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Report of Committee on Land Acquisition and Control of Highway Access and Adjacent Areas

DAVID R. LEVIN, Chairman

Deputy Director, Office of Right-of-Way and Location, U. S. Bureau of Public Roads

•THE COMMITTEE on Land Acquisition and Control of Highway Access and Adjacent Areas continued through the year 1963 to give assistance to State highway departments and other governmental agencies in providing information on new and improved methods of land acquisition to the end that the highway program may be expeditiously and economically carried out.

Previous annual reports of the committee have carried digests of appellate court decisions handed down by State and Federal courts in which matters relating to condemnation of property for public purposes were at issue. Since the beginning of 1963 these digests have been included in a new publication called the "Highway Research Board News," and therefore will not be further carried in the Land Acquisition Committee report. These digests, however, still remain a valuable part of the committee's work and continue to receive widespread recognition in various publications and house organs.

The committee's 1963 report was published in "Highway Research Record Number 8" which included the following papers: "Jurisdiction to Regulate Utilities on Highway Right-of-Way," by James E. Thomson; "Impact of the Highway Program on Railroad Property Rights," by Walter L. Young; "Tenant Relocation and the Highway Program," by J. Allyn Preston; "Effect in Florida of Requiring Condemner to Pay Condemnee's Entire Litigation Expense," by Thomas C. Britton; "Highway Reservations and Land-Use Controls Under the Police Power," by Daniel R. Mandelker; "Techniques of Land Acquisition for Future Highway Needs," by G. Graham Waite; "Use of Official Map Procedure to Reserve Land for Future Highways," by K. W. Bauer; and "Research into the Value of Landlocked Right-of-Way Parcels," by Karl S. Albrink and Joseph F. Cobbs. The last four papers were sponsored by the committee. The study by Mr. Mandelker has received wide distribution including the BPR Regional and Division Engineers.

For several years the committee has had a vital interest in the severance damage studies that are being made in the States. It is interesting to note that at least 46 States have or are now making such studies. A bank of approximately 1,200 cases have been processed, and the data derived therefrom have been used in responding to a number of requests. An analysis of these cases has also been made and was presented at the HRB 43rd Annual Meeting.

A valuable addition to the vast and growing library of works dealing with all aspects of highways is the publication of "Control of Highway Access" by Ross D. Netherton. The book analyzes the framework of statutes, cases, and administrative law that has grown up around the policy of controlling highway access. Here for the first time the legal aspects of access control as they relate to the principles and practices of planning, land acquisition, valuation, and land-use regulation are examined comprehensively. The book traces the historical evolution of legal concepts of public and private property as applied to highways, and presents hitherto unreported data regarding acquisition and control of access rights. The traditionally hazy boundary between the realms of the police power and eminent domain is examined. Also evaluated are the various aspects of the law of nuisance, conveyancing, planning, zoning, and condemnation in connection with highways.

The committee participated in "The Wisconsin Colloquium on Appraisal Research" held at the University of Wisconsin, March 5 and 6, 1963. The Colloquium was primarily a research planning conference for an interchange of views among a small invited group of real estate appraisers, mortgage lenders, Government officials, and professors.

The committee also cooperated with the U. S. Bureau of Public Roads in the production of a comprehensive annotated bibliography on right-of-way.

The committee will continue to provide assistance wherever possible in the right-of-way field, and to provide case information by the issuance of memoranda through the Highway Research Board News.

The year's highlight of committee activities was the open meeting sponsored by the committee at the HRB 43rd Annual Meeting. The five excellent papers presented dealt with right-of-way management techniques and with the many problems in highway condemnation.

The first paper, entitled "The Application of the Critical Path Method to a Highway Right-of-Way Operation," was prepared jointly by Ralph C. Bordley of the Office of Right-of-Way and Location, U. S. Bureau of Public Roads, and Richard C. Tennent of the same Bureau's Office of Research and Development. It is a report on an investigation of the feasibility of using this modern management tool for land acquisition activities. It presents a brief background of the use of CPM in this field and describes the development of a standard or prototype network to be used as a pattern for individual networks for the right-of-way operations in the individual States. The general pattern of the network is applicable to the operations of all of the States although revisions will be necessary to conform to legal requirements and procedures of each individual State.

To determine recent trends in highway condemnation cases a few years ago the U. S. Bureau of Public Roads entered into a contract with the University of Wisconsin. A paper, entitled "Recent Trends in Highway Condemnation Law," presented by Orrin L. Helstad, Associate Professor of Law at the University of Wisconsin is based primarily on information gathered in the aforementioned study for the period 1946-1961. The discussion of trends is divided among three major areas of condemnation law: (a) the right of the condemner to condemn; (b) the right of the owner to receive just compensation; and (c) condemnation procedure. Two general trends appear to emerge: (1) a tendency to look with favor upon the right of the condemner to condemn and to acquire quick possession of the property so that construction may proceed without delay; and (2) a gradual trend toward expanding the scope of the landowner's right to receive compensation.

A review of inverse condemnation problems to focus on the relationships between tort and inverse causes of action was presented in a paper by Daniel R. Mandelker, Professor of Law, Washington University, St. Louis, Missouri. Inverse condemnation has brought concern to many lawyers in State highway agencies because of the role it plays in identifying new interests for which compensation is payable in condemnation law. Claims and interests of all kinds which were not compensated in an original condemnation action, or where no direct taking was involved, are likely to be adjudicated in an inverse condemnation suit. In such suits, the litigants press for compensation for a wide variety of claims, arising out of loss of view, loss of access, and damage from noise, dust, and fumes. The more conventional water damage cases are also common. Even more threatening, the inverse condemnation action is used increasingly as a dodge around sovereign immunity, and highway agencies face a growing number of lawsuits in which inverse condemnation is used to secure damages for what would usually be considered an ordinary tort.

Leonard I. Lindas, Chief Counsel, Oregon State Highway Department, presented an "Analysis and Evaluation of Oregon Condemnation Cases." His study dealt with the period from July 1955 to June 30, 1963, in which the Oregon trial staff prosecuted 635 condemnation actions. It was concluded that charting the trials of cases from a percentage of increase basis does not necessarily give a true picture of trends in jury verdicts. However, one trend appears to stand out, and that is that since 1960 in Oregon's one large metropolitan area—Portland—the highway department has fared better in condemnation trials than in rural areas. Mr. Lindas attributes this to the demonstrated fact that where portions of the Interstate System have been completed, property values have not decreased, but, in fact have increased.

At this session Sidney Goldstein, Chief of the Economic Research Division, Office of Research and Development, U. S. Bureau of Public Roads presented a paper, entitled

"The Discovery Process in Highway Land Acquisition," in which he seeks to evaluate the fundamental nature of the discovery process in litigation and its significance in the land acquisition process for both parties. Implications drawn from this evaluation can serve as a basis for legal counsel and right-of-way personnel in State highway departments and at other levels of government to develop adequate procedures to: (a) counter the inordinate use of discovery rules against State highway departments and the Federal Government in eminent domain cases, and (b) encourage its use where relevant to a determination of fair compensation for the property owner. With approximately ten percent of highway land acquisitions culminating in trial, this process becomes of vital importance. Mr. Goldstein was given assistance on the paper by James C. Rice, and William J. Lavelle, both of the U. S. Bureau of Public Roads.

LEGISLATION 1963

The State acquisition methods for acquiring the millions of parcels required for the highway program have been greatly improved in recent years. It has become obvious, however, that further improvement is necessary if, for example, the right-of-way for the Interstate System is to be acquired in time so that construction of the 41,000-mi system can be completed by the 1972 deadline. During the year a number of States enacted legislation aimed at improving their acquisition processes. A resume of this legislation follows:

Land Acquisition

Hawaii legislation authorizes the sale of unneeded public lands, classifies highways, and provides for the disposition of abandoned public highways.

A new eminent domain law was enacted in Maryland. This is a comprehensive law and provides, among other things, for immediate possession, special benefits, highest and best use, time of valuation, time of taking, nature of interest, right of entry, and abandonment. An interesting innovation on the date of taking is that it permits deviations backwards or forwards in time if the influence of the highway improvement on the value of the property being taken would be eliminated by so doing.

Connecticut legislation authorizes entry upon private property for highway purposes and provides further that upon refusal of entry for borings, soundings or other tests the courts, upon petition, may authorize entry or specify conditions whereby such entry may be authorized.

Georgia shifted the power of eminent domain from the State Highway Board to the State Highway Department.

The Kansas Legislature enacted a law declaring it to be the public policy of the State to acquire real property and rights therein well in advance of highway construction, thereby eliminating costly details in construction, reducing hardship to property owners, and eliminating economic waste occasioned by improvement of such property immediately prior to its acquisition for highway uses.

Minnesota authorized the Commissioner of Highways to acquire lands needed for relocation of railroad tracks, and to exchange such lands or other lands owned in fee by the State for trunk highway purposes but not needed therefor, for lands owned by a railroad company and needed for highway purposes.

Montana approved legislation to require the State highway department to prepare and file a plat in accordance with the provisions of Sec. 11-614 whenever a parcel of land taken for highway use is less than the U. S. legal subdivision of ten acres, or is irregularly shaped so as to require a survey.

A Nevada law provides that taxes levied on real property which is acquired by the State for highway purposes shall be abated ratably for the portion of the fiscal year such real property is owned by the State.

New Jersey authorized the State Highway Commissioner, in addition to the powers now vested in him to acquire lands, to enter into cooperative agreements with housing authorities or redevelopment agencies for acquisition and clearance of property and the equitable sharing of costs. Where consequential damages would result to the owners of remaining property, the Commissioner may acquire such remaining property and transfer it to the authority or agency.

Oklahoma amended their property acquisition law to authorize the Department of Highways, in acquisition of land, to take into consideration present and probable future needs. The measure sets up a procedure whereby upon payment of a sum into court the highway department may take immediate possession of the property in condemnation proceedings. Further procedures are set forth for appeal, etc. Another law provides for the sale of lands no longer needed for highway purposes.

A Rhode Island resolution created an investigative study commission to determine if State citizens were receiving fair market value for their property when taken under eminent domain.

South Carolina legislation gave the Department of Highways the power to condemn the fee title in land.

South Dakota legislation provides that the State Highway Commission may take immediate possession of property needed for highway purposes upon payment into court of the estimated just compensation for the land being taken. Another South Dakota law provides that where real property is voluntarily relinquished to the State Highway Commission under an agreement whereby the damages are determined subsequent to the taking, interest at the rate of six percent shall accrue from the date of the agreement.

Both Utah and Connecticut recodified their highway laws.

West Virginia revised its eminent domain law and provided for immediate possession of property needed for highway purposes upon payment into court of the fair market value.

Outdoor Advertising

The Federal-Aid Highway Amendments Act of 1963 provided a two-year extension from July 1, 1963 to July 1, 1965, for States to enter into agreements with the Secretary of Commerce for the control of outdoor advertising along the Interstate System. Twenty States¹ have already entered into agreements in order to qualify for the one-half of one percent bonus, and this amendment affords the remaining states additional time to take advantage of the bonus if they so desire. Five States (Kentucky, Maine, New Hampshire, New York and Virginia) have received initial bonus payments for controlling outdoor advertising along the Interstate System in accordance with the current standards.

New Jersey and Rhode Island approved new billboard control laws in 1963 making them eligible for the Federal bonus. Maine, Nebraska and New Hampshire enacted laws providing that billboard restriction along the Interstate System will not apply to commercial or industrial zones. Another new law in Nebraska provides for the removal of advertising devices which interfere with the operation of motor vehicles. Oregon transferred all functions relating to licensing permits and enforcement of the State billboard law to the State Highway Commission and State Highway Engineer.

A resolution adopted in Michigan creates a three-member legislative committee to study roadside advertising. New York continued their Joint Legislative Committee on Commerce and Economic Development investigation of all aspects of outdoor advertising. A resolution adopted in Tennessee provides for a study by the Legislative Council Committee to determine whether the State should regulate outdoor advertising on all State highways. Billboard control legislation was considered in almost every State that had not already approved such measures.

Public Utilities

Maryland, Nevada, Tennessee and West Virginia enacted laws permitting reimbursement of public utilities for the cost of utility facility relocation made necessary by highway construction.

The new Maryland law authorizes the State to pay costs of relocating the facilities of publicly owned utilities when necessitated by construction, reconstruction or improvement of the Interstate System when Federal reimbursement is available under the pro-

¹Connecticut, Delaware, Hawaii, Kentucky, Maine, Maryland, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, West Virginia and Wisconsin.

visions of the Federal-Aid Highway Act of 1956 as amended. In Nevada, Tennessee and West Virginia, the legislation authorized the State to pay relocation costs of privately and publicly owned utilities where such facilities are located on the Interstate System, provided such costs are reimbursable from Federal funds.

New legislation in Minnesota permits the State Highway Commissioner to agree to lump sum payments for relocation of utility facilities, based on estimated relocation costs, where the sum so agreed upon does not exceed \$2,500. Texas declared such costs to be an expense of right-of-way acquisition.

Relocation Assistance and Removal Costs

At least 12 States (Hawaii, Massachusetts, Minnesota, Nevada, New Jersey, Ohio, Oregon, Rhode Island, South Dakota, Utah, Vermont, and West Virginia) approved legislation authorizing relocation payments of not more than \$200 for families or individuals, and not more than \$3,000 for businesses or nonprofit organizations, required to move because of highway construction. The new laws in Oregon and West Virginia also stipulate that persons required to move shall receive advisory assistance from the State in finding new locations. New York and North Dakota approved amendments to previously passed tenant relocation laws. Twenty States are now paying such moving costs.²

Controlled Access

The Colorado freeway law was amended to make it permissive rather than mandatory that access be provided between severed portions of property held under one ownership at least once within one mile if the landowner demands such crossing. It permits compensating the landowner in lieu of such crossing. Further amendments provide that no private right of access shall accrue to property abutting any freeway established on a new location, except at such points as may be authorized.

Connecticut amended its limited-access highway law to provide a penalty for entering such highway at any place other than a highway intersection or other designated point.

An amendment to the Iowa controlled-access law provides that no access rights to any highway shall accrue by adverse possession or prescriptive right, nor shall any action heretofore or hereafter taken by any authority from the basis for any such claim.

Montana amended its control of access law to provide additional definitions; includes in term "controlled-access highway" those "portions of throughways and roads, streets and highways within a throughway intersection area." Other sections of the law were also amended.

Oklahoma extended the provisions of the limited-access highway law, except special assessment provisions, to all cities having a population of 3,000 or more (rather than 5,000 or more).

Amendments to the Washington limited-access highway law provide that it shall apply to counties as well as to cities and towns.

²Connecticut, Hawaii, Maryland, Massachusetts, Minnesota, Nebraska, Nevada, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Utah, Vermont, West Virginia, and Wisconsin.

Application of Critical Path Method to a Highway Right-of-Way Operation

RALPH C. BORDLEY and RICHARD C. TENNENT

Respectively, Office of Right-of-Way and Location, and Office of Research and Development, U. S. Bureau of Public Roads

•IN CONSTRUCTION of the Interstate System it is anticipated that more than 750,000 individual parcels of land will have been acquired by 1972. In addition, approximately 1,500,000 parcels will have been acquired for the ABC system of highways by the same date. The enormous workload has forced a number of State highway departments to take another look at their methods of operation, because experience has shown that some of them would not be able to meet their acquisition schedules without considerable improvement in their efficiency.

With this need for an acceleration in the acquisition process in mind, several of the States began experimenting with the Critical Path Method (CPM), a management information and control tool that has been successfully applied in many fields, as a possible solution of their right-of-way acquisition problem. The results of these experiments have been reported to the Washington Office of the U. S. Bureau of Public Roads by Division Right-of-Way Officers.

Following the establishment of the Office of Right-of-Way and Location, this Office reviewed these reports to determine if the Bureau could aid the States in the Application of the CPM to right-of-way activities. Observations indicated a need for the development of a CPM network for right-of-way acquisition procedures. In seeking to develop such a network, the Office of Right-of-Way and Location requested the Electronic Development Division of the Office of Research and Development to provide the needed technical assistance. That request resulted in the study described in this paper.

The study was not a research project in the true sense. It was an investigation of the feasibility of applying an accepted management method that has been successful in many fields, to a specific area of highway development (i. e., right-of-way acquisition).

As a background of the study, several basic thoughts were recognized at the outset:

1. The techniques and control used by many types of management systems are not readily adaptable to the right-of-way function.
2. Any proposed CPM network aimed at improving administration of the highway right-of-way program should be balanced against the requirements of the program.
3. Any CPM network initially developed for this purpose should be tested in a working situation to determine its general applicability to the right-of-way function.
4. Any CPM network found generally applicable to the right-of-way function should be retested in each situation being studied and modified to meet the requirements of that specific situation. The requirements we are concerned with here include such matters as the statutory requirements for eminent domain proceeding, as well as organizational policies, procedures, and personnel capabilities. Hence, the management principles, methods, and techniques that are used in the Critical Path Method must be tailored to fit these requirements as they exist in a specific organization. This tailoring process requires adjustments to both the management method and the organization to obtain a perfect fit; the objective being the satisfaction of the needs of the organization.

As further background, it was recognized that in the right-of-way field many State highway departments have four general needs which require satisfaction, as follows:

1. The need for a better understanding of the right-of-way operation by other divisions of the highway department.
2. The need for improved communications and coordination between the right-of-way division and other divisions of the organization.
3. The need for a clearer understanding of its own operation by the personnel of the right-of-way division.
4. The need for a systematic method of project control within each right-of-way division.

One of the first points which must be understood by all persons concerned with, or affected by, highway right-of-way acquisition is the nature of the acquisition process. To the novice, the acquisition of 100 parcels of real estate for a single highway project may appear as a single undertaking. However, the experienced hand recognizes it as much more than that. To him each parcel of land is a separate job, and 100 parcels mean 100 separate and distinct jobs which often have very little similarity to each other. The methods and procedures required for one of these jobs may be very different from the methods and procedures applicable to any of the others. Also, each individual job may require ten or more tasks. Hence, the supervision of some 1,000 or more individual, though essential, tasks is a very complex assignment. In fact, it is so complex that it cannot be effectively controlled by a simple "check off" procedure. Such control requires a management tool specifically designed for this purpose. The CPM is a management system that can be adapted to this task.

The CPM provides three things: first, a plan for the project in the form of a network; next, a schedule for the plan in the form of time estimates for each activity and calendar dates for completion of all activities; and finally, a control device to measure actual performance against schedule performance in the form of periodic reports. Management is permitted to concentrate its efforts on the problem areas that develop; that is, to operate under the "exception principle." According to this management concept, frequently recurring decisions should be reduced to routine, thereby leaving the manager free to concentrate on more important or exceptionally complex issues. The routine aspects of control under CPM are delegated to the plan, the schedule, and the computer. The electronic computer is also assigned the task of simulating various corrective actions. However, important decisions, such as the selection of the best corrective action for each problem situation, are left for management to decide.

As knowledge of CPM increased, it became obvious that a test application to a right-of-way acquisition project was clearly warranted. Such an application was made in the summer of 1963 when a model of a CPM right-of-way network was applied to the policies and procedures of a State highway right-of-way organization.

This application was broken into five major activities:

1. Development of a standard right-of-way CPM network by U. S. Bureau of Public Roads personnel.
2. Review of a State highway department's right-of-way operations in relation to the CPM network.
3. Discussion of the network and the State's right-of-way operations with the State highway department right-of-way personnel.
4. Initial revision of the network and its submission to the State highway department for review testing and comments.
5. Final revision of the network and the preparation of a report.

A standard CPM right-of-way network was developed through the use of the standard CPM techniques, namely, planning and scheduling of the activities involved.

In the planning phase, a preliminary list was made of all the activities necessary for the successful completion of a highway project. These ranged from the Right-of-Way Estimates for Alternate Location to the Certification of Right-of-Way for the Plans, Specifications and Estimates. To provide a complete picture of how engineering personnel and right-of-way personnel must work hand in hand, the major functions of engineering were also included in the preliminary list.

The preliminary list of activities was reviewed for errors or omissions and revisions were made where necessary. Next, a "follows what" column was developed from this list. In this step, each activity on the list was reviewed and its dependency on other listed activities was determined. This required a rearrangement in the chronological order of occurrence. Upon completion of the "follows what" column, an arrow diagram was drawn. It included all of the activities on the list in the chronological order of their occurrence. This diagram became the first draft of the preliminary CPM network.

During the review of the preliminary network, it was discovered that the activities of appraisal, review appraisal, recommendations of values and negotiations had been depicted incorrectly. The true relationship between these activities in the handling of numerous parcels is very difficult to show on a network. The diagram worked logically for a small number of parcels on a project but broke down for a larger number of parcels.

Many different methods of planning these activities were depicted in alternative arrow diagrams. Eventually, it became apparent that the activities of appraisal, review appraisal, recommended values and negotiations would have to be broken down by some identifiable type of parcels. The groupings adopted for this purpose were "Total Takes," "Partial Takes With Improvements," and "Partial Takes Without Improvements." With this problem resolved, an arrow diagram was designed for use as a prototype or "Standard" network.

On completion of the standard network, an input data form was developed. These data forms serve several purposes. For example, when a project is assigned to a supervisor, the standard form may be used as a checklist. In the development of a work schedule, the time estimates for the various activities may be inserted in the proper lines. If there are any activities that the supervisor feels are not needed for his project, a time estimate of zero is assigned to them. He then submits the data form with the time estimates to the computer section, where CPM calculations and calendar dates are made. The calendar-dated report produced by the computer provides the supervisor with the expected completion date of his right-of-way operations. If this date is not satisfactory, the supervisor must analyze the activities on the critical path and decide which may be completed in less time. Additional computer runs may be made until the desired completion date is obtained, or until it is decided to extend that date into the future.

The scheduling phase of this study was used, not to apply time estimates for a specific project, but to use time estimates to determine which activities would be on the critical path. The critical activities were reviewed and analyzed to determine whether there were any activities that could be removed from the critical path. By revising certain portions of the arrow diagrams and applying the time estimates, the number of critical activities were reduced to a minimum.

The completion of the initial phase of this investigation presented sufficient evidence of adaptability of CPM to justify the conclusion of the study. The available information on the experiences of the various States with CPM was reviewed, and the Minnesota Department of Highways was selected as the State with CPM experience that was typical of most State highway departments. Its network was reviewed and comments were noted in preparation for discussion with officials of that Department.

A two-day discussion was held with the personnel of the Minnesota Right-of-Way Division and the prototype network was presented to them. The various ways of depicting certain areas of concern were discussed and consideration was given to the Minnesota network diagram of right-of-way operation. At the end of the conference, agreement was reached on the revisions necessary to reflect the actual operating conditions in the State on the prototype network. It was agreed that an arrow diagram of the State's right-of-way operations and a revised prototype network would be submitted to the State for review and additional comments.

In the development of an arrow diagram for the State's operations and the prototype network, many areas of interest were found. When the network and the documentation were submitted, a list of suggestions on situations revealed by the CPM analysis was also presented for the consideration of the State's right-of-way personnel.

The comments of the State on the prototype network were received and are being incorporated in a finished prototype network of right-of-way operations (Appendix).

There is little question in the minds of the Minnesota right-of-way people that CPM is the best and most systematic method of project control thus far developed, and that its application to their operation will result in a substantial improvement in the communications and coordination between the various divisions.

The personnel of that Division have found that the time expended on the development of the CPM network has been highly beneficial in that it has brought about a critical analysis of the procedures involved in the preacquisition and acquisition phases of their work. They have found that this critical review has resulted in a substantial saving in time as well as streamlining the entire operation. As an illustration of this point, a 30-day time saving has been effected by a reduction in one operational step.

As this study is reviewed in perspective, it is noted that at least 18 States are using CPM in the three preconstruction operations of Design, Right-of-Way, and P. S. and E. preparation. For their benefit, and for the benefit of others who are seeking improvement of their right-of-way acquisition programs, the following observations are made:

1. CPM Techniques can be adapted to a highway right-of-way operation: Because of the numerous parcels contained in every right-of-way project, the planning and scheduling phases must be considered from different points of view. In the planning phase, the project must be considered with respect to the individual parcels; that is, the network indicates the path that each individual parcel will have to follow. In the scheduling phase the parcels must be considered as groups and the time estimates must be based on the starting time of the first parcel in the group and the finishing time of the last parcel in the group. It is, of course, necessary to estimate the number of parcels that will follow each path in addition to estimating the time required for each activity, but the reporting and "look ahead" features of CPM provide a better means of controlling these variables than with other available management tools.

2. The CPM network planning promotes increased understanding on the part of right-of-way personnel as to the nature of their responsibilities because it depicts the right-of-way operation in greater detail and with more accuracy than is possible with any other management method.

3. The CPM network strengthens the coordination of effort within the right-of-way division and, more particularly, between it and other coordinate divisions of a State highway department because it graphically illustrates the complexity of the right-of-way processes, and clearly identifies the restraints imposed upon that process by operation in other divisions of the State highway department. In this regard, the arrows on the network diagram that connect events occurring in separate sections of the State highway department identify and automatically establish appropriate channels of communication. When the activities on a network path transfer from one operational section to another, the attention of three separate supervisors is focused on one activity. First, the supervisor of the section in which the activity occurs monitors the performance for the completion date. Next, the supervisor of the section in which the terminating event occurs monitors for the starting date of his next activity. Third, and at another organizational level, a top management supervisor monitors the scheduled completion to insure that the transition occurs on time. Furthermore, the several layers of supervision that exercise control at all transition points must maintain communications with each other to provide for any adjustments in schedule which may become necessary.

4. A standard or prototype network can be developed so as to contain all of the activities normally required on about 90 percent of the right-of-way projects. In the other ten percent of the projects (i. e., those which contain special or unusual properties or activities) the standard network is useful as a guide or may be specifically modified for a particular project.

5. An interested State can use a network previously developed elsewhere as a framework or skeleton for the construction of its own right-of-way plan. Where such a plan is being developed, the separation of the parcels into like groups (i. e., Entire Takings, Partial Takings, Takings of Improved Property, etc.) can facilitate the concentration of supervision and control on the parcel group which will contain the greatest problem

areas. The problems encountered in right-of-way projects controlled by CPM will continually disclose needed revisions or modifications in the network plan or the division procedures until the operation is refined into its most efficient pattern.

6. The CPM can remove existing bottlenecks. Such bottlenecks are found to exist usually because the operation, as a unit, had never previously been subjected to a critical analysis. Since the development of the CPM network requires a very close study of each activity and its relationship to the other activities, the study generally produces two immediate results: first, an improvement in the operating procedures, and second, a better knowledge of the operation by the men who direct or perform the activities. The network spotlights illogical arrangements, as well as the relationship and interdependency of the various activities. The schedule can reveal time estimates that are out of proportion to the size and complexity of an activity. The periodic reports of the computer can reveal activities on the critical path that can be made noncritical by rearranging the network. Exposure of these weak points by a critical analysis of the project network works toward improving the operating procedures.

7. Some of the CPM networks developed by State highway department personnel indicated a need for additional training in CPM techniques. However, later revisions of these same networks have shown that some of this needed education is being accomplished through "trial and error" and self-education rather than through a more formal type of training program.

Although CPM is still in the embryonic stage in the right-of-way field, it is going to become increasingly effective as more and more applications are developed and instituted. At present, several groups are engaged in the development of Multi-Project Scheduling for highway programs with a view toward the scheduling of all right-of-way projects at the same time. Such a schedule would indicate when, where, and how the necessary resources of manpower and funds should be allocated to meet the scheduled starting and completion dates. When Multi-Project Scheduling becomes possible and a management system for reporting and control is perfected, the Right-of-Way Administrator will be relieved of many of his most pressing problems.

With the progress already made by a number of the State highway departments in the application of CPM to right-of-way activities, other State highway departments may wish to study its feasibility for their own operation. The standard network (Appendix) may provide a starting point for such a study. Other States that are already using CPM may wish to review this network for clues to possible revisions that will improve their own operations. The adaptation of CPM and the early states of its application require a constant critical analysis and revision of the network and of the operational procedures to perfect the acquisition process. The highest possible stage of perfection in the acquisition process is the goal that the State highway departments must strive for if they are to complete their Interstate Highway Program within available time limits.

The Electronic Development Division, Office of Research and Development, U. S. Bureau of Public Roads has prepared manual A-4, "Critical Path Method Reports," which presents computer programs that will perform all the necessary calculations and calendar dating. The manual is available on request. In addition, on request of any State highway department, the Bureau can provide some assistance in the adaptation of the standard network to the procedures of an individual State or in the development of a network based on the procedures of a State where the standard network is inapplicable.

Appendix

EXPLANATION OF THE STANDARD RIGHT-OF-WAY NETWORK

The "standard" right-of-way network was prepared to indicate a pattern for the development of a CPM network for a State right-of-way acquisition project. It was

therefore necessary to confine the activities to very broad areas and to include only those activities that will appear in the procedures of the majority of the States (see Figs. 1 and 2).

It is believed that the general pattern indicated by this network will be applicable to all of the States although revisions will be necessary to conform to the procedures of each individual State. The activities, as shown, are generally at the earliest point at which the information necessary for their performance is available. It is suggested that these early starting points be given serious consideration, and if possible, a trial, before changing the sequences even though it may mean a change in the existing State acquisition procedure.

The division of the real estate parcels into the separate categories of "Total Takings," "Improved Properties," and "Unimproved Properties" is recommended to provide for the earliest possible starting of the acquisition operation, a degree of balance in the workload of the operation, and the closest possible control of the operation in the problem areas. The separation of the appraisal process into "Before" and "After" Appraisals is suggested to provide for the earliest possible start on the appraisals; a balance in the appraisal workload; and to allow the appraisers to become familiar with the economic and comparable sales data, the unit land values that are applicable, and the value of all of the properties on the project before they consider the "After Value" (and Damages) of the individual parcels. It is believed that a more uniform set of "fair market values" for the acquisition of the required rights-of-way will be arrived at in this manner. This suggested separation should not be considered as requiring the use of different appraisers for the "Before" and the "After" appraisals. The "Before" and the "After" appraisals will be made by the same appraiser; however, it is suggested that he complete all of the "Before" appraisals that are assigned to him on a project before he starts on the "After" appraisals.

The activity "Assign After Appraisals" refers to the assignment or the distribution of information relating to the effect that the proposed construction will have on the individual parcels, rather than an assignment to make an appraisal of the "After Value" of the property. The assignment to appraise is considered to have been made when the individual parcels were distributed among the appraisal force for the "Before" appraisal.

It is not necessary, and probably not advisable, to restrict the individual appraisers to one parcel category, such as "Improved Properties," in the assignment of appraisals; however, the progress reports will have to be made by separate parcel categories. The assignment of information for the "After" appraisals by the project supervisor should include a priority rating by parcel categories so that each individual appraiser will perform his work in coordination with the other members of the appraisal staff.

If it is inadvisable to break the appraisal operation into "Before" and "After" appraisals, the activities labeled "Before" may be used for "Total Takings" and the complete partial taking appraisals will follow the paths labeled "After Appraisals," or all of the appraisal activities may follow the paths labeled "After Appraisals."

The Additional Titles, Appraisals, and Affected Improvements that are referred to in the network, beginning at Event 50, are those properties and improvements that are included within the final right-of-way lines that were not included within the right-of-way lines on the preliminary plans; that is the plans prepared by laying out a standard right-of-way width from the centerline of the selected route location (for example, right-of-way lines laid out 150 ft on either side of the centerline of the selected route of a highway that has a standard right-of-way width of 300 ft). These additionally affected properties will generally be few in number and their inclusion within the right-of-way lines will be caused by the need for additional right-of-way for slopes, drainage, interchanges, service roads, stream changes, sight easements, etc. In the majority of the cases, these additional right-of-way requirements will fall within properties that were included within the right-of-way lines on the preliminary plans.

The Negotiation activity was broken into "Initial Negotiations" and "Final Negotiations of Remaining Properties" for the purposes of conforming to CPM techniques as closely as possible, reducing the number of parcels that require the supervisor's attention and providing the supervisor with a tighter system of reports and control. The activity labeled "Initial Negotiations" will generally include the assignment of parcels

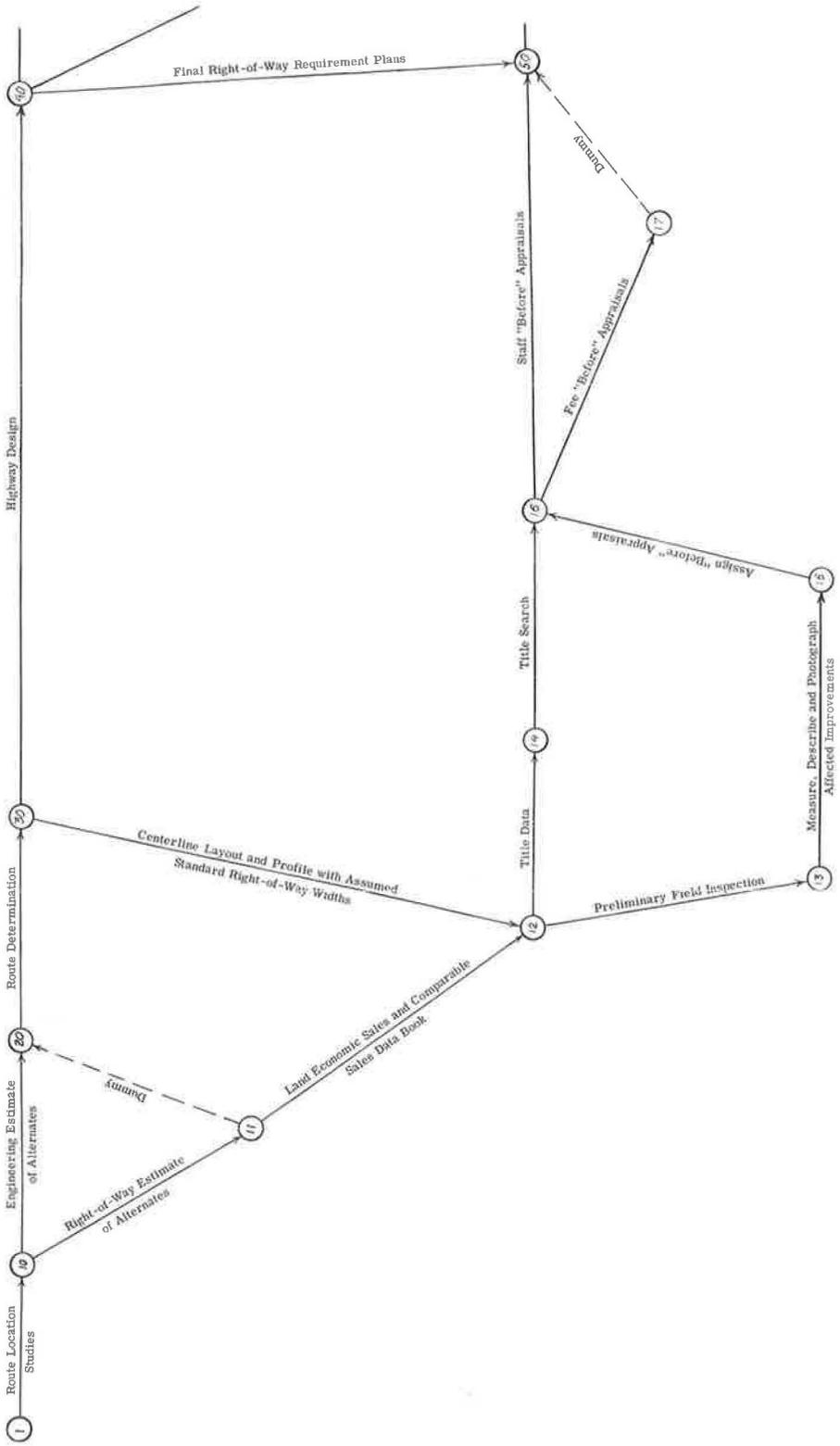


Figure 1.

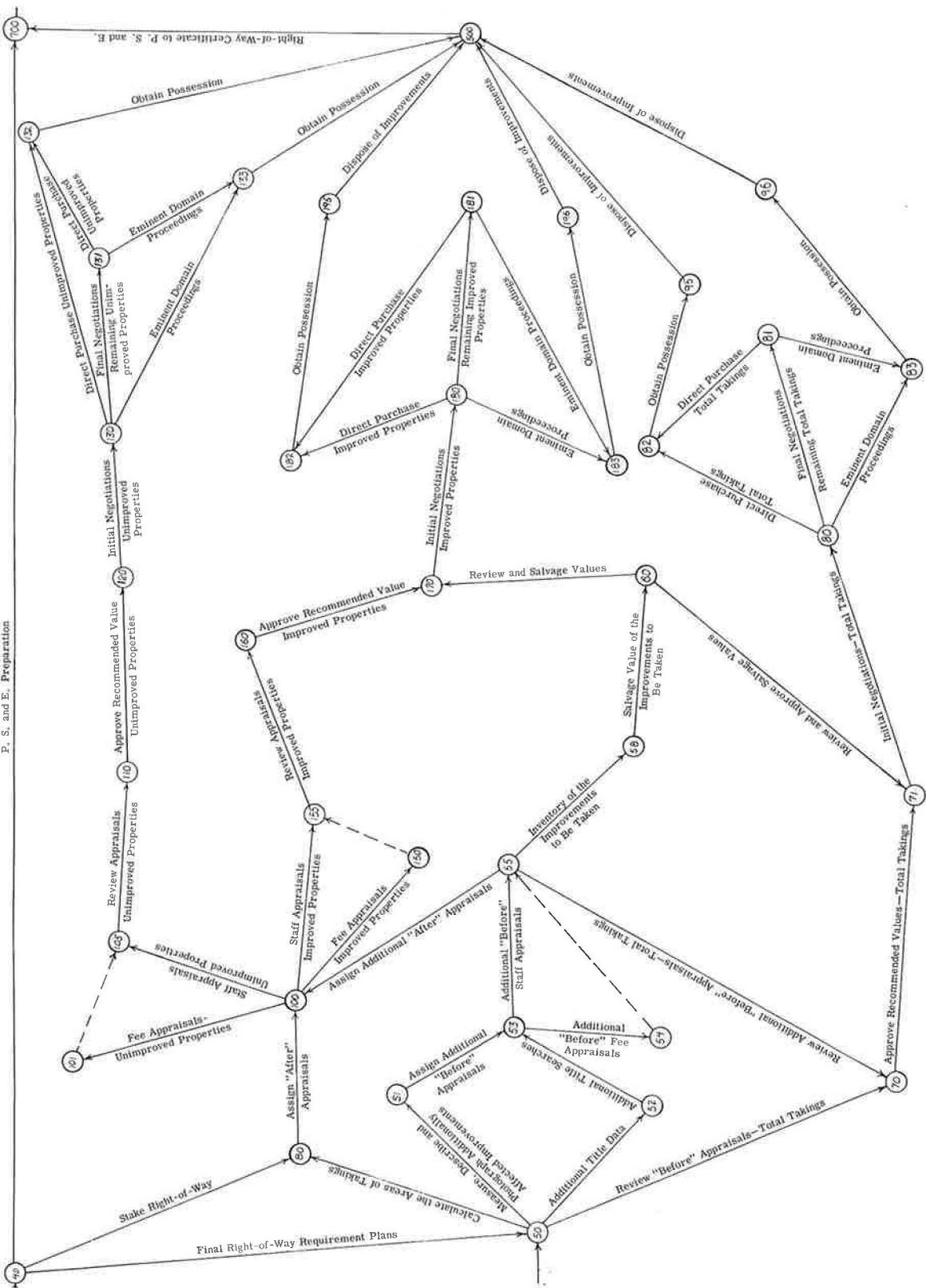


Figure 2.

to the negotiators, the opening of negotiations with the property owner or his representative, and several courtesy calls or contacts. These courtesy calls are made prior to instituting eminent domain proceedings when it is apparent that an amicable settlement will not be reached and the number of calls will be determined by the policy of the State highway department. The activity "Final Negotiations of Remaining Properties" should provide a sufficient period of time to allow additional contacts to be made in those cases where there is an indication that an amicable settlement may be made. This time may be limited by policy to a stated number of calls, after which eminent domain proceedings will automatically be started even though negotiations may be continued to the "courthouse steps" by a representative of either the right-of-way section or the legal section.

If it is the States' policy to dispose of all of the improvements at one time, all of the activities labeled "Obtain Possession" could end at Event 500 and the activity labeled "Dispose of Improvements" could take place between Events 500 and 501. The activity "Right-of-Way Certificate to P. S. and E." would then take place between Events 501 and 700.

Because of the many variations in the engineering and acquisition procedures in the States, the activities in this network have included a very broad area (i. e., Highway Design, Eminent Domain Proceedings). It will be necessary, therefore, for the individual States to break these broad activities into smaller activities and to add such other activities as are necessary to illustrate correctly the acquisition operation within the State. The activities used in this network will be very helpful in developing a "follows what" list to insure that nothing is overlooked. The necessary submissions to and approvals from the U. S. Bureau of Public Roads have been purposely omitted from this network because the necessary additions to and revisions of activities would require their relocation on each of the individual networks of the States.

After a right-of-way network has been developed for a State acquisition operation from this standard or pattern network, time estimates should be taken from the historical records of the right-of-way division and applied to all of the activities to determine which activities fall on the critical path. The activities that appear on the critical path should be examined very closely to determine if they can be performed at the same time as another critical activity or if the time span of the activity can be reduced economically by changing the job methods or by increasing the labor force. Additional computer runs should be made whenever changes are made in the network, or the time estimates, until the network is refined to the point where additional changes are no longer economical.

This network and explanation are presented to aid in the development of individual networks for right-of-way operations by the State highway departments. This network is not expected to be usable in this form by any of the State highway departments at any level of management. For operational use it will need more detail, and for management information and supervision it will need less detail.

The individual State networks should be developed by the men who will actually perform and supervise the acquisition operation. To do this they should know or be instructed in the theory and techniques of CPM networking. With this background and a pattern to follow, the development of a network for right-of-way operations should be considerably reduced in complexity.

Recent Trends in Highway Condemnation Law

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•EXTENSIVE postwar roadbuilding programs have led to much judicial and legislative activity in the field of condemnation law, but the attorney or highway administrator confronted with day-to-day problems seldom has the opportunity to look beyond the law of his own State or in any event beyond the law pertaining to the specific problem with which he is confronted. It is the objective of this paper to provide a broader view of recent happenings in the field of highway condemnation law and to sketch such major trends as seem to be apparent on a nationwide basis.

This paper is based primarily on information gathered in a study being conducted under a contract between the U. S. Bureau of Public Roads and the University of Wisconsin. The study focuses on highway condemnation law during 1946 through 1961 and includes, among other things, a review of legislation and litigation pertaining to highway condemnation during that period. Because 16 years is a relatively brief period on which to base conclusions as to major trends in decisional law, the principal focus of this paper necessarily is on legislative law. Some attention also is given to the inter-relationship of the legislative and judicial processes in the development of condemnation law.

The discussion of trends is divided among three major areas of condemnation law: (a) the right of the condemnor to condemn; (b) the right of the owner to receive just compensation; and (c) condemnation procedure. Before proceeding to a discussion of trends, however, it might be well to take a brief look at the sample of legislation and litigation on which this discussion is based. The survey of litigation is limited to the reported cases of 25 States.¹ Nevertheless, this involves almost 800 cases. The survey of legislation covers the laws of all States enacted during the 1946-1961 period, and occasional references also will be made to laws enacted subsequent to 1961. About 60 percent of the cases were decided from 1957 through 1961. The volume of litigation appears to correspond roughly with the increase in land acquisition brought about by the Interstate Highway program. Legislative activity in the condemnation field appears to show a more even distribution, but it is quite evident that this activity also has increased in recent years.

Right of Condemnor to Condemn

It is often said that the only real problem in most condemnation cases is to determine the compensation to which the landowner is entitled. This may be true, but the fact remains that in almost 14 percent of the reported highway condemnation cases which were reviewed, the landowner, in addition to other contentions which he may have been making, was challenging the right of the condemnor to proceed with the condemnation. Moreover, about 100 different enactments on the part of State legislatures dealt with this aspect of highway condemnation law during the period of 1946 to 1963. Therefore, this is not an entirely moot problem.

What have been the significant trends in this area of the law in the last 15 years or so? In general, it can be stated quite categorically that the trend has been toward expanding the powers of the condemnor. All but a very few of the legislative enactments

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¹ Ala., Ark., Cal., Colo., Conn., Del., Fla., Ga., Ill., Ind., Iowa, Me., Md., Mass., Minn., Neb., N.H., N.C., N.D., R.I., Vt., Va., Wis., and Wyo.

have tended to expand or clarify, rather than to restrict, the condemnation powers of highway agencies. And only in about one out of six of the cases in which the landowner challenged the proceedings (slightly more than two percent of all the cases), did the challenge meet with any success. Nevertheless, it may be helpful to examine briefly some of the specific aspects of the problem.

The right of the condemnor to condemn may be challenged on the ground that the taking is not for a public use or is not necessary to the contemplated public use or is not authorized by statute, as well as on certain other grounds. Some of these specific aspects of the problem are briefly examined in the following paragraphs.

