

Some General Findings From Severance Studies

FLOYD THIEL
Economics and Requirements Division
U.S. Department of Commerce
Washington, D.C.

Severance studies attempt to learn the effect which a partial taking of property has upon the value of the remainder.¹ These studies are inspired by the belief that owners whose property is partially taken for a highway or other public purpose should be compensated fully but that they should not be enriched by payments for damages which do not in fact exist.²

Case Studies

Analysis of the experience of land parcels partially taken for highway right-of-way ordinarily involves investigation of individual takings—the case study approach. For example, Figure 1 shows what happened from a period before the highway went through a property until a part of the remainder is sold. When this happens, when any part of the remainder is sold, it becomes possible to make a preliminary comparison of land values. The per acre value of the parcel which sold can be compared with the per acre value of the entire parcel at the time of the taking.

Such a comparison is obviously not conclusive. It compares per acre values of parcels sold, parcels which may be more or less desirable than the entire property. Since such a comparison shows what happened to land values rather than to owners, it does not show whether owners were benefitted or damaged. The main advantage of such a comparison is that it permits some tentative findings about highway effects in those

¹ Prepared primarily from the results of Ross's analysis and in part from earlier work of G. Broderick.

² Studies of land parcels partially taken for highway right-of-way have for several years now been termed severance *damage* studies. Recently someone observed that damages often do not in fact result—that benefits are three times more likely than damages—and suggested that a proper label would be severance *benefits* studies. Such a title may sound a little over optimistic, and these studies are probably best described as “severance effects studies”, or “property severance studies.”

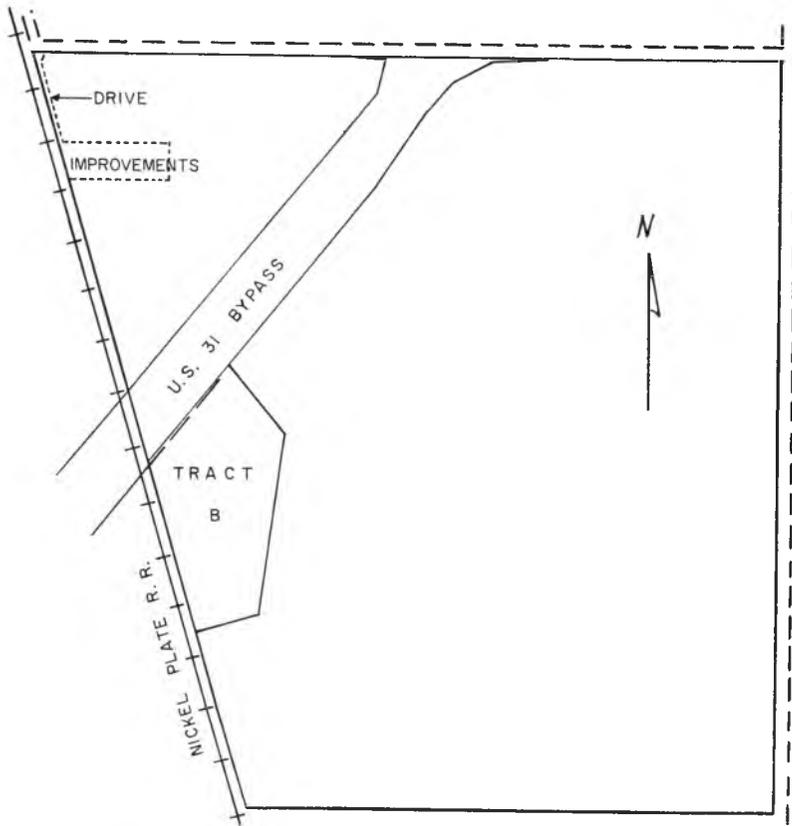


Fig. 1. This sketch and data show what happens for a period from before the highway went through a property until a part of the remainder is sold.

Before value 140 acres at \$300.....	\$42,000
Taking (8 acres) and damages.....	6,000
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After value—estimated at 132 acres.....	\$36,000
Sale of B—6 acres at \$333.....	\$2,000
Per acre value—before	\$300
Per acre value—sale	\$333
Recovery rate ($\$333 \div \300).....	111%

Source: Joint Highway Research Project, Purdue University, in cooperation with the Indiana State Highway Commission and the Bureau of Public Roads

many situations where the entire remainder is not sold. For example, the entire remainder has been sold in only about half of the 2,100 cases in

the Bureau's bank of cases.³ The other 1,000 cases have had only a portion of the remainder sold. For these 1,000 cases and also for the 1,100 cases with the entire remainder sold, the unit value of the remainder parcel sold can be compared with the unit value at the time of the taking. If the per acre value of the remainder parcel which is sold equals the per acre value of the entire parcel at the time of the taking, the remainder parcel is said to have a recovery rate of 100 percent. This "recovery rate" is a rate obtained by dividing the value per acre (or per square foot) of part or all of the remainder which has been sold by the value at the time of the taking. Thus a recovery rate of over 100 percent means that the remainder has increased in unit value. A rate of less than 100 percent indicates the remainder has declined in value—it has not fully recovered.

