Highway Interchanges and Land-Use Controls


There is an increasing awareness that the land use patterns which will dictate the form and structure of future cities are determined, almost irrevocably, by today's physical improvement programs. Because highway interchanges are new focal points of accessibility patterns, there is frequently intense pressure for land development in the vicinity of the interchange. This development, if not competently guided, may hamper the efficient operation of the interchange.

There is agreement that the often haphazard growth witnessed to date is not good and that future growth should be guided, within reasonable limits, in order to effect a desirable future land-use pattern. Furthermore, there is agreement that existing measures for guiding development and controlling land use are inadequate, as ordinarily used, to cope with the problems of urban growth which beset those municipalities clustered together in expanding metropolitan areas. In recognition of this inadequacy, a major objective of current urban research is to develop improved standards, practices and procedures for land-use planning and control.

Most, if not all, of the urban growing pains, termed in this paper "interchange problems," are found in any area subject to urbanizing forces. Likewise, most of the remedies, including land use controls, are applicable elsewhere, and not just near highway interchanges. Nevertheless, concentration on these interchanges is warranted both because a remedy is always more acceptable where the problem is most extreme and because, once a pressing "interchange problem" has generated public acceptance of a land use control, the same control may become acceptable elsewhere at an earlier stage of urban growth.

The demand for improved land use controls comes both from public officials and from private property owners affected. This paper discusses many reasons for the demand by public officials, especially those responsible for highway programs. Realization on the part of private property owners that effectively administered land use controls are important to them, stems from their concern about incompatible mixtures of land use. For example, a recent article lists seven considerations to be taken into account when locating industrial developments in highway interchange areas: The seventh is that: "Locations near interchanges are desirable because of their key position with regard to major routes leading in several directions. However, a location too close to an interchange very often is not desirable because of: (a) Excessive traffic congestion at such locations; (b) Difficulty of access and egress at such points due to the heavy traffic and the often complicated and confusing interchange layout; (c) Excessive noise at such locations."

As this statement suggests, haphazard development in the vicinity of interchanges may create problems attendant upon incompatible mixtures of land use, with consequent loss both of public investment in the highway facility and of private capital investment in adjacent lands. Land-use planning and control can help the community either avoid or alleviate these problems, as the case may be.

Land-use controls in the United States have never been presented in a neat or compact package. Instead, there are the several techniques of land-use control employed by different individuals in varying manners and in scattered places. A continued overview of their relationships to each other and a continued examination of the strength and sharpness of the various techniques, in comparison with each other, is essential.
to their proper and safe use. One purpose of this paper is to report on such an overview and examination.

A further reason for taking a close look at land-use control measures is that considerable research currently under way is being directed to problems which find their ultimate solution in improved land use controls. The kinds of problems to which such research is directed are: (a) to determine the sensitive or "affected" area of the interchange, (b) to determine the types of land uses that occur at different types of interchanges, rural and urban, (c) to determine how these land uses are related to traffic generation at these focal points, (d) to determine the types of economic activities that are desirable at interchange points, (e) to utilize the data for the establishment of predictive models of land development at interchange points, and (f) to aid in the coordination of highway transportation with community development.

Knowledge in each of these categories has practical meaning only when it leads to sound goals incorporated in a comprehensive plan for the "affected" area surrounding each interchange. These goals should be designed so that, when incorporated in a comprehensive plan, they promote the most adequate functioning of the interchanges. But, of course, no matter how logically proper and desirable a comprehensive plan is, it must be implemented to be of value. Therefore, in order that comprehensive plans for interchange areas may be implemented in a manner responsive to the transportation needs of the interchange, improved land-use controls must be developed. To indicate possibilities for improved land-use controls is another purpose of this paper.

In determining whether police power measures should be extended to take into account transportation problems in the highway interchange area, two questions arise. Do these regulations bear a substantial relation to the public health, safety, and general welfare? Is the public interest such that it is reasonable to impose restrictions on the use of property adjacent to freeway or expressway without compensating the owner for any resulting loss in value? The decision involves weighing society's respective interests in the welfare of the public and the individual. A strong case can be made on general considerations without reference to judicial precedents. Highway transportation has become an increasingly important avenue of commerce and the public has an unlimited interest in its further development. Immeasurable economic and social progress has in most instances attended the construction of highway facilities. Furthermore, the public has a huge investment in publicly owned highway systems, another factor which cannot be ignored is the relation of effectively operating highways to national defense. These considerations can only warrant the conclusion that protection of the public welfare is inherent in the protection afforded highways and streets the adoption of appropriate police power regulations.

A more direct basis for extension of police power regulations to take transportation problems into account is the promotion of the public safety. With the increasing motor vehicle traffic, unobstructed approaches to freeways and expressways are essential to safety of not only the through traffic but also those residing and working in the areas surrounding these approaches. The exercise of police powers for the purpose of promoting and protecting the public health and safety has generally met with public approval. As an abstraction "the interchange problem" simply does not connect with most citizens. They know what is happening to the roadside, or for that matter to the country, but so long as they see no practical way of coping with it, they will turn their attention to other pressing problems. Offering comprehensive planning and increased coordination as the answer gets the same reaction. If, on the other hand, specific ways and means of solving a problem are suggested, perhaps the attitude will change. Private citizens, as well as public officials, will lend their support to planning programs and public improvement programs designed to effect a better city for tomorrow. It is with this hope that this paper outlines a program for land use planning and land use control in the vicinity of highway interchanges. Perhaps others will be encouraged to describe the application of land use controls to specific problems.
Comprehensive Planning for Highway Interchange Districts

No doubt, the highway interchange problem should be thought of primarily as a planning problem. Although it is true that attempting to use land-use controls to prescribe desirable developments, rather than to proscribe undesirable developments, is fraught with pitfalls, highway problems can be taken into account by creating a transportation-oriented planning and development district for the interchange area. Development goals arrived at through a comprehensive planning process would be based, at least in part, on highway transportation considerations. These districts could be given planning authority for the affected area surrounding one interchange or for such areas surrounding a number of interchanges. Also, districts could be set up as need for them arises.

Three transportation-oriented considerations should be paramount in these districts:

1. Balancing the transportation system and the land uses it serves: (a) to obtain desirable location for heavy traffic generators; (b) to encourage buffer and transition "zones" between incompatible land uses; and (c) to provide adequate off-street parking and loading.

2. Securing the optimum amount of access control: (a) to limit access to major feeder roads, in the area close to the interchange, thereby keeping traffic on them flowing freely; and (b) to promote separation of traffic with respect to type or classification and trip purpose and destination.

3. Reserving and acquiring right-of-way for future use: (a) to provide for future expansion of the transportation system in the interchange area; and (b) to provide for future frontage roads.

If attention is given to these considerations, a comprehensive plan for the affected area of the highway interchange can be developed that will relate highway operation to land uses and thus produce and maintain a mutually compatible environment. Guidance of roadside development, control of access to all freeways, expressways, roads and streets in the interchange area, and reservation of right-of-way would then be accomplished by using all of the available land-use control measures.

Standards to implement this type of planning for the orderly and desirable development of areas surrounding highway interchanges must be evolved through research effort by the highway and planning professions. Because transportation planning is an integral part of comprehensive planning, competently drawn standards will meet both comprehensive planning and transportation planning requirements. Of course, these standards should be designed so that they will be acceptable in the foreseeable future.

Once standards have been adopted, all the available land-use and access control measures could be coordinated by the highway interchange planning and development district. Until a new land-use control that is not handicapped with the shortcomings of existing control procedures is developed, a more intelligent, comprehensive use of existing techniques must suffice. Each available land-use control offers a partial remedy; the solution becomes more complete when attempts toward partial remedies are coordinated. If a comprehensive program to treat interchange problems is developed by combining all the various land-use controls and other planning implement techniques, certainly a great step forward will have been taken.

The idea of comprehensive planning for highway interchange areas is by no means a new one. Studies of present planning practices in interchange areas indicate, however, that increasing attention must be directed to the availability of such a program. The modern concept of urban renewal shows the way. Urban renewal depends on two important principles. First, a combination of regulation with purchase, and second, a combination of renewal site planning with comprehensive planning. A similar approach should be taken in the highway interchange planning and development districts.

A Proposal: Interchange Planning and Development Districts

Local Administration.—There are two reasons for recommending that planning is
the vicinity of highway interchanges should be the prerogative of a local planning agency. First, the purpose of a highway interchange presumes planning activity at the municipal or county level because the freeway and major arterials intersecting with it must be integrated into the pattern of feeder streets and local service streets in the vicinity of the interchange. Second, in a manner consistent with sound home-rule principles most land-use planning and control measures are locally oriented. Because of this presumption of local activity, a program for encouraging desirable urban development in the vicinity of highway interchanges should call for local planning action where possible.

Where a local government already has planning authority over areas surrounding the highway interchange, local planning for the interchange area should be required:

a) to conform to a comprehensive plan for the development of the locality as a whole,

b) to develop a plan and program to guide physical improvements in the interchange area, and

c) to conform to uniform minimum standards set up by a State planning agency or State highway departments.

State Administration. — On the other hand, there will be some interchanges in areas where no local government has planning authority. Either authority to plan should be delegated to the local government having jurisdiction over the area or a State planning agency should be established with authority to develop plans for the affected area surrounding highway interchanges. If the latter alternative is followed, the comprehensive plan for the development of the interchange planning district should be required to conform with any existing comprehensive plan for the surrounding municipality or region.

In this delegation of authority to plan, the State government has a primary responsibility to provide enabling legislation which will permit solution of problems arising at the highway interchange areas. In drafting this legislation, an effort should be made to accomplish two main objectives: a broad, unambiguous grant of power to local governments or planning agencies in order to stimulate initiative and vigor in meeting control of development, control of access, and reservation for future acquisition responsibilities in the highway interchange area; and a requirement of maximum intergovernmental cooperation in meeting highway interchange problems that cannot be handled properly by each local government or planning agency acting alone.