Public Use Requirement.—The constitutional requirement that the condemned property must be taken for a public use has not proved to be an important issue in connection with condemnation for highway purposes, but it does arise occasionally in unusual or peripheral situations. Statutes authorizing condemnation for "private ways of necessity" occasionally are challenged (usually without success) on the ground that the taking is not for a public use.² Originally, these statutes were designed to provide access to agricultural lands which could be reached from a public highway only by crossing the lands of others. The modern counterpart of this situation is the parcel which becomes landlocked because of the construction of a controlled-access highway which cuts it off from the public highway system. At least one court, without much discussion, concluded that a roadway to provide access to land isolated from any public road would be solely for the benefit of the owner of such land and those having business with him, and that to permit such a road to be laid out therefore would constitute the taking of property for private use in violation of the constitution.³ The more usual attitude, however, is exemplified by an opinion of the supreme judicial court of Massachusetts in which it said that the condemnation of right-of-way for an access road for the benefit of parcels of land incidentally deprived of all or of some means of access by reason of a major freeway project is but a by-product of the major project which unquestionably is for a public purpose.⁴ A similar view has been taken in cases involving the acquisition of land for toll-road service facilities, such as restaurants and filling stations.⁵

Necessity of the Taking.—The question whether the taking is necessary has been raised somewhat more often than the question whether the proposed use is public, but certainly not with any more success. In the absence of a controlling statute, the general rule which seems to be followed is that a finding of necessity by the condemnor will not be disturbed in the absence of fraud, bad faith or gross abuse of discretion on the part of the condemnor. Contentions by landowners that the highway might better be constructed in a different location than that proposed by the highway authorities almost invariably are unsuccessful.⁶ A question of considerable current importance is the extent to which the rule that the condemnor's determination of the necessity of the taking will not be reviewed by the courts (in the absence of fraud, bad faith or abuse of discretion) permits the taking of land for future highway needs. Here again, the courts appear to have been generally sympathetic to the condemnor's cause, provided the highway agency, in question at least, had some reasonably definite plans for future construction.⁷

²E.g.; *Stein v. Darby*, Fla. App., 126 So. 2d 313 (1961); *State ex rel Happel v. Schmidt*, 252 Wis. 82, 30 N.W.2d 220 (1947).

³*Libbee v. Imhoff*, 11 Ill. App. 2d 344, 137 N.E.2d 85 (1956).

⁴*Luke v. Massachusetts Turnpike Authority*, 337 Mass. 304, 149 N.E.2d 225 (1958).

⁵*Opinion of the Justices*, 330 Mass. 713, 113 N.E.2d 452 (1953); *Illinois State Toll Highway Comm'n v. Eden Cemetery Ass'n*, 16 Ill. 2d 539, 158 N.E.2d 766 (1959).

⁶E.g.; *City of Carrollton v. Walker*, 215 Ga. 505, 111 S.E.2d 79 (1959); *Department of Pub. Works & Bldgs. v. Lewis*, 411 Ill. 242, 103 N.E.2d 595 (1952); *Porter v. Iowa State Highway Comm'n*, 241 Iowa 1208, 44 N.W.2d 682 (1950).

⁷*Takings for future use were approved in State Rd. Dep't v. Southland Inc.*, Fla. App., 117 So. 2d 512 (1960); *State Rds. Comm'n v. Franklin*, 201 Md. 549, 95 A.2d (1953); *Woollard v. Arkansas State Highway Comm'n*, 220 Ark. 731, 249 S.W.2d 564 (1952). The taking for future use was disapproved in *State ex rel Sharp v. 0.62033 Acres of Land*, 49 Del. 174, 112 A.2d 857 (1955).

There does not appear to have been much legislative activity in recent years with regard to determinations of necessity. However, there are at least a couple of disturbing clouds on the horizon from the standpoint of highway officials. Vermont, in a general revision of its highway condemnation law in 1957, set up a rather elaborate, and apparently time-consuming, quasi-judicial procedure for determining the necessity of particular highway takings.⁸ And in 1963 New Mexico enacted a law which pertains at least indirectly to determinations of necessity in that it gives the governing bodies of counties and municipalities a veto power over State highway relocations.⁹ One of the major concerns here apparently was the serious noncompensable damages which roadside businesses sometimes suffer when a major highway is relocated, but this seems like a rather drastic way of meeting the compensation problem.

Statutory Authority to Condemn.—Statutory delegation of condemnation powers is perhaps the first point that comes to mind when speaking of the condemner's right to proceed with the condemnation. A review of appellate court decisions in this area leads to the general conclusion that lack of statutory authority certainly has not been any serious impediment to condemnation for highway purposes. Nevertheless, the fact that the issue was raised in a substantial number of cases indicates that there are potential trouble spots in the statutory law pertaining to delegation of condemnation powers. The taking of lands already devoted to a public use, the taking of access rights, the taking of lands within municipal boundaries, the taking of lands for peripheral highway uses, such as drainage or storage sheds, and the taking of lands by local units of government as agents of State highway departments are examples of areas which the cases tend to show are in need of attention.¹⁰

A review of State legislation since 1946 indicates that these are some of the areas which also have received attention. A substantial number of States have patched up their laws in various respects, including clearer specifications as to the type of property interest which may be condemned as well as to the purposes for which property may be condemned.¹¹ Almost invariably, these amendments have tended to broaden the

⁸Vt. Laws 1957, No. 242; Vt. Stat. tit. 19, §§221 to 228.

⁹N.M. Laws 1963, ch. 114; N.M. Stat. §§55-2-50 and 55-2-51.

¹⁰Taking of lands devoted to a public use: *Muscolino v. Superior Court*, 172 Cal. App. 2d 525, 341 P.2d 773 (1959); *Welch v. City and County of Denver*, 141 Colo. 587, 349 P.2d 352 (1960); *Canzonetti v. City of New Britain*, 147 Conn. 478, 162 A.2d 695 (1960); *Elberton Southern Ry. Co. v. State Highway Dep't*, 211 Ga. 838, 89 S.E.2d 645 (1955); *Burnes v. Metropolitan Dist. Comm'n*, 325 Mass. 731, 92 N.E.2d 381 (1950); *City of Goldsboro v. Atlantic Coast Line Ry. Co.*, 246 N.C. 101, 97 S.E.2d 486 (1957); *Dove v. May*, 201 Va. 761, 113 S.E.2d 840 (1960).

Taking of access rights: *Department of Pub. Works & Bldgs. v. Finks*, 10 Ill. 2d 20, 139 N.E.2d 242 (1956); *Luke v. Massachusetts Turnpike Authority*, 337 Mass. 304, 149 N.E.2d 225 (1958); *Hedrich v. Graham*, 245 N.C. 249, 96 S.E.2d 129 (1957).

Taking by other agency for highway department: *Blanton v. Fagerstrom*, 249 Ala. 485, 31 So. 2d 330 (1947); *Martin v. Fulton County*, 213 Ga. 761, 101 S.E.2d 716 (1958); *Tiller v. Norfolk & Western Ry. Co.*, 201 Va. 222, 110 S.E.2d 209 (1959).

Taking for peripheral uses: *Heppe v. State*, 162 Neb. 403, 76 N.W.2d 255 (1956); *Webster v. Frawley*, 262 Wis. 392, 55 N.W.2d 523 (1952).

Taking in municipality: *Town of Greenwood Village v. District Court*, 138 Colo. 283, 332 P.2d 210 (1958).

¹¹Among laws which clarified the type of interest that may be condemned are: *Ariz. Laws 1953*, ch. 126; *Idaho Laws 1953*, ch. 100; *Kans. Laws 1951*, chs. 381 and 382; *N.J. Laws 1951*, ch. 112; *N.C. Laws 1951*, ch. 59; *N.D. Laws 1953*, ch. 177 §90; *N.D. Laws 1959*, ch. 267; *Mich. Laws 1962*, No. 22; *Pa. Laws 1949*, No. 71; *S.C. Laws 1963*, No. 149.

Among laws which clarified the relationship between condemnation powers of State and local authorities were: *Ala. Laws 1955*, No. 566; *Colo. Laws 1955*, ch. 240; *Kans. Laws 1953*, ch. 301; *Ky. Laws 1952*, ch. 180; *N.D. Laws 1959*, ch. 228.

Among laws involving expansion of powers to condemn for various peripheral highway uses were: *N.D. Laws 1959*, ch. 222; *Ga. Laws 1953*, No. 395; *Md. Laws 1951*, ch. 608; *Ohio Laws 1951*, p. 124; *N.C. Laws 1947*, ch. 806; *Pa. Laws 1961*, No. 325; *S.D. Laws 1957*, ch. 25; *Ill. Laws 1949*, p. 1023.

condemnation powers of the State or local highway authorities involved. In addition, there has been significant expansion in such areas as condemnation for limited-access facilities,¹² condemnation for the future highway use,¹³ condemnation of remnants or landlocked parcels,¹⁴ and condemnation of land to be exchanged for land needed for highway purposes.¹⁵ Most legislation has been on a piecemeal basis. However, a few States, usually in connection with a general revision of their highway laws, have enacted comprehensive statutes delegating power to condemn for highway purposes and listing a dozen or more purposes as constituting highway purposes. A good example of a recent enactment of such a statute is found in the new Utah highway code.¹⁶

Right of Owner to Receive Just Compensation

Probably the underlying issue in most condemnation litigation is the amount of compensation to which the landowner is entitled. Even in the appellate courts, almost two-thirds of the cases which were analyzed contained compensation issues in the broad sense of the term. There consequently has been no lack of opportunity for the courts to make new law in this area. When the decisions are viewed in the aggregate, however, it is difficult to discern an overall trend toward either broadening or restriction the scope of the landowner's right to compensation. It is possible to discern apparent trends with regard to certain specific aspects of the law of compensation, and a few of these are commented on later.

When considering what the State legislatures have done during the last 15 or 16 years, the trend is clear—the scope of the landowner's right to compensation gradually has been expanding. This is true even though, for the most part, legislative activity has been confined to a half-dozen or so narrow segments of the law of compensation and even though the legislatures of about one-third of the States have done nothing either to expand or to restrict the scope of compensation.

For the purposes of this discussion, the law of compensation for taking of property by eminent domain is considered to include three separate but related topics: (a) rules governing compensability of specific items of loss or damage; (b) rules for measuring value or damages; and (c) rules pertaining to valuation evidence and its use. The following paragraphs discuss some of the apparent trends in these three specific areas of the law of compensation.

Compensability of Specific Items of Loss or Damage.—In considering first what the courts have done with the rules of law limiting the scope of compensability, it seems desirable to focus on a few areas in which the law has been in a state of uncertainty and in which there consequently has been opportunity for judicial development of the law. Compensability of damage due to impairment of access obviously is one of these areas. The dozens of cases dealing with this subject in recent years afford a reasonably good opportunity to observe the process of judicial development of the law. Perhaps the basic proposition which underlies all the decisions is that damage caused by interference with access is compensable if the interference is unreasonable in view of the particular circumstances involved, for it is clear that not all injury due to interference with access is compensable. As certain types of fact situations keep recurring, however, the courts are likely to develop specific rules to govern specific situations. Thus, a particular State is likely to have developed one rule to govern the situation

¹²Versions of the Model Access Facility Law were enacted in Iowa (Iowa Laws 1955, ch. 148), Kansas (Kans. Laws 1953, ch. 307), Kentucky (Ky. Laws 1946, ch. 225), Minnesota (Minn. Laws 1957, ch. 864), Mississippi (Miss. Laws 1956, ch. 314), New Mexico (N.M. Laws 1957, ch. 234), North Carolina (N.C. Laws 1957, ch. 993), North Dakota (N.D. Laws 1953, ch. 177, §§102-107), Oregon (Ore. Laws 1947, ch. 226), and Wyoming (Wyo. Laws 1949, ch. 85). In addition, a great many laws creating freeway or tollway commissions and conferring condemnation powers upon them were enacted.

¹³Examples of such laws are: Ky. Laws 1960, ch. 220; Kans. Laws 1963, ch. 333; Mich. Laws 1957, No. 262, §13a; Wash. Laws 1961, ch. 281.

¹⁴Examples are: Alaska Laws 1960, ch. 122; Hawaii Laws 1951, No. 12; Neb. Laws 1961, ch. 181, §6; N.J. Laws 1952, ch. 21; Ill. Laws 1957, p. 2042. The Access Facility Law enacted in many States also embodies such powers.

¹⁵Examples are: N.H. Laws 1959, ch. 294; Wash. Laws 1953, ch. 55.

¹⁶Utah Code §§27-12-95 to 27-12-108, enacted by Utah Laws 1963, ch. 39. Other examples are: Neb. Stat. §39-1320, enacted by Neb. Laws 1955, ch. 148; Ark. Stat. §76-532, enacted by Ark. Laws 1953, No. 419.

wherein traffic is diverted from the old highway to a new one, another to govern the situation wherein access by means of a service road is substituted for direct access, another to govern the situation wherein a traffic divider or median strip is constructed in an existing highway, etc.¹⁷ Partly because there is a lack of unanimity of opinion among the courts of the several States as to what rule to apply in each situation, there is no readily apparent nationwide trend toward either expanding or restricting compensability in the area of impairment of access rights. As previously noted, there is a trend toward development of specific rules for specific situations so that the vague standard of reasonableness tends to fade more and more into the background. Perhaps judicial development of the law in this area now has proceeded to a point where careful study could lead to rules suitable for legislative enactment.

The question of whether the landowner is entitled to be reimbursed for his reasonable moving costs is another aspect of the law of compensability that has been presented to the courts a number of times. Most of the courts that have faced the issue appear to have been unwilling to expand the traditional concept of just compensation to encompass such expenses.¹⁸ However, some have hedged on the subject, at least to the extent of allowing the matter to go to the jury,¹⁹ and one court has stated quite positively that the landowner is entitled to be reimbursed for such expenses under the constitutional guarantee of "full compensation."²⁰ This is an area in which State legislatures have been relatively active. Moving-cost statutes were enacted in at least a half-dozen States during 1951 to 1959, and of course the pace has quickened since the enactment in 1962 of the Federal statute providing for Federal participation in the payment of relocation expenses.²¹

Another area in which considerable pressure apparently has been exerted toward expansion of the traditional concept of just compensation is that pertaining to loss of customers, loss of good will, and consequent loss of anticipated future profits of an existing business enterprise. Such losses can be very real and very extensive, and there is a certain reliance interest here that tends to evoke additional sympathy for the business entrepreneur whose business will be adversely affected by the relocation of a highway or by access limitations. As noted previously, a recent New Mexico law prohibiting State highway relocation without the consent of the county or municipal governing body apparently was concerned mainly with protecting the interests of businesses established along the old highway, and it is possible that some of the decisions in the field of access control may have been influenced at least to some degree by the belief that substitution of indirect access for direct access would adversely affect some of the businesses located along the highway. When courts have been faced squarely with the question of the compensability

¹⁷The case by case development of these rules can be illustrated by quoting from the opinion of the California District Court of Appeal in *People v. Sayig*, 101 Cal. App. 2d 890, 905, 226 P.2d 702, 712 (1951): "It is obvious that no general rule can be laid down to cover all situations. We know that property placed in a cul-de-sac by reason of an improvement is entitled to compensation for the depreciation of the property. Bacich case. We know that if property is divided from the highway by an underpass and the only access to the highway is a service road, the property located on the service road has been legally damaged. Ricciardi case. We also know that mere relocation of a highway thus diverting traffic from the property does not legally damage the property. Holloway v. Purcell, supra. We also know that the construction of a divided highway in front of the property does not legally damage it. Holman case. The distinctions between these various situations and their impact on the actual value of the property is simply one of degree. Our case falls within the rule of the Holman case."

¹⁸See, for example, *Arkansas State Highway Comm'n v. Fox*, 230 Ark. 287, 322 S.W.2d 81 (1959); *People ex rel. Department of Pub. Works v. Auman*, 100 Cal. App. 2d 262, 223 P.2d 260 (1950); *City of La Mesa v. Tweed & Gambrell Planning Mill*, 146 Cal. App. 2d 762, 304 P.2d 803 (1956); *Williams v. State Highway Comm'n*, 252 N.C. 141, 113 S.E.2d 263 (1960).

¹⁹*Harvey Textile Co. v. Hill*, 135 Conn. 686, 67 A.2d 851 (1949); *State Highway Dep't v. Robinson*, 103 Ga. App. 12, 118 S.E.2d 289 (1961).

²⁰*Jacksonville Expressway Authority v. Henry G. Du Pree Co.*, 108 So. 2d 289 (Fla. 1958).

²¹76 Stat. 1146; 23 U.S.C. §133. State moving-cost statutes enacted prior to 1962 include: Tenn. Laws 1951, ch. 176; Conn. Laws 1957, No. 601; Md. Laws 1959, ch. 688; Minn. Laws 1959, ch. 656; R.I. Laws 1959, ch. 174; Wis. Laws 1959, ch. 639.

of loss of good will or business profits, however, the answer usually has been that such damages are too speculative to be compensable in eminent domain proceedings.²² Perhaps an answer closer to the real truth is that the courts are fearful of the drain on the public treasury which could result if business losses were to be made compensable without careful restrictions. This is indicated by the attitude of the courts of States in which the legislature has taken the lead to make business losses compensable. For example, Vermont in 1957 enacted a statute expressly making compensable the damages resulting from the taking or use of property "and of the business thereon."²³ The Vermont court has shown reluctance to construe this statute broadly. The court was concerned in one case that there may be many situations in which it is difficult to separate business losses from damage to the land on which the business was conducted and in which compensation both for damage to the land and for damage to the business might lead to double compensation.²⁴ The court held in another case that the statute was not intended to provide compensation for damages due to the relocation of a highway. Whole communities might be seeking damages under such circumstances, said the court.²⁵

Many more examples of the attitude of the courts toward compensability of the various items of damage in eminent domain proceedings could be given, but in the interest of brevity the foregoing examples will have to suffice. When considering what the State legislatures have done, the trend toward expansion of the scope of compensability becomes more pronounced. There have been at least 60 different enactments during the past 16 or 17 years that were designed to expand the scope of compensability and very few that were designed to restrict the scope of compensability. Prior to 1959, however, these laws dealt only with narrow segments of the problem of compensability. For example, most of these laws can be placed in one of the following categories: (a) laws designed to compensate the owner or occupant of condemned premises for part of the cost of removal and relocation;²⁶ (b) laws designed to provide compensation for crops or fixtures located on the condemned premises or for damage caused to personal property;²⁷ (c) laws dealing with prorating of real estate taxes on the condemned premises for the year of condemnation;²⁸ (d) laws designed to compensate the landowner for expenses incurred in defending a condemnation action which subsequently is abandoned by the condemner;²⁹ (e) laws designed to provide the landowner with compensation in the form of interest on the award during periods when he neither had possession nor a right to receive payment of the award;³⁰ and (f) occasional enactments designed to expand the scope of litigation expenses which the landowner is entitled to recover.³¹

Since 1959, there appears to have been some tendency for State legislatures to take a broader look at rules of compensability in eminent domain proceedings. This usually occurs in connection with general revision bills. Thus, the 1959 Wisconsin revision

²² E.g.; *Hot Spring County v. Crawford*, 229 Ark. 518, 316 S.W.2d 834 (1958); *Williams v. State Highway Comm'n*, 252 N.C. 141, 113 S.E.2d 263 (1960); *Ryan v. Davis*, 201 Va. 79, 109 S.E.2d 409 (1959).

²³ *Vt. Laws 1957*, ch. 242; *Vt. Stat. tit. 19, §qq1(2)*.

²⁴ *Pennsylvania v. State Highway Bd.*, 122 Vt. 290, 170 A.2d 630 (1961).

²⁵ *Spear v. State Highway Bd.*, 122 Vt. 406, 175 A.2d 511 (1961). It can also be demonstrated that the Florida court has not shown any inclination to expand the scope of the "business loss" statute of that State beyond its literal terms. See *Hooper v. State Road Dep't*, 105 So. 2d 515 (Fla. 1958); *City of Tampa v. Texas Co.*, 107 So. 2d 216 (Fla. 1958); *Florida State Turnpike Authority v. Anhoco Corp.*, 107 So. 2d 51 (Fla. 1958); *Guarria v. State Rd. Dep't*, 117 So. 2d 5 (Fla. 1960).

²⁶ *Supra*, Note 21.

²⁷ *Cal. Laws 1957*, ch. 1098; *Conn. Laws 1957*, No. 659; *Iowa Laws 1959*, ch. 318.

²⁸ *Tex. Laws 1951*, ch. 484; *Mass. Laws 1953*, ch. 634; *Cal. Laws 1953*, ch. 1792; *Cal. Laws 1961*, ch. 1612.

²⁹ *Ore. Laws 1947*, chs. 283, 533; (D.C.) 61 Stat. 312 (1947); *P.R. Laws 1949*, No. 286; *Nev. Laws 1955*, ch. 188; *N.C. Laws 1957*, ch. 400.

³⁰ *Conn. Laws 1957*, No. 632; *Idaho Laws 1957*, ch. 127; *Mass. Laws 1960*, ch. 298; *Neb. Laws 1951*, ch. 101; *Neb. Laws 1959*, ch. 351; *Nev. Laws 1960*, ch. 239.

³¹ *Iowa Laws 1955*, ch. 226; *Conn. Laws 1957*, No. 632; *N.D. Laws 1957*, ch. 226; *Minn. Laws 1959*, ch. 656.

incorporated several rules designed to expand compensability.³² The same is true of a 1963 Kansas revision bill, but the bill was amended prior to adoption to delete most of these rules.³³ A 1963 Maryland revision provided for some expansion of the scope of compensability.³⁴ And, although it failed of enactment, a 1963 Pennsylvania revision bill³⁵ dramatically illustrated what appears to be a growing trend toward legislative clarification, codification and expansion of the rules for determining compensation in condemnation proceedings. The bill blazed new trails in the direction of legislatively-defined compensability rules, valuation rules, and evidential rules for condemnation proceedings.

Rules for Measuring Value or Damages. —The rules for measuring value or damages, of course, also affect scope of compensability, but here, rules such as the fair market value rule for measuring the value of property taken, the "before and after" or "value of the part taken plus damages" rules for determining compensation in severance situations, are being considered, rather than rules stating whether specific items of damage are or are not compensable. Also included in this category are rules pertaining to set-off of benefits, date of valuation, and the valuation of interests less than a fee simple. Although there has been a fair amount of litigation with regard to rules of valuation, it is difficult to discern any general trends in this area. It appears to be an area that merits further study. For example, a considerable amount of confusion appears to arise from the fact that there are two generally used rules for determining compensation in severance situations;³⁶ there do not appear to be any clear-cut rules for differentiating between general and special benefits;³⁷ there appears to be a considerable amount of confusion as to what rules to apply to the valuation of leasehold interests under various circumstances.³⁸

For the most part, State legislatures have made few attempts in recent years to clarify or codify rules of valuation. There appears, however, to be a trend toward

³²Wis. Laws 1959, ch. 639. Among items of damages made compensable were (a) damages due to change of grade; (b) cost of realigning personal property on the same site when necessitated by a partial taking or a restriction of access; (c) the cost of removing personal property to another site, subject to limitations; (d) refinancing costs, subject to limitations; (e) net rental losses resulting from vacancies during the year preceding the taking; and (f) expenses of plans and specifications rendered useless because of the taking.

³³Senate Bill No. 184 (1963 Session) which, in amended form, became Kans. Laws 1963, ch. 234. Among provisions deleted from the bill prior to enactment were provisions which would have (a) reimbursed the owner for cost of removal of his personal property to another location, (b) reimbursed him for increased cost of new financing, (c) compensated him for damage due to loss of business directly resulting from the taking, and (d) reimbursed the owner for the cost of plans rendered useless.

³⁴Md. Laws 1963, ch. 52.

³⁵H. B. No. 683 (1963 Session).

³⁶Examples of this confusion can be found in the following cases: Morgan County v. Hill, 257 Ala. 658, 60 So. 2d 838 (1952); Shelby County v. Hatfield, 264 Ala. 488, 88 So. 2d 842 (1956); State ex rel Morrison v. Jay Six Cattle Co., 88 Ariz. 97, 353 P.2d 185 (1960); Sorenson v. Cox, 132 Conn. 583, 46 A.2d 125 (1946); Lineberg v. Sandven, 74 N.D. 364, 21 N.W.2d 808 (1946); Barry v. State, 103 N.H. 141, 167 A.2d 437 (1961); Stringer v. Board of County Comm'rs. of Big Horn County, 347 P.2d 197 (Wyo. 1959).

³⁷Among cases which have considered this problem are: Ball v. Independence County, 214 Ark. 694, 217 S.W.2d 913 (1949); Koelsch v. Arkansas State Highway Comm'n, 223 Ark. 529, 267 S.W.2d 4 (1954); People v. Thomas, 108 Cal. App. 2d 832, 239 P.2d 914 (1952); Boxberger v. State Highway Comm'n, 126 Colo. 526, 251 P.2d 920 (1952); Cuneo v. City of Chicago, 400 Ill. 545, 81 N.E.2d 451 (1948); State v. Smith, 237 Ind. 72, 143 N.E.2d 666 (1957); Phillips v. State, 167 Neb. 541, 93 N.W.2d 635 (1958); D'Angelo v. Director of Pub. Works, 89 R.I. 267, 152 A.2d 211 (1959); Townsen v. State, 257 Wis. 329, 43 N.W.2d 458 (1950).

³⁸Among cases that have considered this problem are: City of Dothan v. Wilkes, 269 Ala. 444, 114 So. 2d 237 (1959); State ex rel Morrison v. Carlson, 83 Ariz. 363, 321 P.2d 1025 (1958); Orange State Oil Co. v. Jacksonville Expressway Authority, 110 So. 2d 687 (Fla. 1959); Department of Pub. Works & Bldgs. v. Bohne, 415 Ill. 253, 113 N.E.2d 319 (1953); Batcheller v. Iowa State Highway Comm'n, 251 Iowa 364, 101 N.W.2d 30 (1960); Veirs v. State Roads Comm'n, 217 Md. 545, 143 A. 2d 613 (1958).

codification of the more important valuation rules in connection with the general revision of condemnation procedures.³⁹ A few States also have enacted rules to cover unusual or especially difficult valuation problems.⁴⁰

Rules of Evidence.—Issues pertaining to evidence were involved in almost one out of three of the cases studied. Some of these issues do not have any special significance from the standpoint of eminent domain law as such, but many of them do. Insofar as a trend is discernible, there appears to be a trend toward liberalization of the rules pertaining to qualifications of witnesses and admissibility of evidence. For example, there is some indication that the rules pertaining to qualifications of expert valuation witnesses are being liberalized.⁴¹ The courts of some States which previously excluded evidence of sales of comparable properties now admit such evidence.⁴² Evidence of income and of cost of reproduction is admitted with more reluctance than evidence of sales, yet there appears to be growing judicial sentiment that business income should not be completely ignored in the fixing of the value of the property taken.⁴³ A substantial number of the cases have dealt with the question of the admissibility of evidence of the owner's intended use of the land and of the suitability of the land for subdivision purposes.⁴⁴ The courts do not appear to have been able or willing to develop precise rules in this area. The answer in any particular case appears to depend on the court's judgment as to the utility of the evidence in establishing market value, weighed against the number of misleading and time-consuming collateral issues which the evidence might introduce in the case.

There has been very little legislative activity with regard to rules of evidence pertaining to condemnation cases. An exception to the general rule was the Pennsylvania revision bill introduced in 1963. It attempted to set forth in some detail the rules of evidence which frequently are in issue in condemnation proceedings. The bill contained rules with regard to jury view, to qualifications of expert valuation witnesses, and to the permissible testimony of such witnesses. It is anyone's guess whether this portends

³⁹For example, the "before and after" rule, as well as certain other valuation rules, were codified in connection with revisions in North Carolina (N.C. Laws 1959, ch. 1025), Wisconsin (Wis. Laws 1959, ch. 639), and Kansas (Kans. Laws 1963, ch. 234). Valuation rules also were codified in the recent Maine and Maryland revisions (Me. Laws 1961, ch. 295; Md. Laws 1963, ch. 52).

⁴⁰E.g.; Cal. Laws 1963, ch. 1204 (valuation of park property); Wash. Laws 1956, ch. 156 (building located partly on land taken).

⁴¹For example, in two Massachusetts cases in which the trial court had refused to permit expert witnesses to testify because the witnesses did not have local experience in buying and selling property, the cases were reversed on appeal. The supreme judicial court noted that local conditions do not have the controlling significance in many cases that they had in the pre-automobile era and that there is often more occasion for employing a qualified appraiser of wide experience than to rely only on persons who have had local experience. *Muzi v. Commonwealth*, 335 Mass. 101, 138 N.E.2d 578 (1956); *Newton Girl Scout Council, Inc. v. Massachusetts Turnpike Authority*, 335 Mass. 189, 138 N.E.2d 769 (1956).

⁴²See, *County of Los Angeles v. Faus*, 48 Cal. 2d 672, 312 P.2d 680 (1957); *Redfield v. Iowa State Highway Comm'n*, 251 Iowa 332, 99 N.W.2d 413 (1959).

⁴³See, for example; *State Roads Comm'n v. Novosel*, 203 Md. 619, 102 A.2d 563 (1954), (capitalization of business profits should be avoided, but it was not error for landowner's expert witness to have taken into account in valuing the land the profitable nature of the business conducted thereon); *State ex rel Lord v. LaBarre*, 255 Minn. 309, 96 N.W.2d 642 (1959), (evidence that the gross sales of a supermarket were increasing was admissible for the purpose of showing that the lease was becoming more valuable).

⁴⁴E.g.; *Etowah County v. Clubview Heights Co.*, 267 Ala. 355, 102 So. 2d 9 (1958); *State v. Goodwyn*, 272 Ala. 618, 133 So. 2d 375 (1961); *State ex rel Morrison v. Jay Six Cattle Co.*, 88 Ariz. 97, 353 P.2d 185 (1960); *Arkansas State Highway Comm'n v. O. & B., Inc.*, 227 Ark. 739, 301 S.W.2d 5 (1957); *Arkansas State Highway Comm'n v. Watkins*, 229 Ark. 27, 313 S.W.2d 86 (1958); *Tift v. State Highway Dep't*, 99 Ga. App. 387, 108 S.E.2d 724 (1959); *Department of Pub. Works & Bldgs. v. Lambert*, 411 Ill. 183, 103 N.E.2d 356 (1952); *Aselbekian v. Massachusetts Turnpike Authority*, 341 Mass. 398, 169 N.E.2d 863 (1960); *State ex rel Lord v. LaBarre*, 255 Minn. 309, 96 N.W.2d 642 (1959); *Wishek Investment Co. v. McIntosh County*, 77 N.D. 685, 45 N.W.2d 417 (1950); *L'Etoile v. Director of Pub. Works*, 89 R.I. 394, 153 A.2d 173 (1959).

a trend toward codification of rules dealing with the more common evidential issues in condemnation cases.

Condemnation Procedure

Condemnation procedure is, of course, an important part of condemnation law. Issues pertaining to condemnation procedure were involved in almost one-half of the cases studied, and at least 200 different legislative enactments pertaining to condemnation procedure may be counted during 1946 to 1963. Condemnation procedure is customarily thought of as being statutory. Nevertheless, the courts have played an important role in the development of condemnation procedures. At times, statutory procedures have been so sketchy that the courts necessarily have had to supply the missing rules. At other times, the courts in deciding cases have pointed out defects or ambiguities that subsequently were corrected by legislative action. Finally, the legislatures of a few States recently have taken the position that it is the function of the supreme courts of those States to promulgate procedural rules for condemnation proceedings.⁴⁵

Notwithstanding this role of the courts, it is true that the principal developments in condemnation procedure during recent years have resulted from statutory enactments. Many of these developments have come about through piecemeal amendments, but there also appears to be a trend toward legislative revision of State condemnation laws in the form of major revision bills. Several States have undertaken such revisions, with the result that statutory condemnation procedures have been improved and clarified.⁴⁶ There does not seem to be sufficient evidence at this time, however, to conclude that there is a definite trend toward consolidation of condemnation procedures. Some States, instead of revising or patching up existing procedures, simply have piled one new procedure on top of another.⁴⁷

When the two other major areas of condemnation law (that pertaining to the right of the condemnor to condemn and that pertaining to the right of the landowner to receive just compensation) were discussed, it was said that the overall trend in the first area has favored the condemnor and in the second area the landowner. In the area of condemnation procedure, however, there have been two major trends running side by side—one tending to favor the condemnor and the other the landowner. These trends, however, are consistent with the two major trends previously noted in that procedural changes pertaining to the condemnor's right to condemn and to obtain quick possession of the desired property generally have favored the condemnor, whereas procedural changes pertaining to the landowner's right to receive just compensation generally have favored the landowner. These two trends are now discussed in somewhat more detail.

Procedures Designed to Give Condemnor Possession.—Almost every State has enacted procedures designed to give the condemnor possession of the property at an early stage of the proceedings. Many of these laws were in existence prior to 1946, but many of them also have been enacted since that time.⁴⁸ In general, the courts have been sympathetic to such statutes, although a few States have had difficulty enacting constitutional

⁴⁵ Alaska Laws 1962, ch. 101; Md. Laws 1963, ch. 52.

⁴⁶ Some of the more recent revisions were in North Carolina (N.C. Laws 1959, ch. 1025), Wisconsin (Wis. Laws 1959, ch. 639), Virginia (Va. Laws 1960, ch. 491; Va. Laws 1962, ch. 426), Maine (Me. Laws 1961, ch. 295), Alaska (Alaska Laws 1962, ch. 101), Kansas (Kans. Laws 1963, ch. 234), Maryland (Md. Laws 1963, ch. 52), and West Virginia (W. Va. Laws 1963, ch. 65).

⁴⁷ Consolidations took place in Delaware (48 Del. Laws, ch. 271), Nebraska (Neb. Laws 1951, ch. 101), and Kansas (Kans. Laws 1963, ch. 234). On the other hand, supplemental procedures were enacted in Georgia (Ga. Laws 1957, p. 387; Ga. Laws 1961, p. 517), Louisiana (La. Laws 1954, No. 107), New Mexico (N.M. Laws 1959, ch. 324), and Tennessee (Tenn. Laws 1959, ch. 216). Most of the other States that had revisions either had a uniform procedure to begin with or retained separate procedures for different types of takings.

⁴⁸ Some of the post 1946 enactments were: Ill. Laws 1947, p. 905; La. Laws 1948, No. 326; Alaska Laws 1953, ch. 90; Idaho Laws 1953, ch. 252; La. Laws 1954, No. 107; Ill. Laws 1957, p. 2603; N.M. Laws 1959, ch. 324; Tenn. Laws 1959, ch. 216; N.D. Laws 1961, ch. 274; S.D. Laws 1963, ch. 195.

quick-taking statutes.⁴⁹ Another trend that appears when one views recent legislative enactments in this area, is a trend toward refinement of existing immediate-possession procedures. In this refinement process, it appears that both the condemnor and the landowner have benefited. The revised procedures often provide for better notice to interested parties, for clearer procedures for testing the validity of the taking and the adequacy of the deposit that usually is a prerequisite to possession by the condemnor, and for other adjustments that experience has shown to be necessary or desirable.⁵⁰ Another aspect of this refinement process is to permit the owner to withdraw the deposit under appropriate safeguards.⁵¹ Many of the earlier immediate-possession statutes did not permit such withdrawal. Because the condemnor usually is not required to pay interest on deposits which the landowner is entitled to withdraw, these withdrawal procedures may work to the advantage of the condemnor as well as the landowner.

Procedures for Determining Just Compensation.—Many amendments designed to improve procedures for determining compensation in condemnation proceedings have been enacted in recent years. On the whole, the revised procedures afford greater protection to the landowner's rights than did the old procedures. There has been some tendency, for example, to get away from the old "laying out" procedures in connection with land acquisitions for highway purposes.⁵² These procedures typically provided for the making of an award by a local administrative body and generally with very little opportunity for a hearing on the issues involved. If the landowner was dissatisfied, he had the burden of going to court to attempt to obtain some redress. This is not to say that there has been a trend away from administrative condemnation procedures. For example, both Maine and Wisconsin in the recent revisions of their condemnation laws retained the administrative award procedure for highway condemnation purposes.⁵³ However, the laws were substantially revised so as to give perhaps as good protection to the landowner's rights as he would be likely to have in any judicial condemnation proceeding.

Turning to the more specific changes which have been made in condemnation proceedings, it is found that amendments designed to improve notice procedures have been quite common.⁵⁴ Amendments designed to improve procedures for payment of compensation and for settling conflicting claims also were enacted in many States.⁵⁵ In addition, there has been a great deal of patchwork that is more difficult to classify.

⁴⁹ Among States that have had some difficulty are Georgia and Illinois. Immediate possession statutes were held invalid in *Pilgreen v. City of Atlanta*, 204 Ga. 710, 51 S.E.2d 655 (1949), and in *Department of Pub. Works & Bldgs. v. Gorbe*, 409 Ill. 211, 98 N.E.2d 730 (1951). However, both States subsequently enacted valid immediate possession procedures without amending their constitutions. See: *O.K. Inc. v. State Highway Dep't*, 213 Ga. 666, 100 S.E.2d 906 (1957); *Department of Pub. Works & Bldgs. v. Butler Co.*, 13 Ill. 2d 537, 150 N.E.2d 124 (1958). North Dakota also experienced difficulty until its constitution was amended in 1956. See *Kessler v. Thompson*, 75 N.W.2d 172 (1956). Although Idaho and Washington are among those States whose case law generally is not treated in this paper (see footnote 1), it might be pointed out that those States also have had immediate possession statutes invalidated. See *Yellowstone Pipeline Co. v. Drummond*, 77 Idaho 36, 287 P.2d 288 (1955); *State ex rel Eastvold v. Yelle*, 46 Wash. 2d 166, 279 P.2d 645 (1955).

⁵⁰ Some examples are: Ark. Laws 1963, No. 99 (certain restrictions on withdrawal of deposit by landowner added); Cal. Laws 1961, ch. 1613 (better notice to landowner and other changes); Conn. Laws 1957, No. 384 (better notice to landowner; increased deposit); Fla. Laws 1959, ch. 59-297 (reduction in required deposit); Mont. Laws 1961, ch. 234 (date of possession advanced).

⁵¹ Among laws providing for such withdrawal were: Md. Laws 1950, ch. 54; Va. Laws 1956, ch. 565; Cal. Laws 1957, ch. 2022; Va. Laws 1958, ch. 581; Neb. Laws 1959, ch. 351; Ind. Laws 1961, ch. 317; R.I. Laws 1961, ch. 166.

⁵² E.g.; N.J. Laws 1953, ch. 27; R.I. Laws 1962, ch. 216. A summary "sheriff's jury" procedure in Maryland was repealed in 1962. Md. Laws 1962, ch. 36.

⁵³ Wis. Laws 1959, ch. 639; Me. Laws 1961, ch. 295.

⁵⁴ Among these were: Cal. Laws 1959, ch. 1573; Fla. Laws 1953, ch. 28282; Ill. Laws 1951, p. 1850; Kans. Laws 1955, ch. 213; Minn. Laws 1957, ch. 728; N.H. Laws 1955, ch. 56; Tenn. Laws 1959, ch. 194; Tex. Laws 1961, ch. 105; W. Va. Laws 1957; chs. 82, 83, 84; Wis. Laws 1953, ch. 308.

⁵⁵ Among these were: Ill. Laws 1959, p. 157; Kans. Laws 1961, chs. 208, 209; La. Laws 1954, Nos. 47, 48; R.I. Laws 1962, ch. 76; Wis. Laws 1953, ch. 308.

There is one area of compensation procedure which has hardly been touched by legislative activity but which has been a fruitful source of litigation. This is the procedure for determining the landowner's right to compensation when his property allegedly has been taken or damaged by a highway agency without any formal action on the part of that agency. The proceedings sometimes are referred to as "inverse condemnation," but they may take many different forms. The courts usually manage to find that the landowner has a remedy, but it would seem that a well-conceived statutory procedure might be useful here.

Conclusion

If the postwar trends in highway condemnation law could be summarized in a few words, it could be said that two general trends appear to emerge from the mass of court decisions and legislative enactments: (a) there has been a tendency for both courts and legislatures to look with favor on the right of the highway authorities to condemn the property needed for highway construction and to acquire quick possession so that the improvement projects could proceed without delay; and (b) there has been a gradual trend toward expanding the scope of the landowner's right to receive compensation for some of the consequential damages that previously were considered to be noncompensable and toward improving the procedures whereby such right may be exercised.

Most of the changes which have taken place in highway condemnation law in recent years have been brought about by legislative action. However, there are areas of the law which have been left largely to the courts to develop and which now perhaps have been developed to a point where legislative statement of the rules might be warranted in the interest of clarity and of forestalling litigation. In fact, the time would seem to be ripe for the development of a model condemnation law which would synthesize the best features of the condemnation laws which already have been fashioned by the courts and legislatures of the several States and which could be drawn on by the States in further improving their condemnation laws. One of the products of the study on which this paper is based, hopefully will be at least a first draft of such a law.

A Review of Inverse Condemnation

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•ALONG THE North Carolina coast, a landowner sued the State Highway Commission for damages when the construction of a new by-pass blocked the ocean tides and flooded his land.¹ Near Sheridan, Wyoming, the owner of an outdoor drive-in theater sued the State, alleging that flashing lights from a new Interstate highway had contributed to the failure of his business.² Both of these lawsuits were brought on an inverse condemnation theory, an action in reverse eminent domain in which the landowner sues the highway agency for damages which are alleged to be traceable to the highway improvement.

Inverse condemnation has brought concern to many lawyers in State highway agencies, because of the role it plays in identifying new interests for which compensation is payable in condemnation law. Claims and interests of all kinds, that were not compensated in the original condemnation action, are liable to appear in the form of an inverse condemnation suit, as litigants press for compensation for a wide variety of claims, arising out of loss of view, loss of access, and damage from noise, dust, and fumes. The more conventional water damage cases are also common. Even more threatening, the inverse condemnation action is used increasingly as a dodge around sovereign immunity, and highway agencies face a growing number of lawsuits in which inverse condemnation is used to secure damages for what would usually be considered an ordinary tort. In this review of inverse condemnation problems, the relationships between tort and inverse causes of action are discussed.

A PERSPECTIVE ON INVERSE CONDEMNATION

The seemingly endless variety of inverse condemnation actions calls for some method of organizing what appears to be a chaotic and almost uncontrollable body of legal doctrine. An important first distinction should be taken between two different kinds of inverse condemnation claims. Some inverse suits seek damages for the compensation of interests that were clearly ascertainable at the time of the original taking, and that could have been compensated at that time had the highway agency chosen to do so. For example, if a new highway will deny access that was previously available, this fact is perfectly apparent at the time of the initial acquisition and damages for denial of access could have been paid at that time. Damage falling in this category is evident at the time of the initial improvement and, as it could have been compensated initially, the fact that the landowner seeks subsequent compensation in an inverse action does not change the substantive result.³

On the other hand, some damage for which compensation is sought by way of inverse condemnation is only probable at the time of the initial improvement, and could not have been paid for at that time under well-established rules forbidding the payment of compensation for speculative damage. Seacoast and drive-in examples will illustrate this point. In both cases the highway has obviously altered existing land-use relationships, but at the time the highway was built the damage to nearby property owners had not occurred. Of course, the highway agency might have chosen to acquire additional interests by way of easements or servitudes that would have avoided the damage. For ex-

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¹Midgett v. North Carolina State Highway Comm'n, 132 S.E.2d 599 (N.C. 1963).

²Sheridan Drive-In Theatre, Inc. v. State, 384 P.2d 597 (Wyo. 1963).

³See the discussion in Netherton, R., "Control of Highway Access" (1963), pp. 233-39.

ample, it could have acquired a flowage easement in the North Carolina case. But it chose not to do so, and so the property owner must wait until damage occurs before he can bring his inverse action to seek compensation.

Analytically, of course, these distinctions can be challenged. In a case of denial of access, for example, the fact of injury may not be any more apparent at the time of acquisition than it is in what turns out to be a water damage case. Differences in result may be due to the way in which differing interests are categorized, and the different treatment of the access problem may be due solely to the fact that access has long been treated as a vested right which must be compensated as soon as it is disturbed. Nevertheless, the distinction is a useful one, as it separates those cases in which the highway improvement makes an immediately apparent alteration in pre-existing relationships between the highway and affected landowners, and cases in which the fact of damage is not finally ascertainable until some time after the highway is constructed.

CHOICE OF LAW PROBLEMS

Courts faced with inverse condemnation problems have been able to use a wide variety of legal doctrines in arriving at their decisions. Variety in the choice of concept has been structured by the eminent domain clauses in State constitutions, which typically require the payment of compensation for a "taking," or a "taking and damaging," of "property." Inasmuch as the constitution makes explicit reference to property rights, a property analysis can and has often been used by inverse condemnation cases. Especially in those cases which arise out of floodings and soakings and other forms of water damage, the courts can resort to property law doctrines surrounding the use of water in order to fix inverse liability. Although a ready-made body of private water law is available to aid the courts in finding answers in these cases, its applicability to inverse problems may well be questioned, however. As an early Wisconsin opinion pointed out,⁴ a highway does not use water, it intercepts water. Private law doctrine that evolved in connection with the joint private exploitation of a common resource may not be able to provide the analytical tools that are needed to resolve the liabilities of public agencies, which occupy an entirely different status.