Recovery Rates, Damage Estimates, and Landlocked Parcels

Recovery rates are in a sense just the other side of damage estimates. Damages to landlocked remainders have in the past often been estimated at 90 percent or even at 100 percent, as in Figure 2. An estimate that the after value of a parcel will be damaged 90 percent means that a recovery rate of only 10 percent is being estimated. An estimate of 100 percent damage, as for this landlocked parcel, means that a recovery rate of zero is estimated. The remainder is expected to have no value whatsoever.

An estimate of 100 percent damages, of a recovery rate of zero, is seldom realistic. It was a poor estimate in this case study (Figure 2) and it does not agree with experience in general. Experience of the Bureau's bank suggests that landlocked parcels are typically damaged only about 10 percent. The median recovery rate for landlocked parcels is 90 percent, as can be seen from Figure 3. And the average recovery rate is considerably higher—173 percent. Furthermore, only about 2 percent of the 160 landlocked cases in the Bureau's bank show damages as high as 90 percent, the percentage of damage formerly thought to be experienced by landlocked remainders.

Landlocked remainders do tend to be damaged more than other types of remainders. For example, instead of the median recovery rate of 90 and the average recovery rate of 173 for landlocked parcels, other remainders have experienced a median recovery rate of 140 percent and an average of 326 percent.

³ For the past three years the Bureau has maintained a central file or bank of partially taken cases. These cases are recorded on standard IBM cards so that data can be sorted and retrieved automatically.

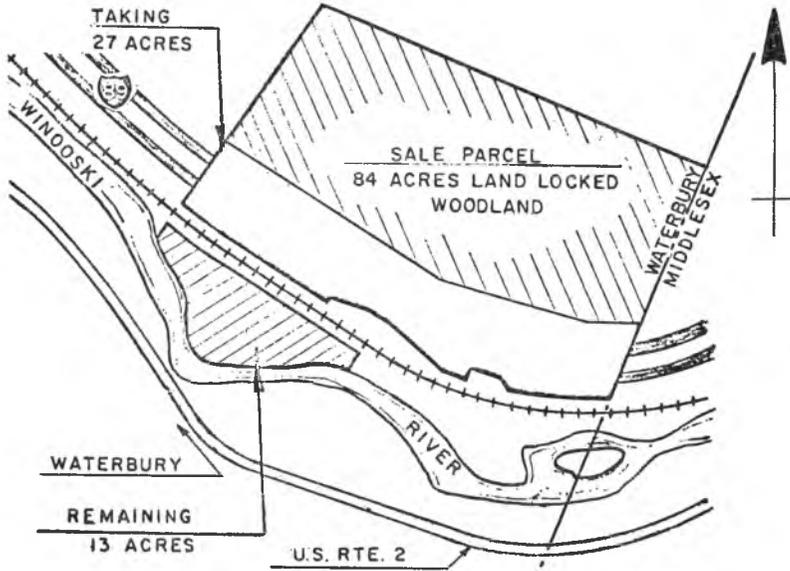


Fig. 2. Before and after values of landlocked remainder.

Before value	\$3,000
Taking	\$270
Damage (100% to 84 acres)	\$2,280
Estimated value of 13 acre remainder	\$450
Sale of timber from landlocked remainder	\$900
Sale price of landlocked remainder	\$200

Source: Vermont Study No. 2

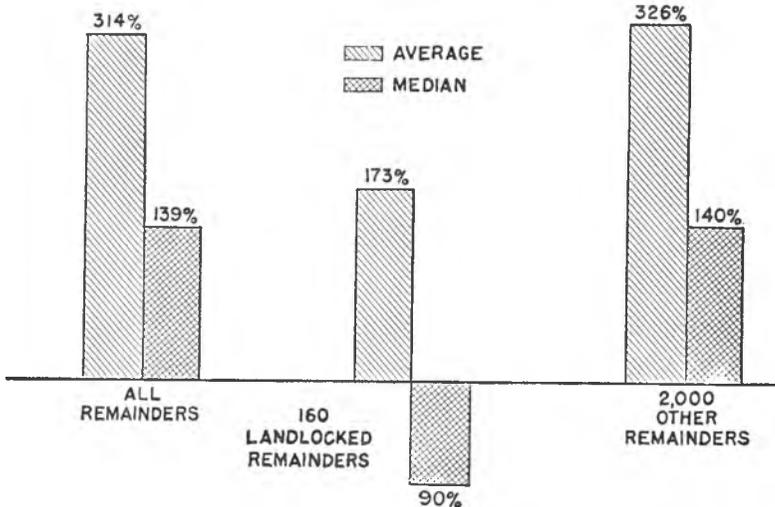


Fig. 3. Median and recovery rates for landlocked and other type remainders.