Procedures. — Whether comprehensive interchange planning is administered by the State or local government, there are several implementing procedures which would be effective. The following are recommended for consideration:

1. Interchange Development Plan — State enabling legislation for State or local planning could require a development plan for the area in the vicinity of the interchange, that is, for the interchange planning district. This development plan could be required to be in conformance with other local planning. The development plan would be a major factor in the advance planning for the highway program. Minimum requirements of the development plan would be specified in the State enabling legislation, and would include at least the following:

   a. A land-use plan for the most desirable utilization of land in the interchange area.

   b. Street and highway plans.

   c. Mass transit plans.

   d. Public services and facilities, and other public improvement plan.

   e. Public buildings and community design, including a subdivision and zoning plan.

Legislation was proposed recently in Kentucky establishing a Highway Interchange Planning and Development Commission with complete planning authority over the affected area surrounding the highway interchange. The authority of this commission would supersede that of a local planning agency. Although this proposed legislation failed to pass the Kentucky Legislature, it still provides a good example of one type of State agency that could solve highway interchange problems.
f. Recreation plans for park, playgrounds, and other recreation areas.
g. Conservation plan, including plans for water and all natural resources, for flood control, and water shed protection.
h. Any other plans applicable.3

2. Program for Implementing the Interchange Development Plan—To insure that development plans for interchange areas will be implemented in a manner responsive to the transportation needs of the interchange, advanced planning for a highway system should require, from the appropriate planning agency, a program for achieving the goals announced in the development plan. Such a program should describe how the available land-use controls and, equally important, combinations of controls, are to be used to implement the interchange development plan. Furthermore, the program should utilize new land-use control procedures, especially the planned unit development concept described below. In this manner the public will be assured that an effort has been made to adapt land use controls to solve problems peculiar to a highway interchange.

3. Standards —If a State agency is not given the responsibility for guiding development in the vicinity of the interchange, minimum standards should be developed and prescribed a State agency. It is believed the States' interest in a State highway extends this far.

A More General Proposal. —A somewhat similar proposal, but broader and more comprehensive, was recently presented by Marion Clawson.4 He suggested that:

...the problems of suburbanization be dealt with through special new forms of local government, tentatively called suburban development districts. If the necessary legislation were enacted, such districts would have very broad powers for planning and for action to carry out or to direct all parts of the development process for suburbs. Their organization and methods of operation should be, and could be, highly flexible to deal with the varied conditions existing in suburbs across the nation. All the major interest groups concerned with suburbs would be represented in the government of such districts, or at least given a chance to be represented. These suburban development districts would be interim governmental units, to be liquidated after suburban settlement had reached some predetermined point.

If this proposal is adopted, the recommended planning responsibility for interchange planning and development districts would be the proper responsibility for Clawson's suburban development district. Nevertheless, enabling legislation for the suburban development district should recognize the transportation elements of planning for areas around a highway interchange. By recognizing transportation requirements specifically, local officials would be encouraged to take effective planning and land-use control measures in a manner responsive to highway transportation requirements. Likewise the courts would be encouraged to uphold the use of such measures.

Application of Planned Unit Development Procedure in Interchange District

The planned unit development procedure is one land-use planning and control measure that warrants special emphasis. Provisions authorizing some version of planned unit development appear in the zoning ordinances of various cities under a number of different captions, the most common being "Planned Residential Development," "Planned Building Groups," "Community Unit Plan," "Dwelling Groups," and "Group Housing."5

4/ Clawson, op. cit. supra note 3, at 76.
5/ Chicago, Ill.; Seattle, Wash.
6/ Denver, Colo.; Shreveport, La.
7/ Atlanta, Ga.; St. Louis, Mo.; Toledo, Ohio.
8/ Grand Rapids, Mich.; Steubenville, Ohio.
9/ Hartford, Conn.; Kansas City, Mo.; Providence, R.I.
Such provisions are quite common in the zoning ordinances of the larger cities in the United States. These provisions (hereinafter referred to as "planned unit development provisions") are in one sense a refinement of the normal hardship procedure. They prescribe planning requirements for large-scale development and establish a review procedure for granting exceptions to the zoning ordinance in cases where proposed developments meet the requirements. In over simplification, the goal is to amend a portion of the zoning map, pursuant to a new set of standards, and then to label the amended portion a planned unit development. This new set of standards can and should bring zoning and subdivision regulation together. Many of the usual subdivision regulation requirements would be included. However, because of the impact of large-scale development on neighboring land and on such elements of the community's comprehensive plan as traffic movement and timing of expansion, additional safeguards might be required as a condition to developing.

Another advantage of the planned unit development procedure is that it is possible, and certainly desirable, to require a review and report on the development by the planning commission. In this way the technical competence of the planning commission's staff can be relied on to help determine the advisability of permitting the planned unit development. By leaving the final decision to the board of zoning appeals, the planning commission is insulated, at least in part, from interest groups. It would seem that once the planned unit development is certain to affect highway transportation, it should be required that the State or local highway department should be required to review and report on the development also. This review by a highway department might be in addition, or a part of, the requirement that the planning commission review and report on permitting the development.

Planned unit development provisions have been used primarily to permit exceptions to the zoning ordinance for large-scale housing developments. It seems likely, however, that their usefulness will not stop with housing. Already such provisions have been suggested as a means of permitting "free use of the best of modern city-planning ideals in redevelopment." Nor does there appear to be any limitations in the law to

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See Tuemmler, "Zoning for the Planned Community," Urban Land, April 1954, p. 3, for surveys of such provisions.
See N.Y. Gen. Mun. Law, Sec. 239-k, for an example of highway department report and new requirements.
E.g., Chap. 9, Art. XI, Sec. 9-11 of the Toledo Municipal Code provides in part:

Section 9-11-1. Plan Required.
The C-4 Shopping Center District shall be laid out and developed as a unit according to an approved plan, as provided below, in order to provide for modern retail shopping facilities of integrated design in appropriate locations to serve residential neighborhoods.

Section 9-11-3. Procedure.

3. A traffic survey prepared by qualified experts indicating the effect of the proposed shopping center on adjacent streets and also indicating the anticipated points of origin and direction and the amount of traffic flow to and from the shopping center.

For another adaptation, see Pittsburgh's provision for a Highway Commercial District, Secs. 1601-1607, Zoning Ordinance, City of Pittsburgh (May 1958).
render them inapplicable to industrial uses, as well as residential and mixed residential-commercial. 15

15/ See Chap. 9, Art XV, Secs. 9-15 of the Toledo Municipal Code where provision is made for Planned Industry Districts as follows:

Section 9-15-1. Plan Required.

The M-3 Planned Industry District shall be laid out and developed according to an approved plan as provided in this Section in order to accomplish its purpose to provide space in attractive and appropriate locations for certain types of business and manufacturing free from offense in modern, landscaped buildings, and to provide opportunities for employment closer to residence with a reduction in travel time from home to work.


13. Generally those office, laboratory and manufacturing uses similar to those listed in this Section, which do not create any danger to health and safety, in surrounding areas and which do not create any offensive noise, vibration, smoke, dust, odors, heat or glare and which, by reason of high value in relation to size and weight of merchandise handled, create very little truck traffic.

Section 9-15-3. (Applies Height, Yard, Parking and Loading Requirements.)


The owner or owners of a tract of land comprising five acres or more may submit to the City Council a plan for the use and development of such tract for the purposes of and meeting the requirements set forth in this Section. Said plan shall be accompanied by information concerning the number of persons to be employed, the effects on surrounding property, and other physical conditions, including the effect of the project on adjacent streets and shall include the following:

1. A site plan defining the area to be occupied by buildings, the areas to be used for parking, the location of roads, driveways and walks, the location and height of any walls, the spaces for loading, and the character and extent of landscaping, planting and other treatment for adjustment to surrounding property.

Section 9-15-5. Review and Approval.

Before any action thereon, the proposed planned industry development plan together with the other required information shall be referred to the City Planning Commission for study and report and for public hearing. If the Commission approves the plans, they shall then be submitted to the City Council for consideration and approval according to the procedures of Section 9-23-3. The approval and recommendations of the City Planning Commission shall be accompanied by a report stating the reasons for approval and finding that the proposed development meets the following specific conditions:

1. The proposed development shall be so related to streets and arteries that the traffic generated can be easily accommodated without causing objectionable volumes of traffic on residential streets.
After adoption of a planned unit development procedure, the designated planning commission and highway department would have the duty of developing the requirements that must be met by a developer in exchange for the permission to develop. For example, the applicant could be required to dedicate land for street or park purposes and, by appropriate covenants, to restrict areas as open space for common use. Furthermore, the proposed development could be required to be designed to produce an environment of stable and desirable character not out of harmony with its surrounding neighborhood or with the highway transportation system that must serve it. Thus one of the main purposes of such standards would be to insure that transportation requirements and needs in the vicinity of a highway interchange are taken into account and dealt with intelligently.

Planned unit development provisions appear to have excellent potential as ways and means of taking transportation requirements and needs into account. Perhaps their most important characteristic is that they provide a means for coordinating the use of many of the measures discussed subsequently.

APPLICATION OF LAND-USE CONTROLS TO HIGHWAY INTERCHANGE PROBLEMS

Land use controls, have never been presented in a neat or compact package, with various measures compared and studied to see how each can be used to help the other. Instead, the several techniques of land use control are employed, in the same scale, by different administrators, in scattered places and in varying manners.

As a step, but only a step, toward such an overview this section reports on a study of the relationships between the various land-use controls. The control measures sought to be pertinent to highway interchange problems are defined. The strength and harshness of the same set of measures are examined in comparison with each other, and suggestions are included as to their use in meeting interchange problems.

Definition of Pertinent Land-Use Controls

The concept of controlling land use is a simple one. The basic theory of controlling access to major arterials and of protecting future streets is also uncomplicated. Nevertheless, measures to accomplish these purposes are widely regarded as complex and confusing.