Even more difficult is the relationship between the law of tort and the law of inverse. Although sovereign immunity is a well-established American legal concept, it has been marked by deep exceptions that, at least in the local government area, make immunity the exception to a wide variety of rules of liability rather than the rule on which a series of exceptions have been grafted. Perhaps the most familiar exception to immunity at the local level is the rule of liability for negligence in the performance of proprietary, as distinguished from governmental functions. Although the proprietary-governmental distinction is difficult to apply in practice, and has come under increasing criticism, it has nonetheless resulted in a finding of municipal liability in a wide variety of situations in which streets are involved. Liability has usually been imposed, for example, for damage caused by inadequately planned culverts.⁵

At the State level, however, exceptions to the immunity doctrine have not been as pervasive. As a result, litigants have had to resort more frequently to inverse condemnation in order to find a way around the immunity principle that will allow them to recover for their damage. Practically all the courts now hold that the eminent domain clause is self-executing, which means that suit can be brought against the State without the necessity of enabling legislation. Whereas less than one-half of the jurisdictions permit a suit directly against the State for damages, alternative procedures are usually available by which the liability of the State can be determined.

The result is continuing tension and conflict between the immunity principle, which bars suits against the sovereign for damages, and the constitutional command to pay compensation. Either the court relies on the addition of a "damaging" amendment to the eminent domain clause, or it construes its "taking" clause to include an interference with the use of land, which is a damaging because it affects less than the full title.

⁴Peck v. Baraboo, 141 Wis. 48, 122 N.W. 740 (1909).

⁵18 McQuillin, "Municipal Corporations" §§ 53.121-53.123, 53.134 (3rd ed. 1949).

Either way, tort doctrines have been able to filter into inverse condemnation decisions, and plaintiffs have been allowed to recover on inverse grounds in cases which would be explainable on a tort theory were it not for the immunity barrier. Confusion may then be twice compounded, because related tort doctrines in the private law field have suffered from long-standing ambiguities.

THE ACT-OF-NEGLIGENCE CASES

Cases in which inverse liability is sought on the basis of a single act of negligence provide a good example of some of the doctrinal problems encountered in this area. A negligent act is nonrecurring and produces a one-time injury. In these cases the courts tend to classify the damage as a tort, and to deny recovery on sovereign immunity grounds. Damage compensable through inverse condemnation arises out of a permanent condition (the highway) that produces recurring property damage, and the courts tend to classify this damage as a taking under the eminent domain clause. Although these distinctions are clear at the extremes, they have a tendency to blur at the middle and may confuse the basis of inverse condemnation recovery.

An important borderline case is *V. T. C. Lines v. City of Harlan*,⁶ a Kentucky opinion. Plaintiff sued the city by way of inverse for damage to its diesel bus engines caused by dust from sandblasting operations in a municipal pool. Earlier decisions in which inverse recoveries had been allowed by the court were discussed, and difficulties of distinction were noted. For example, in one of these earlier cases the court had appeared to allow recovery for negligent maintenance of a culvert.⁷ In the Harlan decision the court concluded, somewhat broadly, that "whenever any property is damaged by a sovereign, whether it is the result of common acts of negligence or is related to the exercise of the police power, damages must be paid by the sovereign."⁸ This case, however, fell "more properly"⁹ with those in which recovery was sought for a negligent act, and so recovery was denied.

Recovery is not usually allowed in the act-of-negligence cases, although the basis of the decisions may not always be clear. In a common and typical case, suit is brought when highway employees spray the roadside with pesticides that drift over an adjacent farm and injure growing crops. Sometimes the decisions can deny liability on the ground that an inverse recovery cannot be based on single tortious acts.¹⁰ But while the temporary-permanent distinction is plausible, not all courts will accept it and some have allowed recovery for damage not caused by permanent conditions.¹¹

Results in these cases may then depend on the way in which the court chooses to categorize the facts. In *Boitano v. Snohomish County*,¹² plaintiff's land was flooded by a spring uncovered during operations in defendant's adjoining gravel pit. After the spring was uncovered, it was directed by means of a channel onto plaintiff's land. There is no indication that any of the work was done negligently, nor was the condition necessarily permanent. Yet the Washington court found for the plaintiff:

The taking or damaging of property to the extent that it is reasonably necessary to the maintenance and operation of other property devoted to a public use is, likewise, a taking or damaging for a public use.¹³

⁶*V.T.C. Lines v. City of Harlan*, 313 S.W.2d 573 (Ky. 1958).

⁷*Commonwealth v. Kelly*, 314 Ky. 581, 236 S.W.2d 695 (1951).

⁸*V.T.C. Lines v. City of Harlan*, 313 S.W.2d 577 (Ky. 1958).

⁹*Id.*, at 578.

¹⁰*Harris v. United States*, 205 F.2d 765 (10th Cir. 1953); *Crisafi v. Cleveland*, 169 Ohio 137, 158 N.E.2d 379 (1959).

¹¹*Nelson v. Wilson*, 239 Minn. 164, 58 N.W.2d 330 (1953); *Patrick v. City of Bellevue*, 164 Neb. 196, 82 N.W.2d 274 (1957).

¹²*Boitano v. Snohomish County*, 11 Wash. 2d 664, 120 P.2d 490 (1941).

¹³*Id.* at 668, 120 P.2d at 492.

The Boitano language is broad enough to bring negligence in the operation of a public facility within the inverse category, and would permit a contrary result in the Harlan case. Most of the act-of-negligence cases are simpler, however, and the attempted use of a single act of negligence to fasten liability on the highway agency has allowed the courts to deny recovery. But the conceptual basis on which they do so is not clear.

THE TRESPASS-NUISANCE APPROACH

In tort law, the position of the private landowner has always been favored. Direct physical invasion of land is actionable as a trespass and recovery was had historically under absolute liability principles. If the physical entry was indirect, actual damage had to be proved and the entry had to be either intentional or negligent. The modern cases have shifted to this position in the direct trespass cases as well. Nuisance, on the other hand, is a non-trespassory action based on a condition on defendant's land that is injurious to plaintiff's property.¹⁴ Although the nuisance action did not originally require intentional or negligent wrongdoing on the part of the defendant, it did require a showing of actual harm.

Trespass doctrine has clearly had its effect on inverse condemnation. When the inverse injury has been a physical and direct invasion, the trespass analogy has been available to construct the taking of a servitude on the basis of a continuing trespass.¹⁵ The absolute liability background of the trespass action may also explain the absolute approach which some courts take when fixing liability through the inverse action on the basis of the eminent domain clause.

Nuisance doctrines founded in tort were also incorporated at an early date into inverse condemnation law. Permanent conditions created in the construction of streets and highways can easily be analyzed as constitutional takings or damages which require compensation. In fact, the close relationship between nuisance doctrine and inverse condemnation may well explain the puzzling nuisance exception to sovereign immunity. Regardless of immunity principles, public agencies have always been responsible for damage inflicted by the maintenance of a nuisance. Early California cases¹⁶ had indeed suggested that the payment of damages for a nuisance is mandated by the constitutional eminent domain provision. Governmental liability for maintenance of a nuisance has since taken a path separate from inverse condemnation, but its inverse origins are evident.

How nuisance theory can support an inverse recovery can be illustrated by the North Carolina example. In that case, so the plaintiff alleged, the construction of the bypass highway created a "dam" which backed up the ocean and caused it to inundate plaintiff's land. The highway was treated as a nuisance and plaintiff was allowed to recover:

But if a governmental agency maintains a nuisance, permanent in nature, causing damage to and diminution in the value of land, the nuisance is regarded and dealt with as an appropriation of property to the extent of the injury inflicted.¹⁷

An interesting conflict over the relationship between nuisance and inverse law has arisen in the airplane overflight cases. Inverse recoveries have been allowed against publicly-owned airports for damage due to recurring flights of airplanes over private property situated near the runways. When airplanes have flown near to but not over the property alleged to have been damaged, liability has been controverted on the ground that a trespass is an essential ingredient to a recovery. The courts are divided on this point,¹⁸ but the long-established basis of inverse condemnation in nuisance doctrine could easily support recovery on a nuisance theory in cases like these.

¹⁴For discussion see Note, 1961 Wash. U.L.Q. 62.

¹⁵United States v. Causby, 328 U.S. 256 (1946).

¹⁶The California story is told in Van Alstyne, "A Study Relating to Sovereign Immunity" California Law Revision Commission (January 1963) pp. 225-30.

¹⁷Midgett v. North Carolina State Highway Comm'n, 132 S.E.2d 599, 606 (N.C. 1963).

¹⁸Compare Batten v. United States, 306 F.2d 580 (10th Cir. 1962), noted, 111 U. Pa. L. Rev. 837 (1963), denying liability, with Thornburg v. Port of Portland, 376 P.2d 100 (Ore. 1962) contra.

SOLVING THE TORT-INVERSE RIDDLE

This exploration into the relationship between tort and inverse doctrine has necessarily been incomplete, but has been sufficient to pinpoint some of the areas of difficulty. Recent developments in the private law of torts have tended to obscure further the traditional bases of nuisance, trespass, and negligence. Conventional distinctions between entry by tangible objects (trespass), and by intangible objects (nuisance), have become harder to sustain in view of modern theories about the form and content of matter. In borderline cases, nuisance and trespass theory have coalesced. Modern authority has also abandoned the absolute liability approach to nuisance, and has likewise abandoned the notion that nuisance is an independent tort unconnected with traditional doctrine. Nuisance has become an effect, an unreasonable interference with the use of land which results from conventionally tortious conduct which may be intentional, ultrahazardous, or even negligent.

What these developments mean is that distinctions between liability in tort, which is blocked by immunity principles, and liability by way of inverse condemnation, which is compensable under the constitution, become harder and harder to defend. A growing trend toward abolition of sovereign immunity, which has now been abolished in many jurisdictions and which has not been available to the Federal Government since 1946, has complicated the solution of these problems. Some observers have felt that abolition of immunity principles could solve the inverse question, as claims prosecuted by way of inverse could then be recovered without restriction in tort. But this expectation will not easily be fulfilled.

A real question exists as to whether the repeal of sovereign immunity is meant to replace inverse condemnation in cases in which the inverse remedy has traditionally been available. More important, exclusions from liability have been adopted by statute or judicial construction in States in which immunity has been abolished, and one of the more important exclusions would avoid governmental liability for damage flowing from the exercise of discretionary functions. Inasmuch as the planning of a highway is classed in the discretionary function category, damage due to defects in construction that can be traced to defective planning has been placed within the discretionary function exclusion, and liability has been denied.

The author offers no easy solutions to the tort-inverse problem. A judicial tendency to adapt to the inverse action the weighing of advantage and harm that is so common to nuisance suits, a development too complex to discuss here, would suggest that courts will increasingly approach the decision of inverse cases on an explicit policy level. It has been suggested that policy considerations, embedded in constitutional provisions for compensation in eminent domain, point to the imposition of an absolute liability on highway agencies in cases in which physical injury to land can causally be connected to the highway improvement. Absolute liability does not make the highway agency an insurer of every loss, however, and the courts should be able to fashion a series of policy limitations to the imposition of inverse liabilities. For example, liability would not be imposed for flooding damage arising out of hurricanes or other Acts of God.

Adoption of an absolute liability approach to inverse condemnation may well lead to a continuing coalescence of tort and inverse theories, gravitating toward a more-inclusive theory of responsibility which can achieve a fairer solution of the problem of public liability. Cause-in-fact problems, for example, would be common both to the tort and to the inverse cause of action. In the meantime, questions about the highway agency's liability for property damage will have to be answered both in the inverse and in the tort context.

ACKNOWLEDGMENT

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Analysis and Evaluation of Oregon Condemnation Cases

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•JURY VERDICTS returned in condemnation cases cannot really be accurately analyzed and evaluated. Certain observations and conclusions that may have some validity may be drawn, however, based on experience, knowledge of the area involved, the parties, the witnesses and the thinking of the times.

During the period between July 1955 and June 30, 1963, 635 condemnation actions were prosecuted in Oregon. Figure 1 shows the wide variation during that period in percentage of increase above the highest offer to settle made by the State.

A study of all cases tried during the period bears out certain conclusions that could be drawn in connection with the percentage of increase approach, which is that the greater increases occur when the offer is less than \$10,000. Experience shows that the average jury has little or no compunction about doubling a \$2,000 offer but is reluctant to double a \$200,000 offer. This phenomenon will always be present and, consequently, charts based on percentages of increase may vary 10 to 20 percent or more in any given year.

Another factor is the demand of the owner. For example, a well-known farmer, legislator and respected community worker was the owner of a beautiful farm. As so often happens, the right-of-way crossed the farm diagonally, but farm crossings were allowed. The offer to purchase was \$10,500, but the owner demanded \$100,000. The case was tried before a jury composed mostly of farmers, and the verdict returned was \$17,500. This was a healthy increase in percentage, but from the standpoint of the demands of the owner and the farm involved, it was not a disgraceful one.

This case was the subject of a GAO audit in 1960, and there was some criticism because the court award was considerably higher than the appraisal. For the benefit of all auditors it should be made clear that the spread between State appraisals and those of the landowner are frequently awesome to behold (Table 1). A jury, generally composed of a cross-section of the residents of the county, are people who have no special knowledge of appraising or of real estate values. Nor have they been briefed beforehand as to any auditing policies against bringing in verdicts in excess of State appraisals. Jurors have to make a decision as to value in a few hours based on the testimony of appraisers who appear on both sides and who, in most cases, have equal qualifications. It seems that most juries feel the correct answer lies somewhere between the State's highest appraisal and the landowner's lowest appraisal. In most cases, the juries have decided more in the State's favor than in the landowner's, even though it would be easier for them to identify themselves with the property owner.

It is, therefore, obvious to anyone who understands the law of eminent domain that a court trial transcends the field of auditing and that the auditor who attempts to apply his training to it is being thoroughly naive.

Charting the trials of cases from a percentage of increase basis may not always give a true picture of trends in jury verdicts. In fact, it can be very misleading, at least from the trial attorney's standpoint. However, there is one trend worth mentioning, and that derives from a comparison of a large metropolitan area with a predominately rural area.

A study of the cases indicates that since 1960 trials in Portland, Oregon's only large city, have been much more successful for the State than trials in rural areas. This is

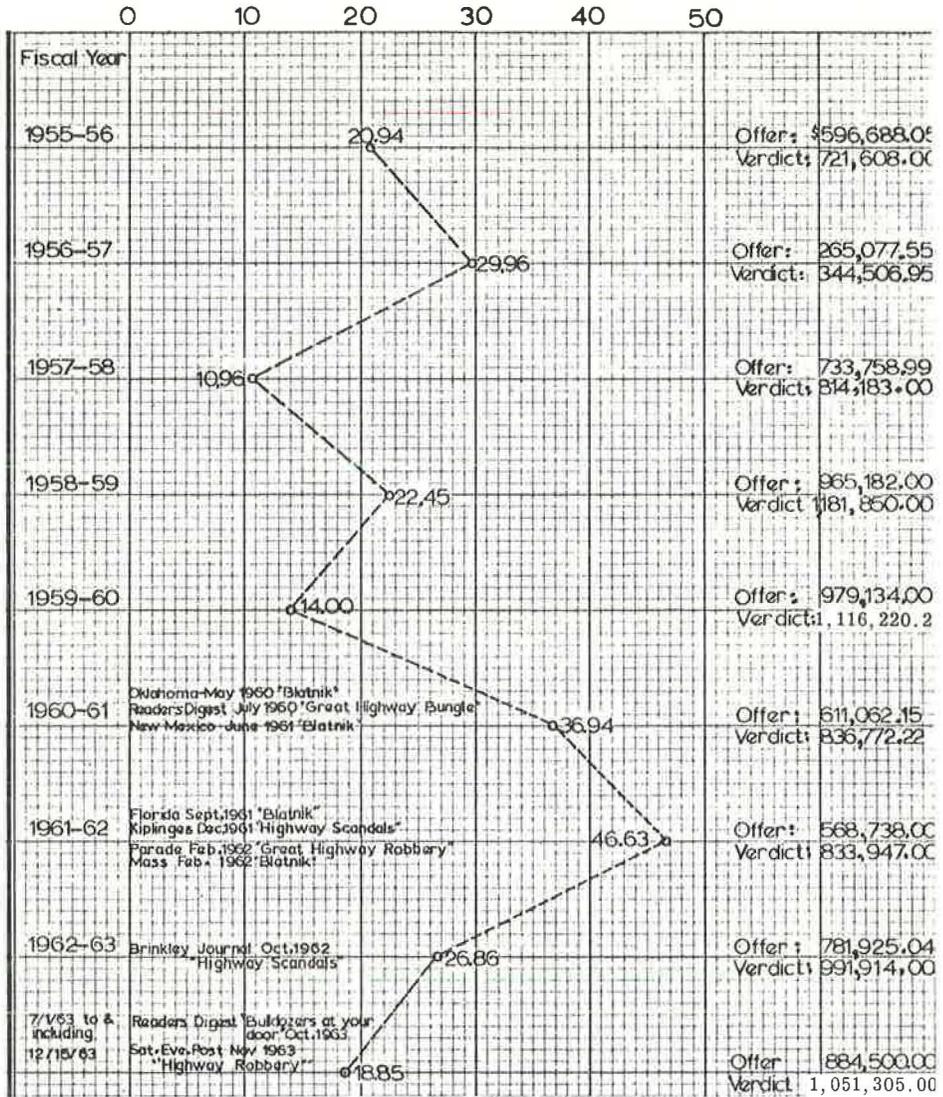


Figure 1. Percent of increase, verdicts in excess of State's highest proposal of settlement.

TABLE 1
SUMMARY OF CONDEMNATION CASES IN OREGON

Date	Total Cases (No.)				Condemnation Cases Tried ^a					Negotiated Cases	
	Filed	Tried	Settled	Pending	No.	Offer (\$)	Demand (\$)	Verdict (\$)	Attorney Fees (\$)	No.	Consideration (\$)
7-1-55 - 6-30-56	203	67	61	189	49	596,688.85	1,218,236.30	721,608.00	70,041.00	966	3,410,955.00
7-1-56 - 6-30-57	232	84	109	283	69	265,077.55	635,506.95	344,506.95	36,434.00	1,066	3,874,499.00
7-1-57 - 6-30-58	257	98	152	288	77	737,758.99	2,342,086.00	814,183.00	76,962.50	789	3,124,083.00
7-1-58 - 6-30-59	330	124	157	338	110	965,182.00	1,962,306.40	1,181,850.00	88,035.00	999	7,597,656.00
7-1-59 - 6-30-60	122	104	153	203	96	979,134.00	2,645,732.75	1,116,220.27	96,815.00	829	5,740,527.00
7-1-60 - 6-30-61	307	98	190	222	77	611,062.15	1,447,734.52	836,772.25	42,036.00	1,215	6,436,631.00
7-1-61 - 6-30-62	333	91	204	260	71	568,738.50	1,714,878.00	833,947.00	57,505.00	1,175	6,467,288.00
7-1-62 - 6-30-63	261	112	175	234	86	781,263.00	1,677,606.00	991,914.00	76,815.00	795	7,673,311.00
Total	2,045	778	1,201		635	5,504,925.04	13,644,086.92	6,841,001.47	534,643.50		

^aVerdicts above offers, \$1,336,076.13; demands above offers, \$8,139,161.83; demands above verdicts, \$6,803,085.45.

a reversal of the trend of the early 1950's. Verdicts in the Portland area since 1960 have averaged 5 to 10 percent greater than offers, whereas during the 1950's they averaged 17 to 20 percent greater than the offers. The change may be because the completion of the Banfield Expressway in Portland and Multnomah County (of which Portland is the county seat) rather vividly demonstrated to the populace at large that the nearness of this segment of the Interstate did not, in fact, reduce property values as then contended by every defense attorney. In fact, subsequent developments proved just the opposite. Eventually this fact found its way into the jury box and the oracles of doom lost a strong argument.

In all counties except one or two, which perhaps suffer a little from provincialism, there is very little or no appreciable trend either up or down. Even a knowledgeable and understanding jury will be influenced by their beliefs and prejudices. It appears that many of the adverse decisions are the result of wide dissemination of public information about highway departments, most of which has been derogatory, to say the least.

Whereas it may not be indicative, it is at least an unusual coincidence that the highest percentages of increase in verdicts occurred during the time of the unmerited degradation of the State highway departments through national publications. For instance, the percentage increase in verdicts was almost 37 percent during fiscal 1960-1, the period when the Blatnik Committee hearings on Oklahoma and New Mexico were made public and in which the Reader's Digest article on the "Great Highway Bungle", which had wide circulation, was published. Fiscal 1961-2 was even worse. It was during this period that the Blatnik Committee released its findings of the Florida and Massachusetts hearings. It was also during this period that the Kiplinger and the Parade magazine articles on highway scandals found their way into millions of homes throughout the land. The percentage of increase was then 46.6 percent, which is the highest they have ever been in the State's history. Presumably the juries' reaction was that if Highway Department employees were going to pay favored contractors for shoddy work, or split fees over fraudulent right-of-way deals, it would be best to give landowners more generous treatment.

The last fiscal period, 1962-3, saw a rather pronounced reduction in the trend even though it was during this period that the Brinkley Journal was televised. Since his disclosures in October 1962, the press and committee hearing results have been somewhat quiet and the increase over offers dropped to 26.8 percent. Perhaps Mr. Brinkley's Journal was a little anticlimatic and did not have the effect of the former writings. People tire of the sensational on a given subject after they have been saturated with it, unless it deals with a subject similar to the Christine Keeler exposé.

One conclusion that can definitely be drawn is that, for a while at least, improper or criminal activities on the part of highway officials and employees do find receptive ears and do find their way into the jury box.

Another factor, which most active trial attorneys recognize, concerns the jury panel as a group. Most juries can be categorized as a plaintiff or defendant jury. People, as a rule, are either conservative or liberal in their approach to a problem. The NACA is cognizant of this, as are its counterparts in defense of claims. Given a new jury panel and two or three emphatic verdicts, plaintiff or defendant, a rush to settle, or a pugnacious tightening up on the part of one or the other, can be seen. It has long ago been discovered that the State highway department fares much better before a defendant's than before a plaintiff's jury. In name, the State is the plaintiff, but in actuality, it is in the same position as the defendant.

A word about provincialism might not be amiss. One county in Oregon is rather remote and isolated from the other counties. The people appear to be clannish. Population is sparse and tillable land is at a premium. Many of these properties are still held by the same families who received the original grant or patent from the United States Government. Most people are acquainted with or know of each other and, consequently, it is almost impossible to secure a jury that does not know of, or have some opinion about, the highway department and the earlier condemnation cases. The new highway traverses a comparatively narrow area lying between the coast range mountains and the ocean.

The county took a dim view of the location because a rather large proportion of good

taxable land was taken from the tax rolls. This feeling found its way into the county's only weekly newspaper, whose editorials were not designed to popularize the highway. For 10 yr, the highway department has been endeavoring to convince juries of land values being testified to by competent and capable real estate appraisers brought in from neighboring counties because local appraisers could not be secured. Some of the local appraisers feel property values are considerably higher than the State thinks they are, and one or two others forthrightly say that to testify for the State would be detrimental from a business standpoint and they could not afford to accept the assignment.

A review of the cases tried in this county during the past 10 yr shows that increases over offers consistently hover between 50 and 150 percent. The problem has not yet been solved, but because construction is nearing an end in that area, perhaps the question will be moot for another decade or so.

Jury verdicts will never be constant. There are too many elements which seem to influence and sway juries in their deliberations. They may take a dislike to one of the parties, or his attorney. The witnesses on one side or the other may irritate them. They may be in a hurry to get home. They may have harvesting to do. They may not feel well. They may not fully understand the case. There may be any number of imponderables which will cause them to compromise in one direction or the other. These are matters that cannot be documented, but only conjectured.

In endeavoring to analyze or evaluate jury verdicts, it may be well to consider the thinking of Hugo Munsterberg on the subject. In "The Mind of the Jurymen," he suggests that the more persons work together, the less every single man can reach his highest level of thinking in the search for the truth. They become a mass with mass consciousness, a kind of a crowd in which each one becomes over-suggestible. He feels that in such a situation each person thinks less reliably, intelligently, and impartially than by himself alone; they are then like any other crowd that can be thrown into panic, or can rush into some foolish, violent action. When such happens, the individual is no longer judging for himself. He did have a good word for the ladies, however. He believes that the woman generally remains loyal to her instinctive opinion. This certainly contrasts with the general idea that a woman easily changes her mind. She may change it, but others cannot.

Mr. Munsterberg concludes that all results show it is really the argument in the jury room that brings cooperating groups nearer the truth rather than seeing how the other man votes. Perhaps this explains why the understanding jury will generally come up with the right answer and why there is shock when a jury runs wild.

AUTHOR'S NOTE:—Since preparation of this paper, another article has appeared in Reader's Digest (Oct. 1963), tantalizingly titled "Bulldozers at Your Door." It will be interesting to note which way the pendulum will swing this time, but perhaps no change will be noted.

The percentage figures of verdicts over offers have been brought up-to-date as follows:

July 1, 1963, to and including Oct. 31, 1963	
Highest proposal of settlement . . .	\$528,975
Verdicts	<u>\$666,565</u>
Difference	\$137,590

A slight reduction (about 1 percent) is indicated over fiscal 1962-3. This perhaps bears out the conclusions with respect to the effect the Brinkley report had, and only time will tell the effect of the latest article.

The Discovery Process in Highway Land Acquisition

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•LEGAL PHILOSOPHERS and practitioners have held different views with respect to the purpose of legal proceedings. Legal practice has been considered by some to be a substitute for "trial by battle," a medieval institution from which has evolved a more refined adversary procedure. To others, adversary practice has represented the only way to settle a dispute with the most efficient counsellor and the most telling presentation of facts at his command able to persuade effectively the arbiter, court, or jury.

This attitude toward adversary procedure when related to another of the substantive and philosophical goals of the legal process, to do justice or to pay fair compensation as in the field of land acquisition, has resulted in a gradual reduction in the opposition process. This has been accomplished through attempts at pretrial conferences and discovery procedures, which are judicial processes to reveal pertinent information to opponents before trial, as well as other legal mechanics. One objective of these mechanics, of course, is to reduce the courtroom drama.

PROCESS AND PROCEDURE

Of particular significance to agencies concerned with public works programs is land acquisition and its courtroom efforts. About 10 percent of highway land acquisitions culminate in trial. In the normal process of trial, of course, standard rules of evidence apply, but even these evidentiary rules, accepted over the years, have resulted in erecting various adversary barriers against a complete exchange of information between litigants.

A new area of legal effort has been created by the acceptance of the Federal Rules of Civil Procedure¹ and the discovery rules included therein. Discovery rules are applicable to every substantive field of civil law, including eminent domain proceedings. As a result, these rules have affected the statutory and the case law of eminent domain. In some respects, discovery meets different problems in this field. For in condemnation, sovereignty and public interest are involved. Should the exchange of information be the same in these cases as in other types of litigation? Are States and the Federal Government reachable by discovery to a greater extent than private citizens? Does the application of discovery rules to the field of eminent domain and experts such as appraisers introduce a new dimension to the problem which makes it necessary for public personnel to be more painstakingly file conscious than they otherwise would need to be?

The nature of discovery rules raises considerable concern on the part of both private and public litigants as to the contribution of the process to the fairness of courtroom proceedings. Public officials, at both the Federal and State levels have been concerned with the possibility that inadequate data will be disclosed; others have been concerned that the secrecy of trial preparation will be disturbed; all are of specific concern and quite distinct from broader questions such as executive privilege or policy.²

Paper sponsored by Committee on Land Acquisition and Control of Highway Access and Adjacent Areas.

¹Federal Rules of Civil Procedure, 28 U.S.C. (1938).

²Porter, P.A. "Release of Government Information in Private Litigation," *The Forum*, Nov. 1963, p. 15.

EVALUATION AND IMPLICATIONS

This paper seeks to evaluate the fundamental nature of this process of discovery in litigation and its significance in the land acquisition process for both parties. Implications drawn from this evaluation can then serve as a basis for legal counsel and right-of-way personnel in State highway departments and at other levels of government to develop adequate procedures (a) to counter the inordinate use of discovery rules against State highway departments and the Federal Government in eminent domain cases and (b) to encourage its use where relevant to a determination of fair compensation for the property owner.

Public improvement agencies are intimately involved in land acquisition. The Federal-Aid Highway Act of 1956, for instance created at one fell swoop a tremendous land acquisition program for both the Federal Government and the individual States. It is anticipated that more than 750,000 individual parcels of land will have been acquired by 1972 for the National System of Interstate and Defense Highways alone at a cost of almost \$7 billion. The ABC system of highways will probably affect twice this number of parcels by the same date.³ Various other public improvement programs including urban renewal, housing, reclamation, and flood control also are involved in such proceedings.

Individual governmental units at the local and State levels and Federal governmental units may be engaged in litigation arising from the exercise of their eminent domain powers at any time. Many of these units are concerned with the applicability of general evidentiary rules to right-of-way acquisition and litigation. Questions regarding discovery of expert witness materials, appraisal records, appraiser names, or evidentiary reports, and data, have recently come forward in right-of-way litigation as these cases have accelerated in number.

THE DISCOVERY PROCESS

Nature of Discovery

Discovery may be considered a judicial process conducted before an actual trial according to certain rules of procedure as adopted by the courts or legislature of a particular jurisdiction and overseen by the judge of the court in which the action is pending. The basic purpose of this process is to furnish pertinent information to one adverse party which the other party may have in his possession or control.⁴

Modern discovery procedures may be conveniently dated by the inception of the Federal Rules of Civil Procedure in the U. S. District Courts on Sept. 16, 1938. The idea of discovery, however, is much older; it originated in the early equity courts as the bills of discovery,⁵ as well as in some of the early code States such as California and New York. The purpose of the bill was to enable the party to prove his own case, not to disprove the case of his adversary.⁶ This same criterion has been set by the courts today.

The Federal Rules, for example, provide for discovery and pretrial procedures in Rules 16, 26 to 37, and 45. Appendix A is a compilation of the rules highlighted in this paper. The Federal courts and all 50 States have some provision for discovery procedures; most States have adopted either the Federal Rules per se or have very similar statutory provisions for deposition and discovery procedures (Appendix C).

Each of the rules cited is interrelated and must be construed together.⁷ This principle is particularly true in those States which have adopted the Federal Rules or have substantially the same provisions.⁸ Discovery by means of written or oral interrogatory,

³Goldstein, "Economic Evidence in Right-of-Way Litigation," 50 Geo. L. J. 205 (1961).

⁴27 C.J.S. §20 (1959).

⁵Id. §1.

⁶Nashville, Chattanooga & St. Louis R.R. v. T.S. Jenkins & Son, 276 S.W. 1, 53 A.L.R. 814 (1927).

⁷Taine, "Discovery of Trial Preparations in the Federal Courts," 50 Colum. L. Rev. 1041 (1950).

⁸South Dakota is an exception. *Bean v. Best*, 76 S.D. 462, 80 N.W. 24 565 (1957), each part of the discovery rules interpreted separately and the scope determined accordingly.

deposition, or production of documents or other tangible things is not limited to the specific provisions of Rules 26 to 37, but through an understanding of these rules as well as Rules 16, 45(a) and 45(d) as one interrelated process. In many ways pretrial procedures and discovery procedures are synonymous.

Federal Rule 16 provides for a pretrial conference to consider:

1. Simplification of issues;
2. Necessity or desirability of amendments to the pleadings;
3. Possibility of obtaining admissions of fact and of documents which will avoid unnecessary proof;
4. Limitation of the number of expert witnesses;
5. Advisability of a preliminary reference of issues to a master for findings to be used as evidence when the trial is to be by jury; and
6. Such other matters as may aid in the disposition of the action.

Thirty-seven States and the District of Columbia presently have some provision for pretrial conferences (Appendix C). The majority of these State jurisdictions have followed the provisions of Federal Rule 16 verbatim. In California, Connecticut, Iowa, Maryland, North Carolina and New Jersey, the scope of the pretrial conference has been expanded to specifically include matters not included under the Federal Rule. The applicable rule in the 1962 Code of Iowa is a good example of such expansion (Appendix B).⁹ New York, however, is among those States which make no provision for a pretrial conference.¹⁰

The purpose of the pretrial conference and procedure has been described in various ways, but the majority of these explanations appear to arise from the cited six considerations listed in the text of Federal Rule 16. All States having pretrial provisions list similar considerations. The proper application of discovery includes the use of Rule 16, as well as the deposition and discovery procedure¹¹ coupled with the subpoena power.¹²

Inasmuch as land acquisition involves the use of technical terms and expert witnesses, pretrial procedures tend to reduce the amount of trial preparation and court time required.¹³ Thus, discovery can be used to simplify the issues before the actual trial, to arrive early at a "fair market value" through the use of appraisal reports and taking of depositions of appraisers and other qualified "expert witnesses," and to thus satisfy the constitutional requirement of just compensation. The purpose of pretrial preparation is not to harass the adverse party or merely to uncover the mistakes or weaknesses of the opponent, but to balance the interests of both parties so that the proceedings may be expedited.¹⁴ The possibility of settlement is greatly increased, unnecessary expense to the parties may be eliminated, fair treatment may be given to both the landowner and the condemner. Thus, the problem of crowded court dockets might be alleviated.

Concerning the advantages of pretrial, it has been said that:

Pretrial is now generally considered one of the accepted means of obtaining "the fullest possible knowledge of the issues and facts before trial." It and the whole system of discovery help us "find the truth," and that is what a lawsuit is intended to do under our system of justice under law.¹⁵

⁹2 Iowa Code 1962, R. Civ. P. §136.

¹⁰1 Barron & Holtzoff, Fed. Prac. & P. §9.33 (1962 Pocket Part). Nor do Mississippi, Nebraska, New Hampshire, Ohio, Oregon, Rhode Island, South Carolina and Tennessee have statutory provisions for a pre-trial conference, though pre-trial conference may exist as a matter of judicial practice.

¹¹Fed. R. Civ. P. 26-37.

¹²Fed. R. Civ. P. 45.

¹³Levin, "Pretrial Practices in Condemnation Cases," Legal Affairs Committee Ann. Meeting, AASHO (Dec. 1960); Allen, "The New Rules in Arizona," 16 F.R.D. 191 (1955).

¹⁴Lester v. People, 150 Ill. 408, 23 N.E. 388 (1890). As to the contemporary problem of crowded court dockets see Banks, L., "The Crisis in the Court," Fortune, Dec. 1961, p.86.

¹⁵Yankwich, "Crystallization of Issues by Pre-Trial: A Judge's View," 58 Colum. L. Rev. 470 (1958).

Consideration of the implications of pretrial and discovery procedure, particularly in recent land acquisition proceedings, has been discussed on a number of recent occasions.^{16, 17, 18}

Although the Federal Rules of discovery had been used in land condemnation litigation with some confusion since their inception, they were made applicable to land condemnation in 1951 by direct provision in Rule 71A (Appendix A). Before adoption of this provision, procedure in Federal courts suffered from a lack of uniformity in the applicability of Federal statutes to condemnation procedures. Rule 71A(a) represents an effort to provide uniformity.¹⁹ Accordingly, it has been held that discovery is available in condemnation proceedings.²⁰ The feeling was recently expressed that all opinions in condemnation cases before the adoption of this rule were mere dicta.²¹

Alaska, California, Delaware, Kentucky, Maryland and Missouri have adopted provisions similar to the Federal Rule.²² In relating discovery practice to condemnation cases, Illinois passed the Civil Practice Act of 1956 which made the rules of discovery, including sanctions, appropriate in condemnation cases.²³ Other States which have recently adopted the Federal Rules or a similar version have not adopted Rule 71A, but they have recognized that section and reserved it for future legislation. This fact, together with recent court interpretations favoring liberal construction²⁴ of their rules following the spirit of the Federal Rules, indicates that the use of discovery in condemnation cases is a new and growing combination of procedural and substantive law.

Scope of Examination

The specification of the unity of pretrial and discovery practice and the reference in the Federal Rules and elsewhere to the use of this practice in condemnation indicates a public policy in favor of discovery in general. But such a policy has various limitations.

Very often the condemnor, a public agency, is concerned with the confidentiality of its internal materials which may have usefulness in a particular trial. A State highway department, for instance, may have gathered, in preparation for condemnation proceedings, appraisal reports prepared by an expert in anticipation of litigating the issue of "just compensation." Similarly, the opinion of the appraiser, the factual material gathered as to the value of the land taken, as well as the highest and best use of the remainder parcel are items that might be best to hold until trial; there may be an absolutely senseless and incompetent matter that is in the files of the agency but being poorly drawn, should not be exposed to public scrutiny. On the other hand, the condemnee may wish to obtain such information feeling that it would make the best case for him, and, in fact, the success or failure of a case may sometimes hinge on the pre-trial discovery stage despite the courtroom expertness of the attorneys.

¹⁶Naftalin, "Pretrial Practice in State Condemnation Cases for Highway Purposes," *HRB Bull.* 294, p. 15 (1961). See additional references in the recent *Ann. Rept.* (1962, 1963) of the Comm. on Condemnation and Condemnation Procedure of the Am. Bar Ass'n.

¹⁷Buscher, "Pre-Trial Discovery Tactics," *HRB Spec. Rept.* 76, p. 78 (1962).

¹⁸Holloway, J. P., "Use of Pre-Trial Discovery Rules in Eminent Domain," *Proc.*, WASHO (1962). Also the California Law Revision Commission has directed a recent Study concerning Pretrial Conferences and Discovery in Eminent Domain Proceedings.

¹⁹3 *Barron & Holtzoff, Fed. Pract. & P.* §1516 (1958).

²⁰*United States v. 1,278.83 Acres of Land, More or Less*, 12 F.R.D. 320 (E.D. Va. 1952).

²¹*State ex rel. Willey v. Whitman*, 91 *Ariz.* 120, 370 P.2d 273 (Sup. Ct. 1962).

²²*Alaska R. Ct. P. & Admin.* 72(a) (1963); *Cal. R. P.* §1262; *Del. Code A, Sup. Ct. R. Civ.*, 71A (Cum. P.P. 1962); *Ky. Rev. Stat.* §177.081(4) (eff. June 19, 1952); *Md. R. Civ. P.* U12 (unann. ed. 1963); *4 Mo. R.S.* 1959, *Sup. Ct. R.* 86.01.

²³Corboy, "Discovery Practice—Documents, Tangible Articles, Real Estate," 3 *U. Ill. L.F.* 797 (1959).

²⁴*Arkansas State Hwy. Comm'n v. Stanley*, 353 S.W.2d 173 (1962); *Shell v. State Rd. Dep't*, 135 So. 2d 857 (Fla. 1961); *State ex rel. Reynolds v. Circuit Ct.*, 15 *Wis.* 2d 311, 112 N.W.2d 686 (1961); *Power Authority v. Kochan*, 216 N.Y.S.2d 8 (Sup. Ct. 1961).

The limits of examination by deposition and discovery for cases pending in the U. S. District Courts are set forth in Rule 26(b) of the Federal Rules (Appendix A). Whereas this rule reads as though it defines the scope of depositions, it has also come to be recognized as setting forth the limits for the entire discovery procedure.

A number of States have adopted Rule 26(b) without any substantial additions or deletions (Appendix C). Three States²⁵ have adopted it with the exception of the last sentence. Seven States²⁶ have added to their comparable Rule 26(b) a proposed amendment²⁷ to the Federal Rules which was not adopted by the U. S. Supreme Court. In addition, two other States²⁸ have made certain other additions to their version of Rule 26(b).

Under Rule 26(b) the examination is not limited to a party to the action but is permitted to be made of any person having knowledge of relevant, unprivileged facts. When a deposition is sought to be taken, no distinction is made between a party and a mere potential witness. This is quite different from the situation under Rules 33 and 34 (Appendix A), in which only the adverse party may properly be examined.

DISCOVERY AND LAND ACQUISITION

Explanation of "Any Matter," "Not Privileged"

One of the most troublesome areas of the discovery rules with regard to land acquisition involves the determination of the proper scope of examination as to subject matter. Any matter, not privileged, which is relevant to the subject matter of the pending action is properly discoverable according to Rule 26(b). The courts, however, have been far from unanimous in their delineations of the scope of discovery, especially in the interpretation of the meaning of "any matter."

The most significant point in this regard, especially for appraisal records in land acquisition cases, is the distinction between "fact" and "opinion." Although no such distinction is made in the rules, the courts have interpreted Rule 26(b) as if there were.

Before making a decision as to whether the material sought constitutes fact or opinion, the extent to which one party must divulge "the identity and location of persons having knowledge of relevant facts" is determined. Discovery of such persons is specifically provided for under Rule 26(b).²⁹ The court must decide whether the person taking the deposition is actually seeking the identity of persons having knowledge of relevant facts, or whether he is attempting to secure a list of the witnesses his opponent intends to call at the trial. There is a division of authority on this latter point.

Apparently "it is permissible under Rule 26(b) to inquire into the identity and location of persons having knowledge of relevant facts, for the purpose of discovery. This provision must not be confused with an attempt to secure a list of witness whom the adverse party intends to call at the trial, however."³⁰ In a number of other cases discovery was similarly denied where the object was simply a list of witnesses to be called.³¹

One court has ruled that a showing of some special circumstances will justify non-adherence to the general rule prohibiting discovery of witnesses.³² On the other hand,

²⁵ Illinois, South Dakota, Tennessee.

²⁶ Idaho, Maryland, Minnesota, Missouri, New Jersey, Washington, and West Virginia.

²⁷ See discussion of proposed Amendment following.

²⁸ California and Maryland.

²⁹ *Aktiebalaget Vargas v. Clark*, 8 F.R.D. 635 (D.D.C. 1949); *Fidelis Fisheries v. Thorden*, 12 F.R.D. 179 (S.D.N.Y. 1952); *Frankel v. Sussex Poultry Co.*, 71 A.2d 754 (Super. Ct. Del. 1950).

³⁰ *Aktiebalaget Vargas v. Clark*, 8 F.R.D. 635 (D.D.C. 1949).

³¹ *Fidelis Fisheries v. Thorden*, 12 F.R.D. 179 (S.D.N.Y. 1952); *United States ex rel. TVA v. Bennett*, 14 F.R.D. 166 (E.D. Tenn. 1953); *Ex parte Wood*, 253 Ala. 375, 44 So. 2d 560 (1950); *Frankel v. Sussex Poultry Co.*, 71 A.2d 754 (Super. Ct. Del. 1950); *Ex parte Driver*, 255 Ala. 118, 50 So. 2d 413 (1951); *Huntress v. Tucker*, 104 N.H. 270, 184 A.2d 562 (1962).

³² *Wilson v. Canyon*, 120 N.Y.S.2d 638 (Suffolk County Ct. 1953).

disclosure of witnesses has been ordered by some courts.³³ New Hampshire, for example, in a personal injury action ordered disclosure of a list of names and addresses of witnesses, ruling that those witnesses were not the exclusive property of either party, and that in the interest of justice their testimony should be introduced in the action.³⁴

Whether or not the names of witnesses must be disclosed has an important bearing on land acquisition cases, because many of the witnesses to be called will be appraisers and other persons having expert knowledge of the subject matter. Consequently, those persons having knowledge of relevant facts will quite often coincide with the witnesses to be called at the trial. To compel disclosure in accordance with Rule 26(b) would often violate the provision denying discovery of the names of potential witnesses. Once the appraiser's identity had been disclosed, he would be subject to the full range of the discovery procedure as to his knowledge of the property. The cases have generally held that the condemnor could refuse to answer interrogatories seeking the names, addresses, and positions of persons who had aided in compiling the appraisal data.³⁵

New Jersey, recognizing this problem and attempting to protect the expert witness, amended their Rule 26(b) in 1955. The amendment states:

A party may require any other party to disclose the names and addresses of proposed expert witnesses; except as provided in R.R. 4:25-2, such disclosure shall be solely for the purpose of enabling the party to investigate the qualifications of such witnesses in advance of trial.³⁶

In 1960, New Jersey handed down an interpretation of its rule. In a personal injury action, the plaintiff was required to disclose the name and address of his expert witness, but the defendant could not take the deposition of the expert as to facts within his knowledge on the theory that the expert was a person having knowledge of relevant facts.³⁷ In arriving at this decision, it found that the language of the rule was clear and interpreted the word "solely" in a literal fashion. By analogy, this would indicate a policy of protecting the work of an appraiser from discovery, even though the appraiser's name must be disclosed.

There is also some discrepancy as to whether information which is known or is equally available to the interrogator is discoverable. One position is that the interrogator is not limited to facts exclusively or peculiarly within the knowledge of the adverse party, even where the interrogator has at his disposal an adequate or even better source of information.³⁸ As recently as 1959, however, in a condemnation proceeding, California held that although there was no valid objection to the discovery of relevant, unprivileged factual data, discovery would be denied because the data were readily available to the defendant by other means.³⁹

On the other hand, some States have adopted, by statute, a more liberal approach and have tried to remove some of the uncertainty surrounding the proper scope of examination. Thus, New Jersey⁴⁰ and Idaho⁴¹ have added a sentence to their rules governing the scope of examination which reads: "Nor is it ground for objection that the examining party has knowledge of the matters as to which testimony is sought." In compelling discovery of matters already within the knowledge of the interrogator, the ratio-

³³Reynolds v. Boston & Maine Transp. Co., 98 N.H. 251, 98 A.2d 157 (1953); Unger v. Los Angeles Transit Lines, 4 Cal. Rep. 370 (Dist. Ct. App. 1960).

³⁴Reynolds v. Boston & Maine Transp. Co., 98 N.H. 251, 98 A.2d 157 (1953).

³⁵Hickey v. United States, 18 F.R.D. 88 (E.D. Pa. 1952); United States ex rel. TVA v. Bennett, 14 F.R.D. 166 (E.D. Tenn. 1953); United States v. 7,534.24 Acres of Land, 18 F.R.D. 146 (N.D. Ga. 1954); United States v. 6.82 Acres of Land, 18 F.R.D. 195 (D.N.M. 1955); United States v. 19.897 Acres of Land, 27 F.R.D. 420 (E.D.N.Y. 1961); United States v. 900.57 Acres of Land, 30 F.R.D. 512 (W.D. Ark. 1962).

