RIGHT OF WAY EFFECTS OF CONTROLLED ACCESS TYPE HIGHWAY ON A FARMING AREA IN ELLIS COUNTY, TEXAS

BY

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Right of Way Acquisition Effects on the
Remaining Rural Farms and Ranches

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The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the Texas Highway Department or Bureau of Public Roads.

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IMPLEMENTATION STATEMENT

Since the Texas Highway Department is responsible for appraising and acquiring right of way, it is in the best interest of the Department to understand better the probable effects of right of way acquisition on farm and ranch operations. Increased knowledge of values, potential damages and economic consequences should permit more thorough appraisals for right of way purposes and should also be of assistance in right of way negotiations and highway location.

The findings of the study should be of particular interest to negotiators, as it provides information regarding agricultural operations on remaining right of way tracts and the adjustments, if any, the operators made after the highway cut through their land. This information should enable the negotiators to act with more assurance when acquiring agricultural land in the future for right of way.

An effort has been made to analyze and organize the findings in a manner to facilitate application in right of way acquisition problems.

SUMMARY AND CONCLUSIONS

This study was primarily concerned with how operators in an intensive farming area adjusted to the location of Interstate Highway 35E through one or more of their operating units. Information was gathered by personal interview from the study area operators and nearby control area operators covering their 1963, 1965 and 1967 operations. These years represent the before, during and after construction periods.

A summary of the findings relative to changes in land tenure, land use, income and travel patterns of the operators affected by the Interstate 35E is presented below:

1. The study is based on information gathered from 39 study area operators with 55 tracts affected by the acquisition of right of way and from 39 control area operators. The tracts affected by right of way ranged in size from 25 to 741 acres with the average size tract being 154 acres at time of taking. Twenty-two of the tracts were operated by the owner, while 33 were operated by renters. After the highway was located, there were 100 separate tracts averaging about 85 acres each. The tracts in the control area being touched by the hypothetical line were classified as control area right of way tracts. These tracts ranged from 40 to 942 acres or an average of 180 acres each. Seventeen of the control tracts were owner-operated and 36 were operated by renters.
2. The Texas Highway Department acquired 774 acres of land from

the 55 tracts or about 14 acres from each tract. The 20 owner-operators received $242,294 for 282 acres, and the 32 landlords of the renters received $255,798 for 492 acres. One landlord donated the right of way. These receipts included payments for land, improvements, damages and easements. The owner-operators received an average of $12,115 each, while the landlords received an average of $7,994 for right of way. The owner-operators deposited 38 percent of the money received into savings accounts. They spent another 22,7 percent on new or old home improvements and about 18 percent was used in making adjustments on right of way tracts or improving the land. Only 3.4 percent of the money received by the landlords was used on the right of way tracts. The other 96.6 percent was used by landlords in other investments or savings.

3. The 55 right of way tracts were formed into 100 separate parcels by the highway. In 1967, 86 of these tracts were still being operated by the study area operators. Eight tracts were sold to nonstudy area owners, and six tracts were released or idle in 1967. Of the 86 tracts, three were sold to other study area operators.
4. Acreage acquired for right of way represented only 3.2 percent of the total acreage of operators and 9.1 percent of acreage in the right of way tracts.
5. Based on comparisons of land use on the right of way tracts in the study and control area, it was found that in 1965 and 1967

the study area operators were devoting more cropland to livestock operations and less to crop production. In the study area, this change was much more pronounced with the owner-operators than with the renter-operators. However, after comparing land use changes in both areas, there was no evidence of any major change in land use as a result of the highway.

6. Based on before and after period acreages harvested on the right of way tracts of the 28 study and 30 control area operators, the analysis shows that the study area operators experienced a 16.1 percent decrease in acreage harvested per operator as compared to a 7.6 decrease experienced by the control group. When comparing the value of crops harvested per operator and per acre, the study area operators also experienced a 31.9 percent and 18.8 percent decrease respectively as compared to a 16.6 percent and 9.8 percent decrease for the control group. Statistical test on the value of crops harvested per operator and per acre indicated that the difference between the study and control operators in the before period was not significant at the 95 percent level, but in 1967 or the after period the difference was highly significant. This indicates that (with all other things assumed equal between the areas other than the highway in the study area) the highway had an adverse influence on the crop dollar receipts.
7. For most of the 26 study area operators for which complete cases were developed, right of way tracts represented less

than 25 percent of the acreage in their total operations. However, in nine instances, the right of way tracts represented the operator's total operation, which was further complicated by the fact that each tract was divided by the highway. The highway effects are much more noticeable on this size of operation.

8. It appears that the loss of right of way has no noticeable effect on the average net cash operating income of the study area operators. In 1963, the average was $6,740 for study area operators and $5,035 for control operators. In 1967, the average was $7,920 for study area operators and $5,747 for control operators. This was especially true with those operators with livestock. The livestock operators in the study area, as a while, appeared to fare as well or even better than those in the control area. However, the small operators with one right of way tract and a few head of cattle sometimes had sizable reductions in their heard as in one case, an operator had to sell out after his place was divided leaving small pasture acreage on each side of the highway.
9. The new highway facility provided the 16 operators (located in the southern half of the study area) with easy access to Waxahachie, the primary trading center for the operators. All other operators continued using their regular routes to town. Many operators reported that U. S. Highway 77 was congested and dangerous before Interstate 35E was completed. Now, the

old route is a much safer and more convenient route for those local residents wishing to use it on intra-area travel.

10. Twenty-four operators experienced changes in travel connected with the operation of the remainder right of way tracts. Twenty-three of these operators had to travel from .1 mile to 4.2 miles greater one-way distances to reach the severed tracts. However, one operator had his travel distance shortened. In order to continue agricultural operations on the severed tracts, the operators were required to travel an average of 372 additional miles each per year.

11. When a highway is constructed through a rural area some of the land owners along the route benefit in various ways during and after the construction of a facility. In this area 12 land owners received a little over $30,000 for the sale of grass sod, fill dirt and rock to the contractor. The amount received ranged from a low of $150 for one-half acre of grass sod to a high of $8,000 for rock. In four cases the excavation of dirt and rock formed lakes. One of the 12 land owners also ended up with a deep well that was drilled and rigged by the contractor for water rights during the construction period.

There was some evidence of increased land values along the route as a few isolated remainder tracts sold for a value somewhat higher than the appraised value of the original tracts or the county average per acre value.

INTRODUCTION

In 1963, a study was begun concerning the effects of right of way acquisition on remaining portions of rural farms and ranches in three different areas of Texas.

The first area selected for study is located along Interstate 45 in Madison County, and represents an area of small ranches. The study has been completed and the results have been published. The second area selected for study is located along Interstate 35E in Ellis County and represents an intensive farming area. This report covers the findings in that area. The third area selected for study is a 10 mile section of Interstate 10 in Colorado and Fayette Counties located about equidistant from San Antonio and Houston and represents a diversified farming area. The "after" portion of the latter study will be completed in 1970.

This report presents the findings developed from data obtained primarily through personal interviews with the study and control area operators in the southern half of Ellis County. The study was concerned with farm operations along a 20 mile section of Interstate 35E.

Statement of the Problem

The taking of land for right of way purposes may affect farm operations in a number of ways. Naturally, it reduces the size of the individual tract which might represent an entire operation or it might represent only a small part of a multi-tract operation. Also the original property may be divided in such a manner as to significantly

reduce its effectiveness as a farm or ranch unit. Thus, it may be necessary for some operators to exchange or sell existing operating units and purchase others in order to obtain units of adequate size.

The extra capital obtained from a right of way sale may stimulate efficiency of the operation and increase productivity. A new highway in some areas may also cause a change in the highest and best use of the land, thus changing the overall value of the property.

Since the Texas Highway Department is responsible for appraising and acquiring right of way, it is in the best interest of the department to understand better the probable effects of right of way acquisition on farm and ranch operations. Increased knowledge of the adjustments that may be required and other economic consequences should aid more thorough appraisals for right of way purposes and should also be of assistance in right of way negotiations and location.

Objectives

In view of information obtained from the owners and operators of land affected by right of way acquisition in Ellis County, the following objectives appear to be the most logical to emphasize in this report.

To determine the effects of right of way acquisition on:

1. Changes in kind and intensity of rural land use;
2. Changes in the number of farm and ranch units, tenure and intensity of operations;
3. Cost of adjustments to new farm and operating conditions; and,

4. Changes in farm income caused by decreasing farm acreage and division of units into separate tracts.

Methodology

The study was designed to use a modified "before" and "after" approach along with the comparative control method in developing the desired information. In this approach, farm management information was gathered from the operators covering a full year's operation in 1963 before the highway affected them in any way. Similar information was gathered from the operators on their 1965 operations to reflect the period during construction. Following a full year of operation under the influence of the completed highway, data were collected on their 1967 operations to represent after period conditions.

In order to account for any external or general influences not attributable to the highway during the study periods, data were collected from operators in a control area that was similar to the study area in the before period.

An attempt was made to interview each study and control area operator three times in order to obtain detailed information regarding each year's farm operation, along with additional data from the study area operators pertaining to changes and adjustments in their operations caused by the highway. The data sought pertained to the operator's entire operations and were primarily of a farm management nature. For operators having more than one tract, as much data as possible were gathered on each tract in their operations. These data were used to

show the relative importance of the right of way tract to an operator's entire operation.

Selection of Study and Control Areas

When selecting a study area, it was necessary to establish certain criteria in order to satisfy the objectives of the study. The highway must have a design equivalent to Interstate standards and have sizable segments constructed on new right of way or newly aligned highway of similar widths. Also, agricultural operations along the facility should be fairly uniform as to type, size and quality, and the study segment should be long enough to permit observations of a fairly large number of farms.

After considering a number of potential study sites and consulting with staff members of the Right of Way Division of the Texas Highway Department, the Ellis County Area was selected to represent an intensive farming area of Texas. Maps were obtained from the Highway Department to determine the number of parcels, size of area, size of takings and other facts pertaining to the right of way acquisition.

Information was then gathered from the local Agricultural Stabilization and Conservation county offices relative to operatorship, type of agriculture and production practices. With the help of ASC officials, a comparable area in the general vicinity of the study area was selected to serve as the control area.

Agricultural Stabilization and Conservation records were also used in determining the nature of a given farmer's operation. The records

contained information regarding the number of tracts owned or rented by an operator, the amount of cropland and pastureland in each tract, and acres planted in crops under various government programs. For those operating several tracts, the ASC records provided the location and land use of each tract. With this background information on each tract and operator, personal contacts with operators were begun.

Personal Interviews

Before being interviewed, each farm operator in the study and control areas was mailed a letter informing him of the study and requesting his cooperation. Concurrently, an article was released to the local papers explaining the purpose of the study.

The interviewing followed the normal procedure of contacting each operator and completing a questionnaire at his convenience. In most cases, it was found that the operators were glad to discuss the proposed highway and its effects on their operations; however, when questioned regarding purchases or sales, they were more reluctant to respond. After operators in both areas were assured that the information given would be held in confidence, complete cooperation was usually achieved.

ELLIS COUNTY AREA

The area of study is located in the southern part of Ellis County about 30 miles south of Dallas. This part of the state is considered excellent farm land as it lies in the Blackland Belt of Texas. The

general location of the area is shown in Figure 1.

The terrain of the area is generally rolling with some flat land. Much of the area is in cultivation, making it more subject to soil erosion on the rolling lands. Most landowners have constructed terraces and sodded waterways to help prevent soil erosion. The smoother soils in the divides between the streams and the well-drained terraces and bottoms along the streams are heavily cropped with cotton and grain sorghum. These are the two major cash crops for the area with grain sorghum rapidly gaining importance. Many operators in the area have added cattle to their operations in recent years, thereby becoming more diversified. They utilize the areas along the streams and waterways for grazing, supplemented with small grain in winter and sudan or other grazing crops in summer. More of the less fertile land is being converted into permanent pastures. Many acres are being planted in coastal bermuda grass which provides abundant grazing when properly managed.

Based on information from the Census of Agriculture, definite trends in this area have been noted during the period from 1954 to 1964. Some of these trends are shown in Table 1. In keeping with the national trends, the number of farms in Ellis County has decreased and the average size has increased. From 1954 to 1964, there was a 39 percent decrease in the number of farms and an increase in the average size from 196 acres to 301 acres. The use of larger and improved equipment is a big factor enabling operators to farm more land. To attain the extra acreage, the operators either buy or rent additional tracts of