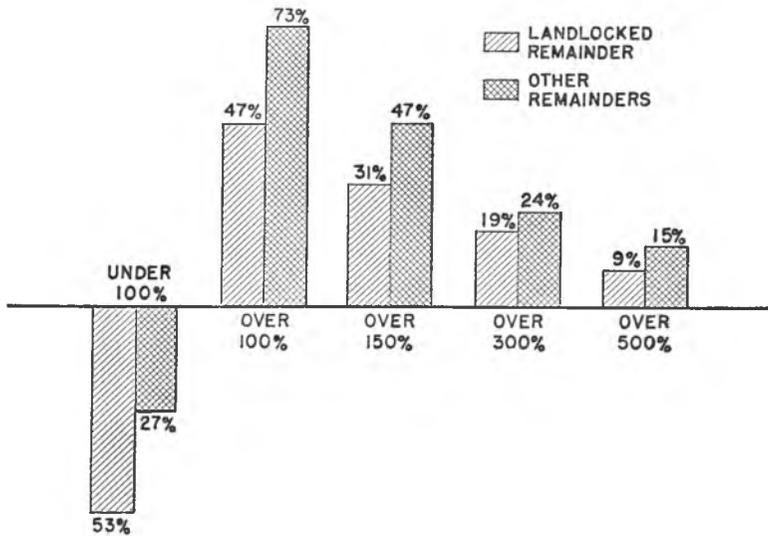


Fig. 4. Recovery rates for landlocked and other remainders.

The frequency distribution shown in Figure 4 also indicates that more landlocked parcels tend to be damaged, have a lower recovery rate, than is true for other parcels. About 53 percent of the landlocked parcels had recovery rates of less than 100 percent compared with about 27 for other cases. Thus, the percentage of the landlocked parcels experiencing some damage was about twice as high as for other cases.

Overall Experience

As suggested above, remainder sales have so far shown more benefits than damages. For the 2,100 cases in the Bureau's bank, about one-fourth show a recovery rate of less than 100 percent. The rest of the cases have a recovery rate of over 100 percent. About half of the sales experienced recovery rates of over 150 percent. Thus in half the cases, the price per acre of the parcel sold was 50 percent or more above the per acre price of the entire property at the time of the taking. This can be seen from Figure 5.

Medians and Averages

Because of the extremely large increases in per acre values for some remainder parcels, simple arithmetic averages may not be a satisfactory summary measure of the typical experience of parcels that are sold. Median values provide another way of summarizing the overall experience. Since a median is a middle value with half of the cases above and half of them below, those remainder parcels with extremely

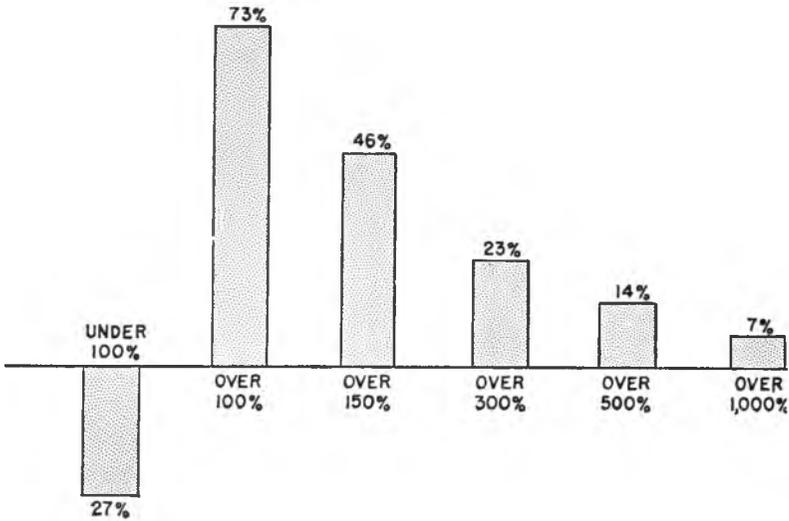


Fig. 5. Land value recovery rate.

high recovery rates do not have such a noticeable effect on median values as on average values. Thus, for the 2,100 sales in the Bureau's bank of cases, the median value is 139 percent, compared with an average value of 314 percent. These comparisons are shown in Figures 6a and 6b.

Time of Sale

These median and average recovery rates, 139 and 314, are for all sales in the Bureau's bank of cases, regardless of the length of time

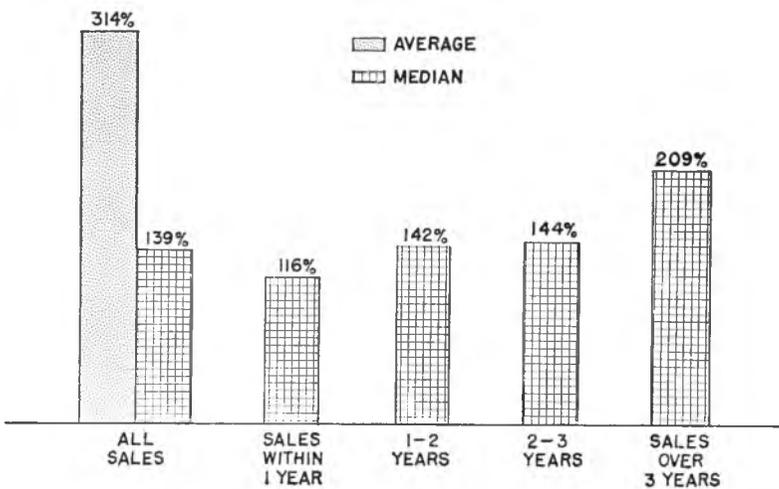


Fig. 6a. Land value recovery rate by time from acquisition to sale.