³⁶N.J. Rules 4:16-2.

³⁷Kusner v. Howard S. Stainton Co., 59 N.J. Super. 93, 157 A.2d 154 (1960).

³⁸Onofrio v. American Beauty Macaroni Co., 11 F.R.D. 181 (W.D. Mo. 1951).

³⁹United States v. Certain Parcels of Land, 25 F.R.D. 192 (N.D. Cal. 1959).

⁴⁰N.J. Rules 4:16-2.

⁴¹Idaho R. Civ. P. 26(b).

nale sometimes used by the courts is that a party is entitled to elicit such information for the purposes of cross-examination, or for the purpose of impeaching the credibility of the witness at the trial. The converse reasoning is that it constitutes an invasion of the "work product" of an expert or attorney, or that it would give to one party a "free ride" and promote laziness.

With regard to the discoverability of matter which one party intends to use as evidence in establishing his case, it has been held that the moving party cannot be allowed to pry indiscriminately into the opponent's case to ferret out evidence by which the case will be proved.⁴²

Furthermore, matters are discoverable if they are not privileged. The uncertainty surrounding the concept of "privilege" makes it so significant in land acquisition cases where the expert witness is so important. Thus, information gathered by an appraiser in preparation of a land acquisition proceeding has been held to be privileged matter,⁴³ which need not be disclosed either at the time discovery is sought or at the trial; but this is by no means a unanimous holding. Attempts have been made to place such reports within the scope of the immunity set forth in the landmark Hickman Case,⁴⁴ whereas other courts have rejected such an interpretation. The Hickman case is invariably the basis for the reasoning of the Federal courts, whereas a number of State courts rely on the amendment proposed to the Supreme Court in an effort to limit the scope of the examination and to protect a party's expert witness from the necessity of disclosing information.⁴⁵

As enacted by Idaho, the amendment reads as follows:

The deponent shall not be required to produce or submit for inspection any writing obtained or prepared by the adverse party, his attorney, surety, indemnitor, or agent in anticipation of litigation and in preparation for trial unless the court otherwise orders on the ground that a denial or production or inspection will result in an injustice or undue hardship; nor shall the deponent be required to produce or submit for inspection any part of a writing which reflects an attorney's mental impressions, conclusions, opinions or legal theories, or, except as provided by rule 35, the conclusions of an expert.⁴⁶

Although the amendment does not mention any privilege which is to attach to the writing of any of the enumerated persons, some courts have read it as if a privilege were granted.

A third major area of disagreement as to the scope of examination concerns that sentence of Rule 26(b) which states that "It is not ground for objection that the testimony will be inadmissible at the trial if the testimony sought appears reasonably calculated to lead to the discovery of admissible evidence." The Federal courts, in accordance with the policy of liberal construction of the Rules, allow a wide range of discovery in this regard, and discovery is permitted of what might normally be regarded inadmissible evidence.

South Dakota, which has adopted a substantial portion of the Federal discovery procedure but has not included that sentence in Rule 26(b), has developed the unique position that the discovery rules are to be interpreted individual as to scope.⁴⁷ Another jurisdiction has recently restricted discovery to the bounds of the trial itself regarding evidence.⁴⁸ On the other hand, New Hampshire, while not adopting the Federal Rules, has

⁴²Smith v. American Employers' Ins. Co., 102 N.J. 530, 163 A.2d 40 (1957).

⁴³City of Chicago v. Harrison-Halsted Bldg. Corp., 11 Ill. 2d 431, 143 N.E.2d 40 (1957).

⁴⁴Hickman v. Taylor, 329 U.S. 495 (1947).

⁴⁵Idaho, Illinois, Iowa, Kentucky, Louisiana, Maryland, Minnesota, Missouri, Nevada, New Jersey, Pennsylvania, Texas, Utah, Washington and West Virginia have adopted similar amendments to their comparable rules 26(b), 30(b) or 34.

⁴⁶Idaho R. Civ. P 26(b). Compare to Kentucky version in Appendix D.

⁴⁷Bean v. Best, 76 S.D. 462, 80 N.W.2d 565 (1957).

⁴⁸Wright v. Philadelphia Transp. Co., 24 D.&C.2d 334 (Pa. 1961).

held that the liberal interpretation given to the rules allows evidence to be discovered, although it may be inadmissible at the trial.⁴⁹

Relevancy

The development of Rule 26(b) through court interpretations has led ultimately to the establishment of "relevancy" as the basic criterion for determining the scope of a discovery examination. Relevancy is not generally to be equated with "relevant" as ordinarily used in the admissibility of evidence. Rather, the relevancy of the subject matter is the test, and subject matter is broader than the precise issues presented by the pleadings.⁵⁰ Elsewhere the real test is considered to be whether an answer would serve any substantial purpose, either in leading to evidence or in narrowing the issues.⁵¹

With such a vague definition of relevancy, control of the discovery procedure in effect rests with the discretion of the court. For example, the discovery of documents was denied in a recent action under the Federal Tort Claims Act, because a "minimal showing of general relevancy and no more" was not considered sufficient good cause for compelling disclosure.⁵² Besides the several restrictions incorporated into Rule 26(b) itself, there are provisions in the subsequent rules that vest the courts with the authority to issue protective orders for the benefit of the deponent.

Rule 30(b) sets forth a number of specific orders which the court may issue at its discretion on a showing of "good cause" by the person to be examined. It is also provided that "the court may make any other order which justice requires to protect the party or witness from annoyance, embarrassment, or oppression." With this broad power, a court can substantially control the scope of the discovery procedure.

Good Cause

In keeping with the policy that all rules for discovery are to be read in *pari materia*, these protective provisions were specifically incorporated into Federal Rules 31, 33, and 34, thereby giving the courts wide discretion in every aspect of the discovery procedure.

It is worth noting that Rule 30(b), which concerns depositions on oral examination, requires a showing of good cause by the deponent before one of the restrictive orders will be issued. The courts have generally interpreted this as implying that depositions may be had as a matter of right, and that they can only be denied for good cause shown. Inasmuch as the rules are to be liberally construed to effect a greater measure of discovery, the courts quite naturally have shown some reluctance in issuing any orders that would narrow the scope of the examination and inhibit the discovery procedure.

Rule 33, providing for interrogatories to parties, permits any party to "serve upon any adverse party written interrogatories to be answered by the party served or, if the party served is a public or private corporation or a partnership or association, by any officer or agent, who shall furnish such information as is available to the party."

Both the scope of examination of Rule 26(b) and the restrictive provisions of Rule 30(b) are applicable to interrogatories. As was the case under Rule 30(b), the serving of interrogatories to be answered by an adverse party is considered by the courts to be a matter of right; therefore, a protective order will be granted by the court only on a showing of good cause by the party interrogated.

In some condemnation cases, objections have been made to certain interrogatories propounded in accordance with Rule 33. These objections were overruled because the purpose was no more than to ascertain the existence of documents supplied to the appraisers.⁵³ Similarly, discovery was also permitted where the moving party sought a

⁴⁹McDuffy v. Boston & Maine R.R., 102 N.H. 179, 152 A.2d (1959).

⁵⁰Kaiser-Frazer Corp. v. Otis & Co. 11 F.R.D. 50 (S.D.N.Y. 1951); Rediker v. Warfield, 11 F.R.D. 125 (S.D.N.Y. 1951); Broadway & Ninety-sixth St. Realty Co. v. Loew's, Inc., 21 F.R.D. 347 (S.D.N.Y. 1958).

⁵¹Territory v. The Artic Maid, 135 F. Supp. 164 (D. Alaska 1955); American Oil Co. v. Pennsylvania Petroleum Prod. Co., 23 F.R.D. 683 (D.R.I. 1959).

⁵²United Airlines, Inc. v. United States, 26 F.R.D. 213 (D. Del. 1960).

⁵³United States v. 62.50 Acres of Land, 23 F.R.D. 287 (N.D. Ohio 1959).

list of the sales of properties which might have been or should have been considered in reaching an evaluation of the property.⁵⁴

THE WORK PRODUCT, AN EXTENSION OF PRIVILEGE

Most litigation involves matters of evidence that are solely within the knowledge of the individual attorneys. These develop as part of the trial preparation and in pursuit of the confidential relation between attorney and client. Names of witnesses, testimony, and individual statements of fact make up the record of an attorney for trial presentation. In this respect, courts have tended to expand the privilege of attorney-client to various work papers that are required for the case. Yet, how far does this privilege extend? Should it include all documents and facts within the knowledge of experts or other witnesses to be called? Or is there some way of disengaging the attorney's work papers from those of witnesses? And does this negate the attorney-client privilege?

This subject has been discussed fully in the recent literature because of a 1947 case which answered many questions and raised a number of others. The interpretations of these additional points have provided the rationale for both Federal and State interpretations of these issues.

Hickman v. Taylor

The landmark Hickman case arose as the result of an accident involving the sinking of a tugboat. After the claim had arisen, but before the action was instituted, the plaintiff's attorney filed numerous interrogatories on the defendant under Rule 33. One interrogatory inquired whether any oral statements of members of the crew were taken in connection with the accident, and requested that exact copies of all such statements be attached and that the defendant set forth in detail the exact provisions of any such oral statements or reports. The defendant refused and was held in criminal contempt by the District Court, which permitted discovery⁵⁵ on the rationale that discovery of all matters relevant to a suit should be allowed to the fullest extent consistent with orderly and efficient functioning of the judicial process, and that the mere fact that statements of third parties have been taken by the attorney does not of itself give rise to the traditional privilege accorded to communications between attorney and client.

The Court of Appeals reversed the District Court and coined the concept of the "work product of the attorney."⁵⁶ This concept represented a new extension of the traditional privilege afforded to the attorney-client relationship by United States courts, though it was already firmly rooted in English law.⁵⁷ The Supreme Court⁵⁸ rejected the extended privilege theory but accepted the new category of work product on a public policy basis and denied discovery of the material sought. As a result the continuing problem of the scope of the work product was initiated. The Supreme Court in Hickman spoke of this problem as "a problem that rests on what has been one of the most hazy frontiers of the discovery process."⁵⁹

⁵⁴United States v. 19.897 Acres of Land, 27 F.R.D. 420 (E.D.N.Y. 1961); In re Cross-Bronx Expressway, 82 N.Y.S.2d 55, 195 Misc. 842 (Sup. Ct. Bronx County 1948); Hewitt v. State, 216 N.Y.S.2d 615, 27 Misc. 2d 930 (Ct. Cl. 1960).

⁵⁵4 F.R.D. 479 (E.D. Pa. 1945).

⁵⁶Hickman v. Taylor, 329 U.S. 495, 511 (1947). Taine, "Discovery of Trial Preparations in the Federal Courts," 50 Colum. L. Rev. 1033 (1950).

⁵⁷Taine, "Discovery of Trial Preparations in the Federal Courts," 50 Colum. L. Rev. 1032 (1950).

⁵⁸Hickman v. Taylor, 329 U.S. 495 (1947).

⁵⁹Id. at 495, 514.

The Court qualified the work product category, and thus distinguished it from the absolute category of privilege with the following explanation:

We do not mean to say that all written materials obtained or prepared by an adversary's counsel with an eye toward litigation are necessarily free from discovery in all cases. Where relevant and non-privileged facts remain hidden in an attorney's file and where production of those facts is essential to the preparation of one's case, discovery may properly be had. . . . Were production of written statements and documents to be precluded under such circumstances, the liberal ideals of the deposition-discovery portions of the Federal Rules of Civil Procedure would be stripped of much of their meaning.⁶⁰

In other words, material sought to be discovered may be classified as the attorney's work product and still be discoverable, whereas any material which is "privileged" is per se nondiscoverable.

Necessity

The conditions on which work product material may be discovered are based primarily on a showing of necessity.⁶¹ Necessity, however, may be shown in a number of circumstances and cannot be specifically defined so as to provide a formula to determine when discovery will be permitted or denied.

"Good cause" is equivalent to necessity. It usually consists of a combination of need factors which justify discovery of what would otherwise not be discoverable. There is no all-embracing practical formula and definitions are of relatively little help.⁶²

Need factors have been predicated on such considerations as the demands of justice, the purpose for which the material is sought, whether or not it is essential to the litigation, whether or not it is otherwise available, and whether or not undue hardship would result if discovery were denied. Thus, the question of necessity becomes circuitous and rests ultimately on the discretion of the court for a determination.

The scope of the holding in the Hickman case is explicitly limited to include only the trial preparations of attorneys and does not include the work product of experts such as land appraisers, economists and realtors. The 1946 proposed amendment to the Federal Rules, discussed in a later section, was designed to provide for reports of experts. The Court, however, rejected the Advisory Committee's proposal and handed down the decision in Hickman, omitting experts and parties other than the attorney. In 1949, the vacuum was filled by an extension of the Hickman rationale in *Alltmont v. United States*,⁶³ an action against the U. S. Maritime Commission for personal injuries. The Court of Appeals reversed the District Court and held that it was improper to construe Admiralty Rule 31⁶⁴ as permitting the libellants, without any showing of good cause, to compel the respondent in answer to interrogatories to produce copies of written statements of prospective witnesses taken by its agents. In extending the Hickman rationale to include the attorney's agent, the court reasoned:

... We can see no logical basis for making any distinction between statements secured by a party's trial counsel and those obtained by others for the use of the party's trial counsel. In each case the statements are obtained in preparation for litigation and ultimately find their way into trial counsel's files for his use in representing his client at the trial.⁶⁵

⁶⁰Id. at 495, 511, 512.

⁶¹4 Moore, Fed. Prac., §26.23 at 1381 (2d ed. 1953).

⁶²Taine, "Discovery of Trial Preparations in the Federal Courts," 50 Colum. L. Re. 1063 (1950).

⁶³117 F.2d 971 (1949); cert. denied, 339 U.S. 967 (1950).

⁶⁴Admiralty R. 31 is the same as Fed. R. 33.

⁶⁵*Alltmont v. United States*, 177 F.2d 971, 976 (1949).

Consequently, the Hickman protection has been extended to include agents other than the attorney who obtained statements for counsel's use.⁶⁶

Since 1950 and the extension made by Allmont, the courts have utilized the work product concept of Hickman in dealing with land appraisers, their opinions and factual reports, in condemnation cases and in dealing with expert testimony in general. A review of the condemnation cases of the past decade reveals a tendency of the courts to assume work product as a category and to deny or permit discovery on the basis of work product without explaining what is meant by the work product. It appears that the material sought will be considered work product, if it is shown that it is of a legal or technical nature requiring the abilities of counsel or an expert employed by counsel in direct anticipation and preparation of a cause of action. This will depend on the individual situation and cannot be given a more definite rule. Once the material sought is found to be work product, discovery will be denied unless factors of necessity are found to outweigh the merits of work product, thus demanding production in the interest of justice.⁶⁷

WHAT IS SUBJECT TO DISCOVERY?

Facts vs Opinions

Many courts distinguish between "factual" and "opinionative" matter. As a result, the scope of examination has been circumscribed in Federal District Courts by Judicial interpretation. A number of States,⁶⁸ however, have explicitly placed the opinion or conclusion of an expert beyond the bounds of the examination by enacting the proposed 1946 Amendment to the Federal Rules (Appendix D).

In the Federal District Courts, discovery in land acquisition cases is usually permitted of factual data, but denied when opinionative matter is requested. For example, a Federal court observed that the reports of land appraisers included two types of information: (a) opinions of the appraisers, and (b) statements as to the factual bases on which the opinions were predicated. The court then declared that the landowner might inspect, copy or photograph the factual material, but that the opinion material, to be determined by the court at an in camera inspection, would be withheld from the landowner.⁶⁹

Discovery has been denied, however, of not only the opinionative matter but also of the factual material contained in an appraiser's report.⁷⁰ No special circumstances were present to justify an exception to the general rule as to the nondiscoverability of opinionative matter,⁷¹ and discovery of the facts of the appraisal report was denied on the ground that said facts were readily available to the landowner's appraisers. Accordingly, it was held in a recent case⁷² that without a showing of necessity, discovery would be limited to the facts on which the opinions or conclusions were based, using a liberal approach in determining what was fact and what was opinion.

⁶⁶Snyder v. United States, 20 F.R.D. 7 (E.D.N.Y. 1956); Thompson v. Hoitsma, 19 F.R.D. 112 (D.N.J. 1956).

⁶⁷Permitted: United States v. Certain Parcels of Land, 15 F.R.D. 224 (S.D. Cal. 1954). Limited to factual materials; State ex rel. Willey v. Whitman, 91 Ariz. 120, 370 P.2d 273 (1962), pre-trial discovery of opinion included; Shell v. State Rd. Dep't, 135 So. 2d 857 (Fla. 1961); State v. Riverside Realty Co., 152 So. 2d 345 (Ct. App. La. 1963), all questions of fact; denied: United States ex rel. TVA v. Bennett, 14 F.R.D. 166 (E.D. Tenn. 1953); State Rd. Dep't v. Shell, 122 So. 2d 215 (Ct. App. Fla. 1960). State Rd. Dep't v. Cline, 122 So. 2d 827 (Ct. App. Fla. 1960); State v. Bair, 83 Idaho 478, 365 P.2d 216 (1961); State ex rel. State Hwy. Comm'n v. Jensen, 362 S.W.2d 568 (Mo. Sup. Ct. 1962); Valley Stream Lawns, Inc. v. State, 164 N.Y.S.2d 482, 6 Misc. 2d 607 (N.Y. Ct. Cl. 1957).

⁶⁸Idaho, Illinois, Iowa, Kentucky, Louisiana, Minnesota, Missouri, Nevada, New Jersey, Pennsylvania, Texas, Utah, Washington and West Virginia.

⁶⁹United States v. Certain Parcels of Land, 15 F.R.D. 224 (S.D. Cal. 1954).

⁷⁰United States v. Certain Parcels of Land, 25 F.R.D. 192 (N.D. Cal. 1959).

⁷¹United States v. 4.724 Acres of Land, 31 F.R.D. 290 (E.D. La. 1962).

⁷²United States v. 284,392 Sq Ft of Floor Space, 203 F. Supp. 75 (E.D.N.Y. 1962).

Only one Federal case involving land acquisition has ordered the production of appraisal reports for inspection and copying by the landowner without limiting discovery to factual material.⁷³ The landowner's motion for production of the appraisal reports was granted, but the landowner was willing to pay part of the appraiser's expenses and neither the reports nor their authors were otherwise available. On a motion by the government in this proceeding for an order limiting the matters to be inquired into in the taking of the deposition of the appraiser by oral examination, the court restricted the deposition to such matters as pertain to the fair market value of the subject matter of the litigation as of the date of taking with no limitation on the discovery of opinionative matter. This decision, however, has been distinguished,⁷⁴ criticized,⁷⁵ and questioned⁷⁶ in subsequent cases. In several other cases, the courts have followed similar rationale but have restricted discovery to factual data.⁷⁷

State courts have been much less inclined to make the fact-opinion distinction. An Iowa case⁷⁸ is the only example in which discovery of opinionative matter in a condemnation proceeding was denied. But here the conclusion of an expert was protected by the 1946 Amendment to the Federal Rules which Iowa adopted. Virginia acknowledged that it at times had "made some distinction between the opinion of an expert and the evidence of a witness to facts."⁷⁹ However, it permitted discovery of the appraiser's opinion on the ground that the appraiser was not the exclusive agent of the condemner.

Yet, a far-reaching California condemnation case⁸⁰ indicated that the appraiser's reports and their contents were within the attorney-client privilege.⁸¹ The privilege here did not extend to preclude the questioning of the expert as to his opinions and conclusions regarding the value of the lands and interest condemned, the reasons for the opinions, or to test the worth of the opinions by such inquiry on cross-examination as will be relevant to the subject matter.

An even more recent California condemnation case⁸² opined that material, whether factual or opinionative, is not privileged merely because it is the result of an expert's mental calculations, where the information on which it is predicated did not emanate from the attorney's client. Factual data is unprivileged because it did not emanate from the client, and an opinion formed by the expert thereon is similarly unprivileged. As a result of this decision, the reports and opinions of an appraiser are subject to discovery in California, because the appraiser would derive his information not from the government or condemning body but from an inspection of land itself.

Discovery of appraisal reports was permitted in Wisconsin, though part of the file of the attorney general was prepared for litigation.⁸³ The attorney-client privilege here

⁷³United States v. 50.34 Acres of Land, 13 F.R.D. 19 (E.D.N.Y. 1952).

⁷⁴In United States v. Certain Parcels of Land, 25 F.R.D. 192 (N.D. Cal. 1959), the court decided that discovery of opinion had been permitted because of a showing of "compelling reasons." In United States v. 900.57 Acres of Land, 30 F.R.D. 512 (W.D. Ark. 1962), the court decided that discovery of opinion had been permitted on the basis of the "extraordinary facts" of the case.

⁷⁵The court said that it "cannot concur" in the opinion of United States v. 50.34 Acres of Land.

⁷⁶In United States v. 284,392 Sq Ft of Floor Space, 203 F. Supp. 75 (E.D.N.Y. 1962), decided by the same court, it was held that the decision in United States v. 50.34 Acres of Land was "not in accordance with the most accepted authorities."

⁷⁷United States ex rel. TVA v. Bennett, 14 F.R.D. 166 (E.D. Tenn. 1953); Hickey v. United States, 18 F.R.D. 88 (E.D. Pa. 1952); United States v. 900.57 Acres of Land, 30 F.R.D. 512 (W.D. Ark. 1962).

⁷⁸Bryan v. Iowa State Hwy. Comm'n, 251 Iowa 1093, 104 N.W.2d 562 (1960); 2 Iowa Code 1962, R. Civ. P. 141(a).

⁷⁹Cooper v. Norfolk Redevelopment & Housing Authority, 197 Va. 653, 90 S.E.2d 788 (Sup. Ct. App. 1956).

⁸⁰Mowry v. Superior Ct., 20 Cal. Rep. 698 (Dist. Ct. App. 1962).

⁸¹This part of the case was overruled by San Diego Professional Ass'n v. Superior Ct., 23 Cal. Rep. 384, 373 P.2d 448 (1962).

⁸²Oceanside Union School Dist. v. Superior Ct., 23 Cal. Rep. 375, 373 P.2d 439 (1962).

⁸³State ex rel. Reynolds v. Circuit Ct., 15 Wis. 2d 311, 112 N.W.2d 686 (1961).

did not preclude the expert appraisers from disclosing any relevant opinions they had formed, whether reported or not. Nor was such information deemed to be protected from discovery as part of the work product of the attorney. A similar instance occurred in Arizona where facts gathered by an adverse party's prospective witness and his opinion were subject to pretrial discovery.⁸⁴ No validity was accorded the objection that the State was invading the work product of the landowner's attorney. The rules of civil procedure respecting discovery by interrogatories, said the court, fail to make any distinction between facts and opinions.

These cases indicate a tendency for a number of State courts to exclude opinion from the attorney-client privilege and work product categories of the Federal courts and leave opinionative material within the scope of examination. In only one case have Federal courts agreed with this trend and that has been distinguished as previously described. The Federal courts simply deny or permit discovery on the basis of whether or not the material sought is considered opinion or fact by the court.

The confusion concerning the discoverability of expert opinion prompted Pennsylvania to amend its rules after two cases of a similar nature reached opposite decisions.⁸⁵ The applicable rule was amended, effective April 1962, to read, "No discovery or inspection shall be permitted which . . . (f) would require a deponent, whether or not a party, to give an opinion as an expert witness, over his objection."⁸⁶ In an explanatory note to this rule change, the Committee acknowledged that subdivision (f) does not attempt to define the difference between "facts" and "opinion as an expert witness."⁸⁷ This distinction, it said, must be decided in each case. The amendment is also applicable in condemnation cases.⁸⁸ Thus, in Pennsylvania, the opinions of an appraiser are protected from discovery before trial by an explicit statement in the rules permitting objection by the appraiser.

The Federal District courts have not permitted discovery of opinionative matter, whereas the State courts have been much more liberal in sanctioning such discovery. The recent holding in a New York District Court anti-trust case may indicate a more liberal Federal approach, however. The court said:

Rather than impose an inflexible rule which would require laborious search for the intricate and elusive (and perhaps illusory) dividing markers separating fact, opinion, contention, and conclusion, it seems preferable to allow those interrogatories which might possibly call for opinion, conclusion or contention, if, on the balance of convenience, answers to them would serve any substantial purpose, either in leading to evidence or in narrowing issues.⁸⁹

This type of case can be distinguished from land acquisition cases by the complex factual situations involved in the anti-trust cases.

Names of Expert Witnesses

In addition to the fact-opinion division, problems arise in connection with the discovery of appraisal reports and their preparation, names of the expert witnesses, the employer of the expert witnesses, the methods of appraisal, the qualifications of the appraiser, and a breakdown of values.

⁸⁴State ex rel. Willey v. Whitman, 91 Ariz. 120, 370 P.2d 273 (1962).

⁸⁵Straub v. Silver, 22 D.&C.2d 36 (1961), permitted unlimited examination of the opposing party's expert witness on the ground that the unamended rule permitted examination of "any matter, not privileged." Wright v. P.T.C., 24 D.&C.2d 334 (1961), arrived at the opposite decision.

⁸⁶Pa. R. Ct. 4011(f) (eff. April 1962).

⁸⁷Amram & Schulman, "The April 1962, Amendments to the Pennsylvania Rules of Civil Procedure," 33 Pa. B.A.Q. (1962).

⁸⁸Ibid.

⁸⁹United States v. Renault, Inc., 27 F.R.D. 23 (S.D.N.Y. 1960).

With regard to the names and addresses of expert witnesses, the Federal courts have consistently held in condemnation cases that they were not a proper subject of discovery.⁹⁰ Nor may the agency or party for whom the appraisers made such reports be discovered.⁹¹ Discovery of the methods of appraisal used by the appraiser has been denied in two Federal court decisions,⁹² whereas a very recent decision in Louisiana held that the State's witnesses would be required to answer all questions of fact asked in regard to their appraisal of the property and the method and manner used in making the appraisal.⁹³ It has been held that the qualifications of the appraisers are not discoverable.⁹⁴ Discovery of the specific values which the appraisers have placed on certain properties has likewise been denied in several cases.⁹⁵

DISCOVERY OF GOVERNMENTAL INFORMATION IN LAND ACQUISITION

A unique situation is involved in the discovery of information against the government. This is the case in land acquisition, where appraiser's reports, opinions, photographs and statements are involved, as provided under Federal Rules 26(b), 33, 34, and 45. Of course, it is not one-sided because the rules apply also to the private party or condemnee. Yet, the fact that one of the parties is a governmental unit may sometimes cause greater concern than where only private parties are involved. In general, there would appear to be a policy against the unnecessary disclosure of files of the executive branches of the Government. However, this consideration must be evaluated in relation to the public interest in disclosure of files containing documents of evidentiary value to effect a just result.⁹⁶

Disclosure of government information has, therefore, been permitted or denied on such considerations as whether the information is necessary solely for the purpose of determining "just compensation"; considered privileged; is fact or opinion; was obtained in the ordinary course of business; is the result of satisfying the requirements of Federal Rules 26, 33 and 34; is otherwise available; and was obtained directly for the pending litigation. Among the kinds of information that have significance for discovery in right-of-way cases are documents, reports and statements, and expert materials.

Documents, Reports and Statements

A succinct summary of the law under this subject can be found in the following analysis by Tolman:

⁹⁰Hickey v. United States, 18 F.R.D. 88 (E.D. Pa. 1952); United States ex rel. TVA v. Bennett, 14 F.R.D. 166 (E.D. Tenn. 1953); United States v. 7,534.04 Acres of Land, 18 F.R.D. 146 (N.D. Ga. 1954); United States v. 6.82 Acres of Land, 18 F.R.D. 195 (D.N.M. 1955); United States v. 19.897 Acres of Land, 27 F.R.D. 420 (E.D.N.Y. 1961); United States v. 900.57 Acres of Land, 30 F.R.D. 512 (W.D. Ark. 1962).

⁹¹Hickey v. United States, 18 F.R.D. 88 (E.D. Pa. 1952); United States v. 19.897 Acres of Land, 27 F.R.D. 420 (E.D.N.Y. 1961).

⁹²United States v. 7,534.04 Acres of Land, 18 F.R.D. 146 (N.D. Ga. 1954); United States v. 6.82 Acres of Land, 18 F.R.D. 195 (D.N.M. 1955).

⁹³State v. Riverside Realty Co., 152 So. 2d 345 (Ct. App. La. 1963).

⁹⁴United States v. 19.897 Acres of Land, 27 F.R.D. 420 (E.D.N.Y. 1961).

⁹⁵United States v. 7,534.04 Acres of Land, 18 F.R.D. 146 (N.D. Ga. 1954); United States v. 6.82 Acres of Land, 18 F.R.D. 195 (D.N.M. 1955); United States v. 19.897 Acres of Land, 27 F.R.D. 420 (E.D.N.Y. 1961).

⁹⁶Reynolds v. United States, 192 F.2d 987,955 (1951), reversed on other grounds, 345 U.S. 1, 73 Sup. Ct. 528 (1953); United States v. Certain Parcels of Land Etc., 15 F.R.D. 224 (S.D. Cal. 1954).

[T]here are now three methods of obtaining documents from the adverse party before trial: by initial court order under rule 34; by interrogatories under rule 33 followed by court order to produce under rule 34; and by subpoena duces tecum at an oral deposition examination under rule 45, which, since 1946, does not specifically require initial court order and which commentators believe, and most courts hold, still should be construed to require it as to parties in order to provide consistency with rule 34. All of these procedures are subject to protective control of the court on motion, under rule 30(b), of the party to whom the request for the document is directed.⁹⁷

In permitting or denying discovery of government documents and reports in condemnation cases, courts have looked to the purpose for which the report was made: whether it was obtained in preparation for trial or in the ordinary course of business, whether good cause was shown in satisfaction of Rule 34, if the material sought is to be considered privileged, whether the information is essential to the litigation and otherwise unavailable, and whether or not the material sought requires discovery of fact or opinion.

Where the issue was solely one of establishing a fair market value of the land at the time acquired by the condemnor, the burden to establish a fair value was on the defendant landowner and the landowner was not entitled to the opinions or reports of the government's expert appraisers in advance of trial.⁹⁸

A New York District Court condemnation proceeding in 1952⁹⁹ permitted discovery of appraisal reports under certain limited conditions. The court stated:

It is shown that the appraisal reports in question were obtained by the Government for the express purpose of determining the compensation which would have to be paid for purchase of the property in question; that these reports are in possession and control of the government; and that neither the reports or the authors thereof are otherwise available to the moving party. There is nothing to indicate that these reports can be regarded as privileged matter.¹⁰⁰

Ohio, in a 1959 proceeding to condemn land for a ballistic missile launching site, permitted discovery by interrogatories to ascertain the existence of documents supplied to appraisers to determine the manner and criterion for valuation, not that the valuation found by the government's appraisers should itself be the subject of discovery. The court was apparently following the "purpose test" as set out in *United States v. 50.34 Acres of Land*.¹⁰¹ In referring to that case this court said:

... while not wishing to express an opinion at this time on the extent to which the court in that case went—requiring disclosure of the final expert opinion—I think the principle is sound.¹⁰²

Discovery of certain statements and reports in a noncondemnation case in 1959 was permitted based on the following reasoning:

Statements or reports made in the ordinary course of business and not in preparation for trial do not embody the lawyers' opinions, tactics, or conclusions, and accordingly they do not enjoy the privilege afforded the attorney's work.¹⁰³

⁹⁷Tolman, "Discovery Under the Federal Rules: Production of Documents and the Work Product of the Lawyer," 58 Colum. L. Rev. 498, 503 (1958).

⁹⁸*United States v. 900.57 Acres of Land, More or Less*, 30 F.R.D. 512 (W.D. Ark. 1962).

⁹⁹*United States v. 50.34 Acres of Land, More or Less*, 13 F.R.D. 19 (E.D.N.Y. 1952).

¹⁰⁰*Id.* at 21.

¹⁰¹13 F.R.D. 19 (E.D.N.Y. 1952).

¹⁰²*United States v. 62.50 Acres of Land, Etc.*, 23 F.R.D. 287 (N.D. Ohio 1959).

¹⁰³*United States v. Swift & Co.*, 24 F.R.D. 282 (N.D. Ill. 1959).

The consensus is, however, that material gathered in preparation for trial either by the attorney or by someone retained by the attorney is generally considered a part of the attorney's work and is not discoverable under the rationale of the Hickman and Alltmont cases.

The courts have been consistent in their requirement that the party seeking discovery satisfy the good cause requirement of Rule 34. Discovery has been denied repeatedly by the courts when good cause was not shown.¹⁰⁴ Production of documents from a party under Rule 45 was denied when the moving party failed to satisfy the good cause requirement of Rule 34. There the court pointed out that the rules were to be construed in *pari materia*.¹⁰⁵ This requirement, however, is not to be construed as a "fishing expedition," because the newer theory is that it is more desirable to allow discovery of some immaterial facts than to deny discovery which may bring to light facts material to the issue.¹⁰⁶

The question of privilege as it arises in land acquisition cases is usually related to the question of whether or not the documents sought are part of the attorney's work product. If such is the case, they are considered privileged and not subject to discovery. If material sought to be discovered is in direct preparation for trial, essential to the litigation or the determination of the truth, and otherwise unobtainable, the courts may permit discovery.¹⁰⁷ Where the production of transmittal letters was not apparently essential to the proper presentation of a taxpayer's suit, the court denied discovery, but cited Moore, on Federal Practice, as stating that:

It is a recognized general principle that in actions involving the administration of Federal law to which the Government is a party, production of government documents should be permitted unless "the Court is satisfied that it would be against public policy to do so." Moore, Federal Practice, 2d Ed., §26.25(b), p. 1176.¹⁰⁸

The position of the courts has been clear, however, that discovery will be denied if unusual circumstances cannot be shown or if the material is otherwise available.¹⁰⁹

In summary, whether the documents or papers sought are fact or opinion relates directly to the problem of discoverability of expert testimony, and discovery of opinion material will be permitted only in special circumstances.¹¹⁰ The determination of special circumstances rests on the judicial discretion of the courts.

¹⁰⁴Carpenter-Trant Drilling Co. v. Magnolia Petroleum Corp., 23 F.R.D. 257 (D. Neb. 1959); Michel v. Meier, 8 F.R.D. 464 (W.D. Pa. 1948), "In allowing plaintiff's motion under Rule 34, the court lays down the following showing plaintiff must make: (a) that there is 'good cause' for the production and inspection of the desired material, (b) material requested must be 'designated' with reasonable definiteness and particularity, (c) that the material must not be privileged, (d) material must constitute or contain evidence relating to matters within the scope of the examination permitted by Rule 26(b), i.e., it must be 'relevant to the subject matter involved in the pending action,' (e) the material must be within the possession, custody or control of the party upon whom demand is made"; Snyder v. United States, 20 F.R.D. 7 (E.D.N.Y. 1956); United States v. 6.82 Acres of Land, 18 F.R.D. 195 (D.N.M. 1955); United States v. Certain Acres of Land, 18 F.R.D. 98 (M.D. Ga. 1955); United States v. 19.897 Acres of Land, Etc., 27 F.R.D. 420 (E.D.N.Y. 1961).

¹⁰⁵United States v. 6.82 Acres of Land, 18 F.R.D. 195 (D.N.M. 1955).

¹⁰⁶Reed v. Swift & Co., 11 F.R.D. 273 (W.D. Mo. 1951). Allen, "The New Rules of Arizona," 16 F.R.D. 189 (1955).

¹⁰⁷Sachs v. Aluminum Co. of America, 167 F.2d 571 (6 Cir. 1948); United States v. Certain Parcels of Land, Etc., 15 F.R.D. 224 (D.S.D. Cal. 1954).

¹⁰⁸E.W. Bliss Co. v. United States, 203 F. Supp. 175 (N.D. Ohio 1961).

¹⁰⁹United States v. Deere & Co., 9 F.R.D. 523 (D. Minn. 1949); United States v. 7,534.04 Acres of Land, Etc., 18 F.R.D. 146 (N.D. Ga. 1954); United States v. 6.82 Acres of Land, More or Less, 18 F.R.D. 195 (D.N.M. 1955).

¹¹⁰United States v. Certain Parcels of Land, Etc., 15 F.R.D. 224 (S.D. Cal. 1954); United States v. Certain Parcels of Land, 25 F.R.D. 192 (S.D. Cal. 1959); United States v. 4,724 Acres of Land, More or Less, 31 F.R.D. 290 (E.D. La. 1962). 4 Moore, Fed. Prac. §26.24 at 1152, and specifically footnote 6 for case citations, and Supp. 1961, p. 81 (2d ed. 1953).

Expert Testimony

In judicial proceedings conducted under the Federal Rules, the discovery of expert testimony arises from the provisions of Rules 30, 31, and 33 as read in conjunction with Rule 26(a) and (b). Depositions may be filed to take the testimony of any person or party on oral examination or written interrogatories for discovery, for use as evidence, or for both purposes.¹¹¹ All rules previously cited, with the exception of Rule 33, provide for a party to take the deposition of any person. Rule 33, however, restricts written interrogatories to "any adverse party" (Appendix A). Although this provision limits the taking of depositions in a litigation, the process is less expensive and quicker than the provisions made by Rules 30 and 31, and it has been more frequently used in cases involving land acquisition.

A 1962 Louisiana U. S. District Court decision¹¹² indicates that experts generally are immune from discovery,¹¹³ although there are a substantial number of district court cases that hold that an expert's deposition may be taken and a copy of his report is subject to discovery.¹¹⁴ Where the taking of oral depositions of officers or agents of the United States, who had knowledge of the value of the property involved, was questioned, the court held that the owners were entitled to take the oral depositions with respect to facts but not with respect to opinions, and that a liberal approach was required to be adopted in determining what is fact and what is opinion.¹¹⁵ The court carefully distinguished its holding from that of *United States v. 50.34 Acres of Land*, in which the same court, 10 yr earlier, had permitted discovery of appraisal reports containing opinions, but with certain limitations based primarily on a showing of necessity.

The District Court of Rhode Island has held that a plaintiff was entitled to liberal discovery in attempting to ascertain facts surrounding methods employed by the defendant in production of its blood plasma, and the fact that the deponents possessed expert knowledge did not immunize them from examination.¹¹⁶ The court distinguished this case from the older case of *Lewis v. United Airlines Transport Corp.*,¹¹⁷ in that the plaintiff in this case was not taking the deposition of experts engaged by the defendant to make a study of the controversy, as was the situation in the *Lewis* case where an engineering expert was employed by the defendant's attorney to assist in preparation for trial. There it was held that the expert was not required to disclose communications

¹¹¹Fed. R. Civ. P. 26(a), 30, 31, 33.

¹¹²*Maginnis v. Westinghouse Electric Corp.*, 207 F. Supp. 739 (E.D. La. 1962).

¹¹³*Lewis v. United Airlines Transp.*, 32 F. Supp. 21 (W.D. Pa. 1940), engineering consultants' report on barrel of aircraft cylinder; *Boynton v. R.J. Reynolds Tobacco Co.*, 36 F. Supp. 593 (Mass. 1941), physician; *United States v. 88 Cases, Etc.*, 5 F.R.D. 503 (D.N.J. 1946), chemists' analysis of orange beverage; *United States v. 720 Bottles, Etc.*, 3 F.R.D. 466 (E.D.N.Y. 1946), chemists' analysis of vanilla extract; *Moran v. Pittsburgh-Des Moines Steele Co.*, 6 F.R.D. 594 (W.D. Pa. 1947), civil engineer's design on cylindrical liquified gas tank, no expert involved, but in dicta held that experts may not be deposed; *Cold Metal Process Co. v. Aluminum Co.*, 7 F.R.D. 684 (Mass. 1947), metallurgist; *Roberson v. Graham Corp.*, 14 F.R.D. 83 (Mass. 1952), experts on antiques; *United States v. Certain Acres of Land, Etc.*, 18 F.R.D. 98 (M.D. Ga. 1955), expert land appraisers; *Colonial Airlines, Inc. v. Jonas*, 13 F.R.D. 199 (S.D.N.Y. 1952), public accounts; *United States v. 7,534.04 Acres of Land, Etc.*, 18 F.R.D. 146 (N.D. Ga. 1954), expert land appraisers.

¹¹⁴*Bergstrom Paper Co. v. Continental Bus Co.*, 7 F.R.D. 548 (E.D. Wis. 1947), engineer's report on situs of explosion; *Cold Metal Process Co. v. Aluminum Co.*, 7 F.R.D. 425 (N.D. Ohio 1947), metallurgist report; *Sachs v. Aluminum Co.*, 167 F.2d 570 (6 Cir. 1948), metallurgist; *Broadway & Ninety-sixth St. Realty Co. v. Lowe's, Inc.*, 21 F.R.D. 347 (S.D.N.Y. 1958), expert in field of motion picture exhibition; *United States v. 50.34 Acres of Land, Etc.*, 13 F.R.D. 19 (E.D.N.Y. 1952), expert land appraisers; *United States v. Certain Parcels of Land*, 15 F.R.D. 224 (S.D. Cal. 1953), expert land appraisers; *Walsh v. Reynolds Metals Co.*, 15 F.R.D. 376 (D.N.J. 1954), heating experts report; *Russo v. Merck & Co.*, 21 F.R.D. 237 (D.R.I. 1957), experts on production of blood plasma; *Colden v. R. J. Schofield Motors*, 14 F.R.D. 521 (N.D. Ohio 1952), automotive expert's report.

¹¹⁵*United States v. 284,392 Sq Ft of Floor Space, Etc.*, 203 F. Supp. 75 (E.D.N.Y. 1962).

¹¹⁶*Russo v. Merck & Co.*, 21 F.R.D. 237 (D.R.I. 1957).

¹¹⁷32 R. Supp. (W.D. Pa. 1940).

with his client nor answer questions calling for his expert opinion. In addition, a recent State case¹¹⁸ discounts the validity of the Lewis case and all condemnation cases before Aug. 1, 1951, when the Federal Rules were made applicable to condemnation proceedings.¹¹⁹ Other Federal cases that have denied discovery of expert testimony, in both condemnation and noncondemnation proceedings, have based their holdings on some distinction between fact and opinion material, the work product privilege, the necessity of production and whether or not the material is otherwise available.¹²⁰

Answers calling for expressions of opinion that might later be used against a United States agency were not permitted, nor were the names of witnesses and persons that were part of the work product of the agency's attorney and were otherwise available. Despite the burden which a landowner has to establish the market value at the time the condemnor took the land, discovery of the expert's opinions or reports was denied. This appears to be the majority view of the Federal courts with regard to condemnation cases; namely, that the movant must be able to show some special circumstances that, in the interest of justice, require discovery and lift the material out of the privileged categories.¹²¹

The State courts generally adhere to the requirement of a showing of special circumstances to justify discovery but have been more liberal in permitting discovery than have the Federal courts, and they have adopted additional tests which place a great deal of discretionary power in the courts.

PROCEDURAL INNOVATIONS

Effective Sept. 1, 1963, New York adopted new procedural rules¹²² that differ from the proposals of the Federal Rules Advisory Committee, as described later, and from the previous rules in many respects. The new rules in New York, however, do not expand the scope or methods of discovery or provide for pretrial conferences in New York. However, in a 1954 condemnation proceeding by a gas company, the court held that pretrial examinations in condemnation proceedings were consistent with the existing Practice Act, on the grounds that a condemnation proceeding is a special proceeding within the meaning of Article 29 of the Civil Practice Act, and, therefore, pretrial examination of the adverse party should be permitted.¹²³

Generally speaking, New York courts have permitted discovery of pertinent information in condemnation proceedings where the issue was one of determining fair market value or just compensation.¹²⁴ In a condemnation proceeding where the claimant sought to examine the State's land and claim adjusters on their appraisal of property,¹²⁵ however, the court denied discovery, holding the materials sought were confidential and of an investigatory nature and an essential part of the work product prepared in anticipation of litigation. Although the new rules establish that the work product and the anticipation of litigation tests deny discovery, the determination as to whether specified materials fall within these categories remains in the discretion of the court.

California has had its own system of code pleading and practice for over a century. The influence of the Federal Rules on the California code has been reciprocal. In 1957 California added a new section to its code on depositions and discovery¹²⁶ influenced

¹¹⁸State ex rel. Willey v. Whitman, 71 Ariz. 120, 370 P.2d (Sup. Ct. 1962).

¹¹⁹Fed. R. Civ. P. 71A(a).

¹²⁰Hickey v. United States, 18 F.R.D. 88 (E.D. Pa. 1952); United ex rel. TVA v. Bennett, 14 F.R.D. 166 (E.D. Tenn. 1953); United States v. 6.82 Acres of Land, More or Less, 18 F.R.D. 195 (D.N.M. 1955); United States v. 900.57 Acres of Land, More or Less, 30 F.R.D. 512 (W.D. Ark. 1962).

¹²¹United States v. 900.57 Acres of Land, More or Less, 30 F.R.D. 512 (W.D. Ark. 1962).

¹²²N.Y. Civ. Prac. L. & R., 185 Sess., ch. 308 (1962).

¹²³Algonquin Gas Transmission Co. v. Schwartz, 132 N.Y.S.2d 639, 206 Misc. 437 (Sup. Ct. Rochland County 1954).