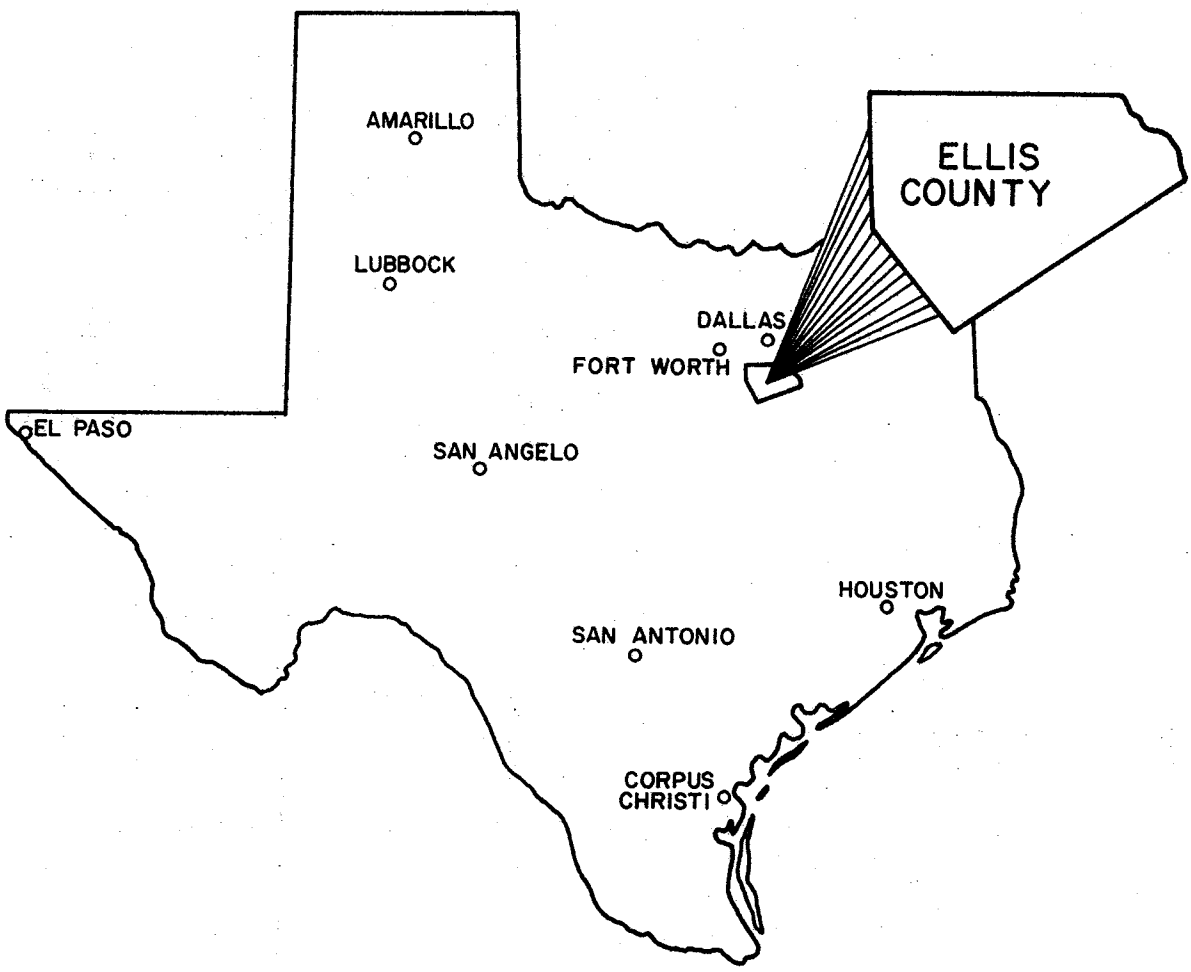


FIGURE 1

General Location of Ellis County

Table 1

Number and Characteristics
of Farms in Ellis County 1954, 1959
and 1964 Based on Census
of Agriculture

	1954	1959	1964
Farms Reporting (Number)	2,885	2,074	1,734
Land in Farms (Acres)	555,526	535,173	522,570
Average Size of Farm (Acres)	196	258	301
Average Value per Acre (Dollars)	131	176	212
Average Value Land & Bldgs (Dollars)	24,213	45,219	64,933
Cropland			
Total (Acres)	404,042	365,214	318,499
Harvested (Acres)	289,271(89)[1/]	262,911(82)	234,007(82)
Pastured (Acres)	58,640(33)	50,599(35)	47,391(32)
Not Harvested or Pastured (Acres)[2/]	56,131(35)	51,704(42)	37,101(38)
Pastureland			
Total (Acres)	139,843	154,037	191,348
Woodland (Acres)	17,083(8)	10,163(10)	7,564(9)
Cleared (Acres)	122,760(63)	143,874(75)	183,784(79)
Improved (Acres)[3/]	25,557(15)	15,487(9)	83,028(46)
Other Land			
Land in Lakes, Roads, Etc. (Acres)	11,641	15,922	12,723

1/ Figures in parentheses represent the percent of operators reporting.

2/ Includes cropland that is in soil building crops, idle, or in some type of Government program.

3/ Pastureland that has been fertilized, weeds controlled and in most cases planted in improved varieties of grasses.

land. These additional tracts are not always contiguous to the original tract but are usually in the general vicinity.

There was a sizable increase in land values in the county from 1954 to 1964. One of the primary reasons for the increase in land values is probably due to increase in demand for land from the urban residents of Dallas and Ft. Worth.

As shown in Table 1, the farmers shifted more of their land from cropland to pastureland. About 72 percent of acreage in 1954 was classified as cropland compared to 61 percent in 1964. Pastureland acreage increased from 25 percent of the 1954 total acreage to 37 percent in 1964. The increase of land in improved pastures indicates that the farmers in the area are improving and intensifying the use of their land.

Trends are also evident in the type of crops being harvested in the area as shown in Table 2. The most noticeable change was the shift from corn to grain sorghum. Farmers in the area reported at the outset of this study that they found grain sorghum to be more suitable and more profitable to produce than corn and altered their production accordingly. Cotton production, due to increased yields through the use of fertilizer and insecticides, has remained stable during the period from 1954 to 1964, even though there was a 60 percent decline in the number of operators planting cotton and a 26 percent reduction in acres harvested. There has been a significant increase in hay production. This is due primarily to the increased use of fertilizer and improved varieties, as the amount of acreage harvested has remained

Table 2

Acreage and Production of Major Crops Produced in Ellis County in 1954, 1959 and 1964 Based on Census of Agriculture

Major Crops	1954	1959	1964
Cotton			
Farms Reporting	2,283	1,378	923
Acres	148,754	119,022	109,086
Bales	37,676	45,903	45,179
Grain Sorghum			
Farms Reporting	Not Available	916	709
Acres	13,794	45,473	40,770
Bushels	7,297	32,680	44,244
Corn			
Farms Reporting	1,484	991	438
Acres	28,101	23,865	6,729
Bushels	434,626	583,392	175,345
Small Grains			
Acres	Not Available	36,197	34,603
Bushels	Not Available	786,682	815,885
Hay			
Total Acres	34,849	31,344	37,016
Small Grain	14,204	13,391	8,577
All Other Hay	20,645	17,953	28,439
Total Tons	24,004	33,643	42,693
Small Grain	7,699	13,559	9,061
All Other Hay	16,305	20,084	33,632

comparatively stable.

As shown in Table 3, farmers in the county have recently increased their livestock operations. Even though there were 626 fewer operators with cattle and calves in 1964 than in 1954, the cattle population increased some 20,764 head. More than twice as many cattle and calves were sold in 1964 than 10 years earlier. The increase was caused by some farmers adding livestock to their operations and also by many of the new owners from the nearby urban areas that purchased farmland in the area to engage primarily in cattle production.

Some tenure and off-farm work characteristics of farm operators are shown in Table 4. There were two notable changes in operatorships in Ellis County from 1954 to 1964. These were the increases in the number of full-time and part-owner operators and the decrease in the number of tenant operators.

Part-owner operators own part of their land and rent or lease additional land. Full-owners are those who own all land operated, whereas a tenant rents or leases his total acreage. In this area, the full-owners usually operated less land than those of the other two categories.

Another interesting characteristic of Ellis County farmers, as shown in Table 4, is the large number of operators engaged in outside employment. These part-time farmers usually adjust their farm operations to fit their off-farm employment. In 1964, 39.1 percent of the operators reporting worked 100 or more days off the farm as compared to 29.3 in 1954 and 33.7 in 1959. A little over 12 percent of the

Table 3

Number of Livestock and Value of Livestock Products Sold in Ellis County in 1954, 1959 and 1964 Based on Census of Agriculture

	1954	1959	1964
Farms with Livestock			
Farms (Number)	2,029	1,591	1,403
Cattle and Calves (Number)	42,411	46,068	63,175
Cows (Number)	4,239	23,575	31,213
Sales			
Cattle and Calves Sold (Number)	23,086	25,075	54,245
Cattle Sold (Number)	7,978	8,093	18,734
Value of Cattle Sold (Dollars)	685,193	1,341,244	5,566,013
Average Value Per Head (Dollars)	86	166	174
Calves Sold (Number)	15,108	16,982	35,511
Value of Calves Sold (Dollars)	904,897	1,866,073	3,262,098
Average Value Per Head (Dollars)	60	110	92
Dairy Cattle			
Farms Reporting	1,121	410	182
Milk Sold (1,000 pounds)	13,905	10,788	13,447

Table 4

Tenure and Off-Farm Work of Farm Operators in Ellis County in 1954, 1959 and 1964 Based on Census of Agriculture

	1954 Operators		1959 Operators		1964 Operators	
	Number	Percent	Number	Percent	Number	Percent
Total Reporting	2,885	100.0	2,074	100.0	1,734	100
Tenure						
Full Owners	1,021	35.4	913	44.0	805	46.4
Part Owners	488	16.9	464	22.4	443	25.6
Tenants	1,355	47.0	682	32.9	475	27.4
Managers	21	0.7	15	0.7	11	0.6
Off The Farm Employment						
Total Working Off Farm	1,374	47.6	991	47.8	921	53.1
100 Days or More	846	29.3	699	33.7	678	39.1
Retirement Benefits						
Number Receiving	Not Available		200	9.6	214	12.3

operators were receiving some sort of retirement benefits in 1964 as compared to 9.6 percent in 1959.

STUDY AND CONTROL AREAS

Description of Study and Control Areas

The study and control areas begin about one mile south of Waxahachie and continue to the southwest for about 20 miles to the Ellis-Hill County line. The study area is located along the new route of Interstate 35E which is west of old U. S. Highway 77. Figure 2 shows the general location of the study area and the control area which is parallel to and about two miles east of the study area. Also shown in Figure 2 are the three small towns of Forreston, Italy and Milford that were by-passed by Interstate 35E. These towns had been served by U. S. Highway 77. At each town, an interchange on Interstate 35E and a spur to the town were constructed to provide the local residents access to or from the interstate highway. In the case of Italy, two interchanges were provided - one southwest of town and the other about one-half mile northwest of the town.

About 75 percent of the study area is excellent farm land with deep black soil, the major portion of which is in cultivation. Most of these farms are not fenced, indicating the practice of only intensive cropping. The other 25 percent of the area is composed of either shallow soil with outcropping of white rock or creek bottoms, subject to overflow. Much of this latter land is fenced and used as pasture-land with some operators having supplementary grazing from small grains

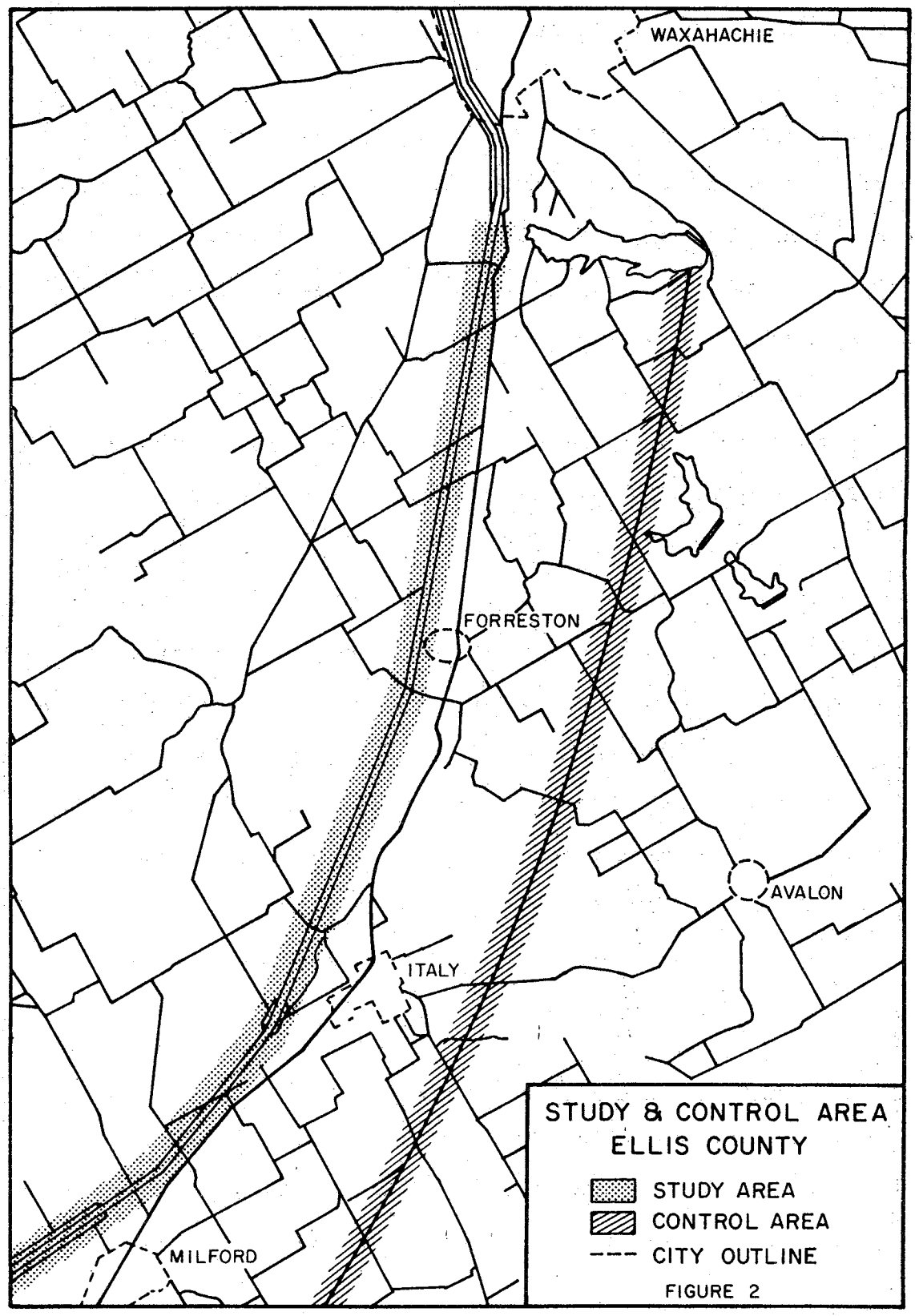

WAXAHACHIE
FORRESTON
AVALON
ITALY
MILFORD
STUDY & CONTROL AREA
ELLIS COUNTY
STUDY AREA
CONTROL AREA
CITY OUTLINE

FIGURE 2

in the winter months and from other grazing crops in summer on portions of the cropland.

The control area lying east of both Interstate 35E and U. S. 77 is bounded on the north by Lake Waxahachie and on the south by the Ellis-Hill County line. The length of the control area is about a mile less than that of the study area. The terrain of the area appears to be less rolling than that of the study area, with more uniformity of the deep black soil. Each area has about equal amounts of land along creeks subject to overflow during heavy rains. The control area has very little outcropping of white rock which was characteristic of a portion of the study area.

The two areas vary considerably in width depending on the size and shape of the tracts touched by the interstate highway in the study area or by the hypothetical line in the control area. Operators of both areas have multiple tract operations with owned or leased tracts outside the boundaries of the immediate areas. These tracts are classified as non-right of way tracts but are included in the study in order to show the relative importance of tracts affected by the right of way acquisition to total operations. Generally, the immediate study and control areas range from one-half to one mile in width.