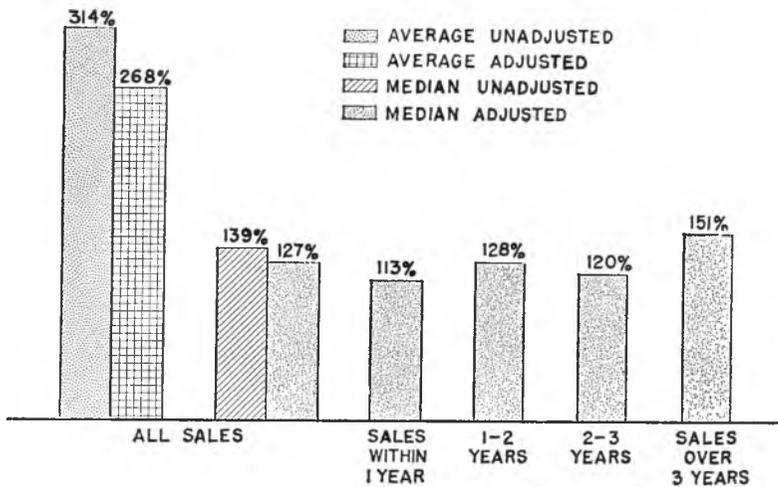


Fig. 6b. Land value recovery rate by time from acquisition to sale, medians adjusted.

between the highway taking and the sale of the remainder. For sales occurring some period of time after the taking it seems necessary to allow for general land value increases. For this purpose, an adjustment of 7 percent per year has been used. With this adjustment applied, the median recovery rate overall becomes 127 percent. This means that in half the cases, per acre values of remainders exceed before values by 27 percent or more. For sales occurring within the first year, the median recovery rate is 113, after it is adjusted for general land value increases.⁴

Recovery rates for sales occurring two, three, or more years after the taking are higher, even after the adjustment is made for general land value increases. For example, the adjusted recovery rate for parcels sold more than three years after the taking is 151 percent. Experience gained so far suggests strongly that it is in the interest of property owners to retain their remainder parcels for a period of time after the

⁴ Average 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 6 percent recently ("Farm Real Estate Market Developments," U.S. Department of Agriculture, C.D.—65, April 1964); (b) average 8 percent increase each year in site value of new and used residences with financing insured by Federal Housing Administration (Housing and Home Finance Agency, "16th Annual Report," 1962, p. 100); (c) Consumers Price Index change of approximately 1.5 percent per year ("Survey of Current Business," January 1965); (d) average annual rate of 2.8 percent in the land value increase for period 1922 to 1956 (Kurnow, E., "Land Value Trends in the United States," *Land Economics*, November 1960, pp. 341-348).

taking. Apparently the value of partially taken parcels tends to go up more than land values generally, at least for three or more years following right-of-way acquisition.

Interchange Effects

What happens around interchanges has received a good deal of attention. For the 2,100 cases in the Bureau's bank, about one-fourth were located within a half mile of an interchange, a distance often used to distinguish between interchange and noninterchange areas. The experience of interchange cases and noninterchange cases is depicted on Figure 7. As might be expected, the recovery rate for parcels located

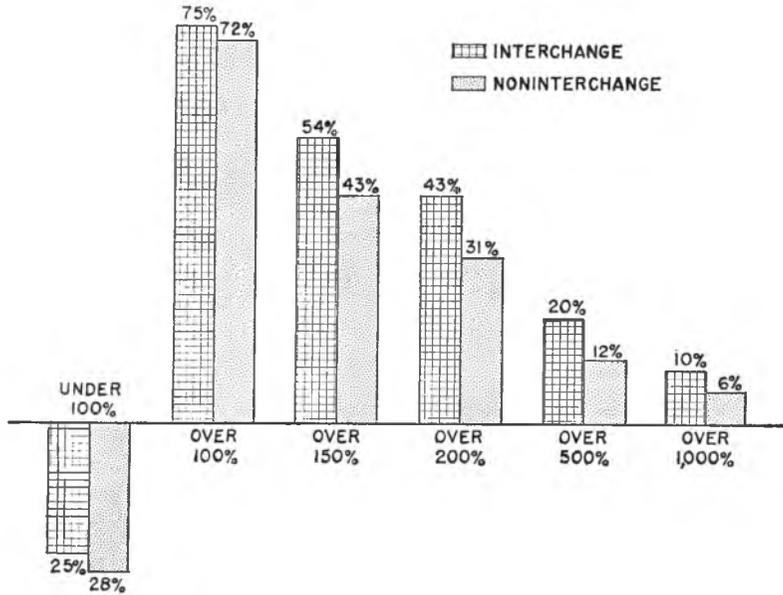


Fig. 7. Recovery rates by nearness to interchange.

within a half mile of an interchange is generally better than the recovery rate for parcels located farther away from an interchange. More of the interchange properties had high recovery rates and fewer of the interchange parcels had low recovery rates than was the case for parcels located away from the interchange.

