures could enact statutes which require a number of administrative appeals prior to judicial review. This exhaustion requirement has been recognized by courts as a prudential doctrine, in part because the court understands that it should let experts consider the issue first.365

362 See Cape, 464 A.2d at 227.
363 See, e.g., Industrial Union Dept. v. American Petroleum Inst., 448 U.S. 607 (1980) (holding that Secretary of Labor exceeded the powers granted to him in the Occupational Safety and Health Act of 1970, implicitly rejecting the view held by then-Justice Rehnquist in the dissent who argued that the fairly broad delegation of powers in that act was an abdication of legislative power).
364 See, e.g., Trade Act of 1974, 19 U.S.C. §§ 2101-2495; see also THOMAS M. FRANCK & MICHAEL J. GLENNON, FOREIGN RELATIONS AND NATIONAL SECURITY LAW, 416-17 (2d ed. 1993). In trade agreements, Congress delegates its own Article I, § 8 ability to regulate commerce with other nations to the President. See 19 U.S.C. § 2112. It prevents the executive from abusing this delegation by setting conditions precedent, one of which is that whatever trade agreement he negotiates will be subject to just such an up or down vote. See 19 U.S.C. § 2191(f), (g).
365 See Darby v. Cisneros, 509 U.S. 137, 153 (1993) (holding that courts will show "appropriate deference to Congress' powers to prescribe the basic procedural scheme under
Increasing the exhaustion requirement, however, only delays judicial review. Still, while such review is not necessarily undesirable—the judiciary’s ability to review for constitutionality should not, and cannot, be abrogated—judicial review of non-constitutional issues may be constrained. For example, under the Administrative Procedure Act, legislatures may constrain, if not eliminate, judicial review of agency action. The judiciary’s ability to review constitutional issues will not be abrogated, as the Court has held that the preclusion of judicial review of constitutional issues will require “clear and convincing” evidence on Congress’ part that such review is precluded. In this way, then, judicial constraints on experienced decision-makers could be minimized, allowing only an evaluation of the constitutionality of their decisions.

CONCLUSION

The problem-solving effort in Euclidean zoning as embodied in the Standard State Zone Enabling Act can be improved in the first instance placing the decision-making power in the hands of those with the most experience. This, in turn, will allow the formulation of goals which are likely to be achieved based on models which most closely represent the system in question. Further, by mitigating the electoral and judicial constraints upon these decision-makers, the actions taken by them, as well as any of their corrective measures, will not be affected by external forces. Those with the most experience with such matters, in short, will not be hindered by those with less experience. This will ensure that Euclidean zoning, as a problem-solving process with distinct phases, represents an effective problem-solving effort. Consequently, while Euclidean zoning will probably

which a claim may be heard in a Federal court requires fashioning of exhaustion principles in a manner consistent with congressional intent and any applicable statutory scheme” (quoting McCarthy v. Madigan, 503 U.S. 140, 144 (1992)).

566 See id.
568 See Administrative Procedure Act, 5 U.S.C. § 701(a)(1) (stating that agency actions will be reviewable “except to the extent that . . . statutes preclude judicial review); Johnson, 415 U.S. at 373–74 (holding that while Administrative Procedure Act § 701(a)(1) may allow statutes to block review by expressly denying it, blocking Constitutional claims will require “clear and convincing” evidence on Congress’ part, since this is, itself, a constitutionally questionable move).
569 See Johnson, 415 U.S. at 373–74.
570 See Dörner, supra note 8, at 43.
571 See id.
continue to envision "the specification of determined geographic areas separated according to zoning districts with the uses permitted in each district set forth in the ordinances," the nature of these districts could look considerably different.\textsuperscript{372}