Degree of Operator Participation in the Study

Forty-seven operators in the study area had one or more tracts of land affected by the right of way acquisition for the 20-mile section of Interstate 35E. The degree of participation in the study of these

47 operators is shown in Table 5. Six of the operators were omitted from the study after the first round of interviews because two were absentee owner-operators, two were not cooperative and two owners had small non-agricultural tracts of land. The remaining 41 operators provided information on their 1963 operations. Thirty-one of the operators furnished information covering their entire operations whether it be one tract of land or several scattered tracts. The other 10 operators had multiple tract operations but furnished data pertaining to only their right of way tracts. These 10 operations had to be omitted from parts of the analysis.

In gathering the 1965 data, interviews were completed with 36 operators. Of the 41 contacted, two preferred not to continue in the study, and three others retired from farming. The remaining 36 operators furnished complete information on their entire operations. The same 36 operators were personally contacted again in 1968, and each furnished complete data on their 1967 operations. Figure 3 shows the location of the 36 study area operators.

After all questionnaires covering 1963, 1965 and 1967 operations were edited, it was found that 26 study area operators had furnished detailed and complete information covering their entire operations for all three years.

The control area had 48 operators having operations touched by the control line drawn through the area. The procedures used in interviewing and gathering operational data from the control operators were the same as those used in the study area. The degree of participation of

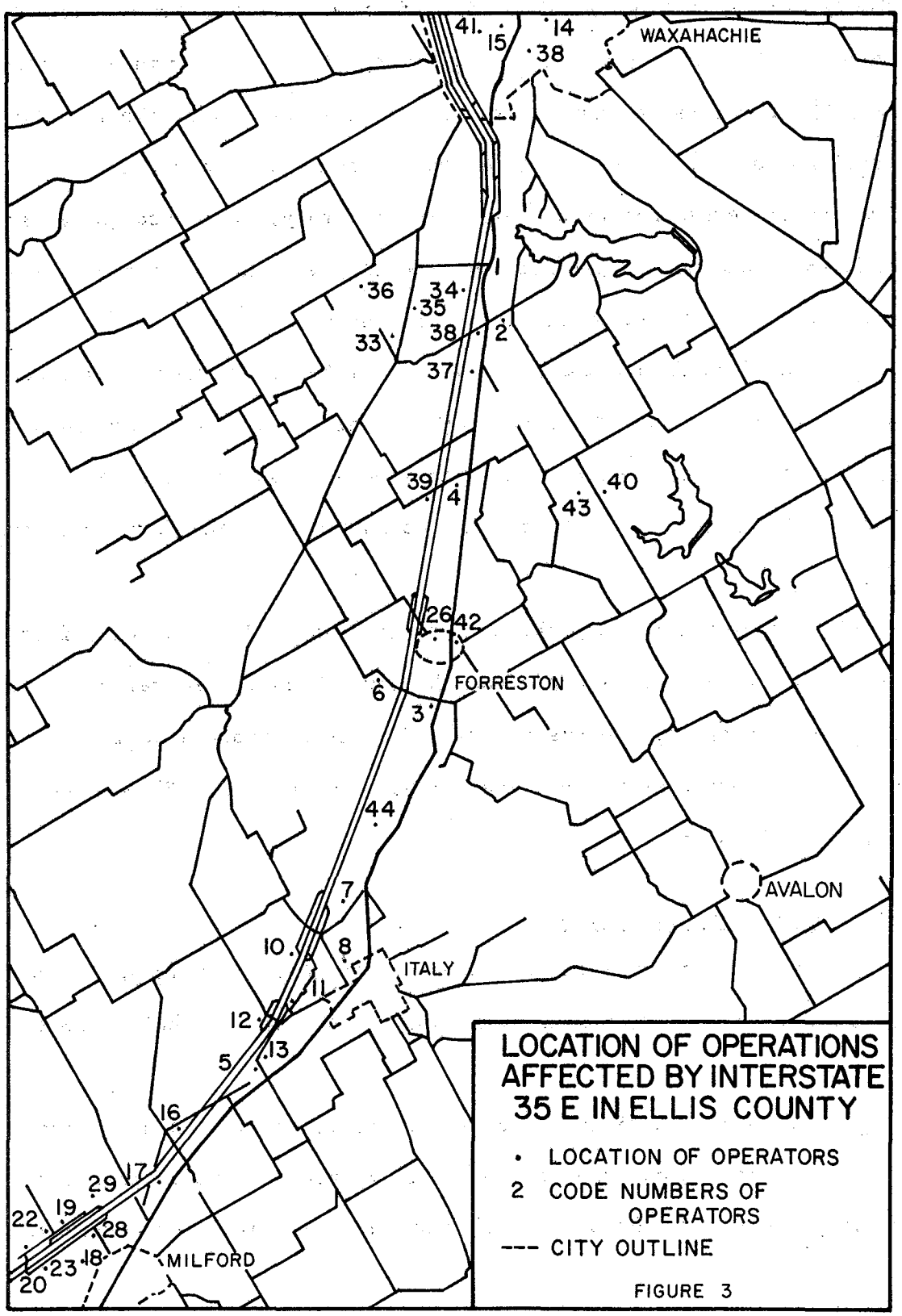
Table 5

Number of Study Area Operators and the Degree of Their Participation in the Study in 1963, 1965 and 1967

	Number
Total operators with land affected by ROW acquisition	47
Operators not cooperating in 1963[1/]	6
Operators furnishing information in 1963	41
Operators furnishing information on ROW tracts only - 1963	10
Operators furnishing information on total farm operations in 1963	31
Total operators contacted in 1965	41
Operators not cooperative	2
Operators retiring from farming	3
Operators furnishing information on total farm operations in 1965	36
Total operators contacted in 1967	36
Operators furnishing information on total farm operations in 1967	36
Operators furnishing information on total operations for all three years - 1963, 1965 and 1967[2/]	26

[1/] Includes two absentee owner-operators, two non-cooperative operators and two with small non-agricultural land.

[2/] These 26 operators are made up of the 31 operators furnishing information in 1963 minus the 5 that ceased operations in 1965. The 36 in 1965 and 1967 minus the 10 operators furnishing operational information only on their ROW tracts in 1963.


WAXAHACHIE
FORRESTON
AVALON
ITALY
MILFORD
41
15
14
38
36
34
35
33
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2
37
39
4
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42
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22
28
18
23
20
LOCATION OF OPERATIONS AFFECTED BY INTERSTATE 35 E IN ELLIS COUNTY
• LOCATION OF OPERATORS
2 CODE NUMBERS OF OPERATORS
--- CITY OUTLINE

FIGURE 3

these operators is shown in Table 6. After editing the questionnaires obtained in the first round of interviewing, it was determined that 42 of the 48 operators had furnished complete information on their entire operations for 1963. Of the six operators not supplying data, two operators preferred not to cooperate in the study, two lived in distant cities and could not be reached conveniently, and the other two operations were too small to be classified as farms.

Of the 42 operators supplying data in 1963, 38 of them furnished complete information on their 1965 operations. The other four operators were eliminated from the study in 1965 because two retired, and the other two operators preferred not to participate any further in the study.

When information was gathered covering the 1967 operations, four more operators were eliminated from the study because two retired, one refused to cooperate, and one was killed in an automobile accident. This left 34 operators who cooperated fully during each of the three years 1963, 1965 and 1967.

Characteristics of Operators

Questions were asked the operators pertaining to their age, outside employment and other outside income in relation to their income from farming.

Ages ranged from 35 to 84 years for the 36 study area operators while the control group ranged from 25 to 79 years. The average for the study and control groups was 52 years and 53 years, respectively.

Table 6

Number of Control Area Operators and the Degree of Their Participation in the Study in 1963, 1965 and 1967

	Number
Total operators with land touched by the hypothetical highway in the control area - 1963	48
Operators not contacted in 1963[1/]	4
Operators contacted in 1963	44
Operators non-cooperative	2
Operators furnishing information on total farm operations in 1963	42
Total operators contacted in 1965	42
Operators non-cooperative in 1965	4
Operators furnishing information on total farm operations in 1965	38
Total operators contacted in 1967	38
Operators non-cooperative in 1967	4
Operators furnishing information on total farm operations in 1967	34
Operators furnishing information on total operations for all three years - 1963, 1965 and 1967	34

[1/] Includes those operators living in distant cities, hobby farms or acreage too small.

The 1963 distribution of operators by age groups in the two areas is as follows:

	Age Groups				
	Under 35	35-44	45-54	55-64	Over 65
Study Area Operators	0	12	9	11	4
Control Area Operators	4	4	10	9	7

In 1963, 11 study area operators and seven control area operators worked during the year on off-farm jobs (Table 7). Some of the operators involved in outside activity were connected with some phase of an agricultural business, such as being an agent for a fertilizer or chemical company, a livestock buyer or a manager of a cotton gin or grain storage operation. These are usually seasonal type jobs which enable the operators to earn extra income with a minimum conflict with their farming operations. Based on the income from all sources in 1963, the study area operators received an average of 81 percent of their income from agriculture compared to 82 percent for the control group. Between 1963 and 1967, there was a slight drop in the average income from agriculture for each group of operators.

From 1963 to 1967, a few operators in each area made changes in their off-farm employment. Three of the seven study area operators with part-time jobs, as agents of fertilizer and chemical companies in 1963, became full-time farmers in 1967. One of the other four operators with full-time off-farm jobs in 1963 devoted full-time to his farming and livestock operation during 1967. Two other operators that were full-time farmers in 1963, cut back on their farming operation in

Table 7

Off-Farm Work and Sources of Income for 36 Study Area and 34 Control Area Operators in Ellis County in 1963 and 1967[1/]

	Study Area		Control Area	
	1963	1967	1963	1967
Off-Farm Work				
Operators with No Off-Farm Work (Number)	25	27	27	27
Operators with Part-Time Jobs (Number)	7	4	2	3
Operators with Full-Time Jobs (Number)	4	5	5	4
Income from Agriculture				
Average for All Operators (Percent)	81	76	82	78
Operators with 75% or More from Agriculture (Number)	27	26	27	24
Operators with 50-74% from Agriculture (Number)	2	2	0	4
Operators with Less Than 50% from Agriculture (Number)	7	8	7	6
Other Sources of Income				
Social Security, Operators Receiving (Number)	3	4	6	8
Operators with Wives that Work Off-Farm (Number)	5	5	3	4

[1/] The 36 study area operators include 10 who gave data on right of way tracts only during the study.

1965 and became engaged in full-time off-farm employment in 1966 and 1967. In the control area, there was one less operator working full-time off-farm and one additional operator doing part-time work in 1967 versus 1963.

As a general rule, those operators with full-time off-farm jobs in either the study or control area were primarily engaged in livestock operations and did very little crop farming. Those who cropped land usually produced some sort of feed crop, such as hay for livestock, that required a minimum amount of field operations.

The control area had twice as many operators receiving retirement income in 1963 and 1967 than the study area. Some of the operators receiving retirement benefits, however, were still actively engaged in farming but usually on a much smaller scale than the younger and more aggressive operators.

Table 7 also shows that five of 36 study area operators could rely on extra income earned by their wives. There were three and four control area operators with wives working in 1963 and 1967, respectively. In most cases, the wives worked in the local school systems as teachers or office staff.

RIGHT OF WAY TAKINGS

Payments Received for Land and Improvements

Information was obtained from the Texas Highway Department regarding payments to landowners for right of way acreage. This includes the fee taking, land for drainage easements and damages to remaining

property. Tables 8 and 9 list the right of way tracts of 20 owner-operators and 25 renter-operators, the acreage acquired and amount received for land, improvements, drainage easements and damages to remaining property. The operators were listed in two groups because the owner-operator receives the money for loss of land and for any damages to the remainder of his property. He can use the money in many ways to make adjustments in his operation to offset the loss of land. This is quite different in the case of the renter-operator and his landlord. The landlord receives the money for both the loss of land and for any damages to the remainder property. Only in a few isolated cases did the renter-operator receive any compensation for loss of land or damages from the landlord.

The 20 owner-operators listed in Table 8 received a total of $242,294 in payments for 282 acres acquired. The amounts received varied from a low of $125 for one acre of land cut off at the corner of a tract and a drainage easement to a high of $37,652 for 31 acres acquired from a 231 acre tract. About one-half of the $37,652 was for damages to the two remainder tracts.

The average appraised value of the whole property for the 19 tracts for which values were available was $314 per acre of about $46,700 per tract of land affected by the highway. Based on the approved values of the land only, the 282 acres acquired were appraised at an average of $266 per acre. Land purchased for the right of way actually accounted for only about 30 percent of the overall payment of

Table 8

Kinds and Amounts of Payments Received by 20 Owner-Operators for Right of Way for Interstate 35E Through Ellis County

Tract Number	Acres in Tract Before Taking	Acres Acquired for ROW	Value of Property at Time of Taking	Approved Values of Right of Way				Amount of Award 1/
				Land	Damages	Improvements	Easements	
*1	231	31	$ 90,000	$ 9,310	$ 19,970	$ 935	$ 75	$ 37,652
*2	47	12	40,500	3,350	1,060		20	5,802
3b	194	17	56,000	5,155	7,375	775	636	13,941
3c	111	16	50,250	4,525	4,500	20		9,045
5	100	12	30,585	2,775	6,700	245	20	9,740
6b	300	2	66,415	405	150	30		585
7	69	9	21,200	1,720	3,475	35		5,230
8c	205	14	59,225	3,510	2,635			6,145
*10b	75	7	26,850	1,530	4,050	5,985		11,188
*11b	50	12	29,745	2,885	7,315	200		10,420
15	133	1		115			10	125
19	74	13	26,025	2,575	5,925	1,300		9,800
20	104	6	34,175	1,115	12,015	80		13,210
*22	70	4		907	7,174	29		9,164
28	92	27	31,360	7,560	6,855	960		15,375
29	514	20	108,515	5,375	8,115	860		14,350
38b	75	9	22,000	2,816	1,030		12	3,858
*27	72	15		3,422	4,968	74	169	9,669
34	123	15	56,000	6,250	11,866		84	18,200
*37	270	19	77,000	4,805	23,780		93	29,015
41a	113	14	26,000	3,250	3,105	120	20	6,495
41b	87	7	36,000	1,930	1,355			3,285
Totals	3,109	282	$887,845	$75,285	$143,418	$11,648	$1,139	$242,294

1/ In seven cases (those with asterisks) the amount of the award differed from the approved value. These discrepancies are due to condemnation proceedings where the amount of the award was set by commissioners or by the county courts.