¹²⁴In re Union Turnpike, 268 N.Y. 681, 198 N.E. 556 (Ct. App. N.Y. 1935); In re Cross-Bronx Expressway, 82 N.Y.S.2d 55, 195 Misc. 842 (Sup. Ct. Bronx County 1948); Hewitt v. State, 216 N.Y.S.2d 615, 27 Misc. 2d 930 (Ct. Cl. 1960); Power Authority v. Kochan, 216 N.Y.S.2d 8 (Sup. Ct. 1961).

¹²⁵Valley Stream Lawns, Inc. v. State, 164 N.Y.S.2d 482, 6 Misc. 2d 607 (Ct. Cl. 1957).

¹²⁶Cal. Code Div. P., Art. 3. Deposition and Discovery, added by Stat. 1957, C. 1904, p. 3322, §3 (operative Jan. 1, 1958).

by the Federal Rules. The condemnation cases litigated since then have reflected a continuing liberalization in permitting discovery. In 1959, the District Court of Appeals¹²⁷ held that an interrogatory seeking facts relevant to the issues and resting within the knowledge of the State, such as what acreage the State had already acquired in the same general area for similar purposes, would be permitted. Interrogatories calling for the names and addresses of the condemnor's appraisers and the contents of the appraiser's reports fell within the attorney-client privilege, an absolute bar, and were denied. This decision was broadened in 1962 by distinguishing between the appraiser's reports and contents and the appraiser's opinions and conclusions regarding the value of certain lands and severance damages. The court held that the attorney-client privilege did not preclude questioning of the appraiser as to his opinions and conclusions regarding the value of the lands and interest therein condemned, severance damages, special benefits and the reasons for said opinions, nor testing the worth of the opinions by such inquiry on cross-examination as would be relevant to the subject matter. In July 1962, the Supreme Court of California went a step further in *Oceanside Union School Dist. v. Superior Court*,¹²⁹ in holding that even the appraiser's reports were not within the attorney-client privilege and that their divulgence could be directed. The court based its reasoning on the "dominant purpose" test¹³⁰ and whether or not the material sought "emanated from the client." Thus the attorney-client privilege became qualified and was no longer absolutely protected in California.

An interesting problem arose in Florida. New rules were adopted there in 1954, based primarily on the Federal Rules. In this context, Florida endorsed the work product immunity of *Hickman v. Taylor* in *State Road Dept. v. Cline*,¹³¹ which denied the taking of depositions of three of the condemnor's appraisers on the ground that the information sought was the work product of the condemnor and not subject to discovery. In 1961, however, the State Supreme Court reversed the 1960 District Court,¹³² in *Shell v. State Road Dept.*,¹³³ and permitted the condemnees to inspect the appraiser's work sheets of the State Road Department. This case has particular significance because appraisal work sheets were involved. The court was very careful in distinguishing this condemnation case from an ordinary case. In the ordinary situation, it said, this would constitute a part of the work product. This holding did not seem to be consistent with the work product approach and should have called for the same application as in private litigation, but the court found a way around that rule by reference to the governmental nature of one of the parties. Unlike litigation between private parties, condemnation by any governmental authority, the court felt, would place the condemnee at a disadvantage in every instance, because the government has unlimited resources to which the condemnee, as a taxpayer, contributes.¹³⁴

Louisiana, traditionally a code State, adopted a new code, effective Jan. 1, 1961, which exhibited an effort to consolidate and retain the basic Louisiana procedure of the older codes (1870) and to draw intelligently on the Federal Rules. The *Buckman* case¹³⁵ involving highway condemnation was litigated before the effective date of the new rules. It held that it was error to require the State to produce certain written contracts and instructions concerning their appraisers in the absence of any showing of undue hardship or injustice in the denial of production. Yet under the new rules, the court has permitted discovery by requiring plaintiff's experts to answer interrogatories regarding facts on which the appraisal of property was based and to have written memoranda avail-

¹²⁷*Rust v. Roberts*, 341 P.2d 46 (Dist. Ct. App. Cal. 1954).

¹²⁸*Mowry v. Superior Ct.*, 20 Cal. Rep. 698 (Dist. Ct. App. 1962).

¹²⁹23 Cal. Rep. 375, 373 P.2d 439 (Sup. Ct. 1962).

¹³⁰The dominant purpose test was first laid down in *Holm v. Superior Ct.*, 42 Cal. 2d 500, 267 P.2d 1025, 268 P.2d 722 (1954).

¹³¹122 So. 2d 827 (Dist. Ct. App. Fla. 1960).

¹³²*State Rd. Dep't v. Shell*, 122 So. 2d 215 (Dist. Ct. App. Fla. 1960).

¹³³135 So. 2d 857 (1961).

¹³⁴*Shell v. State Rd. Dep't*, 135 So. 2d 857 (Fla. 1961).

¹³⁵*State Dep't of Hwy. v. Buckman*, 239 La. 872, 120 So. 2d 461 (Sup. Ct. Pa. 1960).

able to help answer questions.¹³⁶ This case was distinguished from the 1960 case in that this order did not require production or inspection of memoranda or written contracts, but rather questions as to facts on which the appraisals were based. In 1963, the Court of Appeals carried the distinction between fact questions, opinions and the written report or document a step further in *State v. Riverside Realty Co.*¹³⁷ in holding that witnesses for the State would be required to answer all questions of fact asked in regard to their appraisal of the property and the method and manner used in making their appraisal, and that they would not be excused from answering such questions on the basis that they had to refer to written memoranda.

Virginia approached the problem somewhat differently and used an agency principle to permit discovery of the opinion of the condemnor's appraiser.¹³⁸ Discovery was permitted in this case because the appraiser was not the exclusive agent of the condemnor, and it was pointed out that some distinction is made between fact and opinion evidence.

Wisconsin has also permitted discovery of the expert's relevant opinions and observations on the value of property on the theory that such information was neither a part of the work product of the attorney general nor within the attorney-client privilege, but that a direct communication between the expert and his client or staff in connection with the condemnation of the property could be privileged.¹³⁹

Other States, such as Idaho, Illinois, Missouri, and Pennsylvania, have denied discovery following the reasoning of the Federal courts¹⁴⁰ and by emphasizing modified versions of Federal tests.¹⁴¹

Proposed 1946 Amendment to Federal Rules and State Adoption

In 1944, the Advisory Council to the Supreme Court began deliberations on possible amendments to the Federal Rules of Civil Procedure. Just before the Council was to make its recommendations, the Supreme Court of the United States granted a writ of certiorari in the Hickman case. In that opinion, the Court adopted some of the Advisory Committee's proposals but rejected the proposal to amend Rule 26(b) to include the discovery of data prepared for trial and the conclusions of an attorney or expert (Appendix D). Instead, the decision in Hickman was handed down to accomplish a similar result. A number of States, however, have adopted the amendment in one form or another, affixing it either to their comparable Rule 26(b),¹⁴² 30(b),¹⁴³ 34,¹⁴⁴ or in one instance have made it a separate rule in itself¹⁴⁵ (Appendix D).

As proposed to the Supreme Court, the amendment has been adopted in substantially the same form by eight States.¹⁴⁶ The effect has been to clothe any writing prepared in anticipation of litigation or in preparation for trial with a qualified privilege from discovery. In other words, the States extend the rationale in *Hickman v. Taylor* and grant a qualified immunization from discovery. Only on a showing of undue hardship or injustice, attributable to the denial of discovery of such material, will discovery be permitted. A second effect of this rule is to grant an absolute immunity from discovery to any writing that reflects either an attorney's or an expert's conclusions. Under no circumstances is any written matter containing such an opinion subject to discovery.

¹³⁶*State Dep't of Hwy. v. Spruell*, 243 La. 202, 142 So. 2d 396 (Sup. Ct. La. 1962)

¹³⁷152 So. 2d 345 (Ct. App. La. 1963).

¹³⁸197 Va. 653, 90 S.E.2d 788 (Sup. Ct. App. Va. 1956).

¹³⁹*State ex rel. Reynolds v. Circuit Ct.*, 15 Wis. 2d 311, 112 N.W.2d 886 (1961).

¹⁴⁰*City of Chicago v. Harrison-Halsted Building Corp.*, 11, Ill. 2d 431, 143 N.E.2d 40 (1957); *State v. Bair*, 83 Idaho 478, 365 Pa. 2d 216 (1961). *State ex rel. State Hwy. Comm'n v. Jensen*, 362 S.W.2d 568 (Mo. Sup. Ct. 1962).

¹⁴¹"Anticipation of litigation" instead of "in preparation for trial," *Musulin v. Redevelopment Authority*, 25 Pa. County R. 267 (1961); *Construction of Vine St. Extension*, 18 D.&C.2d 115 (Pa. 1959).

¹⁴²Idaho, Maryland, Minnesota, Missouri, New Jersey, Washington.

¹⁴³Illinois, Iowa, Louisiana, Nevada, Utah, [Michigan-1963?].

¹⁴⁴Pennsylvania, Texas, West Virginia.

¹⁴⁵Kentucky.

¹⁴⁶Idaho, Iowa, Kentucky, Louisiana, Nevada, New Jersey, Utah and West Virginia.

In the jurisdictions that have adopted the rule, opinion is by statute eliminated from the proper scope of examination, although there is no clear differentiation between fact and opinion. But inasmuch as an appraisal report, if prepared in anticipation of litigation, is qualifiedly protected, even the factual material is not per se subject to discovery. The result is a substantial degree of immunity from discovery for both the appraiser and the appraisal report.

In the case in Idaho, condemnees tried to get the appraisal reports and were unsuccessful because the appraisers were experts within the rule making conclusions of experts exempt from pretrial discovery.¹⁴⁷ Similarly, Iowa observed that, under it, a writing containing the conclusion of an expert need not be produced for an adversary.¹⁴⁸ Some State law is not so distinct. For instance, Louisiana has both permitted and denied discovery of appraisal reports by statutory interpretation of their comparable provision.¹⁴⁹ New Jersey, in a personal injury action, expressly immunized from production or inspection "the conclusions of an expert."¹⁵⁰

Several other States extend even greater protection to the expert and his work. Minnesota and Missouri, for example, have enacted the amendment with the exception of the qualification placed on the discovery of any writing prepared in anticipation of litigation.¹⁵¹ Consequently, the work product of an attorney is given an absolute immunity from discovery the same as the conclusion of an attorney or expert. In Missouri, however, letters, memoranda, or notes prepared by appraisers for the highway department were exempt from discovery as a work product prepared in anticipation of litigation.¹⁵²

Illinois has likewise granted absolute immunity to reports or documents made in preparation for trial, although its new rule does not follow the proposed Federal amendment or the "essentiality" test of *Hickman v. Taylor*.¹⁵³ The Pennsylvania Rules of Court also grant absolute immunity to both the reports prepared in anticipation of litigation,¹⁵⁴ and to the opinions of expert witnesses.¹⁵⁵

In Texas, absolute immunity has been granted to the communications involving the parties to the suit when "made in connection with the prosecution, investigation or defense" of a claim or the circumstances out of which the claim arose.¹⁵⁶ No mention is made in the statute, however, of protection for the opinions and conclusions of either an attorney or an expert.

The language of the Washington rule is unclear as to the type of protection given to the writing prepared in anticipation of litigation.¹⁵⁷ Absolute immunity from discovery is accorded the conclusions of an attorney or an expert; but as for the work product, instead of conditioning discovery on the showing of an injustice or undue hardship, the rule merely says, "The court need not order the production or inspection of any writing obtained or prepared. . . ."

One other State, Maryland, has enacted a rule with provisions quite similar to those of the proposed Federal rule. The result in Maryland, however, has been exactly opposite to that in the other 14 States. Instead of protecting the deponent from discovery, the Maryland Rules offer him little or no opportunity to avoid disclosing all that he knows concerning the pending action.¹⁵⁸ An appraisers report is not protected even though it

¹⁴⁷*State v. Bair*, 83 Idaho 478, 365 P.2d 216 (1961).

¹⁴⁸*Bryan v. Iowa State Hwy. Comm'n*, 251 Iowa 1043, 104 N.W.2d 562 (1960).

¹⁴⁹*State Dep't of Hwy. v. Spruell*, 243 La. 202, 142 So. 2d 396 (1962), discovery permitted on technical interpretation that material was not ordered to be "produced." *State Dep't of Hwy. v. Buckman*, 239 La. 872, 120 So. 2d 461 (1960).

¹⁵⁰*Cermak v. Hertz Corp.*, 53 N.J. Super. 455, 147 A.2d 800 (1958).

¹⁵¹*Minn. R. Civ. P. 26.02*; *Mo. Sup. Ct. R. 57.01(b)*.

¹⁵²*State ex rel. State Hwy. Comm'n v. Jensen*, 362 S.W.2d 568 (Mo. 1962).

¹⁵³*Ill. Sup. Ct. R. 19-5*; *Ill. Ann. Stat. §101.19-5* (Supp. 1962).

¹⁵⁴*Pa. R. Ct. 4011(d)*; *Musulini v. Redevelopment Authority*, 25 D.&C.2d 267 (Pa. 1961).

¹⁵⁵*Pa. R. Ct. 4011(f)*.

¹⁵⁶*Tex. R. Civ. P. 167*.

¹⁵⁷*Wash. R. Ct. 26(b)*.

¹⁵⁸*Md. R. P. 410*. See Appendix D for text.

may have been obtained in anticipation of litigation. Only the mental impressions, conclusions, opinions, or legal theories of an attorney, as contained in a written report, are protected. If no report has been written by the expert, he may then be examined by either oral or written deposition as to both his findings of fact and his opinions based thereon. To further emphasize the liberality of the discovery procedures, Rule 406(b) states:

The policy of these Rules is to require full disclosure as specified in Rule 410 (Scope of Examination) and the powers conferred by section (a) of this Rule [providing for Orders to Protect Party and Deponent] shall be used only to prevent genuine oppression or abuse.

New York has enacted a modified version of the amendment, effective Sept. 1, 1963. Under the new Civil Practice Law and Rules, the work product of an attorney is not obtainable at all.¹⁵⁹ With regard to the material prepared for litigation, the rule reads as follows:

The following shall not be obtainable unless the court finds that the material can no longer be duplicated because of a change in conditions and that withholding it will result in injustice or undue hardship: (1) any opinion of an expert prepared for litigation; and (2) any writing or anything created by or for a party or his agent in preparation for litigation.¹⁶⁰

The writing and opinion of an appraiser will be only qualifiedly protected from discovery, whereas the work product of an attorney will enjoy an absolute protection. Consequently, New York has established still another method of dealing with this problem, one which gives the appraiser less immunity from discovery than in most of the other States.

Thus, the proposed 1946 Amendment has varied greatly among the States, ranging from no protection at all for the reports and opinions of an appraiser, as in Maryland, to absolute immunity from discovery of both, as in Minnesota and Missouri. This follows the usual development of the law, whereby similar rules may result in different interpretations because of the historical development of the particular State and its legal needs.

CONCLUSION

This paper has sought to indicate the tendency toward liberalizing the discovery procedures in the courts. Federal and State rules have influenced each other and, in general, more open procedures are used so that the adversary content of a trial is minimized by the exchange of information allowed under the various rules.

Distinctions have been made between the discovery of factual data and opinions, especially in the Federal courts. In the State courts, however, opinion information is being allowed discovery in an increasing number of cases. True, there are various qualifications as to how it may be discovered and under what circumstances. In many instances, discovery of opinionative material is dependent on the court's discretion, weighing the private necessities against the public interest for justice. This philosophical basis has seen the discovery of new kinds of materials. Recent legislation has sought to distinguish such matter in a number of States from the attorney's work product. In some States, fact as well as opinion material has been specifically excluded from discovery while others have included it as discoverable. The process of judicial construction has, however, sought to determine a fair balance between the interests involved.

One of these interests is, of course, the individual vs the sovereign. Whereas there have been a few cases which have stated that when a government unit is involved greater discovery against such a unit should be allowed, the courts have generally tended to treat litigants alike—as though they were private parties.

¹⁵⁹N.Y. Civ. Prac. L. & R. §3101(c).

¹⁶⁰Id §3101(d).

In eminent domain proceedings, public authorities can draw certain implications from the Federal and State trends described in this paper based on case and statute law. There is an apparent trend toward discovery of appraisal work sheets, interrogatories concerning factual information regarding individual appraisals, and witnesses' names, including expert witnesses. Both public and private litigants no doubt produce preliminary papers of various sorts which are in an incomplete stage. The courts, to avoid unnecessary interference with ordinary deliberations on the part of the experts involved, need to draw a distinction between reliable factual materials to be relied on by the movant in a case and various preliminary data that have not yet assumed such a role. With regard to expert opinion, whereas it would appear to be sensible to have such opinion available to both sides prior to trial to facilitate adequate trial preparation, many States and Federal Courts have regarded this as an invasion of expertise and of the work efforts of the attorney.

Any efforts to reduce the adversary content of a trial and to arrive at a more factual approach to determination of issue would appear to be commendable. On the other hand, every effort should be made to eliminate a "fishing expedition" because of inadequate trial preparation on the part of the litigants, especially where the materials are readily available to both parties through the use of effort and imagination.

An important caveat is posed. Federal, State, and private litigants must make certain that expert materials developed in anticipation of trial are well prepared, well documented and well reasoned, that the factual materials are substantial and that, if the data are discoverable, they are technically sound. With such efforts there need be less concern for discovery even where opinionative matter may be obtained.

Wise application of the discovery rules to individual cases by the courts will provide the means whereby adequate information is made accessible to both parties and settlement of cases is expedited. Whereas it may appear on the surface that the courts are moving with great haste toward use of discovery procedures, especially against experts, examination in depth of the case law seems to indicate that the courts offer considerable restraints against such indiscriminate use. Where such indiscriminate application has occurred, the legislatures have specified restraints. The development of discovery doctrines has a long history and has only recently affected the field of right-of-way litigation to any great extent. Just as other substantive fields of law have learned to adapt to these procedures, so will there develop a compatibility of discovery procedures with eminent domain law. The greatest defense against inordinate use of the discovery process is good preparation of documents, papers, and other materials by the litigants involved. This process would then result in fair compensation to the condemnee based on the adequacy of the information available to both parties.

Appendix A

FEDERAL RULES PERTINENT TO DISCOVERY PROCESS

(Federal Rules of Civil Procedure, 28 U.S.C. (1961), as amended)

Rule 16. Pre-Trial Procedure; Formulating Issues

In any action, the court may in its discretion direct the attorneys for the parties to appear before it for a conference to consider:

1. The simplification of the issues;
2. The necessity or desirability of amendments to the pleadings;
3. The possibility of obtaining admissions of fact and of documents which will avoid unnecessary proof;
4. The limitation of the number of expert witnesses;
5. The advisability of a preliminary reference of issues to a master for findings to be used as evidence when the trial is to be by jury; and

6. Such other matters as may aid in the disposition of the action.

The court shall make an order which recites the action taken at the conference, the amendments allowed to the pleadings, and the agreements made by the parties as to any of the matters considered, and which limits the issues for trial to those not disposed of by admissions or agreements of counsel; and such order when entered controls the subsequent course of the action, unless modified at the trial to prevent manifest injustice. The court in its discretion may establish by rule a pretrial calendar on which actions may be placed for consideration as above provided and may either confine the calendar to jury actions or to nonjury actions or extend it to all actions.

Rule 26. Depositions Pending Action

(b) Scope of Examination. — Unless otherwise ordered by the court as provided by Rule 30(b) or (d), the deponent may be examined regarding any matter, not privileged, which is relevant to the subject matter involved in the pending action, whether it relates to the claim or defense of the examining party or to the claim or defense of any other party, including the existence, description, nature, custody, condition and location of any books, documents, or other tangible things and the identity and location of persons having knowledge of relevant facts. It is not ground for objection that the testimony will be inadmissible at the trial if the testimony sought appears reasonably calculated to lead to the discovery of admissible evidence.

Rule 30. Depositions Upon Oral Examination

(b) Orders for the Protection of Parties and Deponents. — After notice is served for taking a deposition by oral examination, upon motion seasonably made by any party or by the person to be examined and upon notice and for good cause shown, the court in which the action is pending may make an order that the deposition shall not be taken, or that it may be taken only at some designated place other than that stated in the notice, or that it may be taken only on written interrogatories, or that certain matters shall not be inquired into, or that the scope of the examination shall be limited to certain matters, or that the examination shall be held with no one present except the parties to the action and their officers or counsel, or that after being sealed the deposition shall be opened only by order of the court, or that secret processes, developments, or research need not be disclosed, or that the parties shall simultaneously file specified documents or information enclosed in sealed envelopes to be opened as directed by the court; or the court may make any other order which justice requires to protect the party or witness from annoyance, embarrassment, or oppression.

(d) Motion to Terminate or Limit Examination. — At any time during the taking of the deposition, on motion of any party or of the deponent and upon a showing that the examination is being conducted in bad faith or in such manner as unreasonably to annoy, embarrass, or oppress the deponent or party, the court in which the action is pending or the court in the district where the deposition is being taken may order the officer conducting the examination to cease forthwith from taking the deposition, or may limit the scope and manner of the taking of the deposition as provided in subdivision (b). If the order made terminates the examination, it shall be resumed thereafter only upon the order of the court in which the action is pending. Upon demand of the objecting party or deponent, the taking of the deposition shall be suspended for the time necessary to make a motion for an order. In granting or refusing such order the court may impose upon either party or upon the witness the requirement to pay such costs or expenses as the court may deem reasonable.

Rule 31. Depositions of Witnesses Upon Written Interrogatories

(d) Orders for the Protection of Parties and Deponents. — After the service of interrogatories and prior to the taking of the testimony of the deponent, the court in which the action is pending, on motion promptly made by a party or a deponent upon notice and good cause shown, may make any order specified in Rule 30 which is appropriate and just or an order that the deposition shall not be taken before the officer designated in the notice or that it shall not be taken except upon oral examination.

Rule 33. Interrogatories to Parties

Any party may serve upon any adverse party written interrogatories to be answered by the party served or, if the party served is a public or private corporation or a partnership or association, by any officer or agent, who shall furnish such information as is available to the party. Interrogatories may be served after commencement of the action and without leave of court, except that, if service is made by the plaintiff within 10 days after such commencement, leave granted with or without notice must first be obtained. The interrogatories shall be answered separately and fully in writing under oath. The answers shall be signed by the person making them; and the party upon whom the interrogatories have been served shall serve a copy of the answers on the party submitting the interrogatories within 15 days after the service of the interrogatories, unless the court, on motion and notice and for good cause shown, enlarges or shortens the time. Within 10 days after service of interrogatories a party may serve written objections thereto together with a notice of hearing the objections at the earliest practicable time. Answers to interrogatories to which objection is made shall be deferred until the objections are determined.

Interrogatories may relate to any matters which can be inquired into under Rule 26(b), and the answers may be used to the same extent as provided in Rule 26(d) for the use of the deposition of a party. Interrogatories may be served after a deposition has been taken, and a deposition may be sought after interrogatories have been answered, but the court, on motion of the deponent or the party interrogated, may make such protective order as justice may require. The number of interrogatories or of sets of interrogatories to be served is not limited except as justice requires to protect the party from annoyance, expense, embarrassment, or oppression. The provisions of Rule 30(b) are applicable for the protection of the party from whom answers to interrogatories are sought under this rule.

Rule 34. Discovery and Production of Documents and Things for Inspection, Copying, or Photographing

Upon motion of any party showing good cause therefor and upon notice to all other parties, and subject to the provisions of Rule 30(b), the court in which an action is pending may (1) order any party to produce and permit the inspection and copying or photographing, by or on behalf of the moving party, of any designated documents, papers, books, accounts, letters, photographs, objects, or tangible things, not privileged, which constitute or contain evidence relating to any of the matters within the scope of the examination permitted by Rule 26(b) and which are in his possession, custody, or control; or (2) order any party to permit entry upon designated land or other property in his possession or control for the purpose of inspecting, measuring, surveying, or photographing the property or any designated object or operation thereon within the scope of the examination permitted by Rule 26(b). The order shall specify the time, place and manner of making the inspection and taking the copies and photographs and may prescribe such terms and conditions as are just.

Rule 45. Subpoena

(b) For Production of Documentary Evidence. —A subpoena may also command the person to whom it is directed to produce the books, papers, documents, or tangible things designated therein; but the court, upon motion made promptly and in any event at or before the time specified in the subpoena for compliance therewith, may (1) quash or modify the subpoena if it is unreasonable and oppressive or (2) condition denial of the motion upon the advancement by the person in whose behalf the subpoena is issued of the reasonable cost of producing the books, papers, documents, or tangible things.

(d) Subpoena for Taking Depositions; Place of Examination. —(1) Proof of service of a notice to take a deposition as provided in Rules 30(a) and 31(a) constitutes a sufficient authorization for the issuance by the clerk of the district court for the district in which the deposition is to be taken of subpoenas for the persons named or described therein. The subpoena may command the person to whom it is directed to produce designated

books, papers, documents, or tangible things which constitute or contain evidence relating to any of the matters within the scope of the examination permitted by Rule 26(b), but in that event the subpoena will be subject to the provisions of subdivision (b) of Rule 30 and subdivision (b) of this Rule 45.

Rule 71A. Condemnation of Property

(a) Applicability of Other Rules. — The Rules of Civil Procedure for the United States District Courts govern the procedure for the condemnation of real and personal property under the power of eminent domain, except as otherwise provided in this rule.

Appendix B

EXPANDED VERSION OF FEDERAL PRE-TRIAL CONFERENCE PROVISION

2 Iowa Code 1962, R. Civ. P. §136, Pre-trial Conference

After issues are joined the court may in its discretion, and shall on written request of any attorney in the case, direct all attorneys in the action to appear before it for a conference to consider, so far as applicable to the particular case:

1. The necessity or desirability of amending pleadings by formal amendment or pre-trial order;
2. Agreeing to admissions of fact, documents or records not really controverted, to avoid unnecessary proof;
3. Limiting the number of expert witnesses;
4. Settling any facts of which the court is to be asked to take judicial notice;
5. Stating and simplifying the factual and legal issues to be litigated;
6. Specifying all damage claims in detail as of the date of the conference;
7. All proposed exhibits and mortality tables and proof thereof;
8. Consolidation, separation for trial, and determination of points of law;
9. Questions relating to voir dire examination of jurors and selection of alternate jurors, to serve if a juror becomes incapacitated;
10. Possibility of settlement;
11. Filing of advance briefs when required; and
12. Any other matter which may aid, expedite, or simplify the trial of any issue.

The pre-trial judge may direct the parties to the action to be present or immediately available at the time of conference (Report 1943, amendment 1961).

Appendix C

ADOPTION OF FEDERAL DISCOVERY RULES BY STATES¹

State	Rules Citation									
	16	26(b)	30(b)	30(d)	31(d)	33	34	45(b)	45(d)	71A(a)
Alabama	N	F	F	N	N	I	N	I	N	N
Alaska	F	F	F	F	F	F	F	F	F	F
Arizona	F	F	F	F	F	F	F	F	F	N
Arkansas	F	F	F	F	S	F	F	S	S	N
California	FE	FA	FA	F	F	FC	F	S	S	S
Colorado	F	F	FA	F	F	F	F	F	F	N
Connecticut	I	I	S	N	S	S	I	I	N	N
Delaware	F	F	F	F	F	S	F	F	IF	IF
D. C.	S	F	F	F	F	F	F	F	N	N
Florida	S	F	F	F	S	S	F	F	F	N
Georgia	F	F	F	F	F	F	FA	I	F	N
Hawaii	F	F	F	F	F	F	F	F	F	N
Idaho	F	FA	F	F	F	FA	F	F	FE	N
Illinois	F	I	S	S	S	S	I	I	I	N
Indiana	S	S	I	I	I	I	I	I	N	N
Iowa	FE	S	FA	F	I	I	S	S	I	N
Kansas	F	I	N	N	N	N	I	N	I	N
Kentucky	F	F	FA	F	F	F	F	F	S	S
Louisiana	S	F	FA	F	F	S	F	S	S	N
Maine ²	N	I	N	N	N	N	N	N	N	N
Maryland	FA	FA	FA	I	I	I	FA	S	F	IF
Massachusetts*	F	I	—	—	—	I	I	—	—	N
Michigan ³	—	—	—	—	—	—	—	—	—	—
Minnesota	F	FA	FA	F	F	FA	F	F	F	N
Mississippi*	N	I	—	—	—	—	I	N	N	N
Missouri	F	FA	S	S	F	FA	S	I	I	—
Montana	F	F	F	F	F	F	F	F	S	N
Nebraska	N	S	F	F	F	FA	F	I	I	N
Nevada	F	F	F	F	F	F	F	F	F	N
New Hampshire*	—	—	—	—	—	—	—	—	—	—
New Jersey	FE	FA	F	F	F	FE	F	I	N	N
New Mexico	F	F	FA	F	F	F	F	F	F	N
New York	N	I	I	N	I	N	I	I	N	N
North Carolina	IF	I	I	N	I	N	I	I	N	N
North Dakota	F	F	F	F	F	FA	FA	F	F	N
Ohio*	N	I	—	—	—	—	I	I	N	N
Oklahoma*	—	—	—	—	—	—	I	—	—	N
Oregon*	N	—	IF	S	—	—	—	—	—	N
Pennsylvania	S	I	I	I	N	S	I	I	N	N
Rhode Island*	N	I	—	—	—	—	—	—	—	N
South Carolina	N	I	I	N	I	N	I	I	N	N
South Dakota	F	I	F	F	F	I	I	F	F	N
Tennessee	N	S	FA	I	I	N	N	N	N	N
Texas	S	I	N	N	N	I	FA	I	N	N
Utah	F	F	FA	F	F	F	F	F	F	N
Vermont	S	F	F	F	S	I	S	N	F	N
Virginia	S	I	—	—	—	—	I	I	N	N
Washington	S	FA	F	F	F	F	F	N	N	N
West Virginia	F	IF	F	S	F	F	FA	F	F	N
Wisconsin	F	IF	S	N	S	N	I	N	N	IF
Wyoming	F	F	F	F	F	F	FA	F	F	N

¹ * = States showing little Federal influence, F = same as Federal Rule, FC = Federal Rule changed, FE = Federal Rule expanded, FA = Federal Rule plus an additional paragraph, I = individual State rule, IF = individual State rule showing Federal influence, N = no comparable rule, and S = substantially the same as the Federal Rule.

² Reflects the rules in effect before 1959 repealing statute; more recent material was unavailable.

³ Michigan adopted new rules effective January 1, 1963. The new rules, not available for this study, conform substantially to the Federal practice, except that only evidence admissible at the trial may be taken in discovery proceedings.

Statutory References to Discovery Rules, by States

- Ala. Code, recomp. 1958, tit. 7 (1960).
 Alaska R. Ct. Proc. & Adm'n (1963).
 16 Ariz. Rev. Stat. Ann., R. Civ. P. (1956).
 3A Ark. Stat. Ann. 1947, tit. 28 (1962 replacement).
 (Cal.) 23 Wests' Ann. Code Div. P. (Cum. P. P. 1962).
 1 Colo. Rev. Stat., ch. 4 (1953).
 Conn. Prac. Book of 1951 (Cum. Supp. 1960).

- 13 Del. Code Ann., Super. Ct. R.—Civ. (1953).
 (D. C.) Munic. Ct. R. (1961).
 30 Fla. Stat. Ann. (1954).
 38 Ga. Code Ann. (1959) (Cum. P. P. 1961).
 Hawaii R. Civ. P. (1954).
 2 Idaho Code, R. Civ. P. (Cum. P. Supp. 1961).
 110 Smith-Hurd Ill. Ann. Stat., Sup. Ct. R. (1956).
 2 Burns Ind. Stat. Ann.; I. L. E. Depositions and Discovery §1 (Cum. P. P. 1962).
 2 Iowa Code 1962, R. Civ. P.
 Gen. Stat. Kan. Ann. §60 (1949).
 Ky. Rev. Stat., R. Civ. P. (1953).
 3, 4 La. Stat. Ann. (1961).
 Me. Rev. Stat. 1959 (Cum. Supp. 1961).
 Md. R. Civ. P. (unann. ed. 1963).
 38 Mass. Gen. L. Ann. (1960).
 (Mich.) Gen. Ct. R. of 1963.
 27A Minn. Stat. Ann., R. Civ. P. Dist. Ct. (1958).
 2 Miss. Code 1942 §1699 (1957).
 4 Mo. Rev. Stat., Sup. Ct. R. (1957).
 Mont. Laws, 37th Sess., ch. 13 (1961).
 Neb. Sess. Laws 1951, §§25-1267.01-25.1269 (1952).
 1 Nev. Rev. Stat., R. Civ. P. (1953).
 5 N.H. Rev. Stat. Ann., §516 (1955).
 N.J. Prac., part IV, ch. 4 (1953).
 4 N.M. Stat. Ann. 1953, ch. 21 (1954).
 N.Y. Laws, Civ. Prac. L. & R., ch. 308 (1962).
 1A N.C. Gen. Stat., recomp. 1953.
 5 N.D. Cent. Code Ann., R. Civ. P. (1957).
 Ohio Rev. Code Ann., ch. 2317 (1962 Supp.).
 Okla. Stat. Ann., tit. 12, ch. 10 (1960).
 1 Ore. Rev. Stat., ch. 45 (ch. replaced 1961-1962).
 Pa. R. Ct. (1962).
 2 Gen. Laws R. I., tit. 9, ch. 18 (1962).
 6 Code Laws S. C., ch. 7 (1962).
 2 S.D. Code, tit. 36, ch. 36 (Supp. 1960).
 5 Tenn. Code Ann., tit. 24 (Supp. 1962).
 Tex. R. Civ. P. (1955).
 9 Utah Code Ann., R. Civ. P. (1953).
 3 Vt. Stat. Ann., tit. 12 (Supp. 1961).
 2 Va. Code, tit. 8, R. Sup. Ct. App. (1950).
 0 Rev. Code Wash., R. Pleading, Prac. & P. (1960).
 3 W. Va. Code Ann., R. Civ. P. (1961).
 30, 38 Wis. Stat. Ann. (1958).
 2 Wyo. Stat. 1957, R. Civ. P. (1959).

Appendix D

STATUS OF STATE LAWS¹ AS TO PRIVILEGED MATTER²

State	Expert Report	Expert Conclusion	Work Product	State	Expert Report	Expert Conclusion	Work Product
Alabama	—	—	—	Montana	—	—	—
Alaska	—	—	—	Nebraska	—	—	—
Arizona	N	Q	Q	Nevada ³	Q	A	A
Arkansas	—	—	—	New Hampshire	Q	—	Q
California	N	Q	Q	New Jersey ³	Q	A	A
Colorado	—	—	—	New Mexico	—	—	—
Connecticut	—	—	A	New York ³	Q	Q	A
Delaware	Q	—	Q	North Carolina	—	—	—
Florida	N	Q	Q	North Dakota	—	—	—
Georgia	—	—	A	Ohio	A	Q	A
Hawaii	—	—	—	Oklahoma	—	—	—
Idaho ³	Q	A	A	Oregon	—	—	—
Illinois ³	A	A	A	Pennsylvania ³	A	A	A
Indiana	—	—	—	Rhode Island	—	—	—
Iowa ³	Q	A	A	South Carolina	—	—	—
Kansas	—	—	—	South Dakota	—	—	—
Kentucky ³	Q	A	A	Tennessee	—	—	—
Louisiana ³	Q	Q	A	Texas ³	A	—	A
Maine	—	—	—	Utah ³	Q	A	A
Maryland ³	N	N	Q	Vermont	—	—	—
Massachusetts	—	—	—	Virginia	—	Q	—
Michigan	—	—	Q	Washington ³	—	A	A
Minnesota ³	A	A	A	West Virginia ³	Q	A	A
Mississippi	Q	—	—	Wisconsin	N	Q	Q
Missouri	A	A	Q	Wyoming	—	—	—

¹ See Summary Explanation following.

² A = absolute protection from discovery, N = no protection from discovery, and Q = qualified protection from discovery.

³ States which have adopted the proposed 1946 Amendment to the Federal Rules regarding experts and attorney's work product.

Summary Explanation of Status of State Laws

Alabama.—No cases on point. Ala. Code, recomp. 1958, tit. 7, §§474-489. Provisions are based on the Federal provisions for discovery, but no provision is made for production of documents, requests for admissions, written interrogatories or the other discovery devices available under the Federal Rules. Rules similar to the Federal Rules were proposed in 1957 but rejected in the Senate.

Alaska.—No cases on point. Alaska R. Ct. Proc. & Adm'n 1963, Fed. R. Civ. P. made effective in Alaska on July 18, 1949; 63 Stat. 445, 48 U. S. C. A. §103a (1952).

Arizona.—Rules virtually identical to Federal Rules were adopted, effective Jan. 1, 1940. Latest revision effective Jan. 1, 1956. *Dean v. Superior Court*, 84 Ariz. 104, 324 P. 2d 764 (1958), denying discovery of work product; *State ex rel. Willey v. Whitman*, 91 Ariz. 120, 370 P. 2d 273 (1962), condemnation case permitting discovery of reports and conclusions.

Arkansas.—No cases on point. Procedure is regulated entirely by legislature. 3A Ark. Stat. Ann. 1947, tit. 28 (1962 replacement). In 1949, provisions similar to Fed. R. 16 were adopted, Ark. Stat. §27-2401 (Supp. 1947). In 1953 legislature adopted provisions similar to Fed. R. 26-37, Ark. Stat. §§28-347 to 28-361 (Supp. 1957). As to liberal construction of rules see, *Arkansas State Hwy. Comm'n v. Stanley*, 353 S. W. 2d 173 (1962).

California.—Adopted code pleading in 1851. Judicial Council adopted rules similar to Federal pre-trial and discovery provisions in 1957 & 1958, Cal. Stat. 1957 §3, ch. 1904 p. 3322, operative Jan. 1, 1958. *Oceanside Union School Dist. v. Superior Ct.*, 23 Cal. Rep. 375, 373 P. 2d 439 (1962), condemnation case permitting discovery of expert reports; *Greyhound Corp. v. Superior Court*, 56 C. 2d 355, 364 P. 2d 266 (1961), permitting discovery of work product; for recent discussion of scope of discoverability of expert reports, conclusions and work product see, *Brown v. Superior Ct.*, 30 Cal. Rep. 338 (Dist. Ct. App. 1963).

Colorado.—No cases on point. Procedural rules have been similar in text and interpretation to Federal provisions since April 6, 1941. 1 Col. Rev. Stat., ch. 4 (1953). Keely, "How Colorado Conformed State to Federal Civil Procedure," 16 F. R. D. 291 (1955).

Connecticut.—Adopted code in 1879 Based on the Field Code. In 1957 the Conn. Sup. Ct. adopted rules providing for limited disclosure and pre-trial practice. Conn. Prac. Book of 1951 (Cum. Supp. 1960). Prizio v. Penachio, 19 Conn. Sup. 381, 115 A.2d 340 (Conn. Super. 1955), indicating a trend toward Federal interpretation but protecting written statements as work product.

Delaware.—Adopted rules similar to Federal provisions, eff. Jan. 1, 1948, 13 Del. Code Ann., Super. Ct. R.—Civ. (1953). Empire Box Corp. v. Illinois Cereal Mills, 90 A.2d 672 (Super. Ct. 1952), denying discovery and qualifying protection to expert reports and work product.

Florida.—Rules adopted March 15, 1954, based primarily on Federal Rules. 30 Fla. Stat. Ann. (1954). Shell v. State Rd. Dep't, 155 So. 2d 857 (Fla. 1961), condemnation case permitting discovery of appraiser's work sheets; Shawmut Van Lines, Inc. v. Small, 148 So. 2d 556 (Dist. Ct. App. Fla. 1963), noncondemnation case qualifying discovery of work product.

Georgia.—As of March 25, 1959, the code of Georgia stands amended following for the most part the Federal discovery provisions. 38 Ga. Code Ann. (1959). (Cum. P. P. 1961). Setzers Super Stores v. Higgins, 104 Ga. App. 116, 121 S.E.2d 305 (Ga. App. Ct. 1961), noncondemnation case denying discovery of work product.

Hawaii.—No cases on point. Rules were adopted, eff. June 14, 1954, substantially the same as Federal Rules. Hawaii R. Civ. P. 1954.

Idaho.—Rules which follow closely Federal Rules were adopted, eff. Nov. 1, 1958. 2 Idaho Code, R. Civ. P. (Cum. P. Supp. 1961). State v. Bair, 33 Idaho 478, 365 P.2d 216 (1961), condemnation case denying discovery of experts' conclusions.

Illinois.—A new Civil Practice Act, influenced by Federal Rules, was adopted, eff. Jan. 1, 1956, 110 Smith-Hurd Ill. Ann. Stat., Sup. Ct. R. (1956). City of Chicago v. Harrison-Halsted Bldg. Corp., 11 Ill. 2d 431, 143 N.E.2d 40 (Sup. Ct. 1957), condemnation case denying discovery of experts' statements. Kemeny v. Skorch, 159 N.E.2d 489, 490 (Ill. 1959), as to documents exempt from disclosure.

Indiana.—No cases on point. Indiana has rules provisions similar to Fed. R. 16 and 26(b), but has its own limited provisions for depositions and discovery. 2 Burns Ind. Stat. Ann. (1947); I. L. E., Depositions & Discovery §1 (Cum. P. P. 1962).

Iowa.—Rules adopted, eff. July 4, 1943, are less liberal than the corresponding Federal provisions. 2 Iowa Code 1962, R. Civ. P. Bryan v. Iowa State Hwy. Comm'n, 251 Iowa 1093, 104 N.W.2d 562 (1960), condemnation case in which discovery of experts' conclusions were denied; Hanke v. Iowa Home Mut. Cas. Co., 87 N.W.2d 920 (1958), a noncondemnation case qualifying discovery of attorney's work product.

Kansas.—No cases on point. Procedure to a great extent remains unchanged since 1859. Pre-trial procedure corresponding to Fed. R. 16 was adopted, eff. June 30, 1949. Gen. Stat. Kan. Ann. §60 (1949). Pyramid Life Ins. Co. v. Gleason Hospital, Inc., 188 Kan. 95, 360 P.2d 858 (1961), as to general interpretation of discovery statute.

Kentucky.—Rules similar to Federal Rules were adopted, eff. July 1, 1953, Ky. Rev. Stat., R. Civ. P. (1953). Bender v. Eaton, 343 S.W.2d 799 (Ky. 1961), a non-condemnation case denying discovery of work product.

Louisiana.—Code revision, eff. Jan. 1, 1961; 3, 4 La. Stat. Ann. (1961); State Dep't of Hwy. v. Buckman, 239 La. 872, 120 So. 2d 461 (1960), condemnation case denying discovery of certain contracts and instructions; State v. Riverside Realty Co., 152 So. 2d (Ct. App. La. 1963), condemnation case permitting discovery of expert-factual questions without violating work product.

Maine.—No cases on point. Rules similar to Federal Rules were adopted, eff. Dec. 1, 1959. Me. Rev. Stat. 1959 (Cum. Supp. 1961).

Maryland.—No cases on point. A complete revision of the rules was promulgated in 1956 and rules revised, eff. Jan. 1, 1957. Md. R. Civ. P. (1961 ed.) and as amended through Sept. 1, 1963 (unann. ed. 1963). Baltimore Transit Co. v. Mezzanotti, 227 Md. 8, 174 A.2d 768 (Ct. App. 1961), as to liberal construction of the rules.

Massachusetts.—No cases on point. Procedure continues to follow a practice act first adopted in 1852. 38 Mass. Gen. L. Ann. (1960).

Michigan.—A complete procedural change designated the Revised Judicature Act of 1961, and rules substantially similar to Federal Rules adopted, eff. Jan. 1, 1963. Mich. Gen. Ct. R. of 1963. *Hallett v. Michigan Consol. Gas Co.*, 298 Mich. 582, 299 N.W. 723 (1941), qualified protection of experts' reports; *Wilson v. Borchard*, 122 N.W.2d 57 (Mich. 1963), qualified protection of work product.

Minnesota.—Adopted rules virtually identical to Federal Rules, eff. Jan. 1, 1952. 27A Minn. Stat. Ann., R. Civ. P. Dist. Ct. (1958). In re *Sandstrom's Estate*, 89 N.W.2d (Minn. 1958), production of documents denied for failure to show good cause; *Brown v. Saint Paul City Ry.*, 241 Minn. 15, 62 N.W.2d 688 (1954), discovery of work product denied.

Mississippi.—Limited discovery provisions, unlike Federal Rules. 2 Miss. Code 1942 §§1659, 1699 (1957). *Garraway v. Retail Credit Co.*, 141 So. 2d 727 Miss. 1962, qualified protection of experts' reports.

Missouri.—Mo. Sup. Ct. adopted rules in 1959 similar to Federal Rules, eff. Oct. 1960. 4 Mo. Rev. Stat., Sup. Ct. R. (1959). *State ex rel. State Hwy. Comm'n v. Jensen*, 362 S.W.2d 568 (Sup. Ct. Mo. 1962), condemnation case protecting appraisers notes from discovery as work product; *State ex rel. St. Louis County Transit Co. v. Walsh*, 327 S.W.2d 713 (Ct. App. Mo. 1959), photographs not privileged per se—qualifies work product.

Montana.—No cases on point. Adopted Federal Rules almost verbatim, eff. Feb. 9, 1961. Mont. Laws, 37th Sess., ch. 13 (1961). As to extent of discovery under previous rules see, *State ex rel. Pitcher v. District Ct.*, 114 Mont. 128, 133 P.2d 350 (1943).