A separate section on definitions and terminology will permit an analysis and application of the controls on a coordinated basis, according to function or purpose. Such a presentation will have more meaning than one that defined and discussed each measure separately.

2. The location and arrangement of buildings, parking areas, roads, driveways, and other features shall be adjusted to the surrounding land uses and parts of the site not used for buildings, structures, parking and accessways shall be landscaped with grass, trees and shrubs sufficient in character and extent to form a permanent screen.

3. No materials, products or equipment shall be stored in the open on the site.

4. All roads, parking and loading areas and walks shall be suitably graded and drained and paved with hard-surface material meeting applicable specifications of the Division of Engineering and Construction.

5. Reasonable additional requirements as to landscaping, lighting, signs, advertising devices, screening, building setbacks and accessways may be imposed by the Commission for the protection of adjoining residential property.

Eminent Domain and Purchase.—Purchase and Leaseback. Purchase and leaseback involves the purchase or condemnation by a public agency of land which it deems necessary for some public purpose, such as open space, and the execution of a lease to the former owners, or to others if the owners should be unwilling, on condition that they refrain from developing the land or using it in a manner harmful to the public. California counties and cities have been using this method to preserve scenic view, but the statute does not authorize the use of eminent domain. 17

Eminent domain has been used to acquire property for leaseback in urban redevelopment projects. Its constitutionality for that purpose has been upheld. 18 The constitutionality of an Indiana statute permitting cities to condemn land and then lease it back to private persons on the condition that they maintain public parking lots has also been upheld. 19

Purchase and leaseback have an advantage over the purchase of development rights where experience has shown that jury awards for easements are as high as awards for the fee simple. If the public is going to be compelled to pay excessive amounts for easements, it should acquire the entire fee. It could gradually recoup its expenditure by renting and, when the tract was no longer necessary for the public benefit, by selling the land.

Development Rights or Conservation Easements. To protect the roadside from harmful development, highway authorities may be given authority to acquire easement by purchase or condemnation along highways. 20 The landowner retains possession and beneficial use of the land, but surrenders his right to use the land in a manner harmful to the highway and its users. Typical restrictions prevent the erection of permanent structures where the highway will probably be widened; prevent the removal of scenic trees and shrubbery; prohibit dumping of trash in the easement area; and control the location of signs and billboards.

If properly administered by the courts and administrators, development rights can be purchased for less than the fee simple title, because the owner retains title and control. 21 By paying for development rights highway authorities should encounter less resistance and less animosity than when using police power methods where the property owner receives no payment for restrictions placed on the use of his land. Also the easements are granted in perpetuity and so local pressures which attempt to alter zoning regulations to the detriment of the highway would be relatively ineffective.

On the other hand, if improperly administered the cost of development rights could equal the cost of fee simple purchase without the benefit. Maryland, after experimenting with protective easement areas for a time, abandoned the plan because of its cost and opposition from real estate owners and reverted to the purchase in fee simple of a larger right-of-way. 22 Moreover, the money available for development rights will undoubtedly be inadequate to protect an entire State highway system. Police power methods, such as roadside zoning, will have to be used in conjunction with highway protective and development easements. 23

Excess Condemnation. Excess condemnation is the practice of buying more land than is necessary for the location and servicing of the public facility. Some early State court decisions invalidated statutes authorizing excess condemnation, holding

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19/ Foltz v. City of Indianapolis, 234 Ind. 656, 130 N.E.2d 650 (1955).
20/ For example, Wis. Stat. Ann., Sec. 84.09(1) (1955); and Md. Ann. Code, Art. 89B, Sec. 8 (1957).
23/ For an extended discussion of conservation easements or development rights, see Whyte, supra note 21.
that the excess was not necessary for a public purpose and thus could not be condemned. As a result, many States amended their constitutions to permit excess condemnation. In others the courts arrived at the same conclusion without constitutional amendment. At present the majority of States recognize the validity of excess condemnation.

Excess condemnation can be used to control the development of land adjacent to highway interchanges, assuming control of the development can be shown to be a "public purpose." The excess land could be conveyed with restrictions in the deed to a vendee who would use it for a purpose which would not generate traffic or mar the landscape. The procedure would be similar to that used on urban redevelopment projects in which the State or municipality condemns a blighted area and then reconsigns to developers on condition that they build adequate low-income housing. Condemnation of land for urban redevelopment has been upheld against the contention that it was a taking of property not for a public purpose in 25 States and voided in four.

As a practical matter excess land should be purchased if:

1. The cost of the entire tract is less than the damages that would be awarded to the owner for part of it.
2. The creation of small remnants, unusable for any purpose when not joined, can be avoided.
3. The land can be used to protect the public facility from encroachment and unwholesome uses.
4. The resale of excess land, which may have increased in value because of the public facility, will reduce the cost of acquisition.

A few examples of excess condemnation legislation follow: In California, the State highway Department may acquire excess land not to exceed 150 ft from the boundary of the highway. The surplus can be reconveyed with restrictions to protect the appearance, law, and other amenities. The State Highway Department can acquire the whole parcel of land where the remainder is of little value to the owner or will give rise to litigation. Later it may sell or exchange the excess.

The Colorado Highway Department has power to acquire future rights-of-way and excess right-of-way. Also, wherever the remainder is of little value to its owner, the State Highway Department may acquire and sell or lease the remainder.

In Massachusetts, there is authority for excess condemnation along highways and streets provided it does not exceed what would be sufficient for suitable building lots on both sides of such street or highway. It may later be sold with restrictions.

A recently enacted Maryland provision authorizes the State Road Commission to purchase or condemn land along or near State highway to protect highway scenery, or provide suitable service areas.

Easements. "Easement" is normally thought of as referring to an interest in the land of another, recognizable and enforceable at law. An easement is an interest in real property and the rules governing its creation and transfer follow the rules governing conveyances in land. Easements are distinguished from covenants in that they are created by conveyance whereas covenants are created by contract.

Rhine, Municipal Law, Sec. 17-5 (1957); Holloway, "Acquisition of Marginal or Excess Property With or Without Statutory or Constitutional Provision," AASHE Proceedings, 448 (1958); see generally Cushman, Excess Condemnation (1917).

For numerous citations to State constitutional provisions and statutes permitting excess condemnation for highways, see Condemnation of Property for Highway Purposes - A Legal Analysis, Part I, HRB Special Report 32, pp. 8-9 (1958).

Rhine, Municipal Law, Sec. 25-3 (1957).

For specific examples see Sawtelle, "Reserving Lands for Street and Highway Improvements," HRB Bull. 77, pp. 63-66 (1953).

Cal. Streets and Highways Code, Sec. 104.1.
Col. Rev. Stat., Sec. 120-3-10 (1953).
Mass. Const., Art. X, Sec. 11.
Building Lines. Establishment of building lines is another method of reserving land for future rights-of-way used in several States. This method, based on legislation modeled after the Standard City Planning Enabling Act of the Department of Commerce, generally provides that the governing body of a municipality pass an ordinance or adopt a plan fixing the line of future streets. After this no building permit will be issued for structures in platted rights-of-way. Either automatically or on petition of the landowner, the municipality will appoint a board of appraisers which shall determine the amount of compensation to be paid to landowners for reserving their land until it is condemned. The payment of compensation makes this method possible in States which have held official map acts unconstitutional.

Police Power. —Mapped Street Powers. Official map statutes usually provide that when a municipality files a map of future public streets, landowners may not obtain permits to build on areas within the platted rights-of-way. If they do build they will not be compensated for the buildings by the municipality when it condemns the land. Although commonly used in colonial America, official map statutes fell into disfavor with nineteenth-century State courts which declared several unconstitutional for being a taking of property without compensation.

Recently, however, interest in official maps has been revived because of the great expansion of road building and its attendant cost. Wisconsin, New Jersey, and Tennessee have enacted official map statutes within the last few years. New York in 1958 gave counties the same power to use official maps which its municipalities have had since 1926. These statutes attempt to obviate arguments against their constitutionality by allowing landowners to build in cases of hardship. The Wisconsin and New York statutes have been upheld, but the New Jersey and Tennessee statutes have not yet been challenged.

The concept of the official map is being extended to meet modern conditions. Originally the acts pertained mostly to municipalities, but recently State highway Departments have received similar power to preserve ultimate width of right-of-way. In Washington, when the location of a future highway is established and filed in the proper county office, landowners may not build within the future right-of-way. If the State Highway Department does not move to acquire the property within one year, the filed plan shall no longer be effective. An Indiana statute provides that the State Highway Department has three years to begin to acquire land before the plan is void, but, if the landowner notifies the Highway Department of his intention to build, the department must move to purchase within 90 days. If it does not, the owner may build an later must be compensated for the structure.

A proposed bill in Kentucky to promote highway interchange planning and development would give a State commission authority to use an official map as well as other police power methods to achieve optimum development of interchange areas. In California, after the State Highway Department, county planning commission, and county governing body have proposed and adopted the precise location of a future State highway, no building permit shall be issued for any structure costing more than $500 except under these conditions: the owner will be substantially damaged by refusal to grant a permit; the property will earn a fair return; or the permit is required by considerations of justice and equity.

38 N.Y. Gen. Municipal Law, Sec. 239-g et seq.
39 N.Y. Gen. City Law, Sec. 35.
40 State ex rel. Miller v. Manders, 2 Wis.2d 365, 86 N.W.2d 469 (1957); Headley v. Rochester, 272 N.Y. 197, 5 N.E.2d 198 (1936).
41 Wash. Rev. Code, Sec. 47.28.026 (1951).
43 Cal. Streets and Highway Code, Secs. 140-142.
In Pennsylvania, the Secretary of Highways, with the approval of the governor, establishes ultimate width and lanes of State highways and records them with the proper county. Although there is less State-local cooperation in the fixing of road lines than in California, any structure built after the recording will not be compensated for by the State. There are no hardship exceptions as in California. Neither Pennsylvania nor California has time limits on the period during which building can be prohibited or undertaken only at the builder’s risk.