Table 9

Kinds and Amounts of Payments Received by Landlords of 25 Renter-Operators for Right of Way for Interstate 35E Through Ellis County

Tract Number	Acres in Tract Before Taking	Acres Acquired for ROW	Value of Property at Time of Taking	Approved Values of Right of Way				Amount of Award 1/
				Land	Damages	Improvements	Easements	
*3a	201	34	$ 53,000	$ 8,280	$ 9,355	$	$ 20	$ 17,588
4a	81	14	25,250	3,300	3,255			6,555
4b	159	16	39,500	3,470	3,045			6,515
6a	211	30	87,100	7,125	6,880	1,625		15,630
6c	741	59	170,810	10,590	8,865	10,415	30	29,900
8a	76	5	18,550	925	5,880			6,805
8b	183	25	55,395	6,110	17,330	40		23,480
*10a	75	9	35,375	2,575	300			2,960
11a	54	2		395				395
12	160	2		460			60	520
13	235	22	66,880	5,385	5,295	80	405	11,165
14a	73	9	14,485	1,845	2,140			3,985
14b	50	7	14,200	1,365	2,950			4,315
*14c	25	9	5,370	1,895	1,785	150	160	3,670
14d	83	17	25,435	3,705	5,825	35		9,565
16	135	26	41,885	6,350	6,595	40		12,985
17	197	27	54,120	5,910	4,350	20		10,280
18	204	9	56,945	2,125	1,945	30		4,100
23	162	26	38,080	4,860	10,007	435		15,302
26	512	1	100,035	50				50
38a	83	11	31,500	3,340	3,410	95	65	6,910
39	312	21	79,560	4,650	3,945	2,940		11,535

Table 9 (Continued)

Tract Number	Acres in Tract Before Taking	Acres Acquired for ROW	Value of Property at Time of Taking	Approved Values of Right of Way				Amount of Award
				Land	Damages	Improvements	Easements	
21	74	12	$	$ 2,680	$ 3,155	$ 285	$	$ 6,120
25	267	6		1,080	1,460	30	165	2,735
33	115	15	40,500	4,245	6,244	595	55	11,139
35	106	16	44,000	4,880	9,020			13,900
36	126	1	30,500	160				160
40	197	17	48,915					
42	123	3	32,500	930				930
43a	53	5	10,600	1,185	1,010			2,195
43b	84	26	25,200	8,255	3,145			11,400
44a	120	4	47,695	780	175	125		1,080
*44b	102	6		1,503	134		48	1,929
Totals	5,379	492	$ 1,293,385	$110,408	$127,500	$16,940	$1,008	$255,798

1/ In four cases (those with asterisks) the amount of the award differed from the approved value. These discrepancies are due to condemnation proceedings where the amount of the award was set by commissioners or by the county court.

$242,294 received by the 20 owners. Approximately 62 percent of the appraised values was for damages to remaining property.

The 20 owner-operators received an average of $12,115 each for an average taking of 14 acres per operator. In seven cases, the right of way acquisition was settled by condemnation. In these cases, the amount of the award differs from the approved values. This discrepancy may be noted in totals of Table 8. The $242,294 total is some $11,104 greater than the combined totals of the approved values of land, damages, etc. Based on the approved values, damages were paid to all but one owner. The Texas Highway Department approved damage amounts ranging from a low of $150 on a 300 acre tract to a high of $23,780 on a 270 acre tract divided by the highway leaving the headquarters on the east side of Interstate 35E with only 40 acres.

As shown in Table 9, 33 landlords received a total of $255,798 for 492 acres of land. However, the owner of a tract rented by Operator 40, donated the 17 acres of right of way land. An average of about 9 percent of the acreage in the right of way tracts or about 8.5 acres per tract was acquired for right of way.

Values of whole property at time of taking were available on 28 of the 33 tracts. Based on these approved values of the whole property, the average value of each tract was $46,190 or $274 per acre at the time of taking. The average size of the 28 tracts before taking was 169 acres. In contrast to the owner-operator tracts, there was very little difference in the amount paid for land and that paid for damages. The $110,408 approved value for the 492 right of way acres represented

43 percent of total award, whereas the damages to remainder tracts amount to about 50 percent of the appraised values of right of way takings from landlords. In contrast, the owner-operators received 30 percent for land and 60 percent of the total payments for damages. This was probably due to the rented land having fewer and less expensive improvements that could be affected by the right of way.

Disposition of Money Received for Right of Way

The operators were asked to tell how they used the money they received for their right of way tract. A detailed accounting of how the 20 owner-operators used their compensation is shown in Table 10. The operators had some difficulty tracing the flow of money after it was deposited in the bank. However, after checking their records, they were usually able to provide a rather detailed allocation of the money received.

Thirteen of the 20 operators placed some of the money in savings accounts. This accounted for 38.1 percent of the money received for right of way. The next largest sum of money was spent by 10 operators for improving or constructing new homes. Two of the operators built new homes and eight made improvements to their homes, accounting for 22.7 percent of the total funds received.

This being primarily an intensive farming area, many of the tracts were not fenced. Only 3.5 percent of the money was spent on fencing by 13 operators. Five of the operators had to provide for water on the remainder tracts. These operators reported that they spent $6,088 for

Table 10

How 20 Owner-Operators Spent Money Received for Interstate 35E Right of Way

Items	Number of Operators	Percent of Operators	Amount of Money Used	Percent of Money Received for ROW
Improve Land	9	45	20,110	8.3
Construct Buildings or Corrals				
Severed Tracts	7	35	7,163	3.0
Other Tracts	1	5	962	0.3
Purchase Equipment	2	10	6,000	2.5
Purchase Land	3	15	16,158	6.7
Fencing ROW	13	65	8,518	3.5
Improve or Construct Home	10	50	54,900	22.7
Water Supply (Severed Tract)	5	25	6,088	2.7
Paid on Land Note	6	30	23,970	9.9
Improve Cash Position Saving and Loan	13	65	92,397	38.1
Miscellaneous	6	30	6,028	2.5
Total			242,294	100.0

various types of water systems such as drilling a well, constructing an earthen tank or piping water under the highway.

Three operators reported buying additional land with 6.7 percent of the award money. Nine of the operators reported that they spent $20,110 improving their land. In an intensive farming area such as Ellis County, landowners are much aware of soil erosion. The highway route cut many terraces, and the operators reported that they had to rework some of the terraces and sod the waterways. One operator spent about $4,000 on clearing and straightening of a creek on his severed tract, reclaiming some lowland. Eight of the operators reported that they spent money improving their pastures and cropland.

Table 11 shows the disposition of the money received by the landlords for right of way land. Actually only 3.4 percent of the money is accounted for in Table 11. The operators reported that the landlords did not hesitate to replace fences, but that is about the extent of their expenditures on the renters' tracts. Thirteen landlords spent 2.4 percent or $6,060 on fencing which amounts to about $460 each. Two landlords spent a total of $1,500 improving their renters' homes, and one spent $1,000 terracing and clearing some land. The operators of the rented tracts did not know how the landlord used the other 96.6 percent of the money. Two of the operators reported that their landlord had mentioned using some of the money to pay off loans on the tracts.

Size, Tenure and Land Use of Takings

Table 12 gives an aggregate summary of the size, tenure and land

Table 11

How 32 Landlords Spent Money Received for Interstate 35E Right of Way[1/]

Items	Number of Landlords	Percent of Landlords	Amount of Money Used	Percent of Money Received for ROW
Improve land on ROW tract	1	3.1	1,000	0.4
Fencing ROW tracts	13	40.6	6,060	2.4
Improved renters home	2	6.2	1,500	0.6
Money used by landlords but not on ROW tracts[2/]	32	100.0	247,238	96.6
Total			255,798	100.0

1/ There were 33 landlords but one donated ROW for highway.

2/ Renters reported that the landlords did not spend any of this money on the remaining ROW tracts, other than a few made payments on loans.

Table 12

Characteristics Relating to the Right of Way Tracts,
Acreage Acquired by Type of Land and Tenure from the 55 Tracts

	Tracts of Renter-Operators		Tracts of Owner-Operators		Totals	
	ROW Tract	ROW Taking	ROW Tract	ROW Taking	ROW Tract	ROW Taking
Number of operators	25	25	20	20	39	39
Number of tracts affected	33	33	22	22	55	55
Number of acres of land	5379	492	3109	282	8488	774
Average acres per operator	215.2	19.7	155.5	14.1	217.6	19.8
Average acres per tract	163.0	14.9	141.3	12.8	154.3	14.1
Cropland						
Operators with cropland	25	22	20	17	39	34
Tracts with cropland	33	29	22	18	55	47
Acres of cropland	4258	353	2481	210	6739	563
Average acres per operator	170.3	16.0	124.1	12.4	172.8	16.6
Average acres per tract	129.0	12.2	112.8	11.8	122.5	12.0
Pastureland						
Operators with pastureland	19	15	15	10	28	23
Tracts with pastureland	22	15	17	11	39	26
Acres of pastureland	991	139	585	72	1576	211
Average acres per operator	52.0	9.3	39.0	7.2	56.3	9.2
Average acres per tract	45.0	9.3	34.4	6.5	40.4	8.1

use of the land acquired. As can be seen, the acquisitions averaged 14.1 acres per tract. Broken down by tenure, the renter-operated takings averaged 14.9 acres compared to 12.8 acres acquired from owner-operators. Table 13 shows the distribution of takings by size as a percentage of acres in original right of way tracts and as a percentage of the acres in total operations. Most of the takings were in the 5.1-10.0 and 10.1-15.0 percentage classes, giving them more importance than when considered from the standpoint of the total operation. In the case of the latter, they are very insignificant size wise.

Table 12 indicates that the dominant land use of the takings was cropland, averaging 12.0 acres per taking compared to 8.1 acres per taking for pastureland. The same pattern existed for both the renter-operated and owner-operated takings. However, the renter-operated cropland and pastureland takings were larger than those of the owner-operated takings. (See Appendix A for detailed size and land use on an individual taking basis.)

FARM OPERATIONS

The farm operations of the study and control areas were studied to determine what highway affects, if any, might be indicated. Thus, the efforts were directed toward detecting various changes in the study area operations not present in those of the control area. The changes are discussed first with respect to the right of way tracts and then with respect to the total operation.

Table 13

Distribution of the Size of 55 Right of Way Takings as a Percent of Acres in Right of Way Tracts and Total Operations

Size of ROW Takings in Percentages	ROW Takings in Relation to Right of Way Tracts Number of Takings	ROW Takings in Relation to Total Operations Number of Takings
0 - 2.5	7	28
2.5 - 5.0	4	13
5.1 - 10.0	14	8
10.1 - 15.0	16	4
15.1 - 20.0	7	2
20.1 - 25.0	3	
25.1 - 30.0	2	
Over 30	2	

Changes in Number, Size and Tenure of Operations

Right of Way Tracts of 39 Study and Control Area Operators

Table 14 presents, by period, the acreage and tenure arrangements for 55 right of way tracts in the study area and 53 tracts touched by the hypothetical line drawn through the control area. In the before period, 39 operators in the study area had 55 tracts ranging from 25 to 741 acres in size averaging 154 acres each. Twenty-two or 40 percent of the tracts were being operated by 20 owner-operators at the time of right of way acquisition. These latter tracts ranged in size from 47 to 514 acres, averaging 141 acres each. The other 33 tracts were operated by 25 renters. The size of rented tracts ranged from 25 to 741 acres averaging 163 acres.

In the before period, the 53 control area right of way tracts were operated by 39 operators. These tracts were somewhat larger than the right of way tracts in the study area, ranging in size from 40 to 942 acres with the average being 180 acres. The pattern was the same when compared by tenure. A little over 30 percent or 17 of the control tracts and acres were being farmed by 17 owner-operators, ranging in size from 40 to 303 acres with the average being 167 acres. Tracts operated by renters averaged 187 acres in size and represented 70 percent of the acreage of the so-called right of way tracts of the control area.

After the Texas Highway Department acquired an average of 14 acres per study area right of way tract, some operators began making

Table 14

Number and Acreage of Right of Way Tracts of 39 Study Area and 39 Control Area Operators in 1963, 1965 and 1967

	1963 (Before)			1965 (During)			1967 (After)		
	Operators (Number)	Tracts (Number)	Acres (Number)	Operators (Number)	Tracts (Number)	Acres (Number)	Operators (Number)	Tracts (Number)	Acres (Number)
STUDY AREA									
Total Land	39	55	8,485	38	88	7,418	35	86	7,369
Land Owned	20	22	3,109	20	40	2,721	20	39	2,852
Land Rented	25	33	5,376	22	48	4,697	22	47	4,517
Increased Acreage				1	1	71	2	3	141
Land Rented				1	1	71			
Land Purchased							2	3	141
Reduced Acreage				39	55	1,138			190
Right of Way Acquisition				39	55	774			
Land Sold				3	3	106	3	3	35
Release of Rented Land				2	2	258	2	2	155
CONTROL AREA									
Total Land	39	53	9,550	37	47	9,062	34	42	8,422
Owned	17	17	2,850	15	15	2,417	14	14	2,232
Rented	28	36	6,700	26	32	6,645	22	28	6,190
Increased Acreage				2	3	294	0	0	0
Land Purchased				1	1	24	0	0	0
Rented Land of Retired Operator				1	2	270			
Reduced Acreage				5	6	782	5	5	640
Rented Land Released				3	3	325	3	3	387
Land Sold				1	1	187	1	1	68
Retired Owner-Operator				1	2	270	1	1	185

adjustments with their remaining tracts. Operators 1, 19 and 27 sold portions of their remainder tracts shortly afterwards. Operators 3 and 21 released rented tracts immediately after the highway cut through the tracts. Tract 3a was severed into three parcels of 67 and 39 acres on one side of the highway and 62 acres on the other. Later, the tract was sold to three different people. Operator 8 took over the operation of Tract 21. Operators 4 and 39 traded remainders that they were renting from the same landlord. Now one operator rents all of the land on the east side and the other works the land on the other. In the trade, Operator 39 ended up with four more acres of land.