Why parcels near interchanges tend to have a high land value recovery rate is fairly obvious. Interchange areas offer special opportunities for economic development. It is not so obvious, however, just why rural interchanges are associated with higher land value recovery rates than urban interchanges. Rural interchange remainders appear to

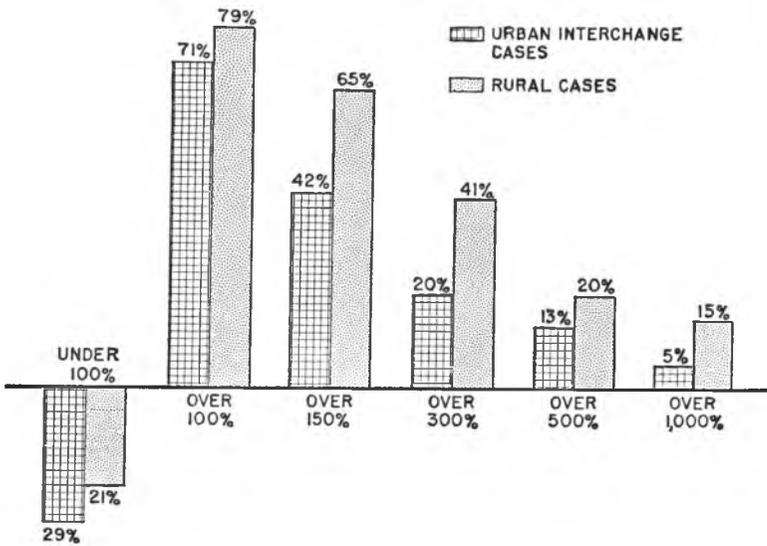


Fig. 8. Recovery rates—interchange cases—urban and rural.

have more sales with high recovery rates and fewer cases with low recovery rates, as can be seen in Figure 8. No doubt one explanation for this is that many properties near rural interchanges tend to be vacant with relatively low valuations at the time of acquisition. Perhaps another reason for the higher recovery rates near rural interchanges may be that rural interchanges are farther apart than urban interchanges so that sites near these rural interchanges tend to be especially sought after. For such properties, land value increases which are high percentage-wise are understandable. The difference between the experience of remainders near rural and urban interchanges is emphasized by the median recovery rates—164 percent for all interchange cases, 239 percent for rural interchanges, and 124 percent for urban interchanges. See Figure 9.

Type of Highway System

As might be expected, remainder parcels along the interstate system have so far experienced more large gains and more losses than has been true along other highway systems. As can be seen in Figure 10 about 14 percent of the remainder parcels located along interstate highway systems have had recovery rates of over 500 percent, a slightly larger portion than is the case for remainder parcels located along Federal-aid primary systems and Federal-aid secondary systems. At the same time, about 28 percent of the remainder parcels located along the interstate

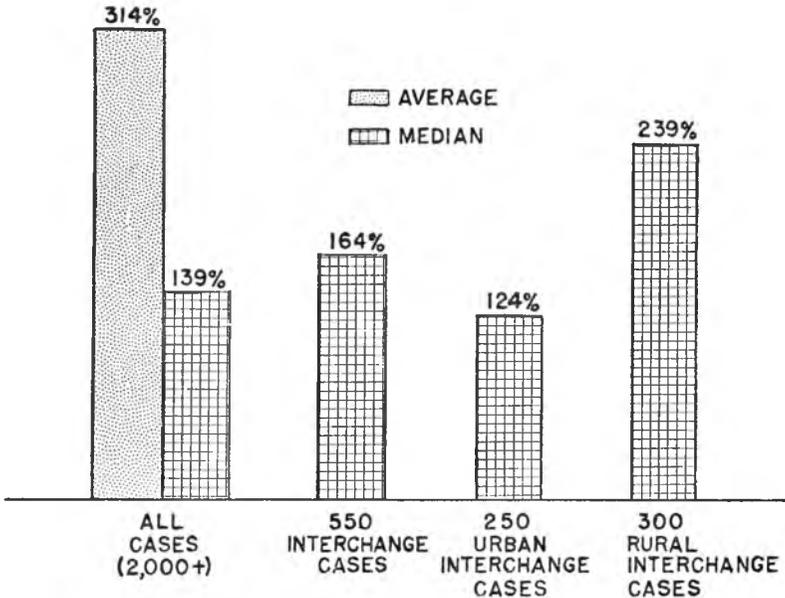


Fig. 9. Land value recovery rates by nearness to interchange.