Nebraska.—No cases on point. As of 1951 Nebraska has had discovery provisions similar to Federal Rules. Neb. Sess. Laws 1951, §§25-1267.01-25.1269 (1952).

Nevada.—No cases on point. Nev. Sup. Ct. adopted rules similar to Federal Rules, eff. Jan. 1, 1953. 1 Nev. Rev. Stat., R. Civ. P. (1953).

New Hampshire.—No provisions similar to Federal Rules. 5 N.H. Rev. Stat. Ann., §516 (1955). *McDuffey v. Boston & Maine R.R.*, 102 N.H. 179, 152 A.2d 606 (Sup. Ct. 1959), permitting discovery of experts' reports; *Smith v. American Employer's Ins. Co.*, 102 N.H. 530, 163 A.2d 564 (Sup. Ct. 1960), denying discovery of work product.

New Jersey.—Rules substantially similar to Federal Rules, eff. Sept. 15, 1948, and revised in 1953. N.J. Prac., part IV, ch. 4 (1953). *Cermak v. Hertz Corp.*, 53 N.J. Super. 455, 147 A.2d 800 (1958), discovery of experts' conclusions denied; *Kaplan v. Jones*, 77 N.J. Super. 31, 185 A.2d 248 (Super. Ct. 1962), denying discovery of work product.

New Mexico.—No cases on point. As of 1949 New Mexico has had rules similar to Federal Rules. 4 N.M. Stat. Ann. 1953, ch. 21 (1954). *Salitan v. Carrillo*, 69 N.M. 476, 368 P.2d 149 (1961), as to scope of discovery.

New York.—In 1962 the N.Y. Civ. Prac. Laws & Rules were adopted, eff. Sept. 1, 1963. The rules do not expand the scope or methods of discovery nor make provision for pre-trial conferences. N.Y. Laws, Civ. Prac. L. & R., ch. 308 (1962). *Murphy v. City Products Corp.*, 188 N.Y.S.2d 247, 17 Misc. 2d 1026 (Sup. Ct. Erie County 1959), denying discovery of experts' conclusions; *Hewitt v. State*, 216 N.Y.S.2d 615, 27 Misc. 2d 930 (Ct. Cl. N.Y. 1960), condemnation case permitting discovery of experts' conclusions; *Pfaudler Permutit, Inc. v. Stanley Steel Service Corp.*, 212 N.Y.S.2d 106, 28 Misc. 2d 388 (Sup. Ct. Monroe County 1961), denying discovery of experts' conclusions; *Salzo v. Vi-She Bottling Corp.*, 235 N.Y.S.2d 585, 37 Misc. 2d 357 (Supp. Ct. Queens County 1962), qualified admission of experts' reports; *Cataldo v. Monroe County*, 238 N.Y.S.2d 855, 38 Misc. 2d 768 (Supp. Ct. Monroe County 1963), qualified denial of insurance reports.

North Carolina.—No cases on point. Limited discovery and deposition procedures. 1A N.C. Gen. Stat., recom. 1953.

North Dakota.—No cases on point. Rules similar to Federal Rules were adopted, eff. July 1, 1957. 5 N.D. Cent. Code Ann., R. Civ. P. (1957).

Ohio.—Procedure is under a legislative code first adopted in 1853. Ohio Rev. Code Ann., ch. 2317 (1962 Supp.). *Neff v. Hall*, 170 N.E.2d 77 (Ct. App. Ohio 1959), con-

demnation case denying discovery of experts' reports; *Nomina v. Eggeman*, 188 N.E.2d 440 (Ct. C. P. Ohio 1962), qualifying discovery of experts' conclusions' in re *Bates*, 167 Ohio St. 46, 146 N.E.2d 306 (Sup. Ct. 1957), denying discovery of work product.

Oklahoma.—No cases on point. Procedure is regulated by a code first adopted in 1870. *Okla. Stat. Ann.*, tit. 12, ch. 10 (1960). Application of *Umbach*, 350 P.2d 299 (Okla. 1960), Federal income tax returns held privileged.

Oregon.—No cases on point. Code provisions regulate procedure and are much more limited than Federal Rules. 1 Ore. Rev. Stat., ch. 45 (ch. replaced 1961-1962). See 40 Ore. L. Rev. 94 (1960) as to work product.

Pennsylvania.—Discovery procedures are not as liberal as comparable Federal provisions. Pa. R. Ct. 1962. *Musulin v. Redevelopment Authority*, 25 D.&C.2d 267 (Pa. 1961), condemnation cases denying discovery of appraisals and valuations; *Wright v. Philadelphia Transp. Co.*, 24 D.&C.2d 334 (Pa. 1961), denying discovery of experts' reports and conclusions.

Rhode Island.—No cases on point. Trend since 1956 to adopt procedure similar to Federal system, 10 R.I. B.J. 7 (Nov. 1961); 2 Gen. Laws R.I., tit. 9, ch. 18 (1956). *De Courcy v. American Emery Wheel Works*, 153 A.2d 130 (R.I. 1959), as to court appointed experts.

South Carolina.—No cases on point. Procedure still substantially the same as under the Field Code first adopted in 1870. 6 Code Laws S.C., ch. 7 (1962). As to general provisions see, *Peagler v. Atlantic Coast Line R.R.*, 101 S.E.2d 821 (S.C. 1958).

South Dakota.—No cases on point. Rules have been adopted similar to Federal discovery provisions. 2 S.D. Code, tit. 36, ch. 36 (1960 Supp.).

Tennessee.—No cases on point. Code provisions limited following some of the Federal provisions. 5 Tenn. Code Ann., tit. 24 (Supp. 1962).

Texas.—A detailed set of rules following Federal provisions, eff. Sept. 1, 1941. A series of amendments in 1957 substantially broadened the discovery procedure. *Tex. R. Civ. P.* (1955). *Harrell v. Atlantic Refining Co.*, 339 S.W.2d 548 (Ct. Civ. App. Tex. 1960), discovery or work product denied.

Utah.—Rules were adopted in 1950 very similar to Federal Rules. 9 Utah Code Ann., R. Civ. P. (1953). *Mower v. McCarthy*, 122 Utah 1, 245 P.2d 224 (Sup. Ct. 1952), denying discovery of expert conclusions and work product.

Vermont.—No cases on point. Discovery procedure similar to Federal procedure was adopted by statute in 1957 and substantially amended in 1959. 3 Vt. Stat. Ann., tit. 12 (1961 Supp.).

Virginia.—Sup. Ct. adopted a set of rules, eff. Feb. 1, 1950, with limited discovery procedure. 2 Va. Code, tit. 8, R. Sup. Ct. App. (1950). *Cooper v. Norfolk Redevelopment & Housing Authority*, 197 Va. 653, 90 S.E.2d 788 Sup. Ct. App. (1956), a condemnation case permitting discovery of experts' conclusions on agency principles.

Washington.—No cases on point. Has adopted Federal Rules on discovery and pre-trial conference. 0 Rev. Code Wash., R. Pleading, Prac. & P. (1960).

West Virginia.—No cases on point. The W. Va. Sup. Ct. adopted rules similar to Federal Rules, eff. July 1, 1960. 3 W. Va. Code Ann., R. Civ. P. (1961).

Wisconsin.—Discovery statutes were amended in 1961 to harmonize with liberal interpretation of Federal provisions. 30, 38 Wis. Stat. Ann. (1958). *State ex rel. Reynolds v. Circuit Ct.*, 15 Wis. 2d 311, 112 N.W.2d 686 (1961), condemnation case permitting discovery of appraisers' reports and opinions; *Walsh v. Northland Greyhound Lines*, 224 Wis. 281, 12 N.W.2d 20 (1943), permitting discovery of experts' reports.

Wyoming.—No cases on point. Wyo. Sup. Ct. adopted new rules similar to Federal Rules in 1957. 2 Wyo. Stat. 1957, R. Civ. P. (1959). See, *Lake De Smet Reservoir Co. v. Kaufman*, 292 P.2d 482 (Wyo. 1956) as to liberal interpretation of courts discretion in permitting discovery of books, documents and papers.

Illustrative Statutory Provisions Regarding Expert Protection from Discovery

A. Absolute protection (A) for the expert's conclusions, and the attorney's work product
Smith-Hurd Ill. Ann. Stat. §101.19-5 (Sup. Ct. R. 19-5): §101.19-5 (1). All matters which are privileged against disclosure upon the trial are privileged against disclosure

through any discovery procedure. Disclosure of memoranda, reports, or documents made by or for a party in preparation for trial or any privileged communications between any party or his agent and the attorney for the party shall not be required through any discovery procedure.

Pa. R. Ct. 4011. Limitation of Scope of Discovery and Inspection. No discovery or inspection shall be permitted which:

1. Is sought in bad faith;
2. Causes unreasonable annoyance, embarrassment, expense, or apprehension to the deponent or any person or party;
3. Relates to matter which is privileged or would require the disclosure of any secret process, development, or research;
4. Would disclose the existence or location of reports, memoranda, statements, information, or other things made or secured by any person or party in anticipation of litigation or in preparation for trial or would obtain any such thing from a party or his insurer, or the attorney or agent of either of them, other than information as to the identity or whereabouts of witnesses;
5. Would require the making of an unreasonable investigation by the deponent or any party or witness, adopted Nov. 20, 1950, eff. June 1, 1951, amended April 12, 1954, eff. July 1, 1954; or
6. Would require a deponent, whether or not a party, to give an opinion as an expert witness, over his objection, amended March 1962, eff. April 1962.

B. No statutory protection (N) for expert's report or his conclusions and only qualified protection (Q) of attorney's work product. Md. R. P. 410

§410 (c). Writings obtainable: Except as otherwise provided in Rule 406 (similar to Federal Rule 30(b) providing for protective orders), a party may be written interrogatory or by deposition require that an opposing party produce or submit for inspection a written report of an expert, whom the opposing party proposes to call as a witness, whether or not such report was obtained by the opposing party in anticipation of trial or in preparation for litigation. If such expert has not made a written report to the opposing party, such expert may be examined upon written questions or by oral depositions as to his findings and opinions.

§410 (d). Writings not obtainable: Except as otherwise provided in Rule 406, a party or deponent shall not be required to produce or submit for inspection:

1. Object prepared for trial. A writing, statement, photograph or other object obtained or prepared in anticipation of litigation or in preparation for trial, except as provided in section C of this Rule, unless the court otherwise orders on the ground that a denial of production or inspection will result in an injustice or undue hardship.

2. Reflecting attorney's conclusions. A writing which reflects an attorney's mental impressions, conclusions, opinions or legal theories (In this case the attorney's work product appears to include only the results of the mental processes of the attorney).

C. Qualifying (Q) protection of expert's report upon condition that it was prepared in preparation for trial and protecting "any part."

Ky. Rev. Stat., R. 37.02. Limitations on the Production of Writings: The deponent shall not be required and the court shall not order a deponent or party to produce or submit for inspection any writing obtained or prepared by the adverse party, his attorney, surety, indemnitor, or agent, in anticipation of litigation or in preparation for trial unless satisfied that denial of production or inspection will result in an injustice or undue hardship; nor shall the deponent be required or the court order a deponent or party to produce or submit for inspection any part of a writing which reflects an attorney's mental impressions, conclusions, opinions, or legal theories, or except as provided in Rule 35, the conclusions of an expert.

Highway Severance Damage Studies— Some General Findings

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•A MAJOR job facing builders of modern highways today is the equitable and timely acquisition of right-of-way. For several reasons, this task may be growing even more complex than it has been in the past (1). Controlled access features of modern highways place more limits on abutters' rights than was formerly the case with free-access roads. Increasing competition for space causes more questions to be raised now when space is taken for highway right-of-way, and this problem is intensified by modern highway facilities needing wider rights-of-way.

Whether or not the task of right-of-way acquisition for highways is growing more difficult, there can be no doubt about the magnitude of this task. For the Interstate System alone, 1.5 million acres costing approximately \$6.5 billion will be required. Right-of-way acquisition in which the Federal Government participates is currently costing about \$750 million/yr (proposed State right-of-way programs for 1963, \$685 million; for 1964, \$757 million; for 1965, \$870 million—for federally participating right-of-way only, excluding the secondary system, except in Indiana). It is the aim of highway officials charged with spending such sums to assure that the money is being spent wisely.

Severance Damage Study Efforts

To assist in the job of right-of-way acquisition, severance damage studies (sometimes referred to as land economic studies) have been receiving increasing attention and use. Severance damage studies are case study analyses of the experience of properties taken in part for highway right-of-way. Beginning in a few States only a few years ago, systematic severance damage studies have now been completed or are under way in 46 States (Fig. 1). The States have supplied more than 1,200 case studies for a central file or of cases established about 2 yr ago in the U. S. Bureau of Public Roads. In addition to these case studies, reported to the Bureau on standard form PR-1030 and/or IBM punch cards, the States have issued more than 1,500 individual case study reports.

Uses of Severance Damage Studies

Severance damage studies are intended to provide the information which will permit equitable payments to be made for property taken. By recording and analyzing experience with property partially taken for right-of-way in the past, severance damage studies make it possible to know what the experience may be for properties partially taken now or in the future. As more is learned about what happens to properties taken in part for right-of-way, and especially about those factors or characteristics that affect value, considerable savings in right-of-way costs can be realized. But severance damage studies are obviously not intended simply to reduce costs of right-of-way acquisition. Inadequate payments for right-of-way are every bit as disquieting to conscientious highway builders as excessive payments.

Many of the benefits to be derived from severance damage studies are already being realized in those States where individual case studies of severed properties have been

completed or are under way. As suggested previously, severance damage studies can help assure the proper spending of tax money for right-of-way purposes by making available to the people involved information relevant to their deliberations. In determining what compensation is proper for right-of-way property, experience in similar situations is obviously of direct relevance.

Case Studies

Analysis to supply experience in similar situations, the purpose of individual severance studies, is the traditional approach employing comparables used so successfully by appraisers. Ordinarily, the best sources for comparables in highway-taking situations are studies completed within the State; for these takings, most States rely on cases within their own borders. For unusual cases (e. g., takings involving special purpose properties), the Bureau's bank can be searched for comparable takings (Appendix, 2, p93).

The usefulness of severance damage data to appraisers is obvious. Severance damage studies provide the facts which appraisers need to make their knowledge of highway-affected land comparable to what they already know about the value of property unaffected by the highway. An appraiser with a thorough knowledge of what has happened in a number of cases similar to that under consideration is obviously in a better position to make an appraisal of a highway-severed parcel which will be fair to both the State and the affected owner.

Adequate severance damage data can have the same general usefulness for negotiators as for appraisers—to provide enough factual information about highway effects so that expectations of highway experience can be based on a body of facts. A negotiator armed with facts will be in a more favorable negotiating position than he would be without a good knowledge of actual experience with highway-severed parcels.

A fairly common result of severance damage investigations is to show (a) that highway-severed land parcels are affected frequently less adversely than is feared, or (b) that the remainder parcel receives a significant benefit. Thus, these studies have obvious usefulness for public relations. Several States have shown that easy-to-understand accounts of experience with highway-severed parcels of land can be useful for keeping affected individuals and the general public informed.

Cases in which highway right-of-way property is acquired by amicable negotiation constitute the bulk of all highway-taking cases. However, for those cases which do result in court proceedings, economic or severance damage studies can be helpful in reaching equitable decisions. Highway attorneys in 15 of the 36 States responding report that they have used economic studies in right-of-way litigation. Although the use of economic studies as direct evidence of value has been very limited, three States have done so. Five States have used such studies on cross-examination (3). Severance damage studies have also been useful as a source of information to the State attorney for cross-examination and to test opposing witnesses on their knowledge of market value. In general, court acceptance of severance damage and land economic study findings is increasing, but slowly (4).

Usefulness of Collection of Cases

A collection of severance damage cases, as the Bureau's bank of cases, not only provides a possible source for comparables but also offers opportunities for analyzing these cases. Obviously the experience reflected in the Bureau's bank of cases cannot be considered typical of all highway takings, primarily because most States have investigated and recorded only a portion, and not necessarily a representative portion, of their total number of partial-taking cases. But the data that can be assembled permit some interesting and perhaps valuable insights. For example, the 647 cases in the Bureau's bank in which the entire remainder has sold provide a good indication of the extent to which the owner was "made whole" or, in a very general way, whether just compensation was provided "Making the owner whole" can be equated to "just compensation" only when both general and special benefits can be used to offset the cost of the taking and any damage to the remainder. Where the law does not permit such offsets, "just compensation" may very well exceed what would be needed to "make the owner

whole" (2, pp. 79-85). The extent to which the owner was "made whole" can, of course, be reckoned by simply comparing the before value of the entire tract with the total amount received by the owner (from payment for property taken plus any payment for damages plus the sales price of the entire remainder).

While there is general agreement about the purpose of severance damage studies—to learn from past experience how to provide equitable payments for right-of-way in the future—there are variations in the way which study findings are presented. Thus, in addition to information showing whether just compensation has been provided, it is sometimes expedient to compare the per acre (or square foot) value at the time of the high-way taking with the per acre value of the remainder (or a part of the remainder) which sells. This comparison ordinarily leaves out of consideration any payment that may have been for damages. It is simply the per acre selling price divided by the per acre value at the time of the taking and is commonly termed a "recovery rate." For this type of analysis, nearly all 1,250 cases in the Bureau's bank of partial-taking cases can be used.

A third type of analysis, multiple regression, permits the measurement of the association between the recovery rate of remainder parcels and several of the variables influencing the recovery rate. For example, for certain types of cases, slightly more than 70 percent of the variation in the recovery rate seems to be explained by the combined effect of the eleven characteristics which have so far been tested.

RECOVERY RATE EXPERIENCE

The recovery rate is a useful concept. A remainder parcel experiencing no change in value would have a recovery rate of 100 percent. A recovery rate greater than 100 percent means that the remainder has increased in value. The recovery rate can be determined when any part of a remainder sells.

Although there are now about 1,250 cases in the bank, cases are not usable for analysis until they are edited and checked. The number of usable cases for different comparisons varies; for the recovery rate analysis, the number of cases is 938. There are perhaps an additional 1,000 case studies (500 in Ohio) which were conducted before working out a systematic and uniform method for conducting and reporting severance damage studies. Because these studies varied considerably in concept and form, they could not be used for the present study.

Limitations of Concept

There are obviously some limitations or shortcomings in using recovery rates for comparison. The recovery rate, for example, leaves out of consideration any payment made for damages; thus, a recovery rate of less than 100 percent provides no indication of whether or not the owner has been made whole or whether just compensation has been paid.

Another problem with using the recovery rate is that the term may carry a negative meaning—the unjustified suggestion that there is some undesirable thing or event to be recovered from. Experience reflected by the Bureau's bank, in which recovery rates typically exceed 100 percent, suggests that it may be more reasonable to expect a benefit than a damage. Notwithstanding these problems, there has been considerable use of the recovery rate concept by right-of-way and appraisal groups, and findings from the Bureau's bank are, therefore, presented here using this term.

Recovery Rates and Total Experience

The results of the preliminary analysis so far are somewhat inconclusive and perplexing. The recovery rates do not seem to vary consistently with some of the characteristics used for comparison (e.g., size of nearest urban place or type of highway system). This may result partly from the fact that these rates have not been adjusted for any payment made by the highway department. When this is done, the pattern sometimes becomes more consistent. For example, the recovery rate for landlocked remainder parcels is likely to be less than 100 percent nearly half the time and more

than 100 percent the rest of the time. But when damage payments are included, only about 17 percent of the owners of landlocked parcels are found to have received less money than they had in property before the highway taking. Therefore, although it is difficult to tell in advance whether the recovery rate for landlocked remainders will be more or less than 100 percent, there can be more certainty in predicting that the total value accruing to the owner of a landlocked remainder will equal or exceed the value the owner had in property before the acquisition took place.

Medians

Because of the extremely high recovery rates experienced by some remainder parcels, simple arithmetic averages may not be a satisfactory measure of the typical recovery rate for severed parcels in the Bureau's bank at the present time. Median values provide a way of summarizing the over-all recovery rate experience in which remainder parcels with extremely high recovery rates will not have such a noticeable effect as on average values.

The median recovery rate for cases in the bank at the present time is 138 percent. This may seem high in view of the fact that it does not include any damage payments whatsoever; it should be remembered that these recovery rates are on a per acre basis and that, in many cases, only a portion of the remainder has been sold. The most valuable portion of a remainder may be sold first (e.g., for a service station at the corner of a parcel adjacent to an interchange) and this would tend to pull a recovery rate upward. Obviously all of the remainder will not have a recovery rate as high as the very valuable portion that has been sold. Conversely, remainders that are odd-shaped, too small, or otherwise uneconomic may have a lower recovery rate than would be true for other, more valuable portions of the remainder which have not been put on the market.

Over-All Experience

Figure 2 shows that in the over-all recovery experience, approximately three-fourths of all cases in the Bureau's bank had a recovery rate greater than 100 percent. Approximately 7 percent of the cases had a recovery rate of more than 1,000 percent, and one-fourth of the cases show a recovery rate of less than 100 percent.

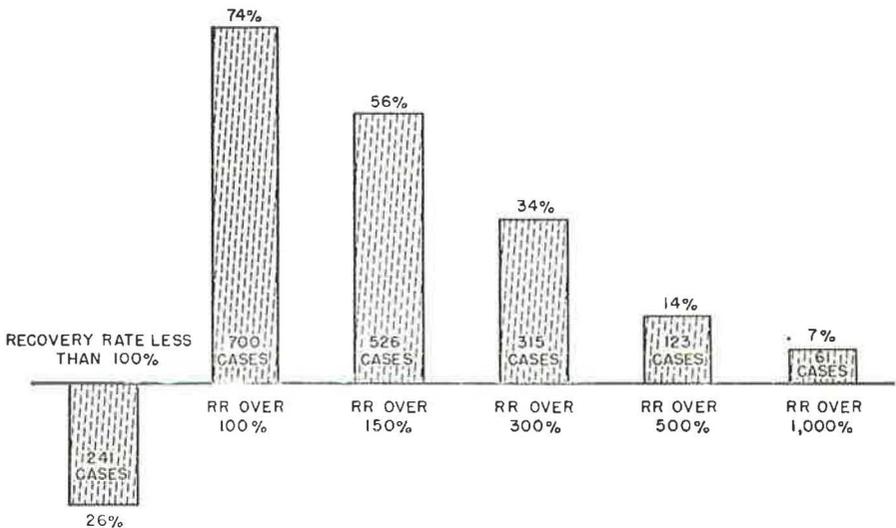


Figure 2. Land value recovery rates (over-all), by number and percent of cases.

In addition to considering recovery rates for all cases in the Bureau's bank, it seems worthwhile to consider recovery rates by categories of cases. The object of this is, of course, to separate and classify known information, with the hope that this experience can be extended and applied to cases in the future. For this purpose, cases in the Bureau's bank have been considered according to such characteristics as (a) time of sale, (b) land use before taking, (c) type of remainder parcel, (d) type of highway involved, (e) visibility from remainder, (f) distance to the new highway, (g) population of the nearest urban place, and (h) location of the parcel with respect to an interchange.

Time of Sale

The effect of time at which a remainder parcel sells on the recovery rate is of interest because it affects the validity of the comparison of before and after values. (If a sale occurs soon enough after the highway taking, there may be little or no need for adjustments for general changes in land values—the before value can be compared directly with the value shown by the sale.) The highway effect is revealed by simply comparing the before value with the value shown by the sale.

The effect that time has had on recovery rates of cases in the Bureau's bank is quite noticeable. Whereas there is no noticeable difference between the recovery rates of parcels that sold immediately after the highway taking or within a few months, those that sold a year or more after the time of the taking tend to have a higher recovery rate. As can be seen from Figure 3, parcels that sold within a year's time had a lower rate of recovery than was true for all cases. One third of the parcels that sold within the first year had a recovery rate of less than 100 percent. Only 12 percent of the parcels selling more than 3 yr after highway taking had a recovery rate less than 100 percent. The effect of time is also clear when the high recovery rates are examined. Nearly 60 percent of the land parcels that sold more than 3 yr after the highway taking had a recovery rate greater than 200 percent, and about 15 percent had a recovery rate of 1,000 percent or greater. In contrast, only about 25 percent of the land parcels that sold within the year of the taking had a recovery rate of greater than 200 percent; 4 percent had a recovery rate of 1,000 percent or greater.

There are several probable reasons why the recovery rate should be higher for parcels selling some time after the highway taking than for parcels selling soon after the taking. One reason is that sellers who dispose of their land some time after the highway taking are more likely to have received the price that they expected to receive; that is, they waited until they were offered a price that satisfied them. Perhaps an even

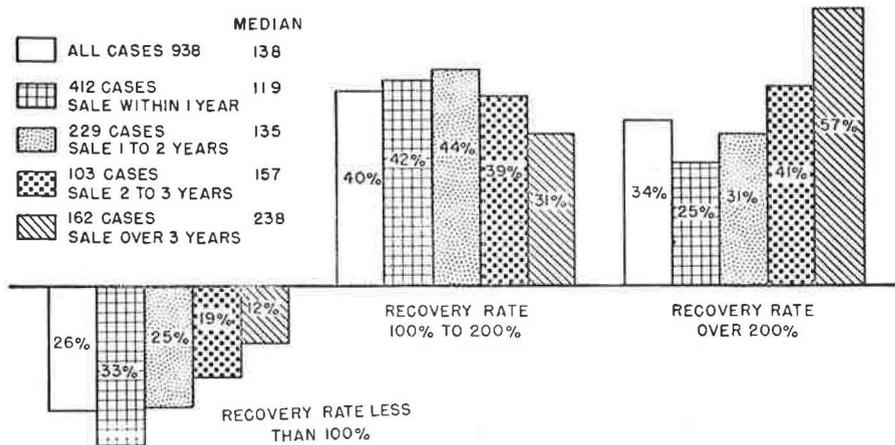


Figure 3. Land value recovery rates, by time from acquisition to sale, unadjusted for general land value changes.

more important reason is the increase in land values occurring generally. Just how much of the increase in the recovery rate is due to general land value increases and how much is due to highway influence cannot be known from the information available in the severance damage bank. It appears that part of the high recovery rates associated with property selling some time after the taking is a highway benefit which is realized by the owners who kept their property long enough for the increase to have been effective. In other words, some of those property owners who sold their property within one year of the highway taking and did not realize the high recovery rates missed part of the highway benefits that those who retained their property longer were able to capitalize on.

An examination of the median recovery rates for parcels selling at varying lengths of time after the highway taking tends to emphasize this time effect. The median recovery rate for property selling within 1 yr was 119 percent; for property selling between 1 and 2 yr after the taking, 135 percent; for property selling between 2 and 3 yr from the time of the taking, 157 percent; and for property selling more than 3 yr after the date of acquisition, 238 percent (Fig. 3).

Whereas the recovery rates given here are based on current values of land, it is fairly obvious that general land value increases can account for only a portion of these increases.

Thus, if the median recovery rates of 119, 135, 157 and 238 percent for parcels selling at varying lengths of time after the taking were adjusted using a composite increase of, for example, 7 percent a year, the recovery rates would still be quite spectacular. As can be seen from Table 1, they would be 115, 121, 129 and 155 percent respectively.

TABLE 1
RECOVERY RATE EXPERIENCE WITH
THE PASSAGE OF TIME¹

Time (yr)	Recovery Rate	
	Unadjusted	Adjusted ²
< 1	119	115
1 - 2	135	121
2 - 3	157	129
> 1	238	155

¹Time between taking and sale of remainder.

²Average annual increase of 7 percent based on: (a) U.S. Department of Agriculture's index of farm real estate values showing an average annual increase of slightly over 5 percent in recent years (5); (b) average 6 percent increase each year in site value of new and used residences with financing insured by Federal Housing Administration (6); (c) Consumers Price Index change of approximately 1.5 percent per year (7); (d) average annual rate of 2.8 percent in the land value increase for period 1922 to 1956 (8).

Land Use

Another characteristic that appears to affect the recovery rate is the use of the land at the time of the highway taking (Fig. 4). The median recovery rate for residential property, for example, is now about 126 percent, compared with a median recovery rate for all cases of 138 percent. The other land uses—vacant, agricultural, and a combination of services, trade, manufacturing, and government—had recovery rates of 143, 149, and 145 percent, respectively. Recovery rates for residential property are relatively poorer. Only 27 percent of the residential

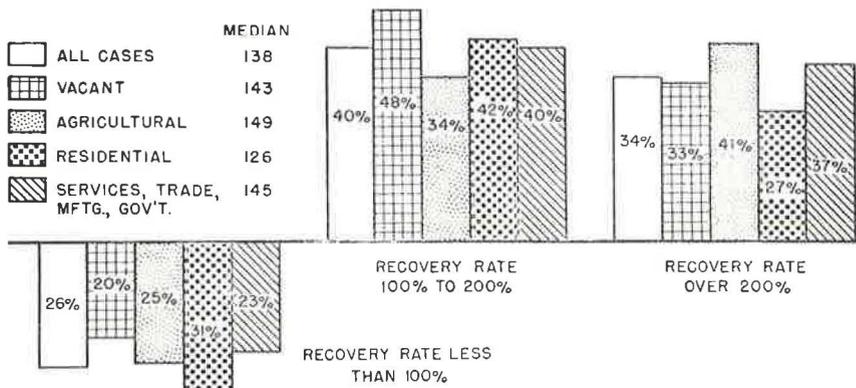


Figure 4. Land value recovery rates, by land use at time of acquisition.

property remainders had a recovery rate 200 percent or more, and 31 percent had a recovery rate less than 100 percent. In considering recovery rates, especially those less than 100 percent, it should be remembered that the recovery rate does not include any highway payment for damages.

Type of Remainder

The recovery rates for different types of remainder parcels (i. e., separated, isolated, or landlocked) also show some interesting and perhaps significant variations. The three main types of remainders (Fig. 5) are defined as follows:

1. A separated parcel is the remainder containing the improvements. Separated parcels may result when a highway taking leaves two remainders or when only one parcel remains—a situation sometimes referred to as "severed."
2. An isolated parcel is an unimproved remainder which generally can be reached only by an adjacent public road.
3. A parcel is landlocked when no access to the parcel exists by use of public facilities or adjacent land of the same owner.

The differing recovery rates experienced by the three main types of remainders are shown in Figure 6. As can be seen, the experience of separated parcels has been better than that for other types of remainders. Only 18 percent of the separated parcels failed to achieve a per acre value at least as great as before the highway taking. For isolated parcels, 35 percent had a recovery rate of less than 100 percent; and for landlocked parcels, 54 percent had a recovery rate of less than 100 percent. At the other extreme, 38 percent of the separated parcels had a recovery rate of over 200 percent, compared with 24 percent of the isolated parcels and 14 percent of the landlocked parcels. All of these findings are tentative, because there are still only a few landlocked cases in the Bureau's bank.

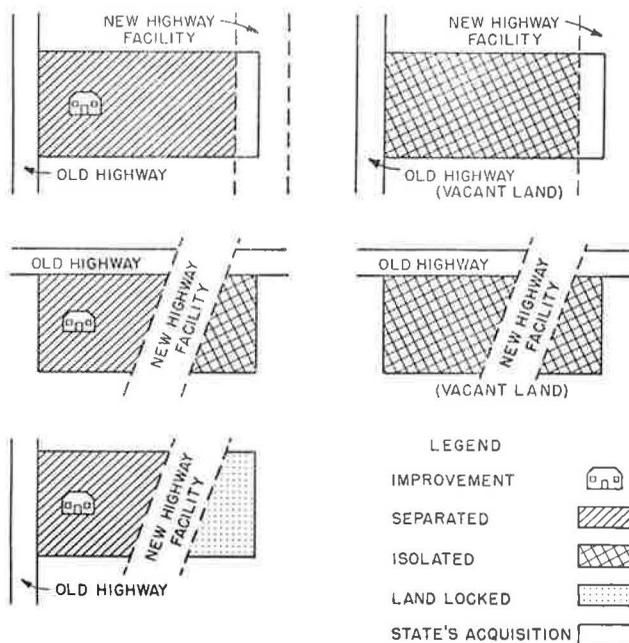


Figure 5. Separated, isolated and landlocked remainders (from 2, p. 38).

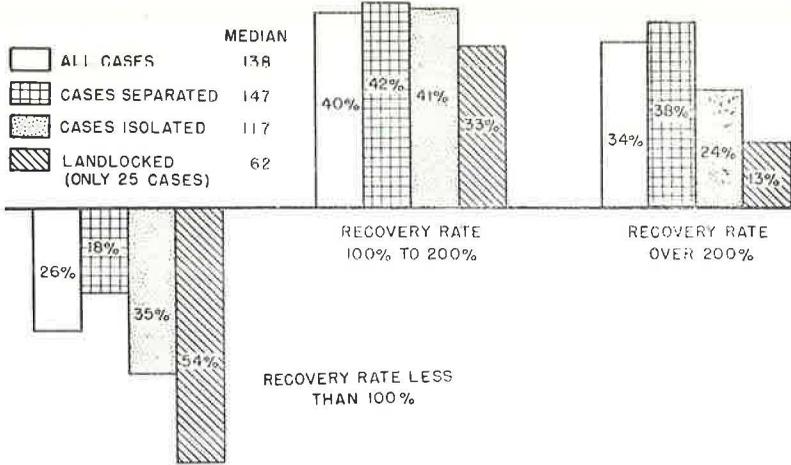


Figure 6. Land value recovery rates, by type of remainder.

Type of Highway System

Some differences appear attributable to whether the remainder parcel was located on an Interstate System, a Federal-aid primary highway, or a Federal-aid secondary road. The median recovery rate for remainder parcels along Interstate routes has so far been found to be about 140 percent, slightly higher than the median recovery rate for all cases in the Bureau's bank. Along Federal-aid primary highways, the recovery rate is about 132 percent and along Federal-aid secondary roads about 135 percent.

In addition to having higher median recovery rates, remainder parcels along the Interstate System have so far experience more large gains and more losses than has been true along other highway systems. Figure 7 shows about 35 percent of the remainder parcels located along Interstate Highway Systems have had recovery rates greater than 200 percent. This is a slightly larger percentage than that for parcels located along Federal-aid primary and secondary systems. At the same time, about 30 percent of the remainder parcels located along the Interstate System have had recovery rates of less than 100 percent, compared with about 24 and 26 percent of the remainders along Federal-aid primary and secondary systems, respectively, with recovery rates of less than 100 percent. Whether this experience along Interstate routes

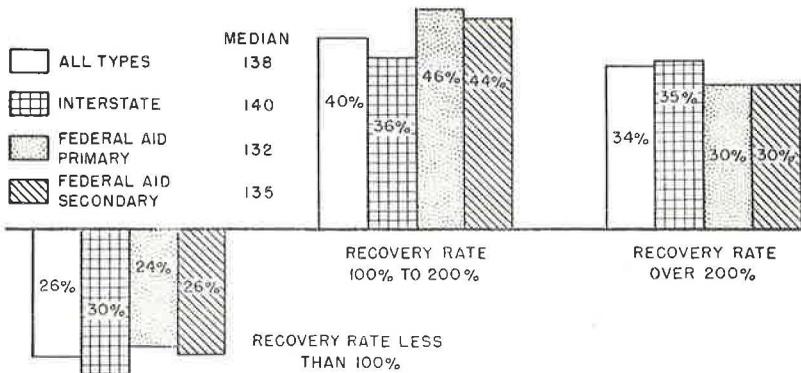


Figure 7. Land value recovery rates, by type of highway system.

will continue when more cases are available to analyze is not clear. Perhaps the overall experience of recovery for remainder parcels along Interstate routes will be more spectacular than for remainder parcels located along other types of highway systems. The higher-than-normal recovery rates along Interstate routes is, or course, quite in line with what many people would expect. And it may be that recovery rates for many parcels located along the Interstate route can be expected to be lower than for parcels located on other types of highway systems because of the lack of direct access to the Interstate System. It should be noted, however, that the contrast between Interstate and non-Interstate experience is sharper at the upper range of recovery rates than it is at the lower end. Thus, the recovery rates along the Interstate System are distinguished from the experience along other highways primarily by the high recovery rates; the low recovery rates along the Interstate System are only slightly different from those found along other types of roads.

Visibility from Remainder

The States sending severance damage cases to the Bureau's bank are providing information as to whether or not the highway is visible from the remainder parcel. (In most cases full visibility of the highway from the remainder also means full visibility of the property from the highway.) Tentative analysis of the recovery rates by visibility is showing some interesting variations, though it is not possible to tell at this point just how significant these differences are. The median recovery rate for parcels from which the highway is fully visible, for example, has been found to be 145 percent, compared with a recovery rate of 133 percent for parcels from which the highway was partially visible and 117 percent for parcels from which the highway could not be seen (Fig. 8). Figure 8 shows that 37 percent of those remainder parcels from which the highway could be seen fully had a recovery rate of over 200 percent, compared with only about 21 percent of the remainder parcels from which the highway could not be seen.

It is interesting to compare this early experience with some of the claims that are often made about the undesirable appearance of modern highway improvements. Apparently the market does not discount property from which the highway can be seen. On the contrary, property from which the highway is not visible appears to fare worse in the market place than property from which the highway can be seen.

Travel Distance to New Highway

Like visibility, the travel distance from the remainder to the new highway appears to have some bearing on the recovery rate of the remainder parcel. Whereas the remainder is ordinarily at or very near the highway for which the taking occurred some travel may be necessary to reach the highway; for example, access may be restricted.

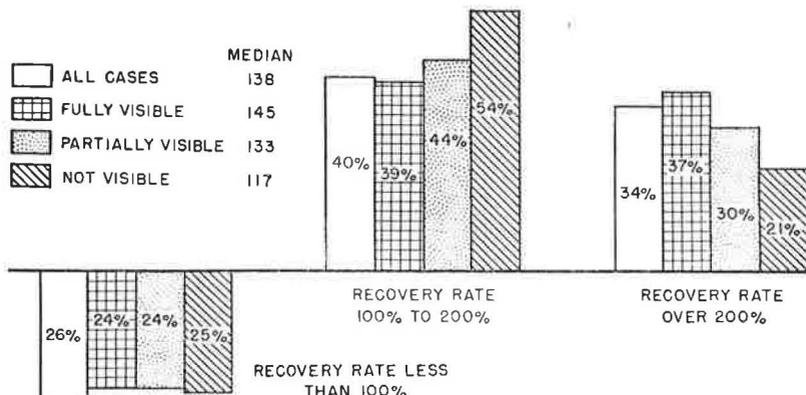


Figure 8. Land value recovery rates, by visibility of highway from remainder.

As might be expected, the bulk of cases in the Bureau's bank involves remainders from which the new highway can be reached by traveling $\frac{1}{2}$ mi or less. These parcels have so far experienced a median recovery rate of 148 percent, compared with only 106 percent for remainder parcels more than $\frac{1}{2}$ mi away in travel distance (Fig. 9). This apparently differing experience is also shown by comparing the parcels having high rates of recovery and those with low rates. For example, about 37 percent of the remainder parcels within $\frac{1}{2}$ -mi travel distance of the highway had a recovery rate greater than 200 percent, compared with about 25 percent of those parcels with longer travel distances. Only 21 percent of the remainder parcels within $\frac{1}{2}$ mi of the main highway had recovery rates of less than 100 percent; for remainder parcels more than $\frac{1}{2}$ mi in travel distance from the highway, about 42 percent had recovery rates of less than 100 percent.

Size of Urban Place

Proximity of a remainder parcel to a growing center of population is often thought to have an important bearing on the demand for the parcel and, therefore, on the selling price. The experience reflected in the Bureau's bank gives only weak support to this expectation. So far, properties near smaller urban places (i. e., those with less than 10,000 people) show a median recovery rate of 119 percent, somewhat less than the

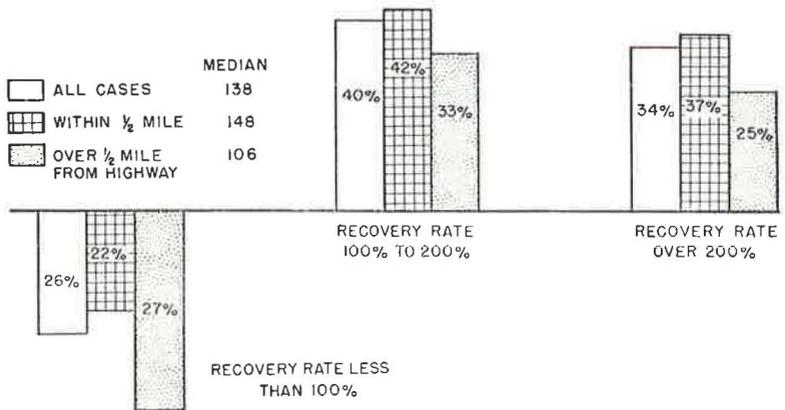


Figure 9. Land value recovery rates, by travel distance to new highway.

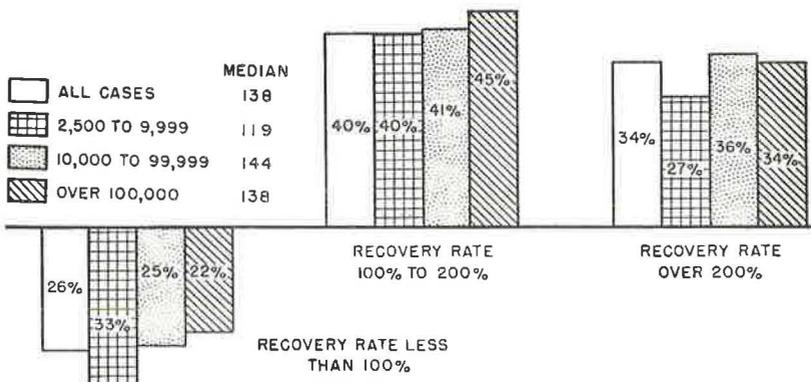


Figure 10. Land value recovery rates, by size of nearest urban place.

138 percent for all cases. Parcels near population centers of 10,000 to 100,000 show a median recovery rate of 144 percent. However, parcels near larger urban places have shown a recovery rate of only 138 percent. As can be seen in Figure 10, differences in recovery rates are small, except that only about 22 percent of the remainder parcels near large urban places had recovery rates of less than 100 percent, contrasted with about 33 percent of the remainder parcels near small urban places. This comparison involves parcels near urban places of varying size; it does not distinguish between parcels at different distances from these urban places. Studies have been made of this latter effect (9, 10).

Interchange Effects

Approximately one-fourth of the more than 900 cases used in this analysis were located within 1/2 mi of an interchange, a distance often used to distinguish between interchange and noninterchange areas. As might be expected, the recovery rate of parcels located within 1/2 mi of an interchange is generally better than the recovery rate for parcels located farther away (Fig. 11). For example, the median recovery rate for parcels located near interchanges is about 164 percent, compared with 131 percent for parcels located away from the interchange. Also, more of the interchange properties had high recovery rates and fewer of the interchange parcels had low recovery rates than was true for parcels located away from the interchange. As can be seen, nearly half of the parcels located within 1/2 mi of an interchange have had recovery rates greater than 200 percent.

Whether Bureau Cases Are Typical

Because many States supplying information about remainder parcels do not record and analyze the experience for all of the remainder parcels in the State, there may be some question as to whether the cases in the Bureau's bank are typical of general partial-taking experience. There appears to be no definitive test for this question. One check that can be made is to compare the findings from the Bureau's bank as a whole with the experience of a State supplying information about all remainder parcels which have sold. Experience for all cases in the Bureau's bank has been compared with information available about California cases which are included in the bank of cases. It should be remembered that the more than 400 cases which California has reported to the Bureau constitute a substantial portion of the approximately 900 cases so far recorded and analyzed in the Bureau's bank.

The findings to date for all the cases in the Bureau's bank compare fairly closely with the findings based solely on cases from California. The median recovery rate for the California cases in the Bureau's bank is about 142 percent, compared with a median recovery rate for all cases of 138 percent. (The comparison was made between California

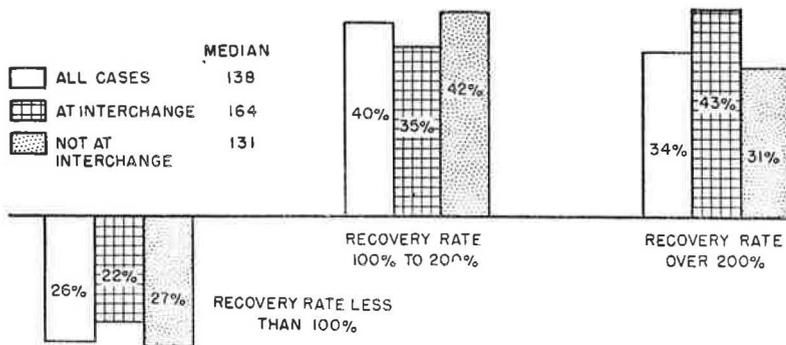


Figure 11. Land value recovery rates, by nearness to interchange (over-all).