Zoning, Including Setback and Front Yard Requirements. The accepted purposes of zoning regulations are (1) to control population density, daylight, air, open space, (2) to obtain a desirable location and distribution of use districts, (3) to lessen congestion in the streets, and (4) to promote the "general welfare." The elements of “the general welfare,” as this term has been defined in zoning law, have been summarized by one authority under the following headings: (a) public health, (b) public safety, (c) appropriate uses of land, (d) preservation of character of neighborhood, (e) stabilization and protection of property uses and values, (f) enhancement of value and utility of property, (g) safeguarding of future development and use, (h) stability of plan and conditions, and (i) aesthetic considerations. Since each of these elements is supported by court decisions, this list could be called a judicial statement of zoning purposes. Although a statement of zoning purposes by a city or regional planner would be somewhat broader and would stress the use of zoning to implement a land use planning process, it would stress each of these elements as well.

These purposes are accomplished by dividing the city into zones or districts and then controlling the use of land and buildings, the size of buildings, and the location on lot. Thus, the conventional zoning ordinance maps the city into separate residential, commercial, and industrial districts and then divides each major classification into subgroups segregating different types of structures, for example, in the industrial classification—limited industrial, light industrial, and heavy industrial. In other words, use zoning rules attempt to classify occupancy into appropriate groupings and segregate incompatible groups.

One zoning measure, the planned unit development procedure, has already been discussed. The relationship between zoning and highway transportation is discussed hereinafter. A more extensive analysis of this relationship and a discussion of highway transportation criteria in zoning law has been reported in another publication.

Setback and Front Yard Requirements. Setback lines are usually included in zoning ordinances to insure adequate front yards. Although legislatures often do not specify the purpose of the setback provisions, there is undoubtedly a constitutional difference between setbacks to require front yards and setbacks to provide for future street widening. If the purpose of the requirement is to protect dwellings from dust, noise, and vandals, it is a proper exercise of police power. If, however, the purpose is to reserve land for future street expansion, the ordinance may be unconstitutional as a "taking" without compensation.

These two objectives are sometimes so intertwined in enabling legislation and municipal ordinances that courts would have difficulty singling one out. Regardless of the dual purpose of the setback requirement, there does seem to be some tendency to treat front yards and other setbacks alike unless the street widening objective is especially noticeable. For example, mere intent of the city officials to eventually widen streets does not invalidate the ordinance as a "taking" since until such time as the local government moves to acquire, the owner has full use and ownership of the land for every purpose except building.

\[\text{McQuillin, Municipal Corporations, Secs. 25.10-25.43 (3d ed. rev. 1957).}\]
\[\text{Gorlef v. Fox, 274 U.S. 660, 47 S. Ct. 675 (1927).}\]
\[\text{City of Miami v. Romer, 58 So.2d 849 (Fla. 1952).}\]
Setbacks for either of these two purposes are normally obtained in one of the following ways:

1. Setback provisions in zoning ordinances.
2. Setback ordinances as such—ordinances stating that for prescribed streets no buildings are to be built any closer to the street line than a specified distance.
3. Setbacks established on plats as a condition to subdivision approval.
4. Setback provisions in privately established deed restrictions (restrictive covenants).
5. The now virtually obsolete method of purchasing setback easements through eminent domain proceedings.

Subdivision Regulations. Subdividers of land are frequently required by local ordinances to submit their plans to the local planning board or council for approval. The planning board examines the plans to make sure that the community's interests are being safeguarded.

As the city or county will eventually maintain the streets and parks within a subdivision, it has an interest in having them properly located and well built. Also, some State subdivision enabling statutes require that the subdivision plan conform to the "master plan" and most subdivision ordinances require conformity with the master plan if there is one.

Subdivision regulations are a planning measure which can be applied to the highway interchange area to guide development. They can also be used to prevent development entirely where to proceed would violate the public health, safety, and welfare. For example, land which is frequently flooded cannot be subdivided under most modern regulations. The likely injury to the community outweighs the right of the owner to use his land for any purpose. Conceivably some types of development near interchange could be prohibited entirely if their construction and operation would have an adverse effect on the traffic-carrying capabilities of the highway.

Total prohibition, however, would only be necessary in extreme cases. Ordinarily other land use controls can be as effective in balancing the highway transportation system and the land uses it is designed to serve. When lots abut on an arterial street a frontage road may be required to prevent each homeowner from having direct access to the street. Such a frontage road could be either between the lot and the arterial, or at the opposite side of the lot from the arterial. Dedication of a nonaccess strip along the arterial may be required. The number of feeder streets can be kept to a minimum and their location adequately spaced. Some uses of access points can be restricted by agreement between the subdivider and the approving authority.

Most subdivision regulation enabling legislation is sufficiently broad to permit application of subdivision controls to commercial and industrial uses as well as to residential uses. An important cross-reference here is to the plan development unit division included in many zoning ordinances. These provisions subject zoning ordinance variances for large-scale development to subdivision regulation type of control.

Another cross-reference is to control of roadside development. Wisconsin requires a subdivider whose land abuts a State trunk highway, and Michigan requires a subdivider whose land abuts a State trunk highway or Federal-aid road to comply with subdivision regulations of the State Highway Commission. The most important regulations restrict access from lots to the highway by requiring frontage roads, limit the number of subdivision streets joining the trunk highway, and establish minimum setback requirements, which make future expansion possible and less costly. Michigan apparently also requires dedication of land adjoining major highways for...
future use." Officials of both States have expressed approval of the statute* and they seem particularly useful in areas in which no local body reviews proposed plats.

Several factors weaken the potency of subdivision regulations in the vicinity of many highway interchanges. Many interchanges lie within the limits of local governments exercising planning authority. In these areas, the local government may not have authority to adopt subdivision regulations or it may not have the experience which the rapidly growing cities have had to acquire in formulating the enforcing subdivision regulations. Unaccustomed to exercising their authority, these localities may prefer not to do so. Furthermore, the minimum area required before subdivision regulations apply means that there is no control over individuals who may choose to build on small parcels abutting the road. Such gaps in the subdivision regulations could be filled by a control of development law discussed in the next subsection. This emphasizes again the need for applying land use controls so that they supplement each other rather than relying on one or two measures to do the entire job.

Control of Development. Some control of development can be accomplished by requiring those who seek to build on land which fronts or has access to a highway to get building permits which have been approved by highway officials. In deciding whether to approve, the officials consider the traffic congestion on the bordering road, the traffic generating qualities of the proposed development, whether the proposed access is limited or uncontrolled, etc. By disapproving they can require changes which will protect the traffic-carrying capabilities of the highway. A provision making an exception for hardship cases helps to bolster the constitutionality of the method.

The advantage of this control is that it helps to fill the holes not covered by zoning and subdivision regulations which are often effective only within or near the limits of municipality. Control of development, on the other hand, can be effective along any highway. Also subdivision regulations can be evaded because of their minimum area requirements, whereas control of development does not depend on the number of acres to be developed.

Re-Use. Urban renewal includes at least four techniques: (a) Redevelopment—demolition and rebuilding in a project area; (b) Housing law enforcement—enforcing of municipal codes and ordinances in a uniform manner to insure maintenance of prescribed standards; (c) Rehabilitation—remodeling and renovating existing structures in a neighborhood or project area; and (d) Conservation—preservation of existing structures. Conservation and rehabilitation programs are frequently conducted together where a community wishes to continue the use and pattern of an area or neighborhood. Among the elements of a conservation program is a neighborhood plan conforming to the community’s comprehensive plan providing for the installation of community facilities, demolition of unsound structures, removal of adverse uses, new construction, rehabilitation, and relocation of structures. Also important, of course, is an effective housing law enforcement program.

The nonconforming use or structure, a use or structure which lawfully existed in a location before the adoption of a zoning regulation prohibiting that type of use or structure in that location, has ordinarily been permitted to continue indefinitely. There have been, however, regular and consistent attempts to confine nonconforming uses as much as possible. For instance, conversion of a nonconforming use into a different type of nonconforming use has been regulated.* Repairs and alterations of

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New York grants this power to county officials, Gen. Mun. Law, Sec. 239-k.


For a discussion of the validity of such enactments see Comment, The Elimination of Nonconforming Uses, 1951, Wis. L. Rev. 685; McQuillan, Municipal Corporations, Secs. 189-25.211 (3d ed. 1950).
nonconforming uses have been limited to those required for safety; resumption of nonconforming uses after they have been discontinued or abandoned has been prohibited; and the replacement of buildings designed for nonconforming uses has been forbidden. It seems likely that a great deal can be accomplished by extending these attempts to confine nonconforming uses and justifying this extension with transportation criteria. This reliance on transportation criteria should result in a two-fold benefit: more frequent success in restricting nonconforming uses and increased protection of the traffic-carrying capability of the roads and streets in the vicinity of the interchange.

But even with this added emphasis on restricting or confining nonconforming use, it is unlikely such uses will disappear or be substantially decreased. Therefore, to insure against their being continued indefinitely, regulatory power to eliminate or terminate nonconforming uses should be authorized in State zoning enabling legislation.

In at least 12 States, zoning enabling statutes expressly authorize one or more classes of municipal government or counties to adopt regulations providing for the elimination of nonconforming uses after an amortization or grace period. However, municipalities in many States without enabling acts that expressly mention such regulations have nevertheless adopted nonconforming use elimination provisions. Furthermore, there have been judicial decisions upholding the validity of such provisions, also without the benefit of supporting enabling legislation.