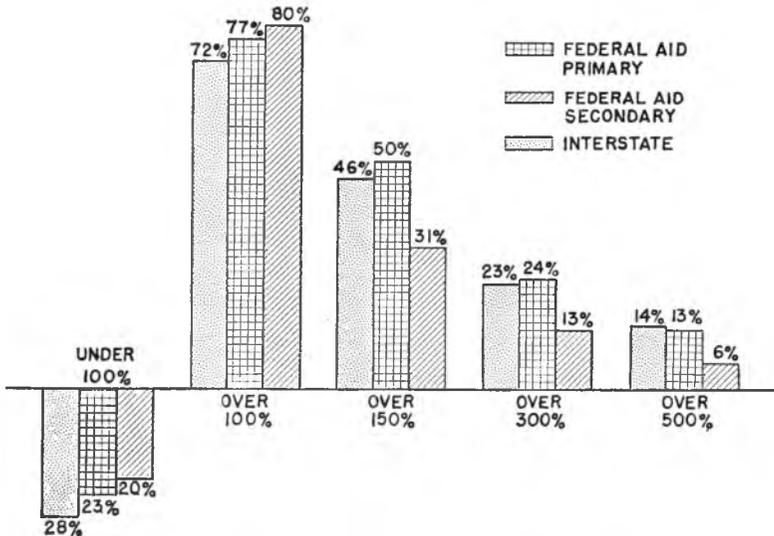


Fig. 10. Recovery rates by type of highway system.

system have had recovery rates of less than 100 percent, compared with about 23 percent of the Federal-aid primary remainders and 20 percent of the remainders along Federal-aid secondary systems with recovery rates of less than 100 percent. Interstate routes appear to be associated with both high and low land values to a greater extent than other routes.

Whether this experience along Interstate routes will continue when more cases are available to analyze is not clear. 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 system. Reasons for high land value gains along interstate routes are also fairly commonly understood.

Extent to Which Owner is Made Whole

For over half the cases in the Bureau's bank of cases the entire remainder parcel has been sold. When this happens, enough facts are available to show whether the owner was placed in as good a position as he was before the right-of-way acquisition. The facts needed for such a comparison are (1) the value before the taking, (2) the highway payment to the owner for the taking and any damages that are estimated and (3) the sale value of the entire remainder. If the total of the payment for right-of-way and the amount which the owner receives from selling the remainder is as great as the before value, the owner can be said to have been "made whole." For example, in Figure 11 the owner

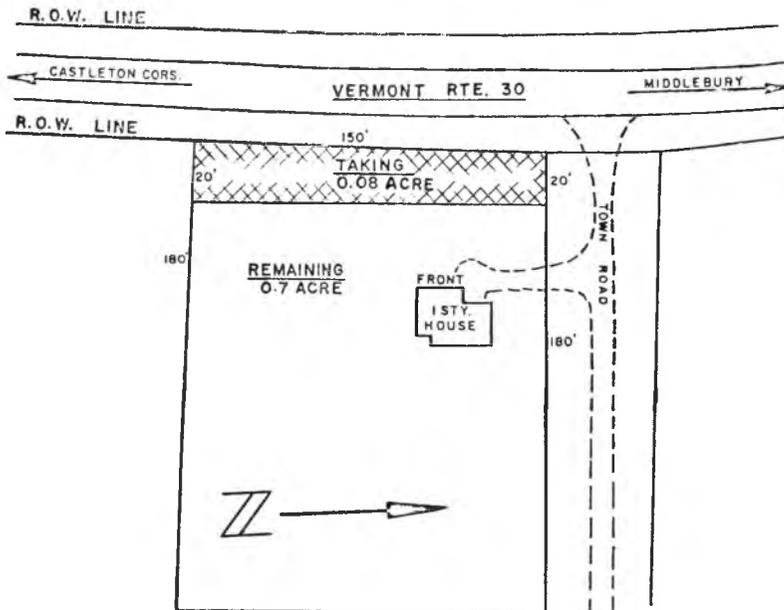


Fig. 11. Before and after values.

Before value	\$8,500
Taking of property	\$ 300
Damages	\$3,200
	3,500
Remainder value	\$5,000
Sale of remainder	\$5,000 (within 6 months)

was "made whole." While there is some resemblance, this concept is not the same as "just compensation," which varies because of the extent to which benefits and damages can be taken into account.

As mentioned above, over half of the 2,100 cases in the Bureau's bank have enough facts available to tell whether the owner was "made whole." For these 1,100 cases, four out of five property owners received adequate compensation or more. The remaining 20 percent of the property owners ended up with less money after the highway taking than they had in property at the time of acquisition. Figure 12 shows this.