After all adjustments were made on the right of way tracts, the study area had 38 operators and 88 tracts in 1965 compared to 39 operators and 55 tracts in 1963. This amounts to a 60 percent increase in the number of tracts, but only a 12.5 percent loss in land from right of way tracts. Of the 12.5 percent decrease in acreage between 1963 and 1965, the loss of land to the right of way was responsible for 9.1 percent. Since a large number of the right of way tracts were divided by the highway, the average tract size decreased from 154 acres in 1963 to 84 acres in 1965. This average is somewhat distorted because some of the small remainders of rented tracts were not being used in 1965 and were not included in the 48 rented tracts.

Between 1963 and 1965, some changes in the number of control area right of way tracts, acreage and operators occurred. Two operators retired, leaving 37 operators with 47 tracts. There was a net loss of four tracts and 488 acres of land from 1963 to 1965. This loss was

caused by three operators, the two who retired and released rented land and one operator who sold one of his tracts. One operator increased the size of his original tract by purchasing a 24 acre adjoining tract of land. A owner-operator quit farming his 270 acres of cropland, and another control area operator rented it. Most of the changes in tracts in the control area were caused by the few operators that quit farming.

By the time the grading was completed for the new highway, the operators of tracts affected by the right of way acquisition had made most of the necessary adjustments in order to operate most of the tracts with land on both sides of the highway. However, between 1965 and 1967, Operators 18 and 19 sold small remainder tracts of 10 and 11 acres to Operator 29. The two tracts join each other providing the new owner with a 21 acre tract. Another major change was the release of a 120 acre rented right of way tract by Operator 42 that was purchased by Operator 35 in the study area. Two owner-operators sold off small tracts for rural residence sites. By the end of 1967, Operator 1 had sold eight or nine lots ranging in size from one-half to one acre from his remainder on the east side of Interstate 35E to individuals for building sites.

Between 1965 and 1967, 640 acres were dropped from the control area right of way tracts. Three operators quit renting tracts containing 387 acres. Two of these operators leased other land to replace the loss, but it was not in the control area. One 68 acre tract was sold and one owner-operator was retired from study after his death in 1966.

After considering all the tract and operator changes occurring in

the two areas, it appears that the major difference between the two areas is that an average of 14 acres was taken from the study area tracts for right of way and that more of the control area operators retired causing the major decrease in control area acreage. However, both areas lost about the same number of acres between 1963 and 1967. The study area operators had more property changing hands, but for the most part, it was among the operators or owners in the area. Another major difference is the severance of the original right of way tract by the new facility, creating many small tracts. This fact is shown vividly by Table 15. This table presents a distribution of control and study area right of way tracts by acre size groups to reflect 1963, 1964, 1965 and 1967 operations. The size of the original right of way tracts in the study and control areas was generally about the same in 1963. But there appears to be some variation between the 81-160 acre and 161-320 acre groups, with the control group having a few more of the larger tracts in 1963. By comparing 1963 with 1964, Table 15 tends to show what the highway did to the size of the remaining farms or tracts of land. As was expected, there was a definite shift of the right of way tracts to smaller parcels. Based on the size of tracts operated by the study and control operators, it is clear that tracts of less than 40 acres are not generally frequent in the Ellis County area. After the highway came through, there were 45 tracts in the study area of less than 40 acres in size.

Between 1964 and 1965, operators had disposed of or quit operating 11 of the right of way tracts. Seven of these tracts were less than 40

Table 15

Distribution of Right of Way Tracts Operated by Study Area and Control Area Operators by Size of Tract and Years

Size of Tracts Acres	1963 Number of Tracts		1964 Number of Tracts		1965 Number of Tracts		1967 Number of Tracts	
	Study	Control	Study	Control	Study	Control	Study	Control
0-5			9		8		8	
6-10			7		8		8	
11-20			9		9		8	
21-40	1		20		15		15	
41-80	15	10	25	10	24	9	23	8
81-160	21	14	19	14	15	12	14	12
161-320	15	26	8	26	7	23	7	19
321-640	2	1	3	1	3	1	3	1
640 and over	1	2		2		2		2
Totals	55	53	100	53	89	47	86	42

acres in size. Size, however, was not always the determining factor in an operator's decision to drop a tract from his operation. In one case, a 201 acre original tract divided into three tracts by the highway, the operator (being a renter) decided to release these tracts, as he did not consider it feasible to continue farming the separated tracts. The three tracts eventually sold to three different parties.

Frequency distributions showing the number of remaining right of way tracts by size groups, by size of original tracts and by tenure are presented in Appendix B.

All Tracts in Operation

Table 16 shows the relative importance of right of way takings to right of way tracts as well as to total operations. In the study area, 39 operators furnished general information regarding right of way takings in relation to 55 right of way tracts and to 143 tracts representing the total operations. The 39 operations ranged in size from a one tract operation containing 69 acres to a 14 tract operation containing 3,167 acres. The 55 right of way tracts of the 39 operators contained 35.3 percent of the total acreage operated in 1963.

Twenty-eight of the operators had only one tract affected by right of way acquisition. For 10 of these operators, the right of way tract represented the total operation. The other 18 operators had multiple tract units. Eleven of the 39 operators had more than one tract affected by the highway. In these instances, one operator had four tracts affected, three operators had three tracts each, and seven operators

Table 16

Size of Right of Way Takings Related to Individual Tracts and Total Operations
(39 Operators)

Operator	Total Operation at Time of Taking		Right of Way Tracts				Right of Way Taking		
			Tracts		Acres				
	Number by Tracts	Number of Acres	Number	Percent of Total	Number	Percent of Total	Acres Acquired	Percent of ROW Acres	Percent of Total Acres
1	1	231	1	100	231	100.0	31	13.4	13.4
2	5	1049	1	20	47	4.5	12	25.5	1.1
3	14	3167	3	21	506	15.9	67	13.2	2.1
4	2	240	2	100	240	100.0	30	12.6	12.6
5	1	100	1	100	100	100.0	12	12.0	12.0
6	4	2131	3	75	1252	58.7	91	7.3	4.3
7	1	69	1	100	69	100.0	9	13.0	13.0
8	5	638	3	60	464	72.7	44	9.5	6.9
10	6	588	2	33	150	25.5	16	10.7	2.7
11	5	353	2	40	104	29.4	14	13.5	4.0
12	2	181	1	50	160	88.4	2	1.3	1.1
13	3	998	1	33	235	23.5	22	9.4	2.2
14	5	298	4	80	231	77.5	42	18.2	14.1
15	2	220	1	50	133	60.5	1	0.8	0.5
16	1	135	1	100	135	100.0	26	19.3	19.3
17	3	474	1	33	197	41.6	27	13.7	5.7
18	2	361	1	50	204	56.5	9	4.4	2.5
19	1	74	1	100	74	100.0	13	17.6	17.6
20	4	383	1	25	104	27.2	6	5.8	1.6
21	2	151	1	50	74	49.0	12	16.2	7.9
22	1	70	1	100	70	100.0	4	5.7	5.7

Table 16 (continued)

Operator	Total Operation at Time of Taking		Right of Way Tracts				Right of Way Taking		
			Tracts		Acres				
	Number by Tracts	Number of Acres	Number	Percent of Total	Number	Percent of Total	Acres Acquired	Percent of ROW Acres	Percent of Total Acres
23	3	461	1	33	162	35.1	26	16.0	5.6
25	2	278	1	50	267	96.0	6	2.2	2.2
26	1	512	1	100	512	100.0	1	0.2	0.2
27	2	129	1	50	72	55.8	15	20.8	11.6
28	5	839	1	20	92	11.0	27	29.3	3.2
29	1	514	1	100	514	100.0	20	3.9	3.9
33	3	452	1	33	115	25.4	15	13.0	3.3
34	12	2563	1	8	123	4.8	15	12.2	0.6
35	4	578	1	25	106	18.3	16	15.1	2.8
36	5	812	1	20	126	15.5	1	0.8	0.1
37	4	916	1	25	270	29.5	19	7.0	2.1
38	4	342	2	50	158	46.2	20	12.7	0.6
39	1	312	1	100	312	100.0	21	6.7	6.7
40	6	1145	1	17	197	17.2	17	8.6	1.5
41	3	281	2	66	200	71.2	21	10.5	7.5
42	3	531	1	33	123	23.2	3	2.4	0.6
43	5	598	2	66	137	22.9	31	22.6	5.2
44	9	815	2	22	222	27.2	10	4.5	1.2
Totals	143	23,989	55	39.0	8,488	35.3	774	9.1	3.2

had two tracts each.

It can be concluded from Table 16 that the sizes of the right of way tracts and takings were very important to some operations, while to most operations the importance was minimal. In no case did the taking represent over 20 percent of the total acres under a single operation. Also, no taking contained more than 30 percent of a right of way tract acreage. Acreages in right of way tracts accounted for more than 50 percent of the total land operated in about half the cases.

The first 26 operators in Table 16 are those who gave data on their total operations. The last 13 operators did not furnish complete information on those tracts of land in their operations not affected by the new highway route, and they will be omitted from certain analyses to follow.

Using the 26 study area and 34 control area operators who furnished complete information for the study, Table 17 and 18 present the number of tracts, number of acres and tenure patterns for total operations during each year of study. As shown in Table 17, the 26 study area operators had increased the size of their operations considerably by 1965.

In 1963, the study area and control area operators were operating an average 3.2 and 2.4 tracts of land, respectively. The study area group not only had more tracts in their operations in 1963, but their tracts also were larger, averaging 179 acres as compared to 161 acres for each control tract. About two-thirds of the total study area acreage were rented compared to about 75 percent of the total control area

Table 17

Changes in Land Owned and Rented by 26 Study Area Operators in 1963, 1965 and 1967

Item	1963			1965			1967		
	Operators Number	Tracts Number	Acres Number	Operators Number	Tracts Number	Acres Number	Operators Number	Tracts Number	Acres Number
Total Land	26	82	14,738	26	131	19,494	26	129	19,267
Land Owned	18	29	5,276	19	49	6,045	20	50	6,193
Land Rented	18	53	9,462	18	82	13,433	18	79	13,074
Increased Acreage				17	18	6,098	7	13	1,073
Land Purchased				5	5	561	-	-	0
Land Rented				12	13	5,537	7	13	1,073
Reduced Acreage				7	8	1,342	7	11	1,300
Land Sold				2	2	49	1	1	5
Release of Rented Land				5	6	707	6	10	1,295
Right of Way Acquisition				26	38	586			
Net Change Between Years 1963-65					+49	+4,756			
Net Change Between Years 1963-67								+47	+4,529

Table 18

Changes in Land Owned and Rented by 34 Control Area Operators for Years 1963, 1965 and 1967

Item	1963			1965			1967		
	Operators Number	Tracts Number	Acres Number	Operators Number	Tracts Number	Acres Number	Operators Number	Tracts Number	Acres Number
Total Land	34	80	12,906	34	83	13,596	34	89	14,270
Land Owned	17	18	3,010	16	22	3,245	17	22	3,089
Land Rented	24	62	9,896	25	61	10,351	25	67	11,181
Increased Acreage				10	12	1,955	6	10	1,081
Land Rented				8	8	1,629	5	9	1,053
Land Purchased				3	4	326	1	1	28
Reduced Acres				6	9	1,265	4	4	407
Land Sold				0	0	0	1	1	184
Release of Rented Land				6	9	1,265	3	3	223
Net Change Between Years 1963-65					+3	+ 690			
Net Change Between Years 1963-67								+9	+1,364

acreage.

By 1965, the study area operators had added a net of 4,756 acres to their operations even though they had 586 acres acquired for right of way purposes. During this same period, the 34 control operators had a net increase of only 690 acres. A major portion of the increase in study area acreage in 1965 resulted from the large amount of land rented by the 12 operators who rented 13 additional tracts containing 5,537 acres. Most of these extra acres were not located near the new highway. Based on the reports from the operators, some were trying to offset their loss to the highway by taking on more land. Eight control area operators rented 1,629 acres of additional land, but this was almost offset by six operators releasing nine tracts containing 1,265 acres.

A few more tracts of land were sold in each area than is shown in Tables 17 and 18. But to keep the acreage balanced by tenure, a tract rented at time of sale was shown in the tables as rented land being released; that is, if the new owner took full possession or if the renter decided to discontinue operating the tract. In either case, the renter released the land; so it is shown that way in both tables. Also, the operators did not always reveal the reasons for releasing rented tracts. In one instance, however, a study area tract sold after being severed by the highway and the renter-operator released the tract because of the inconvenience of operating 205 acres in three parcels. This was one of the six tracts containing a total of 707 acres being released by five operators.

In a number of cases, rented land was exchanged between study area operators. Some tracts were exchanged between control operators. The switching of rented land in an intensive farming area is a common practice since the operators rent on a year-to-year basis. This accounted for a major portion of rented land being exchanged by operators in both areas. However, most of the study area operators of rented tracts continued farming the tracts that were divided leaving acreage on each side of the highway. In 1965 and 1967, some operators farmed remainder tracts as small as one acre and being triangular in shape.

The number of tracts of the 26 study area operators increased from 82 tracts in 1963 to 131 in 1965, of which 39 were created by the highway. During this same period, the control area operators added a net of only three tracts to their operations.

By 1967, the 26 study area operators were operating an average of 741 acres each as compared to the 567 acre average per operator in 1963. The control operators had an average of 420 acres each in 1967, an increase from 379 acres in 1963. Study area operators increased the average size of operations by 174 acres compared to only a 41 acre increase experienced by the control operators.

Another noticeable difference between the two areas is the increase in the number of study area tracts, causing a decrease in the average size of tracts. Very little change in average tract size occurred in the control area. Study area tracts decreased about 30 acres each in size by 1967 from the 179 acre average in 1963. The number of tracts increased from 3.2 tracts per operator in 1963 to five

tracts per operator in 1967.

In conclusion, the net increase in study area acreage is attributable to both owner-operators and renter-operators, with the latter group accounting for about 80 percent of the increase. But in the control area, renter-operators accounted for almost 100 percent of the increase. In all, study area operators increased their total acreage by 24 percent compared to a 10.5 percent increase for control operators.