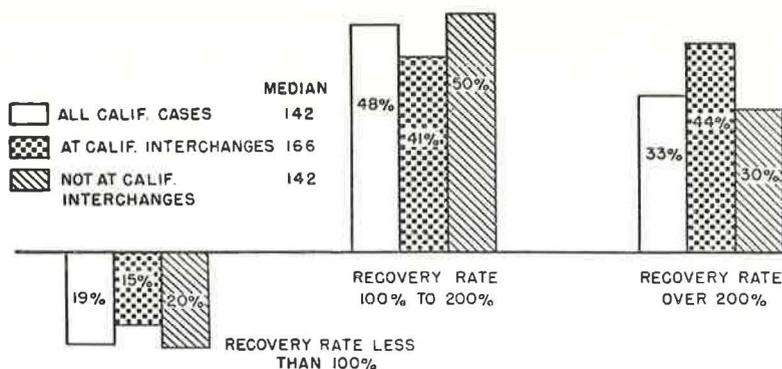


Figure 12. Land value recovery rates, by nearness to interchange (California).

cases and all cases, rather than between California cases and all non-California cases, primarily for convenience. It seems fairly obvious that the variations between California cases and non-California cases would be slightly greater than those between California cases and all cases.) When the California experience with respect to property located near or away from an interchange is compared with that of the Bureau's bank as a whole, there is also fairly close agreement. As can be seen in Figure 12, properties located within $\frac{1}{2}$ mi of the interchange had a median recovery rate in California of 166 percent, compared with the median recovery rate for all interchange cases of 164 percent. For cases located away from an interchange, California cases had a recovery rate of 142 percent, compared with a recovery rate for all cases of 131 percent. It is also interesting to note that the percentage of cases reported by California which were within $\frac{1}{2}$ mi of an interchange (about 25 percent) agrees generally with the percentage of cases near an interchange for all cases in the Bureau's bank (about 29 percent). Thus, it appears that there are similarities in the experience reflected by the California cases and that shown for all cases in the Bureau's bank, except that the recovery rates in California are slightly higher than the recovery rates in other States.

Multiple Regression

Previous studies of the recovery rates of highway-severed remainders have relied on an examination of the influence of several factors taken one at a time. In the present investigation, a start has been made to determine the simultaneous effect of several factors acting in combination and to measure the relative strength of each of the factors. The principal technique used in the analysis presented here is multiple regression. A program developed for the IBM Model 1401 computer was used to compute regression coefficients, their standard errors, and partial correlation coefficients.

As was explained previously, it cannot be known with any certainty that severance damage cases reported to the U. S. Bureau of Public Roads constitute a representative sample of all partial-taking cases. To the extent that the sample of cases reported differs from a simple random sample, therefore, the estimates of sampling errors of regression coefficients are underestimates of the true sampling errors. To compensate somewhat for this, only those regression coefficients equal to or greater than 3 times their standard errors were regarded as significant at the 95 percent level of confidence. (A 95 percent confidence level means that, on a mathematical probability basis, a coefficient of such magnitude relative to its standard error could occur only five times in a hundred.) Because in an analysis based on a simple random sample, a coefficient need be only twice as large as its standard error to be significant at the 95 percent confidence level, the use of three standard errors in the present analysis is a much more demanding requirement for statistical significance. Coefficients with values between 2 and 3 times their standard errors were regarded as marginal, and coefficients with values less than 2 times their standard errors were rejected as not significant at the 95 percent confidence level (11).

The interchange-noninterchange, INT, and distance to nearest urban place, DIST₁, variables were marginally significant, and the coefficients may have resulted from chance fluctuations. The remaining variables (type of highway system, THS, land use before taking, LU, area of land sold, SA, area of entire tract, TA, and population of nearest urban place, POP, were not significant at the 95 percent confidence level.

The multiple correlation coefficient for the combination of variables was 0.72. This is a measure of the combined importance of the several independent factors as a means of explaining the differences in the recovery rate. However, a more conservative measure is the square of the coefficient as an indication of the proportion of the variation in the recovery rate, accounted for mathematically. In this analysis, the proportion explained is 52 percent.

Further experiments were carried out in an effort to explain a higher proportion of the variation in the recovery rate. The selected cases were grouped by TIM, and the several groups were analyzed separately. The best result obtained was for remainders which sold between 1 and 2 yr after the partial taking occurred. For this group, using all the independent variables given in Table 3 except TIM, a multiple correlation coefficient of 0.86 was obtained, indicating that 73 percent (the square of 0.86) of the variation in the recovery rate was explained by the combined effect of the variables used. Four of the variables (TR, DIST₂, CLU, and INT) were significant factors at the 95 percent confidence level. Each of the coefficients was more than 4 times its standard error. The addition of each variable explained between 28 and 33 percent of the variation in the recovery rate left unexplained by the other nine variables.

An effort was made to apply this technique to the entire bank of cases, but with very disappointing results. It was apparent that a linear regression equation could not be expected to describe the relationship of the several independent variables to the recovery rate if the total group of study cases, including those experiencing very large or very small recovery rates, were retained in the analysis. The analysis would, therefore, have to be restricted to those cases falling within a relatively narrow range of the "typical" case.

EXTENT TO WHICH THE OWNER IS "MADE WHOLE"

The extent to which the owner is "made whole" can be determined by comparing "before and after" values. When a State takes part of an owner's property for highway right-of-way, and then after a time the owner sells the entire remainder, it may be said that all the results are in for that owner and for that property. It is then possible to determine the extent of damage or benefit to the remainder.

A before and after examination of the 647 cases where the entire remainder sold reveals the extent to which owners of property partially taken for highway right-of-way were made whole—that is, whether affected property owners were placed in as good a financial position as they would have been had their property not been taken. To measure the effects of the partial taking, the value of the entire property (including improvements) before the taking was compared with the total amount the owner received from the property—i. e., for the property taken, for damages to the remainder, and from the sale of the entire remainder.

Damages—Estimated and Actual

Damage payments were made only to the owners of 60 percent of the properties examined. Examination of the experience of these owners revealed that half of the recipients actually sustained no damage at all, whereas one-fourth of the recipients of damage payments suffered less actual damage than they were paid for. Twenty-two percent of all recipients of damage payments received less in damage payments than they actually sustained.

Of the owners who received no damage payments, 82 percent experienced no actual damage. A comparison of the experience of owners receiving damage payments with those not receiving them shows that for both groups about one owner in five suffered a loss due to an underpayment of damages or to the nonpayment of damages. State highway departments are, of course, just as concerned about property owners receiving in-

adequate compensation as they are about apparent over payment of damages because the goal is to make the owner whole.

It is interesting to compare the experience of owners of property located at interchanges with that of other affected property owners. Separate tabulations were made for the experience of owners of properties located within $\frac{1}{2}$ mi of interchanges and more than $\frac{1}{2}$ mi from interchanges. This comparison revealed that a higher proportion of affected owners in interchange areas (69 percent) were paid damages than in non-

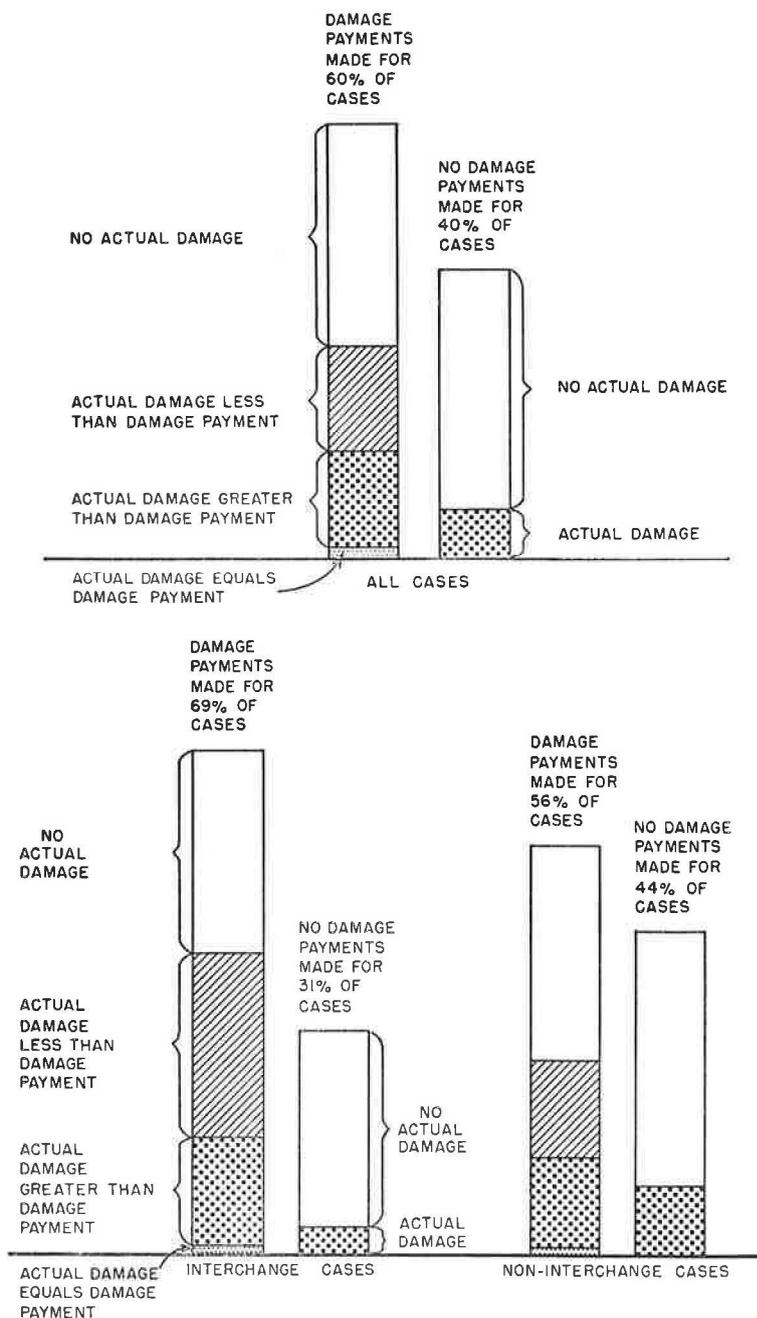


Figure 13. Damage payments vs actual damages.

TABLE 4
PROPORTION OF AFFECTED PROPERTY OWNERS
RECEIVING DAMAGE PAYMENTS

Damages	Interchange		Non-interchange		Total	
	No.	%	No.	%	No.	%
Cases	196	100	451	100	647	100
Paid:	135	69	254	56	389	60
No actual	55	28	134	30	189	30
Less than paid	49	25	56	12	105	16
More than paid	28	14	58	13	86	13
Equal to paid	3	2	6	1	9	1
None paid:	61	31	197	44	258	40
No actual	54	28	158	35	212	33
Actual	7	3	39	9	46	7

interchange areas (56 percent). This difference results at least in part from the differing ratios of controlled-access to free-access highways; remainders at interchange points ordinarily result from a taking for a controlled-access facility, whereas remainders in noninterchange areas may be found along any type of highway. These and other more detailed findings concerning overpayments and underpayments of damage are given in Table 4. Visual comparisons of these findings are also shown in Figure 13.

Damage Payments as Percent of Total Payments

It is of interest to compare the proportion of total State payments accounted for by damage payments for selected categories of partial-taking cases with that for all cases combined. Using aggregate payment figures for all cases combined, damage payments accounted for 28 percent of total payments made by the States for right-of-way acquisition. The supporting data for this finding are given in Table 5. When these cases were grouped by land use before the taking, the most outstanding finding was that for vacant land 49 percent of the cost of acquisition was accounted for by damage payments. Although this comparison by land use was made on an aggregate basis, the result seems to be consistent with the experience of owners of vacant land as described in a latter section. In that discussion it is shown that owners of vacant land fared noticeably better than owners of land in other uses in terms of total value received compared with the before appraised value of their property. Specifically, owners of vacant land had receipts averaging 129 percent of the before value of their property, whereas owners of land in other uses at the time of acquisition by the State had receipts ranging from 107 percent (residential) to 115 percent ("all other" uses) of the before value of their properties. At least a partial explanation of the more favorable after-taking experience of owners of vacant land is given by a comparison of the uses of remainder parcels at the time they sold with their uses at the time of the taking, which revealed that 29 percent of parcels vacant at the taking had shifted to higher uses by the time the parcels sold. By

TABLE 5
DAMAGE PAYMENTS AS PERCENT OF TOTAL STATE PAYMENTS

Cases	Payment (\$100)			Damages as Percent of Total State Payments
	For Taking	For Damages	Total	
All cases:	40,116	15,636	55,752	28
Interchange	10,710	3,483	14,193	25
Noninterchange	29,406	12,153	41,559	29
Land use before:				
Vacant	5,059	4,784	9,843	49
Agriculture	11,259	2,055	13,314	15
Residential	14,297	6,163	20,460	30
Other	9,501	2,614	12,115	22
Type of remainder:				
Separated	26,503	10,474	36,977	28
Isolated	7,389	722	8,111	9
Landlocked	1,337	371	1,708	22
Other	4,887	4,069	8,956	45
Type of highway system:				
Interstate rural	5,448	2,628	8,116	32
Interstate urban	15,638	6,587	22,225	30
FAP rural	4,202	808	5,010	16
FAP urban	4,821	4,030	8,851	46
FAS, local, and other State	2,140	330	2,470	13
Other	7,827	1,253	9,080	14

contrast, only 9 percent of residential parcels had shifted to higher uses by the time they sold.

In view of the very favorable after-taking experience owners of vacant land and considering the high proportion of State payments accounted for by damage payments, it appears that the acquisition of vacant land offers a good chance for improvements in the pursuit of the goal of making the owner whole.

Value Received as Percent of Before Value

A basic comparison is that between the value before the acquisition and the value realized by the affected owner after the taking (Table 6). The total amount received by the owner may be expressed by the following equation:

$$A = P + SD + SP \quad (2)$$

in which

- A = total amount received by the owner for his property,
- P = payment by the State for the property taken,
- SD = payment by the State for damage to the remainder, and
- SP = sale price of the entire remainder.

As can be seen in Table 6, four out of five property owners (80 percent) received either adequate compensation or more. The remaining property owners had less money after the highway than they had in property before the highway improvement. However, a closer examination of the cases where the value realized by owners was less than the value of property that these owners held at the time of the taking helps to put this finding in perspective. In more than 98 percent of these cases, the value received was 50 percent or more of the before value; in 86 percent of the cases, was 75 percent or more; in 76 percent, 80 percent or more; and in half of the cases, the amounts received were 90 percent or more of the appraised value of the entire property before the taking. Thus, most owners losing value did not lose heavily. As can be seen in Table 6, the same sort of "crowding" toward the 100 percent break-even point is evident for property owners receiving adequate compensation or better, although the crowding is less marked. Of the total of 647 owners, 80 percent received 100 percent or more of what their property was worth before acquisition. Twelve percent of the affected owners received double the before value of their property or more.

Experience of "Typical Case"

Another measure of the extent to which the owner is made whole is the experience of the "typical case." As was explained in the section on recovery rate, the median value received as a percent of before value is a more satisfactory single measure of the experience of the typical case than a simple arithmetic average because a median is not noticeably affected by cases with extremely high increases in value. The median value which the entire group of 647 property owners received was 112 percent of the before value of their property.

Travel Distance to New Highway

When individual case studies are grouped by travel distance from the subject parcel to the new highway, some interesting variations in the median values for the groups are revealed. Table 7 indicates that the gain in dollar value was greatest for owners of property with immediate access to the new highway,

TABLE 6
VALUE RECEIVED AS
PERCENT OF BEFORE
VALUE^a

Value Received (%)	Cases	
	No.	%
< 100	132	20
> 100	515	80
> 150	136	22
> 200	74	12
> 500	16	3

^aEntire bank.

TABLE 7
VALUE RECEIVED AS
PERCENT OF BEFORE
VALUE^a

Distance (mi)	Cases	
	No.	Median (%)
0	151	126
0 - 1	321	110
1 - 2	41	103
> 2	34	106

^aExperience by travel distance to new highway.

with the gain falling off as travel distance to the new highway increased up to 2 mi. Beyond 2 mi, the median value rose slightly. The observed decline seems reasonable; the market can logically be expected to recognize the greater convenience and desirability of close access to the new highway. The slight upturn in value received beyond 2 mi must be regarded as tentative and may not be maintained as the Bureau's bank increases in size. At present, the bank contains only 34 cases where the entire remainder sold and where travel distance to the new highway exceeds 2 mi.

Type of Highway System

An examination of median values for groups of cases classified by type of highway system for which the parcels under study were acquired shows rather mixed results (Table 8). Owners of property located along Interstate highways show a higher median return as a percent of before value in rural than in urban areas. However, owners of urban property along Federal-Aid Primary (FAP) systems fared better than those with rural property.

Type of Remainder

Owners of property partially taken for highway right-of-way with the exception of owners of landlocked parcels, fare equally well regardless of the type of remainder. Table 9 indicates that the States, in pursuing the goal of making the owner whole, have approached that ideal about equally well for the different types of remainders. The median value received of 106 percent of before value for owners of landlocked remainders must be regarded as tentative, there being only 24 landlocked cases in which the entire remainder is sold in the Bureau's bank.

It might be well to emphasize at this point that the median values being discussed are not recovery rates as that term is coming to be understood. The medians presented in this part of the paper represent summary measures, for large groups of cases, of the relationship between payments received by affected property owners (including payments for damages) and the appraised value of the entire property before the highway improvement.

TABLE 8
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Type	Cases	
	No.	Median (%)
Interstate:		
Rural	115	115
Urban	224	108
FAP:		
Rural	98	107
Urban	72	117
FAS, local and other State	77	116
All other and combinations ^b	61	128

^a Experience by type of highway system.

^b Includes nonclassified Federal and combinations of Interstate rural with FAP rural, other State, nonclassified Federal, or two other systems, Interstate urban with FAP or FAS urban, and any two or more systems not elsewhere classified.

Access to New Highway

It is generally believed that the degree of access to a public road that is available to the owner of property abutting the road has an influence on the value of the property. To gain some measure of this effect for owners of property partially taken for a new highway improvement, remainder parcels selling in their entirety were grouped by the degree of access to the new highway enjoyed by the owners. In this context, property was classified as having no access to the new highway, even though there may be access to another public road leading to the new facility. Access was classified as unrestricted if the property owner could enter the new highway at any point that his property abutted the highway. If an owner was permitted access to the new facility at a single designated point, his access was classified as restricted to a designated point; similarly, remainders from which access was permitted at two or more designated points were classified as having access restricted to designated points. One additional classification was used—restricted to frontage road—where the owner had direct access to such a road leading to the new facility.

TABLE 9
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Type	Cases	
	No.	Median (%)
Separated	479	113
Isolated	76	112
Landlocked	24	106
Other ^b	68	113

^a Experience by type of remainder.

^b Includes on dead end, separated and isolated, separated and landlocked, separated and on dead end, isolated and landlocked, other combinations not listed, and not reported.

With the exception of owners of parcels having unrestricted access to the new highway facility, all other owners of property classified by various degrees of access to the new facility fared about equally well on the average. As can be seen in Table 10, owners with unrestricted access to the new highway had a median value received as a percent of before value of 124 percent. None of the other group medians differed from the over-all median of 112 by more than 3 percent.

The difference in the extent to which the goal to make the owner whole was achieved (as between owners having unrestricted access to the new facility and all other owners) can also be seen by comparing the percentage distributions of these cases (Table 11). The percentage of owners of unrestricted access parcels losing value was 15 percent as compared to 21 percent for owners of restricted access remainders (including no access). Moreover, a smaller percentage of owners of parcels with unrestricted access experienced small increases in value (100 to 124 percent), and a larger percentage of owners of unrestricted access remainders had larger increases (125 to 149 percent and 150 to 199 percent) than was true for owners of remainders with restricted access. However, approximately the same proportion of owners of restricted and unrestricted access remainders experienced returns of 200 percent or more of before value. These comparisons are illustrated in Figure 14.

TABLE 10
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Degree	Cases	
	No.	Median (%)
No access	366	112
Unrestricted	46	124
Restricted to:		
Designated point	54	109
Designated points	40	115
Frontage road	141	111

^a Experience by degree of access to new highway.

TABLE 11
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Value (%)	Unrestricted (%)	Restricted (%)
< 100	15	21
100-124	35	46
125-149	24	13
150-199	13	9
200-299	5	5
300-499	4	4
> 500	4	2

^a Experience by degree of access to new highway.

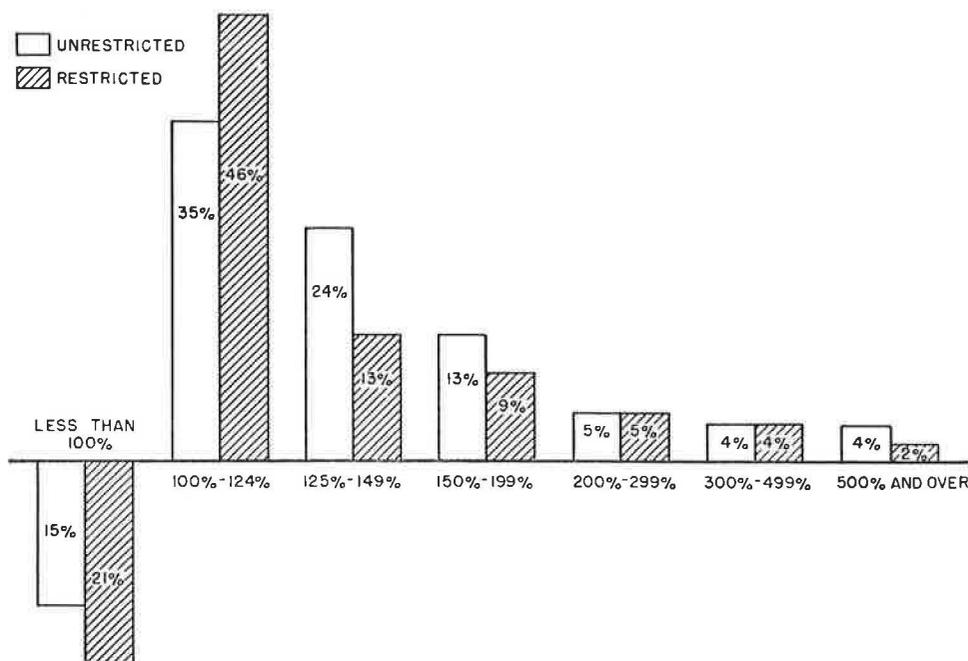


Figure 14. Value received as percent of before value, by degree of access to new highway.

Land Use Before Highway Improvement

The influence that the before land use might have had on the value of the remainder is largely hidden because the recovery rate concept developed focuses on changes in land value irrespective of damage payments, whereas the present discussion includes damage payments. An examination of the experience of affected owners reveals that owners of partially acquired land vacant before the highway improvement received the highest return as a percent of before value, and owners of residential land had the lowest return (Table 12).

The experience of owners of agricultural land and of land in "all other" uses did not differ from the over-all median by more than 3 percent. The experience of owners of vacant parcels (with a median return as a percent of before value of 129) is also compared with that of owners of residential parcels (a median of 107) by percentage distributions (Fig. 15).

TABLE 12
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Land Use	Cases	
	No.	Median (%)
Vacant	139	129
Agricultural	113	114
Residential	297	107
All other ^b	98	115

^aExperience by land use before highway improvement.
^bIncludes wholesale and retail trade, services, manufacturing, government, and all combinations of land use.

As can be seen in Figure 15, owners of vacant parcels had fewer losses than residential property owners (11 percent vs 23 percent). A much higher proportion of owners of residential than of vacant properties realized small gains (100 to 124 percent) over the before value, whereas in each of the higher intervals of gain, owners of vacant land predominate. It is clear that owners of vacant properties generally fared better than residential land owners.

Visibility of Highway from Remainder

A comparison of the experience of affected owners of properties from which the new highway is fully visible with those from which the highway is partially or not visible reveals an interesting pattern (Table 13). The fully visible group shows a median value received as a percent of

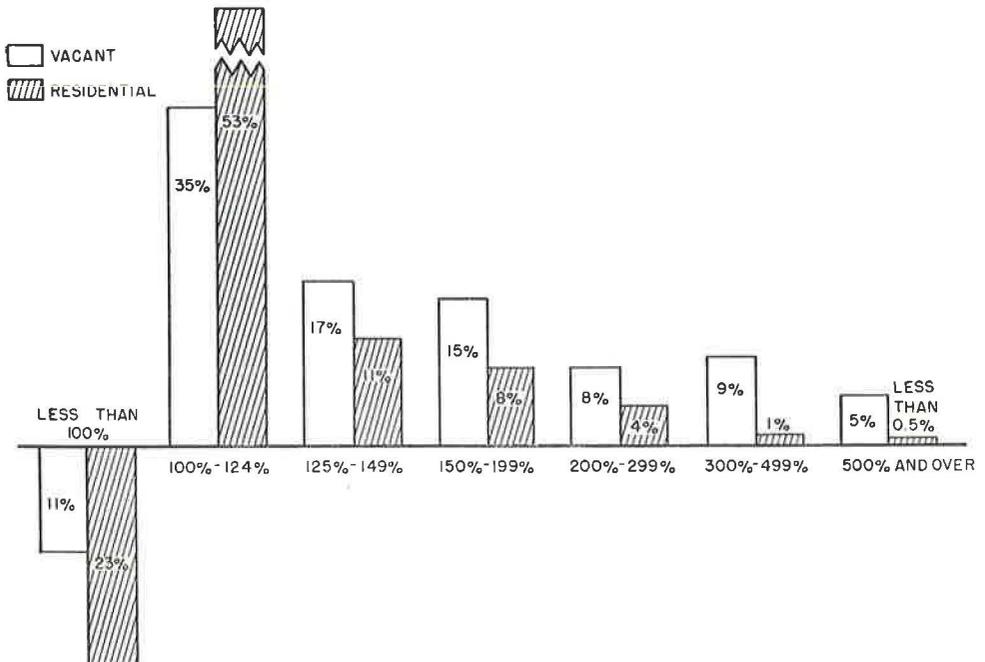


Figure 15. Percentage distribution of value received as percent of before value, by before land use.

before value of 114, slightly more than the over-all median value of 112. The partially visible group has a median slightly less than the over-all median, and the not visible group median of 105 is much less than the other groups. It should be noted, however, that the number of remainder parcels in the Bureau's bank from which the highway cannot be seen is only 27; therefore, the significance of these differences cannot be fully determined at this time.

Nearness to Interchange

Whether a parcel was located at or near an interchange (within 1/2 mi) or away from an interchange had very little effect on the extent to which States met their goal to make the owner whole. The median return to owners was 112 percent of before value for both interchange and noninterchange property. Even percentage distributions of the experience of property owners in these two classifications above and below the break-even point show remarkable similarity between groups (Table 14).

Thus, the experience of the 196 owners of interchange properties was very nearly the same as that of the 451 owners of noninterchange properties, so far as being made whole is concerned. This finding is in contrast to the recovery rate experience of interchange and noninterchange remainder properties discussed earlier. In that discussion, it was shown that interchange remainder properties had a median recovery rate of 164 percent vs 131 percent for parcels located away from an interchange. It appears that this contrast between the total experience of affected owners and the recovery rate experience of remainder properties resulted from appraisers' greater expectation of benefits to interchange properties than to noninterchange remainder parcels, with a consequent tendency toward a leveling off in the total experience of affected owners.

Comparison of Aggregate Before Value with Aggregate Receipts—Entire Bank

In this section, the aggregate experience of affected owners is examined for the entire bank of partial-taking cases (where the entire remainder sold) and for various groupings

TABLE 13
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Visibility	Cases	
	No.	Median (%)
Full	440	114
Partial	156	111
None	27	105
Not reported	24	105

^aExperience by visibility of highway from remainder.

TABLE 14
VALUE RECEIVED AS PERCENT
OF BEFORE VALUE^a

Value (%)	Interchange (%)	Non-interchange (%)
< 100	18	22
100-124	48	44
125-149	12	14
150-199	11	9
200-299	5	5
300-499	4	4
> 500	2	2

^aExperience by nearness to interchange.

TABLE 15
COMPARISON OF AGGREGATE "BEFORE AND AFTER" VALUES^a

Cases	Before Value (\$ × 10 ⁶)	Amounts Received by Owner (\$ × 10 ⁶)			
		Total	Payment For Taking	Payment For Damages	Sale Price of Entire Remainder
All cases:	15.0	20.9	4.0	1.6	15.3
Interchange	3.7	5.8	1.1	0.3	4.3
Noninterchange	11.2	15.1	2.9	1.2	11.0
Land use before:					
Vacant	2.7	4.2	0.5	0.5	3.2
Agricultural	4.9	7.4	1.1	0.2	6.0
Residential	4.2	5.0	1.4	0.6	3.0
All other uses	3.2	4.3	1.0	0.3	3.1
Type of remainder:					
Separated	11.3	14.9	2.7	1.0	11.2
Isolated	1.2	2.8	0.7	0.1	1.9
Landlocked	0.2	0.2	0.1	—b	0.1
All other	2.3	3.0	0.5	0.4	2.1
Type of highway system:					
Interstate rural	2.3	3.9	0.5	0.3	3.1
Interstate urban	5.2	6.6	1.6	0.7	4.4
FAP rural	2.9	3.5	0.4	0.1	3.0
FAP urban	2.1	3.0	0.5	0.4	2.1
FAS, local, and other State	0.9	1.2	0.2	—b	0.9
All other	1.6	2.7	0.8	0.1	1.8

^aIncluding State payments.

^bLess than \$50,000.

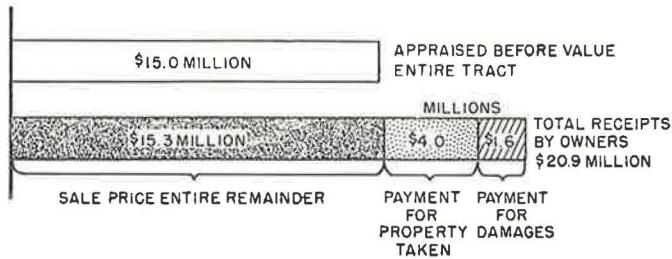


Figure 16. Aggregate appraised value before vs aggregate payments received by owners.

of these owners. For example, the total of the appraised before values of the properties of the 647 owners was \$15 million. The owners of these properties were paid a total of \$4 million for property taken (exclusive of damage payments) and \$1.6 million in damage payments. Finally, these owners sold their remaining property for a total of \$15.3 million. These findings, along with similar data for various groupings of these cases, appear in Table 15 and in Figure 16.

It is, of course, necessary to adjust for a general increase in land values in the interval between date of acquisition and date of sale. This cannot be done for individual cases, but an estimate for the group as a whole can be made. The median elapsed time between the date of acquisition by the State and the date of sale of the remainder was approximately $1\frac{1}{4}$ yr. The average percentage rise in land value, using a composite index, was 7 percent a year, or $8\frac{3}{4}$ percent in the time elapsed. Applying this index to the aggregate appraised value of the remainders at the time of the taking (\$15 million - \$4 million - \$1.6 million = \$9.4 million) produces an expected aggregate market value at the time of sale of \$10.2 million ($\$9.4 \text{ million} \times 1.0875 = \10.2 million). A comparison of this estimate of the expected aggregate market value of the remainders at the time of sale with the actual aggregate sale price gives a general idea of the extent of land value increases and/or overpayments for damages. Remainders which might have been expected to sell for \$10.2 million sold for \$15.3 million. (This is of course an oversimplification because some State laws do not permit the use of benefits to offset the cost of taking or even to offset damages to the remainder.) Thus, a general increase in land value of the remainders of parcels partially taken for highway right-of-way was more than enough to cause the aggregate receipts of affected owners to be considerably higher than the aggregate before value of their property.

This finding, of course, should in no way be understood to mean that severance damage payments should never be made. It has already been demonstrated (Table 4) that 38 percent of affected owners did actually suffer damage and that 20 percent received either insufficient or no damage payments. In fact, the only purpose served by this kind of aggregate analysis is to indicate the outside theoretical limits of the improvement that might be made in the awarding of damages to owners of highway-severed properties. However, it appears that very careful consideration should be given to the offsetting of benefits against damage payments where appropriate, and to the offsetting of benefits against payments for property taken where appropriate and where State law permits.

SUMMARY

It must be emphasized that the findings presented in this paper are not representative of all cases. Although information in the Bureau's bank of cases does not now permit formulas to be developed to predict the experience of remainder parcels, certain tentative observations can be made:

1. The recovery rate for cases in the Bureau's bank is typically more than 100 percent. In fact, in three out of four cases, a land value increment has followed a highway taking. The median recovery rate is now about 138 percent.

2. Certain characteristics tend to be associated with a higher-than-average recovery rate: (a) nearness to an interchange, (b) a sale at an extended period of time (e.g., over a year) after the taking, (c) a vacant (rather than, for example, residential) land use before acquisition, (d) a separated (rather than a landlocked) remainder, (e) easy access to the new highway, (f) full visibility of the highway from the remainder, and (g) proximity to a populous urban place.

3. The owner is being made whole (which approximates just compensation) in four out of five cases. Property owners who lost value generally lost very little. Gains, on the other hand, ranged from small gains to very large gains.

4. Owners of residential properties are more likely to experience losses than owners of land in other uses. Losses suffered by residential property owners may be particularly disquieting because such property owners tend to be those least able to bear losses. However, losses have been experienced by only 23 percent of the owners of residential property and, as mentioned previously, these losses have been small.

5. Gains are often associated with vacant remainders. Gains to owners of vacant property are often associated with changes of the land to a higher use. Damage payments made to owners of vacant parcels have been shown to be unrealistically high in many cases. Experience suggests that high damage payments for vacant parcels partially taken should in the future receive close scrutiny.

6. When the simultaneous effect on the recovery rate of several facts acting in combination was studied, the most influential factors were found to be (a) change in land use, (b) time elapsing from acquisition to sale, (c) travel distance to the new highway, (d) type of remainder, and (e) nearness to interchange.

For one of the groups of cases studied, a coefficient of multiple correlation of 0.86 was obtained, indicating that 73 percent of the total variation in the recovery rate was explained by the combined effect of the several independent factors used in the analysis.

REFERENCES

1. "An Editorial." *Right-of-Way*, p. 5 (Oct. 1963).
2. "Manual for Highway Severance Damage Studies." U. S. Bureau of Public Roads, Washington, D. C.
3. Lewis, H., "Practical Use of Land Value Economic Studies in Right-of-Way Litigation." Paper presented at 9th Pan-American Highway Cong., OAS, Washington (May 1963).
4. Goldstein, S., "Economic Evidence in Right-of-Way Litigation." *Georgetown Law Jour.*, 50(2):205-233.
5. "Farm Real Estate Market Developments." U. S. Dept. of Agriculture, Econ. Res. Div., C. D. 64 (Aug. 1963).
6. "16th Annual Report." Fed. Housing Admin., Housing and Home Finance Agency, p. 100 (1962).
7. "Business Statistics." (Oct. 4, 1963).
8. Kurnow, E., "Land Value Trends in the United States." *Land Econ.* (4):341-348 (Nov. 1960).
9. Longley, J. W., and Goley, B. T., "A Statistical Evaluation of the Influence of Highways on Rural Land Values in the United States." *HRB Bull.* 327, pp. 21-55 (1962).
10. "Colorado Land Economic Study—Interstate 25—North of Denver." Colo. Dept. of Highways (1963).
11. Lansing, J. B., and Blood, D. M., "A Cross-Section Analysis of Non-Business Air Travel." *Amer. Stat. Assn. Jour.*, 53(284) (Dec. 1958).

*Appendix*COMPARISON OF PRINCIPAL CHARACTERISTICS OF
SUBJECT PROPERTY AND COMPARABLE

Characteristics	Subject Parcel	Comparable Sale
Land use before	School	Elementary school
Land use after (expected)	(School)	Retail ¹
Size before, acres	10	11
Size after, acres	8	8
Highway characteristics	Interstate	Interstate
Value before, \$	70,000	69,000
Value of portion acquired, \$	20,000	18,000
Estimated benefit (+) or damage (-), \$	—	- 15,000
Estimated remainder value, \$	—	36,000
Sale price of remainder, \$	—	89,000
Effect of taking, \$	—	+ 38,000

¹Although the elementary school was expected to continue as a school, the use changed to retail soon after the taking. In this case, which is recorded in the Bureau's bank, dollar amounts have been rounded to the nearest hundred.

Community Effects on Remainder Parcel Valuation

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•EACH YEAR the California Division of Highways completes more than 8,000 separate appraisals of real property needed for highway rights-of-way. About half of these appraisals are made in instances where only a portion of a whole property is needed, leaving the remainder in private ownership. For each partial acquisition two appraisals must be made: one of the property "before" removal of the portion needed and one reflecting its value "after."

Ordinarily a before valuation presents little problem—especially in the case of residential properties. The appraiser searches the immediately surrounding area for recent sales of similar properties. The comparable sales are adjusted for minor differences in time of sale, improvement, and neighborhood influence. If an appraiser is familiar with the area in question, the appraisal can often be accomplished in as little as one day. The choice of comparables which are near in both time and location insures that the economic influences which bear on value will be similar and obviates the necessity for any extensive market or community research.

The after valuation presents an entirely different problem. This appraisal must reflect the effect on a property of the removal of a portion and of the construction of the highway facility immediately adjacent. Theoretically the methodology of the after appraisal could be exactly the same as that used to determine the value before. However, a search of the immediate area for recent sales of similarly affected properties will almost always yield no result. This is understandable because in more than 10 yr of freeway construction in California, less than 40,000 remainder parcels have been created in the entire State; it has been estimated that far fewer than half of these have been sold, while still fewer represent valid and useable sales.

There is, of course, a next best solution. Sales from other areas, which are neither timely nor near in location, might provide some indication of freeway effect from which an appraiser could form an opinion of value. However, the courts have been understandably reluctant to admit as evidence sales which are not near in time or location and appraisers are reluctant to use substantiating data which will not be accepted in court. Their logic is clear; value is a function of time and location and any comparison of properties in different areas or sold at different times is error prone.

Despite the reluctance of the courts to admit sales of remainder parcels as evidence, they still remain the only factual documentary evidence of freeway effect. They are useable in a few specific instances and their usefulness could be extended if a means were found to document the necessary adjustments for time and location. For these reasons the California Division of Highways some years ago began a systematic investigation of every valid remainder parcel sale occurring along every California freeway. To date, approximately 1,000 such remainder parcel sales have been collected, tabulated and analyzed. Information collected includes appraised values of the whole property, of the part required for right-of-way, and of the remainder; eventual sales price; control data to permit time adjustments; physical changes in property; and physical data regarding property location, acquisition, and construction of the highway facility.

The objectives of the mass data collection were the determinations of the possible pattern development, of the relation of key variables, and of similarities. A range of effect might be determined on the basis of values and physical characteristics so that

an appraiser could, with reasonable confidence, form an opinion in any similar instance. Unfortunately, careful correlation and analysis have as yet produced no discernable patterns. Neither the physical characteristics of the takings, of the highway construction, nor of any minor geographic benchmarks provide keys to the use of the sales examples. In many cases, the investigation of these features and their correlation revealed diametrically opposed effects in situations of almost exact physical comparability. The appraiser with complete access to all gathered sales can find examples to support either damages or benefits in almost any case, depending on his own pre-formed opinions.

Because physical variables seemed to provide no clue to measurement of freeway effect, evidence of other variables was sought in the literature. A comprehensive study which concerned itself with only the possible effect of freeway construction and not that of severance suggested one approach to the problem. This study, of value trends among whole properties in residential tracts containing 22,396 homes, was completed by the Division of Highways in March 1957 (1). Sales among 1,697 homes constructed adjacent to freeways were compared with the sales prices of homes away from immediate freeway influence. Two significant conclusions of this study were that (a) "... factors inherent in the entire tract, such as the livability and physical appeal of the houses in one tract as opposed to another, or the social and economic status of the residents, have a greater influence on the price trend than a freeway, school, or some other non-residential use adjoining a small percentage of the homes in a particular subdivision," and (b) "The annual trend in resale prices among subdivision homes adjoining freeways follows a pattern consistent with the price trend of comparable homes."

A conclusion that relative demand in an area might outweigh any possible detrimental physical influence from a highway would seem to follow logically. This is, of course, a well-known fact in the case of commercial or industrial properties affected by freeways. Many examples have been gathered in these latter categories which show fantastic price increases for parcels whose shape has been virtually mangled and where nearly any other potential use has been precluded. In these cases, demand has clearly outweighed any physical detriment imposed by either right-of-way acquisition or freeway construction.

No such clear-cut factors are involved in residential property price changes. But inasmuch as measurable physical and geographic factors provide no clue to the wide variations in freeway effect among residential properties, it could be assumed at this point that relative demand in a residential area is also the major variable which ought to be measured. Unfortunately, the remainder parcel analyses made to date do not contain any data that would permit the measurement of relative demand levels or their effect on the parcels involved.

If the assumption is correct that relative demand levels in a residential area are responsible for the presence or absence of damages, an intensive large-scale study must be undertaken to provide the supporting data needed.

Before this could be done, a pilot study had to be completed which would strongly indicate that the effort would be justified. A recent study of remainder parcel sales in San Diego County was aimed at providing the necessary supporting data. The objective of the study was to relate subsequent sale prices to community economic trends. If the analyses among similar properties in dissimilar communities gave indication that properties tended to be unaffected or benefited in a strong demand area, the premise of the pilot study would be confirmed.

Efforts were concentrated in two suburban communities; La Mesa and El Cajon, about 15 mi east of the San Diego central business district (Fig. 1). They are reached from downtown San Diego by traveling two nearly parallel freeways which join into one at the eastern edge of La Mesa. The two communities have a common border, La Mesa being closer to San Diego. El Cajon is the last suburban community along this transportation corridor that is undergoing any intensive urbanization at the present time. Beyond El Cajon, most of the residential development is in the nature of ranches and small estates.

A freeway was completed through La Mesa to the El Cajon city limits early in 1957. The sales investigated in La Mesa are located along a portion of Calif. 198 which con-

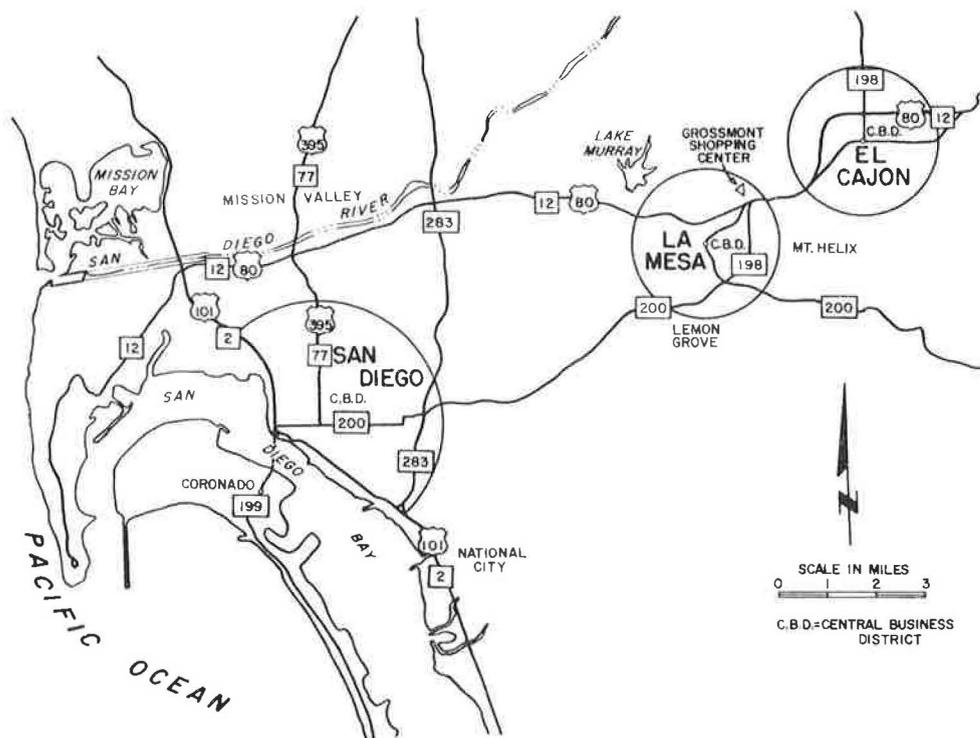


Figure 1. San Diego urban area.

nects Calif. 200 and 12. Calif. 12 was completed through El Cajon late in 1961. The orientation of the pilot study was toward solving an appraisal problem. Data on the remainder parcel sales followed a typical appraisal approach. Field research in the communities was primarily interview and observation because these are the tools most readily used by an appraiser. Reliance was on interview with local real estate salesmen and brokers who had worked in the communities for an extended period of time. Statistical data gathered were of the simplest type, i. e., population, retail sales, assessed valuation, and building permits. No attempt was made to correlate mathematically trends in these areas with trends in the real estate market, because most real estate appraisers do not have the facilities for extensive mathematical analysis. As a result, data relating to the communities of El Cajon and La Mesa are presented in the narrative fashion of an anthropological monograph with a limited statistical profile. There is a possibility of some distortion of image, but this possibility exists to a degree in all community studies, regardless of approach, technique, and sophistication.

REMAINDER SALES DATA

The after value of a remainder is an appraised value at the time of the highway acquisition. Freeway effect, in a specific instance, can be measured by adjusting this value to the time of study by use on a trend basis of sale prices of properties not physically affected by the freeway. Freeway effect is then the difference between the adjusted value and the actual sale price. For instance, if property in the area increased 5 percent during a year lapse, then the after value of the subject was increased in like percentage. The difference between this adjusted price and the actual sale price indicates the amount and degree of damages and benefits to the individual parcels.

Obviously, this adjustment, as well as the appraised after value, is subject to some error because the appraised after value relies to some extent on the judgment of the appraiser. For the sake of convenience, and in hope of canceling some of this potential error, the effects on these parcels were summarized by averages.