Examples of nonconforming use elimination provisions can be found in the zoning codes of Cook County, Denver, Pittsburgh, Baltimore, and Buffalo. The latter two have been considered in the courts. Whereas near term elimination of substantial

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61/ Selligman v. Van Allmen Bros., 297 Ky. 121, 179 S.W.2d 207 (1944); State ex rel. Miller v. Cain, 40 Wash.2d 216, 242 P.2d 505 (1952); McQuillen, Municipal Corporation Sec. 25:205 (3d ed. 1950).
62/ Supra. note 60.
63/ Ibid.
64/ See Stanhagen, "Highway Transportation Criteria in Zoning Law, Bureau of Public Roads" (October 1950) for a discussion of criteria that could be used for this purpose.
65/ One such provision may be found in the Kansas statute, applying to certain classes of counties, which states "that reasonable regulations may be adopted for the gradual elimination of nonconforming uses." Gen. Stats. of Kan. Ann., Sec. 19-2919 (1950). For a similar provision applicable to cities and towns, see Code of Virginia, Sec. 15-843 (1950).
66/ An even more specific provision, which spells out in detail the methods by which nonconforming uses may be eliminated is contained in the Illinois statute applicable to cities, towns, and villages. Ill. Stats. Ann., ch. 24, 73-1 (1942). It reads:

"Provisions may be made for the gradual elimination of uses, buildings and structures which are incompatible with the character of the districts in which they are mad or located, including, without being limited thereto, provisions (a) for the elimination of such uses of unimproved lands or lot areas when the existing rights of the persons or to whom the uses to which they are devoted are discontinued; (b) for the elimination of uses to which such buildings and structures are devoted, if they are adaptable for permitted uses; and (c) for the elimination of such buildings and structures when they are destroyed or damaged in major part, or when the have reached the age fixed by the corporate authorities of the municipality as the normal useful life of such buildings or structures."

There has been considerable judicial recognition of the need to eliminate nonconforming uses. See People v. Miller, 304 N.Y. 105, 106 N.E.2d 34 (1952); Spurgeon v. Bd. of Commissioners of Shawnee County, 181 Kan. 1008, 317 P.2d 798 (1957).
68/ Cook County, Ill., Zoning Ordinance, Art. V, Sec. 5:3 (1960).
70/ Pittsburgh, Pa., Zoning Ordinance, Art. 27, Sec. 2703 (1958).
71/ Baltimore, Md., City Code, Art. 40, Sec. 13 (1953).
72/ Buffalo, N.Y., City Code, Ch. LXX, Sec. 18 (1953).
structures will probably require purchase or condemnation, elimination of "open uses" is possible and has been judicially upheld. Although uses subject to these "amortization" provisions usually are close to falling within the nuisance class, it appears likely that some nonconforming uses causing traffic congestion, while not measuring up to a nuisance in law, can nevertheless be eliminated or "amortized".

License and Permit Procedures. Under the police power, a governing body can require a license or a permit for the conduct of businesses affecting the public health, welfare, and safety. For example, licenses or special permits are frequently required, under appropriate legislation, for construction and operation of automotive service stations. The intent is to prevent a concentration of unnecessary traffic generators.

Permits may be denied even when the district is zoned for gasoline stations, if the proposed station would increase traffic hazards, emit noise, and adversely affect property in an area in which no additional station was necessary.

It would seem reasonable for a governing body to pass an ordinance requiring licenses for other classes of traffic generators in the interchange area. The court probably would uphold the permit or license procedure provided the enabling legislation clearly related the regulations to the public safety, health and welfare, and the classifications established bore a reasonable relation to the purpose intended.

Contractual Agreements.—Restrictive Covenants. When subdividing large tracts of land for residential purposes, the subdivider frequently conveys each lot subject to restrictions against use of the lot for various purposes. On a broader scale, that is, applying to commercial and industrial uses as well as residential, the Federal Urban renewal Act authorizes the restrictions to include "covenants, conditions or provisions" in any "contract or instrument made pursuant to this title." Additionally, a number of adjoining landowners often enter into mutual covenants restricting the use of their property. So far as such restrictions are reasonable in their character, they are enforced by courts in favor of the original owner, in favor of the owner of any of the lots into which the tract is divided, and against the owner of any of the lots who attempts to disregard the restrictions.

A great majority of private restrictions do not appear to have been designed independently to suit the needs of the particular development, but instead are substantially the same as a set of restrictions included in the FHA model. On the other hand, the intent of the requirement in the Federal urban renewal legislation, that the redeveloper enter into restrictive covenants, is to insure that the land use in the redeveloped area would remain in accordance with the plan for the redevelopment project. In other words, restrictive covenants as used in urban renewal are designed specifically to suit the needs of the particular development.


See Dallas v. Halbert, 246 S.W.2d 686 (1952), for a decision discussing the distinction between eliminating a nuisance and eliminating, under a zoning ordinance a nonconforming use that is not a nuisance. See also State ex rel. Dema Realty Co. v. Donald, 168 La. 172, 121 So. 613, cert. denied, 280 U.S. 556 (1929) (court found the nuisance eliminated to be a nuisance "in fact and in law"). This decision was relied upon to sustain the same ordinance in State ex rel. Dema Realty Co. v. Jacoby, 168 La. 123 So. 314 (1929). See Comment, The Elimination of Nonconforming Uses, 1951 L. Rev. 585. Apparently, in Louisiana, a business otherwise legal becomes a nuisance per se, in the area in which it is prohibited by a zoning ordinance, New Orleans Liberty Shop, 157 La. 26, 101 So. 798 (1924).


Housing Act of 1949, 63 Stat. 416 (1949), as amended, 42 U.S.C.A. Sec. 1455(a) and Sec. 1456(c)(7).


Federal Housing Administration, Land Planning Bulletin No. 3, Data Sheets 201, 249 (1949).
Conditional Use Agreements. Conditional use agreements restrict the kind of use that can be made of access to a highway from abutting property. Allowed uses are ordinarily for residential, farm, or restricted commercial and industrial purposes.

This type of agreement is most easily obtained where there is a State law preventing the accruing of rights of access to property abutting upon future State highways, except such access as the State highway department may permit. If use of access is restricted in this manner, payment to the property owner is not required. Under such a statute, the Oregon State Highway Commission has permitted access, restricted as to use, to those highways on new locations where complete prohibition of access was not necessary to safeguard the motoring public. This technique is equally applicable to all classes of roads, streets and major arterials on new location. Its utility with respect to traffic facilities in the vicinity of a highway interchange is obvious.

In States having no such statute, conditional use agreements must be obtained by purchase or eminent domain. Again, the main use of this procedure has been in Oregon.

Doctrine of Nuisance Law.—At common law a roadside owner can be prohibited from interfering with the public right of "ready and easy passage." The prohibition can be based on three principles:

1. the roadside owner has violated his property law duty as owner of a "servient tenement" not to interfere with the "dominant" rights of the public;
2. the roadside abuse is enjoinable as a public nuisance; and
3. the roadside owner is guilty of continuing negligent or intentional conduct, in breach of his duty to permit free and safe passage on the highway.

Encroachments which directly affect the highway can be prohibited. For example, prohibiting the continued operation of a gasoline pump located so near the road that its operation hampered traffic has been upheld.

Uses of private land that affect the highway indirectly are not so easily eliminated. Attempts at eliminating such uses of private land have been most successful where the legislative body has given the courts clear guidance. For example, some States have enacted laws prohibiting billboards as nuisances.

Modern zoning ordinances have gone far in prohibiting uses on private property which will affect the driver and increase traffic hazards. The Princeton, N. J., zoning ordinance, to prevent glare, limits the intensity of light used in signs which can be seen from the right-of-way. The Fairfax County, Va., ordinance goes farther in restricting traditional land uses. It prohibits fences (except those made with open wire and walls over three and one-half feet high on corner lots where they obstruct the view of oncoming traffic.

The regulation of such matters as the height of fences is best done by legislation which can insure uniformity and lay down specific standards. But the occasional, unpredictable nuisance on private property can best be met by the courts acting without legislative guidance. Unfortunately, there is little judicial precedence on which the courts can rely. The case cited most frequently is Perlmutter v. Greene, where the court permitted the superintendent of public works to build a screen in front of a large billboard on private property to conceal it from users of the nearby highway. The billboard was a menace because it hid the dangerous nature of the road.

In other situations where the traveling public is endangered, the court will have to
weigh these dangers against property rights and determine whether to intervene. Obviously, there is a need for competent expert testimony.

Use of Land-Use Controls—A Comprehensive Approach

Until a new land-use control that is not handicapped with the shortcomings of existing control procedures is developed, a more intelligent, comprehensive use of existing techniques must suffice. Each available land use control offers a partial remedy; the solution becomes more nearly complete when attempts toward partial remedies are coordinated. If a comprehensive program to treat interchange problems is developed by combining all the various land-use controls, certainly a great step forward will have been taken. This section reports on an examination of the strength and sharpness of these controls with respect to their utility to alleviate highway interchange problems. Or the most part, highway interchange problems fall into three categories: Balancing the transportation system and the land use it serves, securing the optimum amount of access control, and reserving and acquiring right-of-way for future use. Therefore, each land-use control has been investigated and its potential, as a partial solution to the problem at hand, determined. Also as a result of this problem by problem analysis, it is possible to isolate pertinent measures and suggest ways of coordinating their administration and application. Table 1 gives the measures discussed in each of these problem areas.

Balancing the Transportation System and the Land Use it Serves.—A comprehensive community plan has been called "a series of plans (as it exists at a particular date in the office of the planning agency) for various types of physical improvement in which efforts have been made to take into account the present and probable future needs of the community for such improvements, together with some considerations of the interrelationship, especially spatial relationship, among the various physical features." The key function of comprehensive planning is to develop a future land-use plan to serve as a guide for various types of physical improvement. This guide for physical improvement is developed (a) by making economic and population projections, (b) converting these projections to future land uses, and (c) distributing these land uses in accordance with planning goals and objectives.

A typical highway planning process bases future traffic predictions on the land-use pattern incorporated in such a future land-use plan. Obviously, a highway system developed in this manner will be inadequate if the population and economic projections are inaccurate. Though not in so obvious a manner, failure to achieve planning goals assumed and incorporated in future plans can also render the highway system inadequate or ineffective. Achievement of these planning goals depends, in a large measure, on effective land-use control. Consequently, the validity of the highway planning process depends on effectively administered land-use planning and land-use control.