Changes in Kind and Intensity of Land Use

One of the primary concerns of this study is to determine the effects of the highway on the land use of various tracts in the farm or ranch operations. It is expected that the land use of right of way tracts would be directly affected by the facility. Therefore, changes in kinds and intensity of land use in the study and control areas will be presented, first for right of way tracts and then for whole operations.

Right of Way Tracts of 36 Study Area and 34 Control Area Operators

Table 19 shows the major land uses of the right of way tracts in the study and control areas. This presentation includes all right of way tracts of the 36 study area and 34 control area operators who furnished operational information on the right of way tracts for all three years. However, there is one exception in the study area, that being an owner that cooperated in the study but in 1967 sold the remainder of his right of way tract to the adjoining owner who is also a study area

Table 19

Changes in Land Use of Right of Way Study and Control Tracts of 36 Study Area and 34 Control Area Operators[1/]

	1963 Percent of Acres		1965 Percent of Acres		1967 Percent of Acres	
	Study	Control	Study	Control	Study	Control
Cropland	80.0(36)	83.6(34)	78.7(36)	83.3(34)	76.3(35)	83.5(33)
Harvested	61.9(35)	66.7(31)	55.8(34)	69.0(31)	50.1(34)	59.5(31)
Harvested and Grazed	1.5(3)	2.5(7)	5.7(7)	2.2(5)	4.5(7)	3.2(7)
Grazed	11.4(13)	5.1(6)	12.7(15)	4.1(11)	13.4(16)	5.4(11)
Government Program	3.0(5)	7.4(13)	3.5(5)	5.5(11)	7.6(19)	12.3(33)
Idle and Waterways	2.2(10)	1.9(8)	1.0(10)	2.5(16)	0.7(9)	3.1(11)
Pastureland	20.0(20)	16.4(16)	21.3(22)	16.7(16)	23.7(21)	16.5(15)
Woodland	1.3(6)	1.4(4)	1.3(6)	1.4(4)	1.3(5)	1.1(2)
Cleared	16.3(17)	8.3(10)	13.7(15)	4.4(5)	10.2(13)	3.8(5)
Improved	1.8(8)	5.9(6)	5.4(15)	10.0(10)	11.7(16)	10.5(10)
Other Pastureland[2/]	0.6(4)	0.8(2)	0.9(5)	0.9(2)	0.5(4)	1.1(3)
Total Acreage	8026(36)	8659(34)	7418(36)	8461(34)	7369(35)	8422(34)

[1/] Figures in parentheses are numbers of operators.

[2/] Includes idle and other unaccounted for pastureland.

operator. The new owner did not change the use of the land.

Over the three year period, cropland acreage in study area right of way tracts declined about four percentage points, while that of the control area remained constant. It is recalled that the takings were composed of 73 percent cropland and 27 percent pastureland. This fact alone contributed to the decline of cropland in relation to pastureland acreage which increased about four percentage points. The loss of 657 acres by the study area from 1963 to 1967 resulted primarily from right of way acquisition, but a few small tracts which were sold to persons outside the area contributed to part of the loss. In the control area, the 34 control operators lost only 237 acres which resulted from the sale of land or from renters releasing acreage of the control right of way tracts.

Table 19 also shows the extent of shifts in land uses, reflecting changes in intensity of land use in both areas. In the case of cropland harvested, the 36 study area operators had a 12 percent decrease between 1963 and 1967. In contrast, control operators had a seven percent decrease. Operators in both areas were affected in 1967 by a new cotton program which led to reductions in cotton acreages. This is partly responsible for the decrease in acreage harvested and the increase in government program acreage in 1967. However, the latter percentage increase was about the same for both areas.

It is evident that some operators in the study area were gradually devoting proportionately larger portions of their land to livestock production than was the case in the control area. This is pointed out

by the increase in improved pastureland acreage and the extra cropland acreage that was being used for livestock grazing in the study area. Both areas showed increases in the acreages in improved pastures and in the number of operators having such acreages. Consequently, study area operators increased the grazing potential of their pastureland more than those of the control area. Study area operators also decreased their cleared unimproved acreage by a greater percentage than did those of the control area. This is an indication that study area operators used their right of way tract pastureland more intensively in 1967 than in 1963 and in relation to control operators. Also, study area operators decreased the intensity of use of their cropland between periods and they did so to a greater extent than did the control operators.

To investigate further the land use changes on right of way tracts, the study and control area tracts were divided into two groups, tracts operated by owners and rented tracts, as shown in Tables 20 and 21. Table 20 indicates that only owner-operators shifted significant cropland acreage to pastureland acreage between 1963 and 1967. In fact, the percentage of cropland and pastureland acreage of renter-operators remained about the same. The renter-operators did shift a greater percentage of their cropland harvested acreage into harvested and grazed, grazed and government program uses than did the owner-operators. Also, they made very few changes in the intensive pastureland categories between periods compared to their counterpart owner-operators. Renter-operators were not permitted by their landlords to shift large acreages from cropland to pastureland uses and to improve the cleared pastureland

Table 20

Changes in Land Use of Rented and Owned Right of Way

Tracts of 36 Study Area Operators[1/]

	1963 Percent of Acres			1965 Percent of Acres			1967 Percent of Acres		
	Owned	Rented	Total	Owned	Rented	Total	Owned	Rented	Total
Cropland	72.5(20)	86.3(22)	80.0(36)	69.2(20)	85.0(21)	78.7(36)	62.9(19)	86.5(20)	76.3(35)
Harvested	41.9(19)	78.7(21)	61.9(35)	34.6(20)	69.9(21)	55.8(34	29.8(19)	65.6(20)	50.1(34)
Harvested and Grazed	3.3(3)	0.0	1.5(3)	5.2(5)	6.1(2)	5.7(7)	3.9(5)	5.0(2)	4.5(7)
Grazed	19.9(10)	4.2(8)	11.4(13)	22.1(11)	6.4(8)	12.7(15)	20.9(13)	7.7(7)	13.4(16)
Government Program	5.2(4)	1.2(1)	3.0(5)	7.1(4)	1.0(1)	3.5(5)	8.1(8)	7.2(17)	7.6(19)
Idle and Waterways	2.2(4)	2.2(8)	2.2(10)	0.2(2)	1.6(9)	1.0(10)	0.2(2)	1.0(7)	0.7(9)
Pastureland	27.5(13)	13.7(9)	20.0(20)	30.8(15)	15.0(9)	21.3(22)	37.1(14)	13.5(9)	23.7(21)
Woodland	2.4(4)	0.3(2)	1.3(6)	2.8(4)	0.3(2)	1.3(6)	2.6(4)	0.2(2)	1.3(5)
Cleared	21.6(11)	11.8(7)	16.3(17)	17.0(9)	11.7(7)	13.7(15)	9.1(7)	11.1(7)	10.2(13)
Improved	3.2(7)	0.7(1)	1.8(8)	10.7(12)	1.8(3)	5.4(15)	25.1(13)	1.4(3)	11.7(16)
Other Pastureland	0.3(3)	0.9(4)	0.6(6)	0.3(3)	1.2(4)	0.9(7)	0.3(3)	0.8(4)	0.5(7)
Total Acreage	3671(20)	4355(22)	8026(36)	2961(20)	4457(21)	7418(36)	3201(19)	4168(21)	7369(35)

[1/] Figures in parentheses represent number of operators.

Table 21

Changes in Land Use of Rented and Owned Right of Way Tracts of 34 Control Area Operators[1]

	1963 Percent of Acres			1965 Percent of Acres			1967 Percent of Acres		
	Owned	Rented	Total	Owned	Rented	Total	Owned	Rented	Total
Cropland	78.4(15)	85.6(24)	83.6(24)	77.3(45)	85.4(24)	83.3(34)	77.3(14)	85.7(22)	83.5(33)
Harvested	49.1(12)	73.5(23)	66.7(31)	46.0(12)	77.2(23)	69.0(31)	45.5(11)	64.5(22)	59.4(30)
Harvested and Grazed	0.2(1)	3.3(7)	2.5(7)	8.3(5)	0.0	2.2(5)	3.2(3)	3.2(5)	3.2(7)
Grazed	12.0(7)	2.5(6)	5.1(10)	10.2(5)	1.9(7)	4.1(11)	13.2(7)	2.7(6)	5.5(11)
Government Program	15.5(7)	4.3(7)	7.4(13)	11.1(5)	3.5(7)	5.5(11)	13.9(9)	11.7(21)	12.3(25)
Idle	1.6(2)	2.0(4)	1.9(6)	1.7(2)	2.8(11)	2.5(10)	1.5(2)	3.6(9)	3.1(10)
Pastureland	21.6(13)	14.4(19)	16.4(29)	22.7(12)	14.6(19)	16.7(28)	22.7(12)	14.3(17)	16.5(27)
Woodland	0.8(1)	1.6(4)	1.4(4)	0.9(1)	1.6(4)	1.4(5)	0.9(1)	1.2(2)	1.1(3)
Cleared	10.7(6)	7.3(12)	8.3(16)	10.4(7)	2.2(7)	4.4(12)	8.7(5)	2.0(7)	3.8(10)
Improved	7.4(7)	5.4(8)	5.9(13)	10.5(8)	9.8(12)	10.0(18)	12.8(8)	9.6(11)	10.5(18)
Other Pastureland	2.7(2)	0.1(2)	0.8(2)	0.9(1)	1.0(2)	0.9(3)	0.3(1)	1.5(3)	1.1(4)
Total Acreage	2390(15)	6269(24)	8659(34)	2232(15)	6229(24)	8461(34)	2232(15)	6190(22)	8422(34)

[1] Figures in parentheses represent number of operators.

acreage.

Comparing the owner-operations with renter-operations between areas and periods (1963 versus 1967), it is found that it was uniquely owner-operators in the study area who made major shifts in land uses. They intensified their use of pastureland acreage more than did their control area counterparts by decreasing the unimproved cleared acreage 12.5 percent compared to two percent. They increased the improved pasture acreage 22 percent compared to 5.4 percent. The study area renter-operators increased their cropland harvested and grazed as well as just cropland grazed acreage by several percentage points while their control area counterparts changed these acreages very little.

The comparison of the operations of the right of way tracts of both the owner-operators and renters in the two areas seems to indicate that owner-operators in the study area made some changes in their land use as a result of the highway influence. An owner-operator can adjust the use of his land to suit his likes or dislikes whereas a renter does not necessarily have the same prerogative. Any major change the latter makes has to be approved by the landlord. The increased acreage in improved pastures of the owner-operators in the study area was likely related to operators intensifying the use of the remaining land to offset the loss to right of way.

All tracts of 26 Study and 34 Control Area Operations

The 1963 land use patterns of the 26 study area and 34 control area operators who supplied all information for the three years generally followed those of Ellis County in general. (See Table 2.)

However, it appears that the land use pattern of the study area between 1963 and 1967 tended to follow the trend of the county more closely than did that of the control area, when comparing the percentage of total land being used as cropland and pastureland over the years.

Tables 22 and 23 present a comparison between the cropland and pastureland acreages of the study area and control area operations. As was the case for right of way tracts from 1963 to 1967, study area operators decreased their total cropland acreages and increased their pastureland acreages by greater percentages than their control area counterparts. In the study area cropland harvested acreages decreased about 18 percent compared to seven percent for the control area. The control operators made greater use of the soil bank than study operators, increasing that acreage by seven percent compared to three percent for the latter group. Study area improved pastureland acreage increased 12 percent compared to six percent for the control area. For the other more specific uses within major use groups, the percentage changes in the two areas were not very different.

In summary, Tables 22 and 23 show that there were notable differences in kinds and intensity of land uses between the study area and control area operations for the 1963-67 period. These differences became more pronounced by 1967. Just how much influence the highway had on some of the changes in land use is uncertain. According to the operators, the majority of the land changes were not caused by the highway but by their own independent decisions to change crops or to establish more improved pastures. This was especially emphasized by

Table 22

Changes in Land Use of All Agricultural Land Operated
by 26 Study Area Operators in 1963, 1965 and 1967

Type of Land	1963			1965			1967		
	Operators	Land		Operators	Land		Operators	Land	
	Number	Acres	Percent	Number	Acres	Percent	Number	Acres	Percent
Cropland	26	10,543	71.5	26	11,858	60.9	26	11,594	60.2
Harvested	23	8,344	56.6	24	8,625	44.3	20	7,557	39.2
Harvested & Grazed	3	100	.7	9	647	3.3	10	575	3.0
Pastured	10	910	6.2	17	1,485	7.6	16	1,372	7.1
Feed & Grain 2/	3	128	.8	5	122	.6	3	58	.3
Soil Bank 2/	5	916	6.2	8	810	4.2	17	1,847 1/	9.6
Cropland Rented to Others	0	0	0	0	0	0	1	88	.5
Other Cropland	10	145	1.0	11	169	.9	8	97	.5
Pastureland	24	3,985	27.1	24	7,394	37.9	24	7,519	39.0
Improved Pasture	12	1,248	8.5	19	1,423	7.3	20	3,857	20.0
Unimproved Cleared	15	2,649	18.0	15	5,270	27.1	14	2,971	15.4
Woodland	2	49	.3	7	649	3.3	6	630	3.3
Idle Pastureland	1	14	.1	2	27	.1	4	36	.2
Pastureland Rented to Others	1	25	.2	1	25	.1	1	25	.1
Other Land 3/	22	210	1.4	24	225	1.2	23	154	.8
Total Land	26	14,738	100.0	26	19,477	100.0	26	19,267	100.0

1/ Includes idle cropland in governmant cotton program.
2/ Represents diverted land in government programs.
3/ Includes land for buildings, roads, and any land not accounted for.