TABLE 1
LA MESA REMAINDER SALES^a

Sale	After Value (\$)	Adjusted Value (\$)	Sale Price (\$)	Net Change (\$)
1	19,490	20,662	21,500	+ 738
2	10,548	10,759	11,250	+ 491
3	10,548	11,708	13,000	+ 1,292
4	11,256	12,494	14,500	+ 2,006
5	10,730	12,447	13,900	+ 1,453
6	10,730	13,091	15,000	+ 1,909
7	13,144	14,590	14,800	+ 210
8	24,693	27,904	30,000	+ 2,096
9	11,720	11,837	11,500	- 337
10	14,625	17,404	16,000	- 1,404
11	13,011	13,663	12,500	- 1,163
12	13,011	13,793	13,300	- 493
13	13,011	14,443	13,950	- 493
14	14,700	15,288	15,000	- 288
15	11,720	14,086	14,000	- 86
16	13,851	13,990	13,950	- 40
Avg.	13,549	14,885	15,259	+ 368

^aGross change, + 12.5%; net change, + 2.5%.

La Mesa

After limiting consideration to residential parcels, there were 16 valid sales in La Mesa (Table 1). Generally, this group has experienced a net benefit of 2.5 percent more than the general price rise in the immediate area.

Sales 11, 12 and 13 are three sales of one property, with sale 11 being the earliest, 12 the next and 13 the last. These sales are summarized in Table 2. Sale 9 and 5 are two sales of one property, sale 9 being the earliest. The first feature apparent is that the amount of damage may change through time. In addition, as Table 2 shows, the degree of damage (shown as a percent of sales price) changes through time. All other things being equal, the degree of damages should be a constant percentage of all subsequent sale prices. This theoretical constant does not bear out in the case of the market in La Mesa.

The two parcels which appear to be most severely damaged have something in common, i. e., isolation. For the sake of convenience Sales 11, 12 and 13 are designated parcel A, and Sale 10, parcel B. In the before condition, parcel A was a corner parcel. The freeway taking left a triangular parcel, the freeway being the base of the triangle and two city streets terminating at the freeway being the two sides. The apex of the triangle, the corner of the two city streets, was the point farthest from the freeway. In the after condition, parcel A is rather like an island, surrounded and exposed on all sides. It is, in a sense, physically isolated from all its neighbors.

Parcel B, also, is isolated in the after condition, but in a unique manner: it is situated on a street that was to some degree stratified in the before condition. At one end of the street were fine new homes, ranging from \$14,000 to \$50,000. The other end of the street was older, containing frame bungalows built in the 1920's and a chicken farm. There was, then, a "best" end and a "worst" end of the street. Parcel B would, in the before condition, be considered as part of the best end of the street, the improvement being worth at the time approximately \$12,000. The construction of the freeway, however, separated the two ends of the street—the best end on one side of the freeway and the worst end on the other. Parcel B was left on the worst end. This itself may not have been enough to create damage, but it is now the only new improvement located on this street; it stands isolated from the neighborhood of which it was once part.

The social and physical isolation of these two parcels are the only two instances where damages can be explained in a context of an apparent benefit of 2.5 percent. The other damaged parcels apparently are not unique, and on any project it would be expected that there would be a range of effect from damages to benefits because of the inconstancy of demand. Physically comparing them with the benefited parcels, no variables would be

TABLE 2
SALE HISTORY OF ONE REMAINDER IN LA MESA^a

Sale	Date	Adjustment Factor	Adjusted Value (\$)	Sale Price (\$)	Damage	
					Indicated (\$)	% of Sale
11	3/14/57	1.048	13,668.00	12,500	1,168	9.4
12	8/8/57	1.06	13,793.00	13,300	493	3.7
13	5/19/59	1.11	14,443.00	13,950	493	3.53

^aRight-of-way acquired 7/11/55; before value, \$14,000; after value \$13,011.80; sold three times as shown.

found to facilitate prediction. On the average, however, properties in La Mesa show a strong tendency toward being benefited by the freeway.

El Cajon

Sales in El Cajon reveal a contrary pattern. As Table 3 shows, three of the eight parcels show a benefit and the rest show a damage.

The average difference in sales price of the remainders, compared to a similar area, is -4.23 percent. It is interesting to note that of the eight sales, four are abutting the freeway, and four are not. The portion of the nonabutting parcels acquired was for a frontage road or city street widening. Of the four freeway abutting parcels, three are the benefited parcels. All nonabutting parcels show a damage.

In contrast to La Mesa, there is a possibility that the El Cajon parcels in the vicinity of the freeway may be rezoned sometime in the future—most likely to multiple residential. If there is rezoning, the superior identification features of the parcels abutting the freeway would most likely bring an increment to those parcels. For this reason, these parcels may have some speculative value and this may be reflected in a relative benefit.

The sales investigations in the two communities admittedly provide only the slimmest documentation of benefit in one community and damage in the other. It is rare, however, to find as many as 16 roughly similar remainder properties which have sold in a single community; therefore, the data were considered to be sufficient evidence for the purposes of this pilot study. To give credence to the initial assumption, it was necessary to examine, with the limited tools available, the relative demand structure in the two communities.

COMMUNITY ANALYSIS

La Mesa and El Cajon are not actually communities as the term has been defined (2); they are primarily segregated aggregates (3). As a result, the character of these communities has changed somewhat in the last 10 yr, and will probably continue this change (4). The change is primarily attributed to the urbanization of California and the suburbanization of pre-existing communities. The consequent change in population has had significant impact on the normal indicators of community exchange activities. Both El Cajon and La Mesa in recent years have become increasingly dependent, both economically and socially, on the San Diego urban area. A complete analysis of their characters as communities would of necessity include an extensive consideration of the San Diego urban area and the interdependencies that have developed in the last several years. However, such a project is beyond the scope of this paper at the present time.

Between the city limits of the two communities is the unincorporated area of Grossmont. The Grossmont residential area generally follows the configuration of Mt. Helix and is considered to be one of the prime prestige neighborhoods in San Diego. Most Grossmont homes are on view sites. The proximity of Grossmont, as well as topography (Fig. 2), has had significant effect on the development of both communities and may be primarily responsible for the differences between them.

La Mesa

The topography of La Mesa is primarily rolling and hilly. The old city developed in a bowl between the hills and along the old highway. Residential development extended into the hills south and east of the city in a spotty manner, becoming increasingly more deluxe in the direction of Grossmont. Downtown La Mesa was primarily a conglomeration of small shops extending for several blocks along the old highway (US 80). The old town is caricatured as a quiet village composed of retired businessmen and doctors tending small lemon or avocado groves.

TABLE 3
EL CAJON REMAINDER SALES^a

Parcel	After Value (\$)	Adjusted Value (\$)	Sale Price (\$)	Net Change (\$)
1	7,345	7,613	9,000	+ 1,387
2	14,000	14,154	14,750	+ 596
3	9,127	9,455	8,700	- 755
4	10,948	12,185	12,500	+ 315
5	11,296	12,127	10,981	- 1,146
6	11,884	12,522	8,500	- 4,022
7	13,345	13,805	13,500	- 306
8	13,345	13,998	13,900	- 98
Avg.	11,411	11,986	11,479	- 507

^aGross change, + 0.2%, net change, - 4.23%.

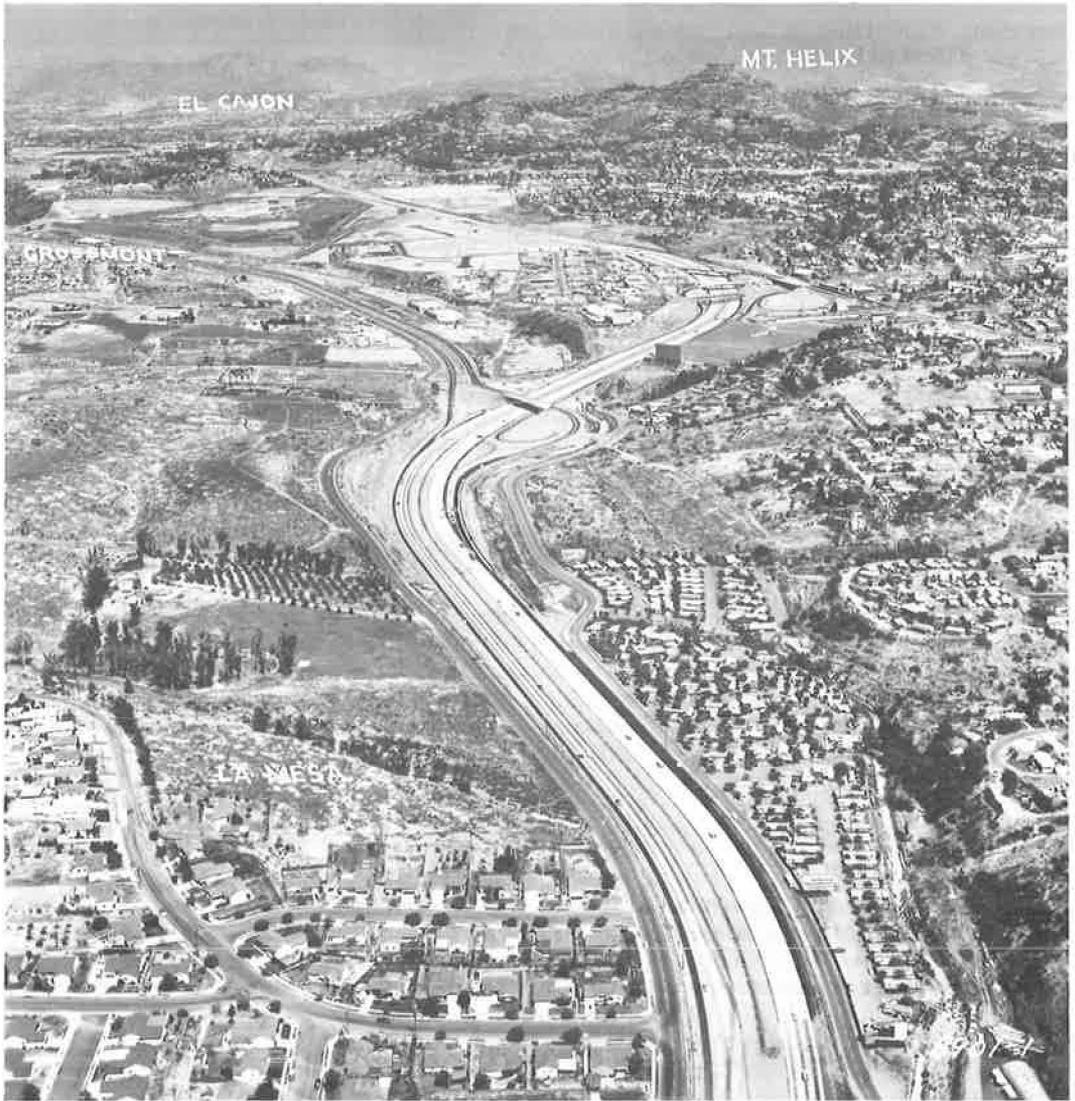


Figure 2. La Mesa-El Cajon-Grossmont area, showing freeways.

La Mesa, today, has become a typical middle-class bedroom community. The hills to the north are covered with homes: custom homes, tract houses and apartments. The hilly terrain with its view lots, combined with a warm climate, modern transportation, and proximity to Grossmont made La Mesa a natural residential suburb in the path of the San Diego boom. Today La Mesa has a large shopping center—Grossmont Shopping Center—on a plateau overlooking the old town, which draws its customers from all over the eastern San Diego urban area. It competes successfully with other established and larger, shopping centers in surrounding communities. Retail sales in La Mesa in the last five years have doubled—from \$26 million in 1957 to \$54 million in 1962 (5). Population nearly tripled between 1950 and 1960—from 10,946 to 30,441 (6).

El Cajon

El Cajon is situated mainly on the flat floor of a fairly broad valley. This difference has several implications in the development of the community. For example, residen-

tial areas cannot emulate Grossmont with its rolling hills and view lots. The flat land of El Cajon, by reducing land development costs, reduced the cost of marketing a residential improvement, and consequently, attracted customers who desired lower-priced homes. If it were feasible to construct a scale of residential neighborhood desirability for the San Diego area, Grossmont would be at the top of the scale, La Mesa would be slightly above the middle, and El Cajon would be about one-quarter of the way to the bottom of the scale (excluding the residential section of the community located in the vicinity of Fletcher Hills in rolling terrain and adjacent to Grossmont). Of course, such a scale would be purely subjective, and the rating of the communities on this basis is not based on any factual material. But then, any scale which might indicate relative degrees of desirability must, by definition, be subjective.

Before the construction of the freeways, La Mesa and El Cajon most likely would have been approximately equal in terms of a desirability scale. Each was sparsely settled; each had a rather wide range of house types and values represented in their respective limits; each was characterized as being semi-rural and suburban.

MARKETING CHANGES

El Cajon, before the era of urban expansion, was a minor marketing center for the surrounding area. For example, in 1957 retail sales in El Cajon were 50 percent greater than in La Mesa (\$40 million as against \$26 million). In 1957, per capita retail sales (all outlets) were \$1,850 in El Cajon but only \$1,140 in La Mesa. In San Diego County as a whole, per capita sales were approximately \$1,100. The El Cajon marketing area undoubtedly included parts, if not all, of La Mesa. The construction of improved transportation facilities reduced the space-time ratio to the major marketing center of the urban region and ultimately changed the character of El Cajon. In 1962, just 5 yr and two freeways later, per capita sales (all outlets) were: San Diego County, \$1,050; El Cajon, \$1,430 (off \$420); and La Mesa, \$1,660 (up \$520). Total retail sales increased 40 percent in El Cajon during this period (from \$40 million to \$57 million), but the community's role as a marketing area declined as competition from other areas increased with the expansion of the San Diego urban area.

This change of character becomes especially vivid when per capita sales are broken down into categories. For example, in La Mesa, general merchandise (department stores, etc.) increased from \$29.50 in 1960 to \$362.00 in 1962. This reflects the opening of the Grossmont Shopping Center and marks the beginning of a new era for La Mesa. But it marks the end of an old one for El Cajon. La Mesa has progressed at the expense of El Cajon. The location and environment in La Mesa, in connection with the merging of two freeways, made it a much more desirable location for a modern shopping center, and this one feature alone was enough to end the retail domination of El Cajon in the local area. El Cajon has a shopping center, but it is primarily a community shopping center and is not designed to attract customers from the surrounding areas.

In the future, it is most likely that these two communities will diverge even more. For example, the topography and location of El Cajon make it a fairly good prospect for future industrial development, and, in fact, the city has adopted a policy of encouraging industry. An area known as El Cajon Industrial Park has been set aside on the north of the community; light industry has developed to some extent along the freeway at the west of the city, and it seems likely that this trend towards an industrial orientation will continue. Because of topography, this sort of development is not feasible in La Mesa. If diversification of tax base were the primary goal of city government, El Cajon would make better progress than La Mesa.

Ecology and local government decisions have dictated a divergent course for La Mesa and El Cajon. Probably the freeway system played a major role in this development; its role of improving accessibility, reducing the space-time ratio, and reducing transportation costs most likely accelerated the suburbanization of both La Mesa and El Cajon. In neither case can the divergent roles be wholly attributed to the freeway; if a pre-existing propensity to develop in this manner is assumed, it may be concluded that the role of the freeway was to, at most, reinforce or strengthen that trend.

SUMMARY AND CONCLUSIONS

There is, then, a strong desire and hence, market for La Mesa homes that is absent in El Cajon. This fact, when coupled with the earlier approximation of a tendency toward benefit in La Mesa and toward damage in El Cajon would seem to substantiate the basic premise of the pilot study and provide justification for further efforts to develop a means of measuring relative demand so that adjustments can be made for location, as well as for time.

Aside from the major conclusion of the study, at least two significant warning signs were noted: (a) even in an area of generally beneficial influence a property may be severely damaged if it is isolated from other like properties which tend to generally support values, and (b) even in an area where demand is generally weak a property may be benefited if the possibility of a zone change to permit a more compatible and higher and better use exists. Each before and after appraisal should carefully note the possibility of either of these occurrences.

The pilot study utilized a monograph technique which is a method entirely unsuited to the presentation of evidence in court proceedings. The court would prefer the submission of sales evidence with sound documentation as background for any adjustments. Much data collection remains before such an adjustment can be made with confidence. It is suggested that two additional bits of information about each remainder sale might help significantly in the development of a measure of relative demand: (a) the original asking price for the subject property, and (b) the length of time that it was listed for sale. To be able to relate this period for purposes of measurement, however, some index of relative demand in the surrounding area must be provided. This could be accomplished by the development of an average listing period for control properties. A comparison of the listing period of the subject property with the average listing time in the area should permit an index of relative demand levels to be constructed.

It was mentioned earlier that many examples exist of properties which have enjoyed substantial special benefits. These properties are, almost without exception, those where an obvious change to a higher and better use has occurred as a result of the properties peculiar relationship with the adjacent highway. The relative demand index need not be developed in these cases. The problem properties are mainly in the residential class where no obvious reason exists for benefits or where damage amounts might be more than ordinary because of depressed demand in the surrounding area.

The investigations conducted during this pilot study clearly showed that damage-benefit appraisal is an art still in its infancy. The fact of damages or benefits is established in the market place as is the value of property in general but, unfortunately for the damage-benefit appraiser, this market place is nearly always an environment different from that in which he is working. The appraiser must exercise more than ordinary care in every partial acquisition situation to insure adherence to the concept of just compensation. In these instances, more than ordinary care would envisage a complete market analysis until such time as additional documentation can definitely establish a pattern of effect in the different market environments in which the appraiser must form his opinions.

REFERENCES

1. Kelly, J. F., "Residence and Freeways." Calif. Highways and Public Works, 36 (3, 4) (March-April 1957).
2. Kelly, J. F., "Community Benefits—A Suggested Method of Analysis." Calif. Div. of Highways (April 1963).
3. Arensberg, C. M., "The Community as Object and as Sample." Amer. Anthropologist, 63 (2) (April 1961).
4. Arensberg, C. M., "La Mesa—A Study of Its Future." Public Affairs Res. Inst., San Diego State Coll. (Nov. 1959).
5. Reports of Calif. Board of Equalization.
6. Reports of Calif. Dept. of Finance, Budget Div., Financial and Population Res. Sect.

A Digital Computer Technique for Calculating Costs of Right-of-Way

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This article describes a digital computer program for making a land cost analysis along a highway right-of-way. The principle employed for determining a "running" (per station) cost along the centerline projection is basically one of matrix theory. Essentially, two matrices exist within the system; one used to define the location of the route centerline is superimposed on another used to assign varying costs to pieces of land in the area. Following development of the program written in FORTRAN coding, an analysis was conducted on five hypothetical lines. Limitations of the approach and possible applications are discussed.

•THE COST of buying land for highway construction can be a major item, particularly in well-settled areas, and, therefore, warrants the designer's attention, especially in early stages of route location.

Interacting components of engineering standards and construction costs are constantly working toward the detriment of each other. If engineering standards are high, they are attained only with the expenditure of much money. Conversely, if available funds are low, a sacrifice in engineering standards may result. Manpower limitations often are influential factors in attempting to provide the best engineering at the least cost. It would appear, therefore, that with the aid of high-speed electronic computer facilities for routine computation, one could justify their use in investigating many routes. From this viewpoint, should the land costs along a particular route become an important factor, a computer technique could act as a tool for investigative work.

Although beyond the scope of the present paper, over-all consideration to location and design problems would also include applications of photogrammetry such as described by Pryor (1) and Henry (5).

DEVELOPMENT OF PROGRAM

Other investigators have reported on various approaches to the problem of computing right-of-way costs of a number of trial lines using computer techniques (2, 6). The approach described here essentially uses two sets of matrices in computer memory. One set defines grid boundaries in terms of Cartesian coordinates and is used to locate segments of the line being investigated. This is superimposed on a second set of matrices which identifies the cost of the various parcels of land within the boundaries of the area under study. The cost of right-of-way for a trial line is accumulated as a running cost for each station. Comparison of the results of several trial lines can easily be made.

Assuming that a conventional system of Cartesian coordinates is established, the x,y location of points which define a route can be computed. Many programs developed for highway design purposes include this feature. The descriptive coordinates for points

spaced at any interval (e. g., 5 ft) can be produced easily for tangent and curved portions of any route within the ordinary limits of geometric standards for alignment.

From analytical principles, the length of a line segment can be determined if the coordinates of the terminal points of the line segment are known. Accordingly, information required to compute the running costs of land along a trial route is as follows: (a) an appraised cost of the land along the route (in units of right-of-way), (b) the width of right-of-way to be secured, and (c) knowledge of the terminal points of line segments defining the route.

To accomplish compatibility between the computer and the computer user, assignment of costs can be manipulated using matrix principles. Regarding locational descriptions, the x and y coordinate axes can be assigned to the lower and left edges of the hypothetical area under study. Thus, assuming conventional conditions, negative coordinates can be eliminated. The matrix principle virtually permits perfect agreement between computer memory and actual map conditions. Cartesian coordinates are then of significant value; they are utilized to define boundary values of rectangular blocks containing appraised cost indices. These inferences, of course, presuppose a plane coordinate network such as that currently encouraged by the U. S. Bureau of Public Roads and other organizations.

Hence, if a means exists of providing a representative display (topographic and/or land-use map) of an area through which proposed lines are to be projected, the problem can be handled by computer application. Knowing the patterns of cost indices in terms of x, y coordinates, the problem becomes one of introducing the cost of the blocks per unit of area, the x, y boundary values associated with these blocks, and the desired width of right-of-way, respectively, into the computer system.

The practical aspects of the approach developed are important; for proper execution of this technique, there are considerations that warrant further attention. First of all, knowledge of the grid patterns must be ascertained. Which grid number is associated with what x and y boundary values? What land cost index corresponds to that grid number? Also, the direction of the centerline as it progresses through the area in question must be known.

To satisfy the foregoing demands, the analytical aspects of the model should be considered. Figure 1 shows a general condition that commonly exists in the field; i. e., the right-of-way passes through parcels of land of different values. Areas 1, 2, 3 and 4 represent four arbitrary patterns of cost, each area being different in its cost per unit area. Consideration of matrix theory shows that it can be applied to the solution of the problem at hand.

X, Y formation permits a convenient relationship that can be placed in computer storage.

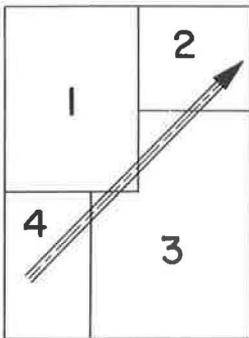


Figure 1. Right-of-way passing through parcels of land of different values.

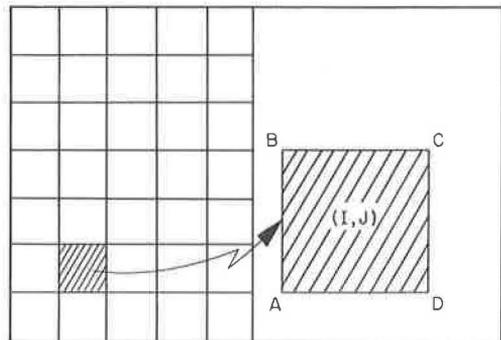


Figure 2. General matrix pattern of model (left), and enlarged I, J grid within model (right).

A 2-dimensional array may be thought of as being composed of horizontal rows and vertical columns. The first of the 2 subscripts then refers to the row number, running from 1 up to the number of rows, and the second to the column number, running from 1 to the number of columns. For instance, an array of 2 rows and 3 columns might be shown in mathematical notation as

$$\begin{array}{l} A_{1,1}, A_{1,2}, A_{1,3} \\ A_{2,1}, A_{2,2}, A_{2,3} \end{array} \quad (3)$$

Final development of the program then became one of establishing a core of matrices in computer memory; one matrix defined the grid boundaries, and another was superimposed to assign costs to the specific grid encompassed within these boundaries. The following procedure was used to assign i, j values to the first matrix: If $I =$ rows and $J =$ columns, the location of any point (i, j) uniquely defines its position with respect to a reference datum. Figure 2 (left) shows the general pattern of the system. In this instance, the hatched section represents one I, J grid within a rectangular matrix.

PHYSICAL MODEL

For purposes of convenience in trying out the technique described, a physical model was drawn with grid lines spaced at 5 in. (Actually, the grid was drawn on a topographic map and was used also for computer program development involving line description and earthwork analysis, which are beyond the scope of the present paper.) At an assumed scale of 1 in. = 50 ft, each grid square represented 250 by 250 ft of area.

The enlarged grid (Fig. 2, right) is the I, J block drawn out for further examination. For the physical model, the rectangular coordinates x, y (matrix definition and computer notation) of the corner boundaries A, B, C and D are, therefore:

$$A = 250 (J-1), \text{ and } 250 (I-1) \quad (1)$$

$$B = 250 (J-1), \text{ and } 250 (I) \quad (2)$$

$$C = 250 (J), \text{ and } 250 (I) \quad (3)$$

$$D = 250 (J), \text{ and } 250 (I-1) \quad (4)$$

This process is conducted on all grids within the matrix by iterative routine and stored in memory for subsequent use. A grid identification number is also a product of this matrix. A similar procedure was adopted for assigning the cost indices to the respective grid squares. From Eqs. 1, 2, 3, and 4 the boundary limits confine the area, permitting the designer to ascertain the location of the route centerline; hence, all he is required to specify is the I, J of the point.

The completed manuscript consisted of a 5-by-7 rectangular grid arrangement. The matrix pattern, therefore, consisted of 35 equal squares. A display and documentation of the final model is shown in Figure 3. Each grid square contained integer data for identification and computational purposes. For an example grid square in Figure 3, (2, 2) represents the subscripts assigned to the example grid square for identifying the I, J of the complete matrix, and [200] represents the cost index, in dollars per unit of area, of the area in which the example grid square is located (an arbitrarily chosen index to depict land value). In this study, an acre was the parameter of areal extent.

The program, as written, was capable of varying the costs at the will of the user. Cost indices used in the study for depicting appraised land values were \$10,000, \$200, \$60, and \$20 per acre for settled and varying levels of marginal lands, respectively. These indices were assigned arbitrarily to the grid squares to represent a patchwork pattern of land value. The boundaries of the patchwork pattern used in the study are shown by the sinuous lines in Figure 3.

The mechanical operation for computing costs per station is fundamental. The programmed instructions compute the cost for each segment by multiplying the width of way (which also may be varied if desired) by the running length of 5 ft, converting this into

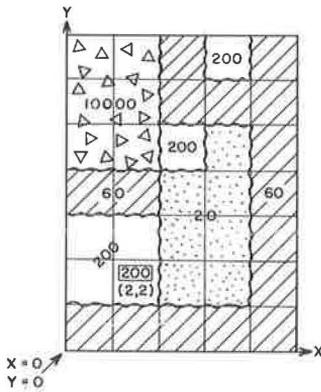


Figure 3. Documentation of cost assignment to grid squares.

acres, and multiplying the area by the cost index applicable for the particular grid unit in which the line segment lies. The cost for each segment is accumulated for each station and continues over the entire length of the line.

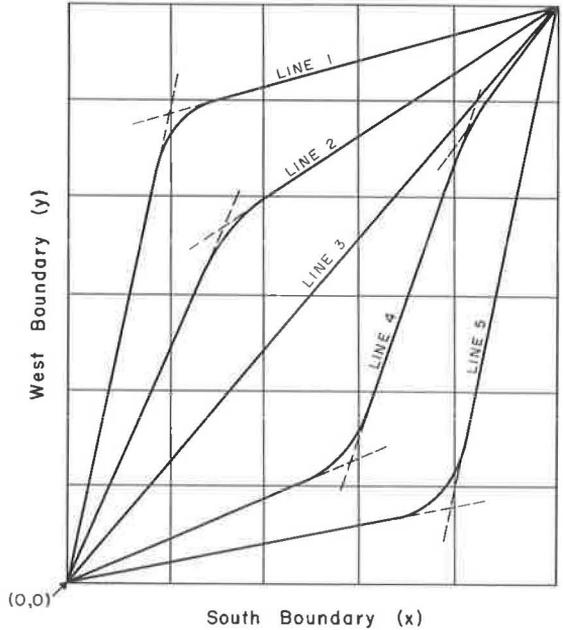


Figure 4. Locations of lines chosen for investigation.

INPUT REQUIRED

The following parameters must be furnished for execution of the program:

1. Appraised or estimated land costs for each grid square;
2. Beginning and ending station and their respective coordinates for each line segment (output from related program describing route);
3. Width of right-of-way between terminal points for each line segment;
4. Total cost (initial) accumulated up to the beginning station; and
5. Line identification number.

EXAMPLE PROBLEM

For trial purposes, five lines were arbitrarily selected for investigation. The general locations of these lines are shown in Figure 4. The assumed right-of-way width was 300 ft, and the cost indices for land were assumed to be those already shown in Figure 3. The beginning station for each line was assumed to be zero, and the accumulated cost up to the beginning of each line was taken to be zero dollars.

The digital computer used for this investigation was an IBM 1620 Data Processing System accompanied by an IBM 1622 card reader-card punch unit. The average execution time for the five trial routes was 2.5 min.

Table 1 summarizes the results of five trial lines. The output format in the computer program was designed so that the results were arrayed in the following manner:

Station	Total Cost, Dollars
XX	XXXXX.XX

Figure 5 is presented to give a pictorial display of the land cost for right-of-way acquisition for the total study. Values in Figure 5 are those excerpted from Table 1.

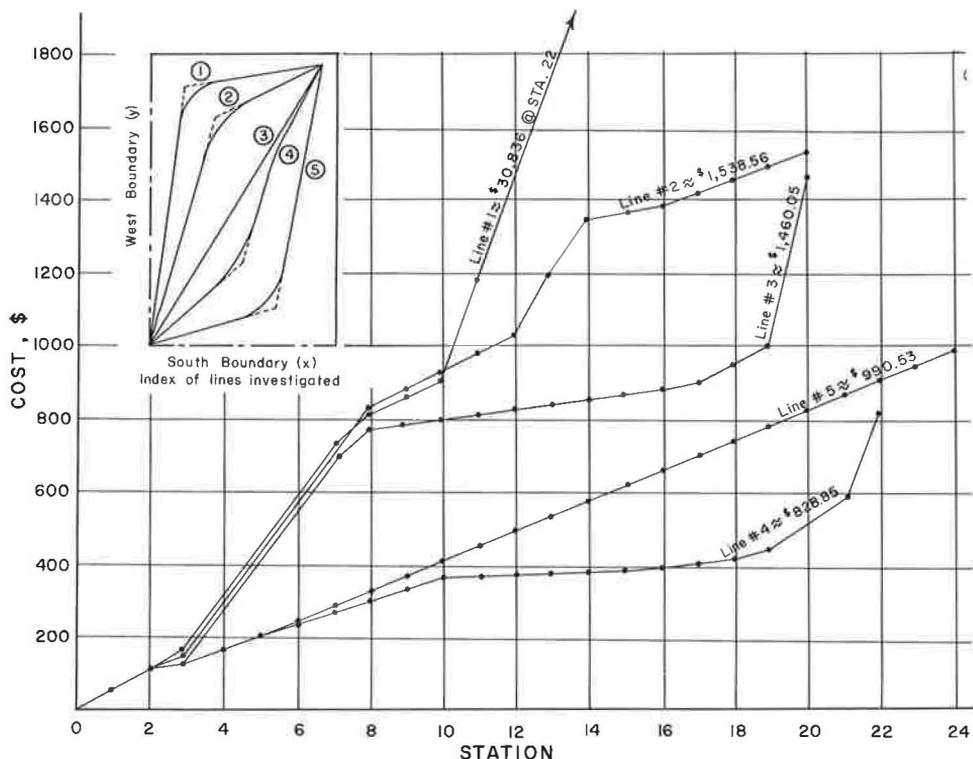


Figure 5. Plot of right-of-way costs by station for alternate routes.

DISCUSSION OF RESULTS

From either Table 1 or Figure 5 the total accumulated cost as well as the pattern of cost over each of the five trial lines can easily be determined. It would appear that the right-of-way costs for Line 4 are most favorable in comparison to costs of the other lines. The cost of right-of-way for Line 1 is highest as the result of passing through a relatively short section of highly valued land. Sudden changes in the slopes of any of the curves in Figure 5 indicate where sudden changes occur in the value of the land through which the lines pass. Given such station-cost patterns, minor shifts in some lines could be noted which would result in costs more favorable than any trial line investigated thus far.

LIMITATIONS OF APPROACH AND SUGGESTIONS FOR FURTHER DEVELOPMENT

It is well to consider some of the limitations of the approach outlined here, especially as they would affect the validity and accuracy of the results.

TABLE 1
RESULTS OF LAND COST ANALYSIS^a

Station	Cost (\$)				
	Line 1	Line 2	Line 3	Line 4	Line 5
1	41.32	41.32	41.32	41.32	41.32
2	82.64	82.64	82.64	82.64	82.64
3	167.35	152.89	123.96	123.96	123.96
4	305.09	290.63	237.60	165.28	165.28
5	442.83	428.37	375.34	206.61	206.61
6	580.57	566.11	513.08	247.93	247.93
7	718.31	703.85	650.82	285.12	289.25
8	822.31	841.59	763.77	298.89	330.57
9	863.63	926.30	777.54	312.67	371.90
10	904.95	967.63	791.32	326.44	412.32
11	7,107.43	995.17	805.09	340.21	453.64
12	13,994.48	1,046.14	818.86	353.99	494.96
13	20,887.52	1,184.88	832.64	367.76	536.28
14	27,768.56	1,321.62	846.41	381.54	577.61
15	30,547.60	1,353.79	860.19	395.31	618.93
16	30,588.92	1,373.27	884.98	409.08	660.25
17	30,630.24	1,414.59	926.30	422.86	701.57
18	30,671.56	1,455.91	967.62	458.67	742.90
19	30,712.88	1,497.24	1,008.95	499.99	784.22
20	30,754.20	1,538.56	1,460.05	541.32	825.54
21	30,795.52	—	—	582.64	866.86
22	30,836.84	—	—	828.85	908.18
23	—	—	—	—	949.51
24	—	—	—	—	990.83

^aCosts varying (grids assigned different costs); constant right-of-way approximately 300 ft selected in card data; land cost approximately 0 + 00 = \$0.

Any approach to the accurate estimation of cost for right-of-way for trial lines, including the one outlined here, is limited by the accuracy of the appraised or assumed cost of the land being studied. Accuracy is needed on the dollar amounts, as well as the specific locations of the parcels or buildings involved. It is not a question of value of an entire property which might include some portions of high value and others of low value. It is a question of the value of the particular strip that would be taken by the right-of-way. A building on a given property is either taken or not taken depending on the specific location of the building and the specific location of the right-of-way. Any automated system of data processing for right-of-way costs would depend on a systematic and efficient method of identifying the location and values of land and improvements whether the data are derived from assessors' maps or records, airphotos, or field inspection. The system used should strive for accuracy and, at the same time, should avoid arousing public concern prematurely. The problems of arriving at sufficiently accurate and detailed values of land and improvements are formidable and are beyond the scope of this paper. For purposes here, it is assumed that the required data are available for analysis.

Given adequate data on land costs, however, there is a mathematical limitation of the grid matrix approach which should be noted. The boundaries of the areas of different cost indices must theoretically coincide with the grid network. Skew orientation of cost boundaries, or spacing of cost boundaries between the grid network, cannot be permitted. This limitation might not be serious in a general study where generalized boundaries of land values could be defined to coincide with a grid system. Actually, however, the boundaries of land of different values are likely to be oriented in any fashion, and often include curved or irregular sides. Buildings are frequently odd-shaped and set in many orientations. If an accurate accounting of land and building costs is to be made by the grid matrix approach, the grid network must be divided finely enough to permit reasonably accurate approximations of actual locations of land areas and buildings by the matrix notation. The limit of the computer memory storage capacity limits the fineness of the grid and the areal extent of the problem which can be undertaken in a one-step solution.

In possible application, a coarser grid might be used in rural areas and a finer grid in settled or urban areas. Because input cost figures are based on unit area, special attention should be given to the problem arising when the right-of-way cuts through part of a building, when, in fact, all of the building must be taken. This, again, relates to the matter of the fineness of the grid network required to attain needed accuracy.

Whereas the input data are based on appraised or estimated value, experience shows what additional percentage might be added to account for damages and adjustments normally encountered in various areas classified by land use. Refinements of this sort could make the resulting figures accurate enough to be suitable for use in preliminary engineering studies.

In addition to using results to assist in preliminary route studies, once a route is chosen, the data derived from such a study could be filed and used later for review and comparison with the results of the actual cost of acquisition. Large deviations between the two could be spotted easily and could be checked to determine whether the discrepancies were due to errors in original estimating or to impropriety in the business dealings.

CONCLUSIONS

This article has elaborated on a computer approach for estimating right-of-way costs along a route and has possible applications in the investigation of trial lines during preliminary route location studies. Widths of right-of-way and appraised costs of land parcels through which the route passes can be varied as they are input parameters of the program. Using high-speed computer facilities for routine calculations, the engineer is permitted to investigate a wide range of alternate routes. The neat, orderly output can be checked with a minimum of effort and is a self-explanatory document which can be filed for later use. The logic of the approach is sound from the engineering standpoint, and gives satisfactory mathematical results. Further method investigation and program refinements are warranted.

The program described here has been limited only to right-of-way cost determination. In practice, consideration should be given to all significant variables and conditions involved in route design (4). To be most useful and efficient in actual automated location and design problems, the determination of right-of-way costs should be integrated with the determination of line, grade, earthwork, and any other item of construction and operating costs which can be quantified.

ACKNOWLEDGMENT

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REFERENCES

1. Pryor, W. T., "Getting from Map to Ground." HRB Bull. 283, pp. 56-62 (1960).
2. Miller, C. L., and Weisberg, D. E., "Zone Cost Evaluation Program EA-2." Mass. Inst. Technol., Cambridge, MDPW-BPR Res. Proj. 138 (Oct. 1960).
3. McCracken, D. D., "A Guide to FORTRAN Programming." John Wiley, New York, pp. 40-41 (1962).
4. Schureman, L. R., "The Electronic Computer in Highway Engineering." Jour. Highway Div., Proc. ASCE, 85 (HW3, Pt. 1): 39-63 (Sept. 1959).
5. Henry, H. A., "Development of Photogrammetric Methods for Right-of-Way Operations in Texas." HRB Bull. 283, pp. 39-48 (1960).
6. Weisberg, D. E., "Use of Digital Computer in Land Acquisition Cost Evaluation." Mass. Inst. Technol., Cambridge, unpubl. M. S. thesis (May 1961).

Appendix

COMPUTER PROGRAMING TERMS, LISTING AND FLOW CHART

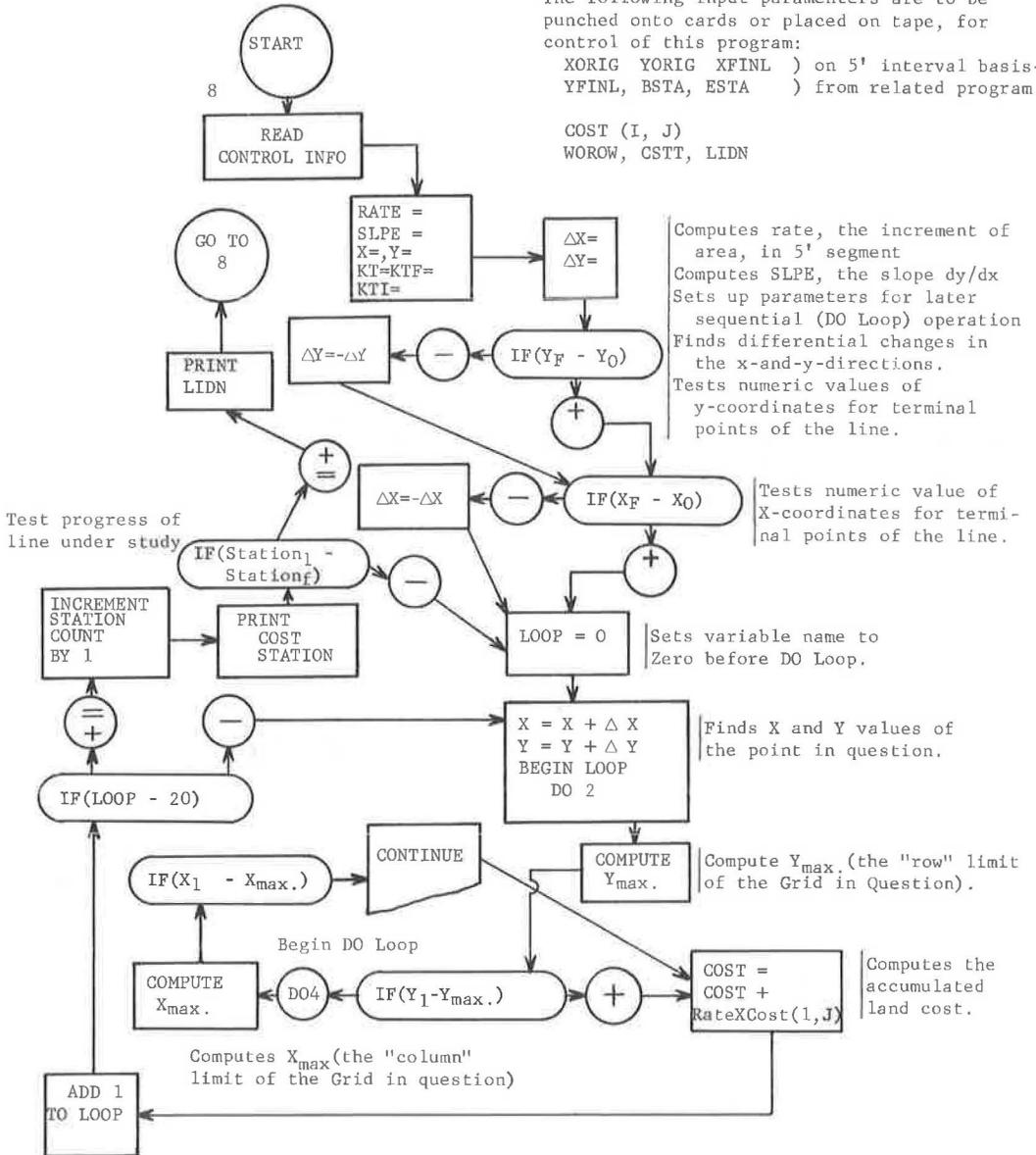
Definitions of Programing Terms

- COST (I, J):** Represents cost indices, stored in memory; designed to furnish the cost patchwork pattern by arraying index costs for zones in a row and column arrangement
- XORIG¹:** Beginning station X-ordinate
- YORIG¹:** Beginning station Y-ordinate
- XFINL¹:** Ending station X-ordinate
- YFINL¹:** Ending station Y-ordinate
- BSTA¹:** Beginning station
- ESTA¹:** Ending station
- WOROW:** Width of right-of-way chosen
- CSTT:** Initial cost (at BSTA)
- LIDN:** Line identification number
- RATE:** Represents area secured for land acquisition for 5-ft increment of center-line, in acres, for a given WOROW

¹From related program, this input data are either punched on cards or placed on tape to be read in at 5-ft intervals.

The following input parameters are to be punched onto cards or placed on tape, for control of this program:
 XORIG YORIG XFINL) on 5' interval basis-
 YFINL, BSTA, ESTA) from related program

COST (I, J)
 WOROW, CSTT, LIDN



Increments the route centerline;
 performs this 20 times in the length of 1 full station.
 (Advancing in this manner assists in better determination of the grid square being penetrated.)

Figure 6. Flow chart.

SLPE:	Defines slope of route under investigation (divides total change in Y-direction by the corresponding X-direction)
DELX:	Represents differential change in X-direction, incremental length divided by conventional slope function
DELY:	Represents the differential change in Y-direction for a given increment in length, equal to absolute value of slope multiplied by d(X)
LOOP:	Parameter used for later sequential operation within system
YMAX:	Row limit of grid in matrix under investigation
XMAX:	Column limit of grid in matrix under investigation

Program Listing

```

DIMENSION COST(7, 5)
8 DO 1 I = 1, 7
DO 1 J = 1, 5
1 READ7, COST(I, J)
READ7, XORIG, YORIG, XFINL, YFINL, BSTA, ESTA
READ7, WOROW, CSTT, LIDN
RATE = 5. *WOROW/43560.
X = XORIG
Y = YORIG
KTI = BSTA
KT = KTI
KTF = ESTA
SLPE = (YFINL - YORIG)/(XFINL - XORIG)
DELX = 5./SQR(1. +(SLPE)**2)
DELY = ABS(SLPE*DELX)
IF(YFINL - YORIG) 10, 11, 11
10 DELY = - DELY
11 IF(XFINL - XORIG) 12, 13, 13
12 DELX = - DELX
13 LOOP = 0
6 X = X + DELX
Y = Y + DELY
DO 2 I = 1, 7
YMAX = I*250
IF (Y - YMAX) 3, 3, 2
2 CONTINUE
3 DO 4 J = 1, 5
XMAX = J*250
IF(X - XMAX) 5, 5, 4

```

```
4 CONTINUE
5 CSTT = CSTT + COST(I, J)*RATE
LOOP = LOOP + 1
IF(LOOP - 20) 6, 7, 7
7 KT = KT + 1
TCOS = CSTT
JSTA = KT
PRINT7, JSTA, TCOS
IF(KT - KTF) 13, 9, 9
9 PRINT7,
PRINT7, LIDN, LIDN, LIDN, LIDN
GO TO 8
END
```