The relationship between land use and the highway system, makes it necessary for the physical development of each to be balanced with the other. Hence, the often expressed need to balance the highway transportation system with the land use it serves involves a continuing process of coordination. Logically, coordination must extend to the elements of "balance." Three of the most important elements are timing of development, intensity of land use, and location of traffic generators.

1. Timing of Development. Where land is developed before the arterial system, traffic congestion results that is extremely expensive to alleviate. One such "soundly based municipal planning policy" should be a requirement that urban growth be coordinated with the development of an adequate arterial system. It has recently been suggested that suitable regulations be designed to set up zones of building priority and to regulate the tempo of building, to be "administered pursuant to soundly based municipal planning policy." Zoning powers can be used to control the timing and programing of physical improve-

ments in undeveloped areas. Frequently, low density requirements are designed to slow the pace of development until more intensive municipal facilities are available, at which time the ordinance may be liberalized by amendments. The timing and programming aspect of low density zoning, however, is not ordinarily the only purpose of such zoning nor do the courts usually rely on this purpose as a justification for zoning action. Although low density zoning appears to accomplish its timing and programming objectives, it can also be a wasteful means of obtaining non-use and contributes, no doubt, to the much discussed "scatteration" of urban development. Nevertheless, the use of residential zoning to accomplish control of timing and programming of development should be considered when developing a comprehensive plan for the affected area surrounding a highway interchange.

TABLE 1

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<th>USE OF LAND-USE CONTROLS—A COMPREHENSIVE APPROACH</th>
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Perhaps a less controversial use of zoning to limit structural development is restricting permissible land uses to agriculture. William H. Whyte, an advocate of conserving open space, reports that the farmers of Santa Clara County, California, established exclusive agricultural zones in order to prevent mass development from sprawling into farm land. F. B. Williams commented that if restrictions are placed on an area too late, but

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ness and industrial uses are likely to creep in, and remain as nonconforming uses, to
the great injury of the area and the community," which is even more true today than
it was in 1945. The courts have recognized this also and have upheld the application
of zoning powers to undeveloped areas. In upholding an ordinance the Supreme Court of
California stated that "zoning in its best sense looks not only backward to protect dis-
tricts already established but forward to aid in the development of new districts..."^6
And the Supreme Court of Appeals of Virginia, in upholding a zoning ordinance which
largely restricted an 18-acre tract to residential uses, stated that "zoning ordinances,
in the main, deal not with present conditions, but with conditions to come."^6
Here again the use of zoning powers to accomplish timing objectives has troublesome
mutations. A zoning ordinance applied to an undeveloped area may be unreasonable be-
cause the restriction is placed on the property too early, that is, if residential develop-
ment is not, or will not soon be, feasible, a lack of fair market is indicated and most courts will
probably hold the ordinance goes beyond regulation, and must be recognized as a taking.84
Advocates of conserving open space also suggest the purchase of development rights
to accomplish their objectives.88 Although these proponents of conserving open space
would, no doubt, object to reliance on an open space program for obtaining timing and
programming of development objectives, nevertheless, coordinating open space control
and timing and programming efforts should benefit both.
It is preferable to pace development and provide buffer and green belts by purchasing de-
development rights rather than by exercising regulatory powers, because: the property
owners are compensated for the reservation of the land; a more forthright approach
accomplishing timing and programing objectives is possible; pressures for intensive
development is easier to resist if the development rights are owned by local govern-
ments; and finally, a well planned program for the purchase of development rights is
certain to be less wasteful of land than zoning for minimum lot area.
A good deal of control over timing of developments could be accomplished adminis-
tratively by a careful programing of public improvements. The planning agency can
even more certain of achieving its goals if it coordinates programing with (a) the
community's zoning and subdivision regulations, (b) an open space program based on
the purchase of development rights, conservation easements, restrictive covenants,
and (c) advance purchase of conditional use agreements.

2. Controlling Intensity of Land Use and Location of Traffic Generators. Intensity
land use has an obvious relationship to the traffic problem. Limiting population den-
cy, restricting the type or character of land use, limiting the height of buildings,
quiring front, rear and side yards, and requiring minimum lot areas can all aid in
omoting a balance between intensity of land use and the highway system. Control-
ging the location and separation of land uses also has an obvious relationship to the
traffic problem.
The feasibility of regulating the intensity of land use and the location of traffic gen-
erators will depend on when the regulation is to take place. Control over the inten-
sity of land use is most feasible and easily achieved through land use controls that
take effect before the land is developed. Similarly, a desirable distribution of traffic
generators can best be accomplished by completing a land use plan before develop-
ment occurs and then permitting development only if it promotes the objectives of the
plan. Obviously, land-use controls that take effect before development occurs must be

(Sup. Ct. 1925), affirmed 274 U.S. 325, 47 Sup. Ct. 594 (1927); see also Jones v. City of Los
Angeles, 211 Cal. 304, 295 Pac. 14 (1930), and 8 McQuillin, Municipal Corporations, Sec. 27
(1957).
[6] See generally: Whyte, supra note 90; and Solberg, "Open Space Control," HRB Bulle-
256 (1960).
relied upon for restricting or prohibiting urban development which would defeat the ob­jectives of the land use plan. Greater use of these controls should be made to limit urban expansion where traffic facilities are overburdened and guide future development to areas where adequate facilities either exist or can be built. This need is especially pressing around interchanges designed to serve through, as well as local, traffic.

Most efforts to implement land use planning have utilized zoning and subdivision regulation. Frequently, these two measures have been joined in a single control pro­cedure called in this paper a planned unit development. Planned unit development provisions for large-scale projects, and performance standards for smaller projects can be the basis for land-use control which will relate highway operation to land uses and thereby produce and maintain a mutually compatible environment.

Balance will also be promoted by taking the following five measures: First, the function of the feeder streets and arterial street system in the interchange area must be determined. Two examples will help describe this first step. The streets in an industrial district should carry only that traffic connected with the operations of the district’s tenants. An arterial highway through an industrial district should be studiously avoided, for the benefit of both the industrial (or commercial) development and the highway. Or the function of the interchange itself might be involved. For in­stance, a need for parking space to serve car pool participants at expressway inter­changes has been suggested as a result of studies of the Merritt Parkway between New Haven and Stamford, Conn. These studies show a trend to put the interchange into use as a meeting place for people with the same trip destination, but living too far apart for the normal car pool pick-up arrangement. The members of the car pool meet at the interchange and continue to their destination in one car instead of three or four. The "leftover" cars are parked on approaches to the interchanges causing traffic congestion and traffic hazards. Provision of parking facilities would result in obvious benefits. Second, an estimate should be made of anticipated demand for land use and anticipated traffic generation in the vicinity of the interchange. Third, the arterial system in the area can be planned as an integral part of the plan for the whole commu

Fourth, the various police power devices can be utilized to maintain the efficiency of the arterial. Fifth, issuances of permits for planned unit developments and building permits for specified traffic generators could be conditioned on their conformance with standards designed to encourage balance and other planning and transportation objec

Ordinarily, those responsible for accomplishing the objectives of a land-use plan have not (usually because they lacked money or authority) used techniques such as: purchase or condemnation of development rights or conservation easements; purchase of the fee and leaseback of the property to be used for specified purposes only; and purchase of conditional use agreements. If these rights and interests in property could be purchased or condemned before urban development occurs in the general vicinity, use of land is more likely to be in accord with the objectives of the land-use plan. Control over the development is assured because of governmental ownership of either the right to develop the land in the planning district or the right to restrict access to that land. Of course, the effectiveness of all of these measures depends upon competent administra­tion. Clawson’s Suburban Development District and the author’s Highway Inter­change Planning and Development District are both prompted by a desire to improve the administration of planning controls as undeveloped areas become developed. Both suggest changes in the administrative framework of planning to facilitate improved administration.

Although land-use control measures are nowhere near as effective when the land has already been developed extensively, the intensity of land use and the location of traffic generators can be influenced even where all the land is already highly developed. For example, if the zoning ordinance makes the use nonconforming, it may be possible to eliminate or amortize the use. Where elimination is not possible, the conversion of a nonconforming use into a different type of nonconforming use can ordinarily be
regulated. It is also possible to limit repairs and alterations of nonconforming use structures to those required for safety; to prohibit resumption of nonconforming uses after they have been discontinued or abandoned; and to prohibit the replacement of buildings designed for nonconforming uses. Additionally, where a traffic generator is a nonconforming use considerable regulation of its undesirable characteristics is possible; thus, operation of the use can be restricted and the amount of traffic generated reduced.

Another way of regulating the intensity of land use and the location of traffic generators where the land has already been developed is to show that the use comes within the legal definition of a nuisance. For instance, if operation of the land use is adversely affecting the functioning of the highway, it may be possible to enjoin further operation of the use. The courts will not grant an injunction however, until it is shown that the use being made of the land so hampers safety and traffic flow that the use should be enjoined as a traffic hazard.

Where the use in question is nonconforming and results in a traffic hazard as well, would seem reasonable that both measures would be more acceptable to the courts. This is because of the weight usually given in nuisance cases to zoning board determinations and findings about the character of the district, and because proof that the use constitutes a traffic hazard will be considered by the courts in determining whether to approve elimination of a nonconforming use. Although applicable only to extreme departures from a desirable land-use pattern, these two measures should be included in a land-use control scheme for developed areas.

The most direct means of effecting a change in the existing land-use pattern is thorough redevelopment and conservation. Redevelopment becomes especially effective when a well-drafted planned unit development provision has been included in the community's zoning ordinance. If re-use of the land is made to balance with available transportation facilities, the benefit will be twofold. The redevelopment will be aided in accomplishing its objective because it will be served by adequate transportation facilities and, in turn, these facilities will not be overtaxed. Such balance was probably intended by the drafters of the legislation to follow naturally as a result of the requirement that the renewal be in accordance with a comprehensive community plan.

Frequently, some of the traffic generators causing the most serious congestion will be located in blighted areas adjacent to the arterial. When this situation exists, great deal can be accomplished, through redevelopment, to alleviate congestion and promote balance between the arterial system and the land uses the system serves.