Table 23

Changes in Land Use of All Agricultural Land
Operated by 34 Control Area Operators
in 1963, 1965 and 1967

Type of Land	1963			1965			1967		
	Operators	Land		Operators	Land		Operators	Land	
	Number	Acres	Percent	Number	Acres	Percent	Number	Acres	Precent
Total Cropland	34	10,860	84.1	34	11,183	82.3	34	11,702	82.0
Harvested	31	8,767	67.9	32	9,279	68.2	31	8,755	61.4
Harvested & Grazed	-	-		8	268	2.0	4	185	1.3
Pastured	21	1,044	8.1	15	586	4.3	14	747	5.2
ASC Feed & Grain	8	238	1.8	5	105	0.8	2	44	0.3
ASC Soil Bank	6	486	3.8	6	557	4.1 1/	32 1/	1,528	10.7
Other Cropland	11	325	2.5	20	388	2.9	17	443	3.1
Total Pastureland	31	1,919	14.9	31	2,284	16.8	31	2,445	17.1
Improved	12	456	3.6	23	1,287	9.5	23	1,386	9.7
Unimproved Cleared	22	1,255	9.7	16	657	4.8	13	765	5.4
Woodland	3	95	0.7	5	161	1.2	5	151	1.0
Idle	6	113	2.9	6	135	1.0	7	143	1.0
Rented to Others	-	-		1	44	0.3	-	-	
Other Land	29	127	1.0	29	129	0.9	29	123	0.9
Totals	34	12,906	100.0	34	13,596	100.0	34	14,270	400.0

1/ Includes 26 operators with 1,139 acres in the government cotton program.

some of the study area operators who were developing more improved pastures in 1965 and 1967.

Changes in Crop and Livestock Production

The production of crops and livestock for each year of study was converted to dollar values based on sales by each operator in an effort to determine the extent of between area differences in the total operations. To evaluate crop production on the right of way tracts, crops were converted to dollar values based on market price of crop. Due to the difficulty of obtaining livestock data for the right of way tract only, no attempt was made to analyze on that basis.

Right of Way Tracts

After evaluating the operations on the right of way tracts by the 36 study and 34 control area operators as shown in Tables 19, 20 and 21, eight study area and four control area operators were omitted from this analysis on crop production. Those operators omitted had little or no crop production in either 1963 or 1967.

A value was calculated for all crops produced on the right of way tracts by the 28 study area and 30 control area operators. For those crops that were sold, such as cotton, grain sorghum, wheat and oats, actual receipts of crops sold were used. For seed crops or feed crops used on the farm in livestock operations, values were calculated based on market value of crop at the time of harvest. The value of crops of renters were calculated on total crops produced on the rented tract.

The landlord's share was included in the totals for this analysis.

Table 24 presents a frequency distribution of the study and control area operators based on value of crops raised per operator before and after Interstate 35E severed the farms of 28 study area operators. There was a decline in the number of study area operators appearing in the crop value classes of greater than $15,001 between 1963 and 1967 from three to none. In the control area, the decline was from five operators to three. For value classes under $10,001, the percentage of study area operators increased from 82 percent to 96 percent between 1963 and 1967. In contrast, the percentage of control area operators in the grouped classes failed to change. These figures apparently reflect the study area operators' shifting from cropland to pastureland at a greater rate than was done in the control area.

To summarize the crop farming operations on the right of way tracts, comparisons by area and time period are presented in Table 25. The percentage decrease in cropland harvested acreage was greater in the study area than the control area, both on a total acreage and a per operator basis. The dollar value of crops produced per acre or per operator decreased sharply, the declines for the study area being about double those of the control area.

Statistical tests were used to evaluate the differences between study and control area average acres of cropland harvested per operator and average dollar value of cropland harvested per operator. By computing Student's t-values and comparing them with the theoretical values at the customarily accepted 95 percent confidence level, these

Table 24

Frequency Distribution of 28 Study and 30 Control Area Operators Based on Value of Crops Harvested Per Operator from Right of Way Tracts in 1963 and 1967

Dollars	Study Area Operators[1]				Control Area Operators[2]			
	Before		After		Before		After	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Over 30,000	0	0	0	0	2	6.7	0	0
25,001-30,000	0	0	0	0	1	3.3	2	6.8
20,001-25,000	1	3.6	0	0	2	6.7	1	3.3
15,001-20,000	2	7.1	0	0	0	0	1	3.3
10,001-15,000	2	7.1	1	3.6	6	20.0	7	23.3
5,001-10,000	12	42.9	9	32.1	9	30.0	6	20.0
2,501-5,000	7	25.0	11	39.3	6	20.0	7	23.3
0-2,500	4	14.3	7	25.0	4	13.3	6	20.0
Totals	28	100.0	28	100.0	30	100.0	30	100.0

Table 25

Changes in Acreage and Value of Crops Harvested from Right of Way Tracts of 28 Study Area and 30 Control Area Operators in 1963 and 1967 [1]

	Study Area	Control Area
Acreage Harvested by Operators[2]		
1963 (Acres)	3,865(71.9)	5,334(67.0)
1967 (Acres)	3,244(66.5)	4,931(62.4)
Average Acres Harvested Per Operator		
1963 (Acres)	138.04	177.80
1967 (Acres)	115.86	164.37
Change in Acreage Harvested Per Operator from 1963-1967		
Change (Acres)	-22.18	-13.43
Change (Percent)	-16.10	- 7.60
Value of Crops Harvested on Right of Way Tracts		
1963 Value (Dollars)	187,650	304,727
1967 Value (Dollars)	127,831	254,126
Value of Crops Per Operator		
1963 Value (Dollars)	6,702	10,158
1967 Value (Dollars)	4,565	8,471
Change in Value of Crops Per Operator from 1963-1967		
Change (Dollars)	-2137	-1687
Change (Percent)	-31.9	-16.6
Value of Crops Harvested Per Acre		
1963 Value (Dollars)	48.55	57.13
1967 Value (Dollars)	39.41	51.54
Change in Value of Crops Per Acre from 1963-1967		
Change (Dollars)	- 9.14	-5.59
Change (Percent)	-18.80	-9.80

[1] Includes only those operators that harvested crops in both 1963 and 1967 from the same tracts. Eight of the 36 study area operators and 4 of the 34 control area operators were omitted from this part of the analysis because of little or no crop production in either 1963 or 1967.

[2] Figures in parentheses represent the acreage harvested as a percent of total land in Right of Way tracts of these 28 study and 30 control area operators.

tests revealed that there was no significant difference (other than that due to chance) between the means of acres harvested in 1963 or 1967 by the study and control area operators. However, the 1967 difference is significant at the 88 percent confidence level.

For the per operator dollar values, the 1963 difference was not significant at the 95 percent level, but the 1967 difference was highly significant. This indicates that the highway probably had some influence on the difference in the value of crops produced on the right of way tracts in 1967.

All Tracts in Operation

To show the importance of the value of various crops produced on all tracts in the operation, detailed information for each year of study is presented in Table 26 and summarized in Table 27. (Data for all tracts in operations for all three years were obtained for only 26 study area and 34 control area operators.) Not all of the operators produced crops in each year. For example, in 1963 three study area and three control area operators did not harvest any crops. However, they did plant various grazing crops for supplementary grazing and hay production.

There was very little difference in the total acreage in crops between 1963 and 1967. Of the individual crops, cotton and maize were the most important (acreage and value-wise) to the total operation in both areas. Cotton had been the major crop in the areas for years, but due to the government programs and the trend toward a diversified

Table 26

Acreage and Value of Crops Produced by the 26 Study and 34 Control Area Operators from 1963 to 1967 in Ellis County

	1963			1965			1967		
	Acres	Production	Value	Acres	Production	Value	Acres	Production	Value
STUDY AREA									
Cotton (bales)	(16)[1/] 2,822	1,211	173,019	(16) 3,229	1,791	234,450	(15) 2,555	1,280	115,200
Maize (tons)	(18) 2,550	3,135	127,673	(21) 3,606	5,290	191,011	(19) 3,792	4,330	171,972
Wheat (bu)	(16) 646	15,520	26,640	(16) 1,012	13,711	18,831	(7) 599	9,014	12,390
Oats (bu)	(5) 385	10,856	8,855	(8) 206	6,417	5,440	0 0	0	0
Corn (bu)	(11) 602	28,725	34,741	(7) 166	7,031	9,331	(2) 24	800	1,070
Hay (bales)	(18) 1,016	39,386	28,571	(15) 739	45,953	37,497	(19) 825	60,085	43,370
Total	(23) 8,021		399,499	(24) 8,958		496,560	(20) 7,795		344,002
CONTROL AREA									
Cotton (bales)	(29) 5,662	2,475	366,817	(29) 4,739	2,904	370,270	(26) 3,235	2,079	172,522
Maize (tons)	(21) 1,656	1,778	62,777	(26) 3,569	5,919	212,968	(28) 4,705	6,133	244,212
Wheat (bu)	(21) 828	17,935	34,774	(17) 542	10,481	15,051	(8) 538	6,412	9,310
Oats (bu)	(5) 55	1,847	1,988	(10) 180	6,259	4,949	(2) 30	450	370
Corn (bu)	(12) 275	9,632	11,342	(7) 144	6,198	8,029	(3) 96	2,225	2,890
Hay (bales)	(20) 454	20,774	14,074	(19) 342	17,918	12,793	(17) 339	20,694	15,584
Total	(31) 8,930		491,772	(32) 9,516		624,060	(31) 8,943		444,888

1/ Figures in parenthesis represent number of operators.

operation, it has become less important. In fact, between 1963 and 1967, maize replaced cotton as the major crop in both areas.

An increased amount of hay was harvested by each group from fewer acres in 1965 and 1967. This was especially evident for study area operators as they almost doubled the production of hay per acre from 1963 to 1967. Improved varities and intensifying hay production was the primary reason for the increase. Also, it is keeping the growing dependence upon livestock in the general area.

Table 26 shows that the value of crops was substantially greater for both groups of operators in 1965 than in either 1963 or 1967. This was due to the fact that all crops produced unusually well, except for the winter grain crops which were hit by diseases. Between 1963 and 1967, the value of crops in both areas declined but by a somewhat greater amount in the study area.

Table 27 shows a before and after comparison of the value of crop production on the right of way tracts of the 28 study area and 30 control area operators, compared to the value of crop production on the total operations of the 26 and 34 control area operators. First of all, the right of way tracts represent about 44 percent of the total land of the study area operators in 1963. The control right of way tracts represented about 62 percent of total operations in the control area in 1963. This was about the same ratio of land harvested by both groups of operators between right of way tracts and total operations.

The total value of crops produced from the study area tracts decreased about four percent more than it did in the control area.

Table 27

A Comparison of Acreage and Value of Crops Harvested from Right of Way Tracts and from All Tracts or Total Operations of Study and Control Area Operators in 1963 and 1967[1/]

	Study Area		Control Area	
	Right of Way Tracts [2/]	Total Operations [3/]	Right of Way Tracts [2/]	Total Operations [3/]
Acres Harvested				
1963	3,865 (28)	8,021 (23)	5,334 (30)	8,930 (31)
1967	3,244 (28)	7,795 (20)	4,931 (30)	8,943 (31)
Percent Change Between Years	-16.1	-2.8	-7.6	+0.2
Value of Crops Produced				
1963	$187,650 (28)	$399,499 (23)	$304,727 (30)	$491,772 (31)
1967	127,831 (28)	344,002 (20)	254,126 (30)	444,888 (31)
Percent Change Between Years	-31.9	-13.9	-16.6	-9.5
Value of Crops Harvested Per Acre				
1963	$48.55	$49.80	$57.13	$55.07
1967	39.41	43.03	51.54	49.75
Percent Change Between Years	-18.8	-13.6	-9.8	-9.7

1/Value of crops includes crops raised and fed to livestock.

2/Production figures are based on right of way tract operations of the 28 study area and 30 control area operators shown in Table 25.

3/Production figures are based on total operations of the 26 study area and 34 control area operators.

The difference was considerably greater for the right of way tracts only. A sizable amount of the decreases in each area resulted from farmers receiving about $50 less per bale of cotton sold in 1967. The total value of crops harvested per acre from right of way tracts and from total operations decreased in both areas but by greater percentages in the study area. Again, the percentage decline for the total operation was not as great as that for the right of way tracts. There is no clear explanation for the larger decrease in the value of crops harvested per acre on the right of way tracts than on tracts in the total operation. It is possible that some of the tracts divided by the highway were not being farmed as intensively in 1967 as the other tracts in the operation. This was true with a number of the operators renting right of way tracts. Due to the inconvenience of traveling from one side of the new facility to the other, they sometimes passed up one plowing or an application of insecticide. This could not have occurred for control right of way tracts, however. Thus much of the variability may have derived from other than right of way effects.

Beef cattle production, as mentioned earlier, is gradually becoming more widespread among the farmers in the study and control areas. Cattle production was the only significant livestock enterprise in these areas. Two operators had a few hogs and three operators had about 10 head of sheep to control weeds around equipment stored outside. The total number and dollar value of cattle on the farms in each area are shown in Table 28. The number of cattle represents that number which the operators had on hand at the end of each of the study years.

Table 28

Number and Value of Livestock on Hand December 31 of 1963, 1965 and 1967 by Study and Control Area Operators

	1963 (Before)			1965 (During)			1967 (After)		
	Operators Number	Head Number	Value Dollars	Operators Number	Head Number	Value Dollars	Operators Number	Head Number	Value Dollars
Study Area									
Cows	21	634	85,950	18	839	141,605	13	218	33,850
Cows with Calves	17	284	54,185	16	264	51,955	17	873	176,850
Calves	17	275	16,905	6	166	18,205	2	29	3,230
Heifers	2	50	7,375	9	64	7,985	7	96	13,510
Bulls	19	53	13,180	16	61	13,995	15	58	17,400
Total	23	1,296	177,595	22	1,394	233,745	18	1,274	244,840
Control Area									
Cows	22	164	20,664	24	153	24,275	17	175	30,660
Cows with Calves	21	200	36,508	23	294	57,125	20	269	56,235
Calves	20	180	10,364	7	42	3,411	1	9	495
Heifers	5	14	1,490	8	50	6,675	10	46	5,435
Bulls	16	18	3,950	19	26	6,200	16	21	6,575
Total	27	576	72,976	25	565	97,686	23	520	99,400

For most operators in each area, this number is a good measure to show the relative increase or decrease in their livestock operations. However, three operators in the study area and one in the control area did not have a foundation herd and were continually buying and selling cattle.

Between 1963 and 1967, the total number of cattle decreased slightly in both areas. On the other hand, the total value increased in both areas - 38 percent in the study area and 36 percent in the control area. The primary difference between the two areas was that the study area operators had larger herds of mother cows than those of the control area. This difference became relatively greater through the study period. Table 29 shows the distribution of study and control area operations based on the number of mother cows in their herd by year of operation. No operator in the control area had over 80 head of cows, while in 1963 there were four operators in the study area with over 80 head. In 1965 and 1967 the latter number increased to five.