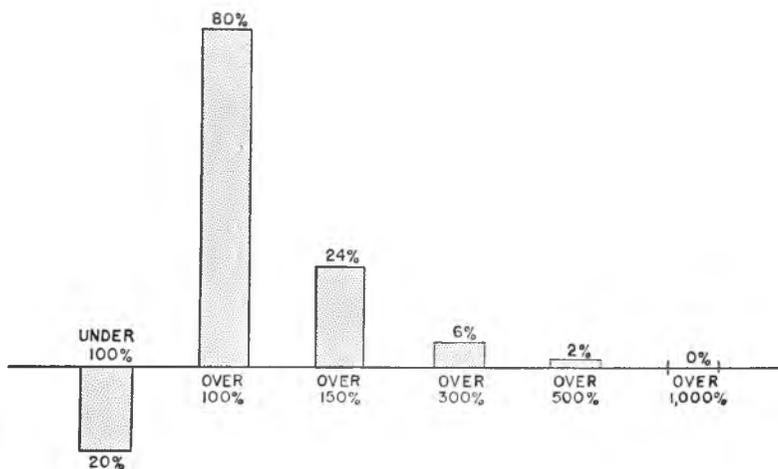


Fig. 12. Percent of owners made whole.

Recovery Rates and Total Amounts Received

Comparing recovery rates and total amounts received for the cases in the Bureau's bank of cases provides some indication as to the types of remainders which may be sold in part only. For example, the relatively high recovery rates suggest that some highly valued portions of remainders are being sold off—no doubt many of them for such purposes as highway services. See Figure 13. It should be kept in mind that the fairly high recovery rates do not reflect damage payments, as is the case for the figures depicting total amounts received. Thus, the real differences tend to be even greater than those shown on Figure 13.

Damages—Estimated and Actual

For the cases analyzed, damage payments were made to the owners of 60 percent of these properties, while the remaining 40 percent received no payments. Examination of the experience of owners receiving damage

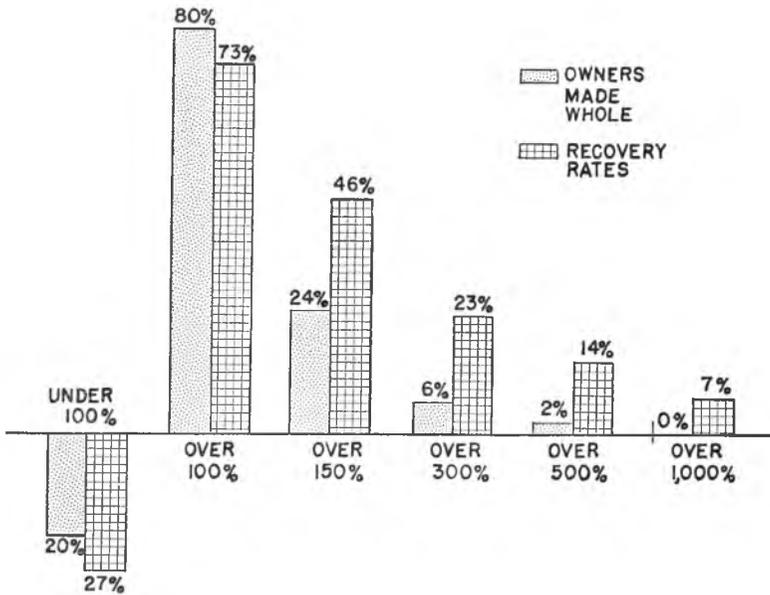


Fig. 13. Owners made whole and recovery rates—overall.

payments revealed that half of the recipients actually sustained no damage at all while one-fourth of the recipients of damage payments suffered less actual damage than they were paid for. A fifth of all recipients of damage payments received less in damage payments than they actually sustained. Of the owners who received no damage payments, over four-fifths experienced no actual damage while the remaining fifth of nonrecipients of damage payments suffered actual damage. Thus for both groups, about one owner in five suffered a loss due to an underpayment of damages or to the nonpayment of damages. Highway officials are of course just as concerned about property owners receiving inadequate compensation as they are about apparent overpayment of damages—since the general goal is to make the owner whole. A visual comparison of these findings is provided in Figure 14.

Damage Payments for Vacant and for Residential Remainders

Another comparison—of the experience of vacant and residential properties—reveals some interesting and perplexing variations. For all cases, damage payments accounted for 28 percent of total payments for right-of-way acquisition. But for vacant land, nearly half the cost of acquisition was accounted for by damage payments.