Access Control. —Access Control is the second key consideration that must be en into account in the administration of planning controls in a highway interchange planning and development district.

Commercial and industrial development in the vicinity of highway interchanges usually includes land uses that generate large amounts of traffic. Instances where resulting induced traffic obstructs the free flow of traffic on the intersecting highway, or cross road, and on other approach roads, are becoming commonplace. The protection gained for the freeway facility as a result of access control effectively serves the usefulness of these facilities; however, uncontrolled access on the crossroad and approach roads can render this protection meaningless. Therefore, a major purpose of comprehensive planning in interchange areas should be: (a) to maintain the traffic-carrying capability of the cross road and other feeder roads through controlling location, design, and use of access to the arterial, (b) to develop freeway characteristics on these roads, (c) to provide for future expansion of the transportation system.

Sec 105(a) of the Housing Act of 1949, as amended, provides that redevelopment project loan and grant contracts shall require a general plan to which the project forms. 63 Stat. 416 (1949), as amended, 42 U.S.C.A., Sec. 1455 (a) (1957). Ibid.
in the interchange area, and (d) to provide for future control of access to the cross roads and feeder roads.99

As discussed previously, the highway must be related to the land uses it serves and a mutually compatible environment produced. Basic to this is determining the various police power devices that can be utilized to maintain the efficiency of the arterial by developing freeway characteristics.100

The freeway, as defined by the American Association of State Highway Officials,101 has three chief characteristics in which it differs from a city street and which contribute to its high traffic-carrying capacity. These characteristics are: (a) divided roadways, (b) controlled access, and (c) grade separated intersections. Although none of these freeway characteristics can be fully imposed on an existing city street without great cost, they all can be imposed to a lesser degree, on many streets, at little cost. The result of partial attainment of freeway standards would not, of course, be full freeway capacity, but it could be substantial increase in the capacity of most arterial streets.

Three police power regulatory measures can be used to attain, to the maximum degree possible, these three freeway characteristics.102 The three police power regulatory measures are: restricting mid-block left turns,103 closing driveways,104 and barricading cross streets.

These three proposals, of course, will not all be useful in all situations. Different in traffic patterns, physical characteristics of streets, legal authority, and the length to which civic authorities are willing to go to alleviate traffic problems require that different measures be applied to different arterials, and even to different parts of the same arterial. But by adapting and combining variations of these proposals, and of the principles which gave rise to the proposals, freeway characteristics can be developed to some extent in many existing arterials.

An example of such variation would be the institution of all three proposed regulations—left turn restriction, driveway closure, and street barricading—for the rush hours only. The resulting "rush hour freeway" would best provide traffic service to highway users when their needs are greatest without unduly sacrificing the arterial's other function of providing land service for local traffic and abutting owners.

The applicability of these proposals depends on the local situation which should be carefully analyzed. The measures that will do the most good can then be selected.

The utility of subdivision regulations as a land-use control stems from the fact that they affect the landowner at a time when the cost of complying with them can be easily ascertained and for the most part passed on to the purchasers of the subdivide parcels. Where a requirement in the subdivision regulations stands to benefit the purchasers of the subdivided property, at a cost that is reasonable with respect to the benefit gained, its chances of gaining all around acceptance will be good. In addition to being logical from a common sense point of view, this conclusion appears to follow from the findings of the Wisconsin study made by Consigny and Zile.105 For these reasons careful consideration should be given to developing subdivision regulations that require the subdivider to provide for the future protection of the neighborhood from traffic congestion. One such regulation would be to require a grant to the local government of a negative easement of nonaccess encumbering all lots on major streets.

99/ The general theory of highway access control and roadside protection is covered in Levin, "Public Control of Highway Access and Roadside Development," U.S. Government Printing Office (1947), and "Roadside Protection," American Automobile Association (1951), and, therefore, is not treated extensively in this discussion.
102/ For a decision upholding the selective elimination of access on the basis of modern traffic conditions, see: Finks v. Department of Public Works, 139 N.E.2d 215 (1956).
103/ Supra note 100 at 66.
104/ Supra note 100 at 67.
105/ Supra note 100 at 69.
This would create partially controlled-access expressways out of arterial streets and major feeder roads to the highway interchange, while at the same time protecting residential, commercial or industrial development from through traffic. Subdivision regulations can also change the land development pattern somewhat in that they may require structures to face an access street rather than the main artery, thereby limiting access to the arterial street to certain designated points. The regulations may require observance of front, side, and rear yard requirements. They might also require buffer strips or service roads along key arterials. All of these restrictions would have a definite tendency to alter "ribbon" development along otherwise uncontrolled access arterial streets. To the degree these requirements reduced "ribbon" development, they would encourage the more desirable planned unit development concept.

Additionally, subdivision regulations can be used to acquire such access control and roadside protection measures as conditional use of access agreements, restrictive covenants, development rights, and conservation easements.

To the extent that subdivision regulations are used to acquire open space, flood plain easements, and park land for the community, coordination of subdivision planning and advance highway planning should result in the location of these open spaces along the highway in a manner that will conserve residential amenities and protect the traffic arterial from harmful access. 107

As a result of the high rate of urban growth, obtaining the protection for highway interchanges available through these measures is much more feasible now than in periods of less dynamic growth. The opportunity to incorporate many desirable amenities into urban developments, including commercial and industrial developments, in many cases so apparent and feasible that failure to act is tantamount to poor government. 108

The control of roadside development and the control of street openings are pressing traffic problems along the cross road and other feeder roads to the interchange. 109 A recent trend that is especially responsive to these problems is the granting of authority for administrative control of development along existing and proposed roads and streets in both cities and counties. This control can be exercised in a workable manner by requiring that any building permit, issued for a structure along a major arterial, be referred to the official responsible for operating and maintaining the arterial for his report and approval. This approval may be given subject to stated conditions with reference to curb cuts or other means of access. Also approval should not be granted without taking into consideration the prospective character of the development, the traffic which it will generate, the effect of such traffic upon the existing street system, the design and frequency of access, and the extent to which such development may impair the safety and traffic-carrying capability of the arterials affected.

Provisions permitting control of roadside development and control of street openings should be drafted so that requirements may be varied where carrying out the dict letter of the traffic and street officials' report is impractical or causes undue hardship to the property owners affected. Properly drafted, these control measures can be used to require adequate access features for gasoline stations, parking lots, shopping centers, and other roadside developments; and to require developers of residential and commercial subdivisions to provide for access to the lots adjacent to the arterial roads from a side street rather than from the arterial road. For instance, the case of a proposed supermarket or shopping center on a busy street, instead of

7/ See Frey, Dansereau, Gratto, Markham, and Pashek, "Planned Versus Unregulated Development in a Suburban Community, A Case Study," Department of Agricultural Economics and Rural Sociology, Agricultural Experiment Station, Pennsylvania State University (1960) for an interesting development of this suggestion.
8/ Ibid.
9/ This section is almost wholly based on a similar discussion in Stanhagen and Lins, "Application of Police Power and Planning Controls to Arterial Streets," 80-81, Bureau of Public Roads (Oct. 1960).
only having authority to require a minimum width driveway, the city could require that all access be located on a cross street, that the new driveway include a merging lane to the heavily traveled street, or that some other arrangement designed to reduce traffic friction be constructed. Thus the harmful uncontrolled dumping of traffic onto an arterial street can be eliminated without resort to the extreme measure of prohibiting the establishment of traffic-generating businesses along major arterials.

Agreements for the conditional use of access can be either purchased or obtained through an exercise of the police power. Where unlimited access already exists, any agreement granting the right to control the use of access to a governmental agency must be purchased. Thus, where existing roads are to be improved, agreements should be obtained early in the advanced stages of the highway program in order to keep purchase costs at a minimum.

On the other hand, where the road or street has not yet been constructed, the subdivision or control of development legislation applying to the land adjacent to the road or street should require that such an agreement be entered into as a condition for subdivision or the granting of a building permit.

Controlling the use of access by agreements rather than controlling access through exercise of the zoning powers has the advantage of providing a certainty not always to be expected from zoning. Well conceived zoning plans may become riddled by exceptions and variances to the zoning ordinance. But once the governmental authority purchases or obtains, under its police power, a conditional use agreement it is relatively certain that future use of the access will be in conformance with the comprehensive plan for the area. Should the State highway department or planning agency desire to broaden the use of access, it is completely within its authority to do so. It would appear, therefore, that conditional use of access agreements have considerable potential as a technique for implementing comprehensive planning.

Setback and front yard requirements are related only in an indirect way to the control of location, design and use of access. They can, however, reduce traffic friction at access points and street intersections by increasing the sight distances at these places and for this reason should be a part of the total approach to control of access.

Roadside zoning has been used to protect otherwise uncontrolled access highways from deterioration through roadside development. Restrictive covenants can perform a similar function with respect to achieving control of access. Both can be used as a means of restricting the use of land. If the land adjacent to the roadway is restricted by zoning to residential use, for example, then obviously the use of access will be similarly limited. Restrictive covenants can likewise be used to limit land use, and they have the additional advantage of providing a greater degree of stability than does zoning.

In using promissory restrictions, attention should be given to administration, enforcement and termination of the restrictions. It has been suggested that an elective body of trustees be created and charged with the duty of overseeing and enforcing the restrictions. "Clearing" procedures to terminate the restrictions can be provided by statute.

These two methods of restricting land use can be used to complement each other. Thus, if zoning is used to prescribe a broad framework of land use control within which private restrictions can function to gain greater stability, the chances of roadside zoning succeeding will be increased.

Easements and restrictive covenants which can be used to provide nonaccess restrictions on lots abutting major thoroughfares are intended to benefit the community as well as the individual lot owners in the subdivision. Therefore, easements and restrictive covenants should be drafted to give a local governmental agency the right to enforce

112/ See Clark, Covenants and Interests Running with the Land 198 (2d ed. 1947), and Ascher, Private Covenants in Urban Redevelopment in Woodbury, Urban Redevelopment: Problems and Practices 258-260 (1953).
them. Also, restrictions which the local government has demanded as a condition to plat approval can be rendered easier to enforce if they are obtained in the form of easements and restrictive covenants. Where local law is such that the desired restriction will not fit in the "easement" category, restrictive covenants can usually be relied upon to accomplish the desired objective. If this alternative is taken, attention should be given to the matter of who will be charged with the duty of overseeing and enforcing the restrictions.

A license and permit procedure can be used to supplement a zoning ordinance, thereby giving the courts more specific legislative guidance. Courts will uphold legislative determinations that a special use permit must be obtained before certain classes of traffic generators (for example, service stations) may be constructed. The issuance of the permit can be denied on grounds that traffic congestion will be increased. In effect the permit procedure resembles "spot zoning," but with the significant difference that the permit can be conditioned in a manner that will render the proposed use compatible with the surrounding neighborhood. Thus the issuance of a permit can be conditioned, on whether or not the proposed use will increase traffic congestion by causing friction at points of access to a major traffic arterial. Where compatibility cannot be achieved the permit can be denied.

Purchase and leaseback and purchase or condemnation of development rights or conservation easements would have a similar effect. Land acquired as a part of an open space, park, flood plain control, or other public program could be restricted in a manner that would promote control over access or use of access. This could be accomplished either by conditioning the lease where the property has been purchased or leaseback, or by purchase of conditional use agreements where development rights or conservation easements have been purchased or condemned. In the latter situation, there should be little cost involved in acquiring conditional use agreements, because public authority is at the same time acquiring development rights and the use of access would thus be restricted in any event. The reason for authorizing the highway department to obtain the additional protection of a conditional use agreement is that so doing the highway department gains a much greater and more certain control over subsequent use of access, either by another government agency or by a private owner purchasing from the agency.

Purchase and leaseback, purchase or condemnation of development rights or conservation easements, and police power measures, such as roadside zoning, must be used in a coordinated manner. If these procedures are not coordinated, they will frequently end up working at cross purposes. Conversely, coordination will allow each to supplement the other for an over-all beneficial result. Excess condemnation can so be used to supplement a zoning ordinance and gain control over the use of land and access. For instance, where more property than is needed for the highway facility is acquired under authority permitting excess condemnation and where all or a portion of the excess property is to be conveyed back to private ownership, the State highway department is in a good position to reconvey subject to specified limitations and restrictions. Thus, the use of certain access points, or the use of the entire property conveyed, could be restricted.

Most conservation and rehabilitation (urban renewal) programs embarked upon today have not involved a realignment of the neighborhood street pattern. However, some have closed off existing streets, constructed cul-de-sacs, changed four-street intersections to two 90-degree elbow turns thereby obtaining curved street alignment, and made other street improvements resulting in better neighborhood conditions. If the neighborhood street pattern is changed in this manner to increase the amenities of the neighborhood, the access control provisions outlined above that are so helpful in maintaining the traffic-carrying capability of an arterial, can be obtained at the same time. If the objective of aiding transportation is incorporated in the conservation and rehabilitation program, the result will be not only to aid the arterial system, but to further the objectives of the conservation and rehabilitation program.

There is a possibility that neighborhood design standards, similar to standards included in subdivision regulations, for areas undergoing a private renewal process could be developed and profitably promulgated. These standards would require that
the private efforts be directed towards desirable goals. Since conservation and rehabilitation programs normally call for some public contribution, what could be more reasonable than making a part of this contribution the converting of the neighborhood street system from a grid pattern to a limited and controlled access pattern? Properly handled this approach could give the close-in neighborhood many desirable attributes. If this "rehabilitation" is undertaken along with adoption of meaningful density controls significant strides towards lessening congestion can be made. This by itself will aid considerably in halting creeping blight.

Acquisition and Reservation of Land for Future Use.—The third highway transportation consideration that must be taken into account in comprehensive planning for the interchange planning and development district is the reservation and acquisition of land for future use. Doubtless street and highway reservations, even when the right-of-way boundaries are precisely determined, will become common only to the extent that they can be imposed without compensation under the police power.

Arguments for acquiring land for future use are substantial, however. Certainly when highway transportation planning has progressed to the point where street boundaries can be precisely mapped, acquisition for future use has immense cost saving potential. But even where the precise location of future road beds is not known, a good case can be made for present acquisition for future use. Hugh R. Pomeroy stated in "Bringing Zoning up to the Automobile Era," HRB Bull. 101 (1955):

We cannot design communities and routes of travel and communications to serve them in accordance with what we do not yet know, and what we do not yet know will always lie ahead and will always render our best plans obsolete. The wisest thing that we can do is to try to keep out of the way of the future, and the only way in which we can begin to do this is to provide space—space that will be required in order to build over again, and again and again, all the major community facilities that we are now building or may build in the future.

In this concept, space for the channels of movement that are an integral part of any community composite must be ample beyond anything that we have yet thought to be necessary. Belts of open land up to 1,000 feet wide would probably permit whatever provision for movement that the future may require, without engaging in the repeated process of tearing the community apart to overcome our earlier deficiencies....

Acquisition. Early acquisition of rights-of-way reduces the cost, because land values rise rapidly in areas which will soon border on modern streets and roads, and postponement of purchases means that eventually a higher price will have to be paid. Furthermore, early acquisition prevents the construction of improvements on land which will be soon condemned.

It also allows highway authorities more time to purchase property, an important factor on urban projects where thousands of properties must be acquired.113/
A provision supplementing the Virginia Code, adopted in 1958, provides that real property acquired for future use "shall be held in the physical possession and control of the owner from whom such real property is acquired, if requested by him, subject to a reasonable rental if such property be improved, until the State Highway Commission shall give such owner written notice of the intention to immediately begin construction of the highway or project contemplated." Acquisition can precede construction by 12 years, in the case of an Interstate Highway, and 6 years for any other highway.

Ohio has adopted an apparently farsighted approach to accomplish acquisition for future use. An Ohio statute (Ohio Rev. Code (1953), Sec. 5501.11) authorizes the Director of Highways to contract with several State retirement boards for the use of pension funds to purchase land for future rights-of-way. The contracts are two-year agreements, renewable to a total of five years. Pursuant to them the director, acting as agent for the board, purchases land, the title of which vests in the board, while the Director of Highways has control and management. Before construction begins, the director will purchase the land for the State (from the board) with current appropriations, paying an agreed rate of interest. This statute, the first of its kind, is a significant innovation in the search for methods of providing sufficient funds for financing early acquisition of rights-of-way, and should benefit the public considerably.

Combining these two approaches would circumvent the need for legislation providing for revolving fund financing. However, the revolving fund approach remains the most direct and easy to administer method of financing acquisition for future use.

Advance acquisition need not be limited to early purchase of the entire fee simple. Indefinite use agreements, development rights, restrictive covenants could all be purchased well ahead of construction, many times at small cost.

There is extensive literature on the need for advance acquisition. For this reason attempt has been made here to be thorough. Instead, the objective has been to describe advance acquisition and to stress its importance as an element of comprehensive planning in a highway interchange area.
Reservation. Many cities attempt to guide development of their street system by using "master street planning" alone. Subdivision regulations and mapped street powers, however, have important legal sanctions that can be used to give additional meaning to master street plans and comprehensive community plans. Thus subdivision regulations and mapped street powers, when joined with other measures such as zoning control of development and street openings, purchase of development rights or conservation easements, and purchase of conditional use agreements, can prevent the construction of buildings which could, if built, impede the most beneficial development of the street system in the highway interchange district. A judicious combination of police power and eminent domain procedures can make achieving community and transportation planning goals much easier. Combining police power and eminent domain measures is an important feature of recent Tennessee legislation. 117 This legislation is designed to permit immediate acquisition of land where the board of zoning appeals orders the issuance of a building permit because the denial of such permit would result in the land being so adversely affected as to create a "hardship." Thus, the combined use of police power and eminent domain could permit an effective reservation of right-of-way for future highway development and result in improved implementation of a comprehensively planned circulatory system. Such a fusion of measures can result in making use of the best portions of both while at the same time minimizing the adverse effects of both.

Although their use as reservation devices exclusively would probably not be upheld by the courts, setback or front, side and rear yard requirements have an indirect relation to reserving land for future acquisition. Space is provided alongside the highway for widening and otherwise improving the highway without incurring the expense of purchasing and removing costly buildings. Also, if the property is converted to commercial or industrial use and the volume of traffic using the opening or curb cut increases, space will be available for requiring and constructing properly designed access. Since development causing an increase in traffic usually is accompanied by change in zoning and issuance of a building permit, a control of development procedure can be used to insure properly designed curb cuts or driveway access points in the space reserved as a result of setback and front yard requirements.

Ordinarily reservation procedures are used solely to provide for future street construction, street widening, and reconstruction of intersections. Where possible reservation provisions should be used to facilitate future adoption of the following: (a) Restriction of left turn movements; (b) Closing of driveways; (c) Barricading of cross streets; (d) Creation of rush hour freeways; and (e) Separation of traffic by type of motor vehicle. Subdivision regulations, mapped street powers and purchase of easements, and restrictive covenants can be used to "build-in" the police power regulations so that when they are needed they can be more easily adopted. For example subdivision regulation and mapped street powers can accomplish access control by platting future intersections and service roads. Conditional use agreements can provide that driveways may be closed, barricaded or otherwise controlled at some future date.

Enabling legislation setting up special highway interchange planning and development districts could require advance planning, to be completed well ahead of the construction of the interchange, for the limited access highway, interchange facility and arterial street system in the interchange planning and development district. If, as a result of this requirement, the highway and street system is determined at an early date, a judicious use of the various reservation measures can be made to reserve land for construction of the system. Large savings in the cost of right-of-way acquisition would be only part of the total benefit to the public. In addition, protection from harmful roadside development could be built into the highway by acquiring the right to control the location, design and use of access.