The result is that owners of vacant land have been treated better

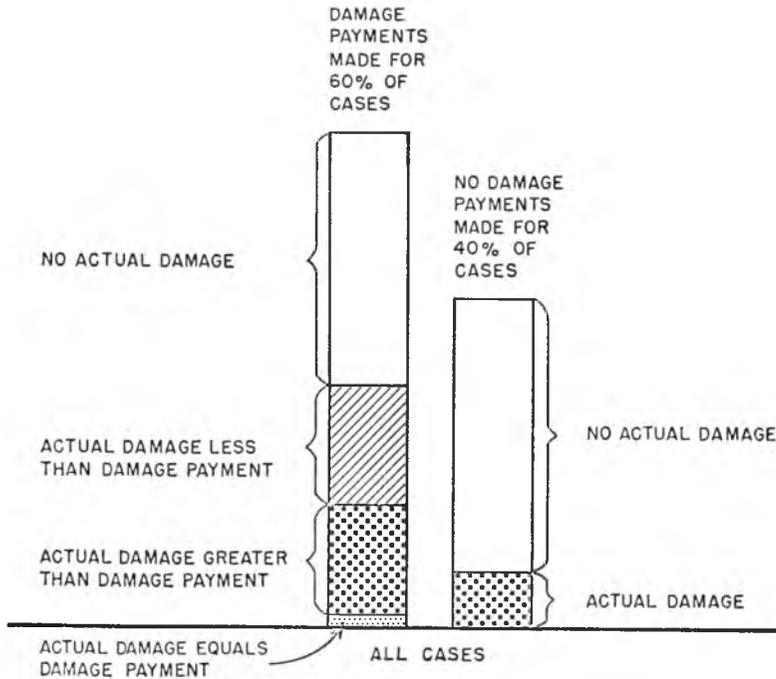


Fig. 14. Comparison of damage payments with actual damages.

than owners of other types of property. For example, owners of vacant land had receipts amounting to 129 percent of the before value of their property compared with 107 percent for residential properties. This contrast between vacant parcels and residential parcels is highlighted by Figure 15. As can be seen, owners of vacant parcels had fewer losses than residential property owners (11 percent versus 23 percent). And a much higher proportion of owners of residential than of vacant properties experienced relatively small gains over the before value. It is clear that owners of vacant properties generally fared better than residential land owners.

At least a partial explanation of the more favorable after-taking experience of owners of vacant land is given by still another finding from the Bureau's bank. A comparison of the uses of remainder parcels at the time they sold, with their uses at the time of the taking, reveals that nearly a third of those parcels which were vacant at the time of taking had shifted to higher uses by the time the parcel sold. By contrast, less than a tenth of residential parcels had shifted to higher uses by the time they sold. These findings suggest that the acquisition of vacant land

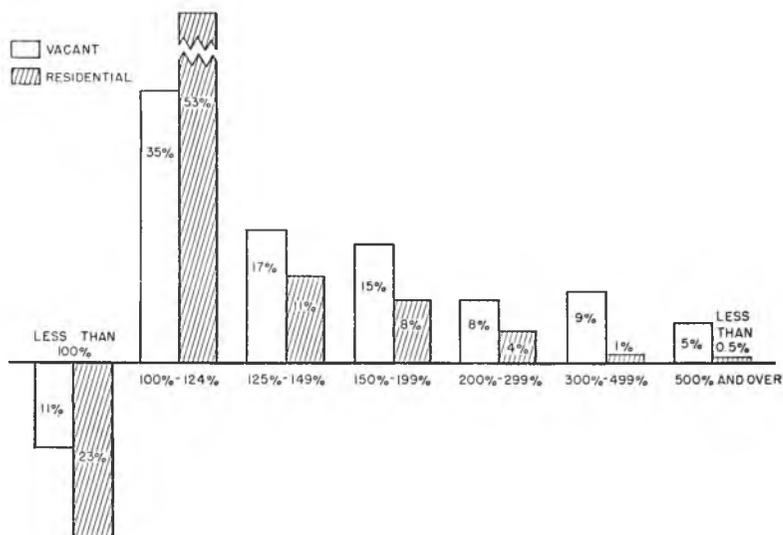


Fig. 15. Percentage distribution of value received as percent of before value by before land use, vacant and residential.

offers a good chance for improvement in the pursuit of the goal of making the owner whole.

Severance Cases as Comparables

Analysis of case studies in the Bureau's bank is of course only one of the purposes for which this information was intended. The Bureau's standard form for gathering partial-taking information and the Bureau-recommended procedures for recording, sorting, and analyzing these findings lend themselves to providing comparables for highway taking situations, especially for special purpose properties. Several such comparables have been supplied, and numerous requests have been received for special purpose comparables. While the national bank of cases may be useful for special purpose properties such as roller coasters, breweries, churches, schools, etc., states are generally developing their own file of severance information for the more common types of cases.

Summary

By organizing and making available in usable form experience gained in highway acquisition, severance studies offer a way of correcting certain overpayments as well as the relatively few cases where too little is being paid for highway right-of-way. Many state highway departments are now enjoying this benefit from their own severance studies. In addition to this use of severance studies, which must be regarded as their

primary purpose, findings from analyzing a collection of cases can be expected to provide some guidelines for right-of-way acquisition in the future. While 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 land value recovery rate for cases in the Bureau's bank, the comparison possible when all or part of the remainder has been sold, tends to be more than 100 percent; typically, it is 139 percent or about 126 percent when adjusted for general land value increases.
2. Certain characteristics are associated with a higher-than-average recovery rate. These include (a) nearness to an interchange, especially nearness to a rural interchange, and (b) a sale some period of time (e.g., over a year) after the taking.
3. Landlocked parcels have not experienced the heavy damages which are often paid. Typically the damage appears to be about 10 percent.
4. The owner is being compensated adequately in four out of five cases. Gains to owners, which occur in four out of five cases, tend to be large. The remaining one-fifth of the cases involve losses, which are generally small.
5. Owners of vacant properties are more likely to experience gains than owners of residences.
6. 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 properties partially taken should receive close scrutiny in the future.