There were five fewer study area operators with cattle in 1967 than 1963 as compared to four fewer control operators. Of the five study area operators, one operator was between selling and buying back periods; two operators sold their right of way tracts and livestock in later part of 1967; one sold his livestock; and another, a renter, was forced to sell his four cows due to the loss of pasture to right of way. Of the four control operators with no cattle in 1967, two retired and the other two, with less than 10 head each, decided to sell out.

Of the five study area operators with no livestock in 1967, three

Had 10 head or less in 1963, one had from 11 to 20 head, and the other had from 21 to 40 head. Of the four control operators with no cows in 1967 each had 10 head or less in 1963.

Most of the changes occurring between the three time periods were rather small, usually of 10 head or less, but a few study area operators made large changes. The latter were larger operators who varied their herds a great deal depending on range, feed or financial conditions at the time.

A study of the livestock inventories does not indicate that the highway caused the study area operators as a group to reduce their herds after right of way taking. The taking did cause four small operators with less than 10 head to reduce their herds. The larger operators usually had several tracts, and in most cases, the loss of right of way had very little effect on the size of their herds.

Changes in Expenses and Income

One of the major objectives of the study was to determine the highway's effects, if any, on the net income of study area operators, To pursue such an objective, receipts and expenses of the two groups of operators are compared on a before and after period basis.

Expenses

Operating Expenses.-Tables 30 and 31 present the operating expenses of study area and control area operators for 1963, 1965 and 1967. The list of expenses include all major operating expenses but not major capital expenditures such as farm equipment purchases. Rent was the largest expense for each group of operators over the study period. Labor was the next largest expense for both groups of operators. Fertilizer, feed and fuel were other major expenses.

Between 1963 and 1965, the study area operators experienced an

increase of about 20 percent compared to a 4.5 percent increase for the control group. (Tables 30 and 31.) This difference in expenditures between the areas might suggest that study area operators possibly spent more money in 1965 in an effort to adjust or compensate for the loss of land to right of way or for their tracts being divided by the highway. Some operators, usually the smaller ones, reported that they had encountered additional expenses connected with the operations on the remaining tracts. Such cash-crop-related expenses as those for fertilizer, insecticide, rent in kind and machine hire increased considerably more, percentage-wise, in the study area than in the control area. In fact, the latter area had a decline in insecticide and machine hire expenses. Seed expenses declined in both areas but more in the study area. Many of the study area operators reported that they intensified the use of fertilizer by almost doubling the amount applied per acre. This, along with ideal weather conditions, enabled the operators to produce better than average crops. The livestock related expenses such as feed purchases and pasture fertilizer declines more in the control area than in the study area. Cash rent did not increase as much in the study area as in the control area.

Between 1963 and 1967, the two groups of operators increased total expenses more nearly the same, with the study area group increasing 3.7 percent compared to 5.3 percent for the control group. The two groups of operators experienced similar increases and decreases in expenses between 1963 and 1967 but differed a great deal between 1963 to 1965. This also might suggest possible highway influence on study area

expenditures. Perhaps with the extra funds acquired from sale of right of way land, the owner-operators were in a better fiancial position to make the necessary adjustment in an effort to offset their loss of land. However, the 16 operators of 33 rented tracts were not compensated in any way for the loss of land or for the inconvenience of operating the divided tracts of various sizes and shapes after the highway route was established.

Table 32 presents a frequency distribution of study and control operators based on the change in operating expenses per operator between 1963 and 1965 and between 1963 and 1967. The array of operators shows that between 1963 and 1965 about 54 percent of the study area operators increased their expenses compared to 47 percent of the control area operators. On the other hand, between the before and after period (1963-1967), the operators of both areas were distributed rather evenly with about half of them reducing their expenses and the other half increasing their expenses.

Comparing the two groups, differences in expenses between 1963 and 1965 provide another indicator that the study area operators performed differently after the highway cut through their farms sometime in 1964. To the extent that the highway caused a shift from crops to livestock, the expense pattern would be expected to change accordingly. To the extent that the highway caused a shift to more intensive use of remaining cropland to accomplish this. Both of these types of adjustments are reflected in the changed expense patterns of the study area immediately after the highway influence occurred. In this case, it is believed that the study covered periods in which study area operators were shifting to livestock more rapidly.

Table 29

Frequency Distribution of 26 Study and 34 Control Operators Based on the Number of Cows They Had in Their Herds at the End of 1963, 1965 and 1967

Number of Head	Study Area Number of Operators			Control Area Number of Operators		
	1963	1965	1967	1963	1965	1967
160 over	2	2	2			
81-160	2	3	3			
41-80	2	1	1	2	2	3
21-40	3	2	4	6	7	6
11-20	3	7	2	7	7	4
0-10	11	7	6	12	9	10
Total	23	22	18	27	25	23

Table 30

Changes in Operating Expenditures of 26 Study Area Operators in Ellis County From 1963 to 1965 and 1967[1/]

Type of Expenditure	Amount of Expenditure			Changes in Expenditure			
	1963	1965	1967	1963-1965		1963-1967	
	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Percent)	(Dollars)	(Percent)
Feed Purchased	26,606(19)	21,298(21)	18,293(21)	-5,308	- 19.9	-8,313	- 31.2
Veterinary	1,034(10)	2,458(13)	1,390(11)	1,424	137.7	356	34.4
Fertilizer Cropland	23,901(16)	33,873(20)	27,731(19)	9,972	41.7	3,830	16.0
Pasture	1,392 (6)	1,088 (5)	3,460 (5)	- 304	- 21.8	2,068	107.0
Insecticides & etc.	11,905(11)	12,810(13)	8,246 (9)	905	7.6	-3,659	- 30.7
Seed	17,282(25)	14,223(22)	14,832(20)	-3,059	- 17.7	-2,450	- 14.2
Gas and Oil	23,831(20)	25,919(23)	27,759(23)	2,088	8.7	3,928	16.5
Repairs	15,055(19)	21,012(22)	22,592(23)	5,957	39.5	7,537	50.1
Machine Hire	12,707(18)	20,707(23)	21,723(21)	8,000	63.0	9,016	71.0
Labor	54,846(23)	50,241(22)	53,648(23)	-4,605	- 8.4	-1,198	- 2.2
Fence Repair	1,531 (4)	1,825 (8)	1,590 (9)	294	19.2	59	3.8
Interest	10,582(15)	10,753(11)	10,146(10)	171	1.6	- 436	- 4.1
Insurance and Taxes	7,003(24)	8,408(25)	8,636(26)	1,405	20.0	1,633	23.3
Feed Raised and Fed[2/]	29,186(17)	34,617 (6)	40,664(17)	5,431	18.6	11,478	39.3
Rent Cash	12,889(16)	15,688 (5)	20,620 (9)	2,799	21.7	7,731	60.0
Crops	78,963(16)	119,777(17)	69,933(17)	40,814	51.7	-9,030	- 11.4
Totals	299,527	360,080	310,599	60,553	20.2	11,072	3.7

1/ Numbers in parentheses are the number of operators reporting the particular expense.

2/ Not included in totals.

Table 31

Changes in Operating Expenditures of 34 Control Operators in Ellis County From 1963 to 1965 and 1967[1/]

Type of Expenditure	Amount of Expenditure 1963 (Dollars)	1965 (Dollars)	1967 (Dollars)	Changes in Expenditure 1963-1965 (Dollars)	1963-1965 (Percent)	1963-1967 (Dollars)	1963-1967 (Percent)
Feed Purchased	9,799(24)	5,278(20)	9,417(22)	- 4,521	- 46.1	- 382	- 3.9
Veterinary	765(14)	393 (7)	1,126(18)	- 372	- 48.6	361	47.2
Fertilizer Cropland	37,685(29)	42,954(29)	42,584(27)	5,269	14.0	4,899	13.0
Pasture	984 (6)	609 (3)	3,167 (9)	- 375	- 38.1	2.183	221.8
Insecticides & etc.	26,285(23)	19,494(21)	10,722(17)	- 6,791	- 25.8	-15,563	- 59.2
Seed	17,031(30)	16,465(29)	15,860(27)	- 566	- 3.3	- 1,171	- 6.9
Gas and Oil	27,982(32)	33,552(30)	35,313(31)	5,570	19.9	7,331	26.2
Repairs	26,469(30)	26,439(28)	36,235(30)	- 30	- 0.1	9,766	36.9
Machine Hire	22,021(25)	17,001(26)	25,285(28)	- 5,020	- 22.8	3,264	14.8
Labor	73,991(30)	55,414(32)	53,936(30)	-18,577	- 25.1	-20,055	- 27.1
Fence Repair		156 (2)	437 (5)	156	N/A	437	N/A
Interest	11,199(26)	12,137(23)	11,250(18)	938	8.4	51	0.5
Insurance and Taxes	6,818(30)	11,437(30)	10,476(31)	4,619	67.7	3,658	53.7
Feed Raised and Fed[2/]	14,835(22)	14,470(21)	12,697(21)	- 365	- 2.5	- 2,138	- 14.4
Rent Cash	1,625 (8)	2,197(10)	5,572(10)	572	35.2	3,947	242.9
Crops	94,544(22)	129,676(20)	114,877(25)	35,132	37.2	20,333	21.5
Totals	357,198	373,202	376,257	16,004	4.5	19,059	5.3

1/ Numbers in parentheses are the number of operators reporting the particular expense.

2/ Not included in totals.

Table 32

Frequency Distribution of the 26 Study Area and 34 Control Area Operators Based on the Amount of Change in Operating Expenses Per Operator Between Years

Dollars	Changes Between 1963 and 1965		Changes Between 1963 and 1967	
	Number of Operators		Number of Operators	
	Study Area	Control Area	Study Area	Control Area
+More than 4000	3	0	3	3
+2001 to 4000	2	5	2	4
+1001 to 2000	5	5	2	3
+501 to 1000	2	1	4	1
+1 to 500	2	5	2	5
No Change	0	1	0	1
-1 to 500	2	3	3	2
-501 to 1000	4	3	3	4
-1001 to 2000	2	2	4	3
-2001 to 4000	0	6	1	6
-More than 4000	4	3	2	2

than control area operators. Right of way takings may have accelerated the study area shift.

Cattle Purchases. - Table 33 shows the expenditures of study and control area operators for various types of cattle. Most cattle were purchased for breeding purposes while some were purchased for resale after being on grass and grain for a short period. In 1965, four study area operators made large purchases of calves to place on winter pastures for fattening.

The number of cattle purchased by control area operators remained about constant during all three years, while study area operators made large increases in their purchases during 1965 and 1967 compared to the 1963 level. In fact, the total dollars paid for the study area cattle increased 919 percent between 1963 and 1967 compared to only 57 percent for those of the control area.

Gross Income

Table 34 presents the gross income from crops, livestock, government payments for cotton and diverted cropland, custom work and other farm income of the study and control area operators for the years studied. Each of the farm related incomes is discussed separately.

Crop Income. - The gross crop income as presented in Table 34 is the value of all crops raised, excluding the value of feed fed to livestock. The latter may be considered to have been marketed through livestock sales. The method of computing crop value also assumes that crop inventories did not vary from year to year. This assumption is

Table 33

Cattle Purchases by the 26 Study and 34 Control Area Operators in 1963, 1965 and 1967

	1963 (Before)			1965 (During)			1967 (After)		
	Operators Number	Head Number	Value Dollars	Operators Number	Head Number	Value Dollars	Operators Number	Head Number	Value Dollars
Study Area									
Cows	2	10	1,240	1	20	2,300	4	53	6,975
Cows with Calves	0	0	0	4	38	5,848	4	108	19,500
Calves	5	62	1,845	4	342	23,850	3	115	8,755
Heifers	0	0	0	1	5	975	2	17	1,625
Bulls	4	4	760	6	18	3,978	2	6	2,325
Total	11	76	3,845	16	423	36,951	15	299	39,180
Control Area									
Cows	8	32	4,408	8	35	4,429	4	38	6,180
Cows with Calves	1	4	770	3	16	2,565	4	23	4,422
Calves	3	35	1,895	2	11	785	1	14	1,120
Heifers									
Bulls	3	3	610	3	3	615	1	1	300
Total	10	74	7,683	8	65	8,394	7	76	12,022

Table 34

Agricultural Income and Expenses of the 26 Study Area and 34 Control Area Operators in 1963, 1965 and 1967 [1]

Item	Study Area			Control Area		
	1963	1965	1967	1963	1965	1967
Gross Income						
Crop	$370,313(23)	$461,943(24)	$303,338(23)	$476,937(31)	609,590(32)	432,191(31)
Cattle Sales	82,999(21)	104,937(19)	150,406(20)	31,115(25)	39,387(26)	39,901(22)
Government Payments	3,628 (6)	9,107(10)	65,095(17)	12,781(19)	8,758(11)	103,579(32)
Custom Work	12,300 (8)	19,500 (5)	11,373 (6)	13,530(10)	12,414 (5)	6,085(10)
Other Farm Income [2]	9,380 (4)	18,740 (5)	25,500 (4)	1,718 (6)	1,558 (3)	1,910 (5)
Total Income	478,620	614,227	555,712	536,081	671,707	583,666
Average Income Per Operator	18,408	23,624	21,373	15,767	19,756	17,167
Cash Expenses						
Operating Expenses	299,527(26)	360,080(26)	310,599(26)	357,198(34)	373,202(34)	376,257(34)
Cattle Purchased	3,845(11)	36,951(16)	39,180(15)	7,683(10)	8,394 (8)	12,022 (7)
Total Expenses	303,372	397,031	349,779	364,881	381,596	388,279
Average Expense Per Operator	11,668	15,270	13,453	10,732	11,223	11,420
Net Cash Operating Income						
Total	175,248	217,196	205,933	171,200	290,111	195,387
Average Per Operator	6,740	8,354	7,920	5,035	8,533	5,747

[1] Figures in parentheses represent number of operators.

[2] Includes income from the sale of poultry, hogs, horses and sheep.

Cattle purchases may reflect some build up of herds and thus may not be fully an operating expense. However, due to the frequency of trading of livestock, the inclusion of purchases should give a more accurate pattern of cash operating incomes.

approximately correct except perhaps for cotton marketing.

Between 1963 and 1965, total gross crop income increased about 25 percent in the study area compared to a 28 percent increase in the control area. But, between 1963 and 1967, this income declined in both areas, about 18 percent in the study area and 9 percent in the control area. While their total crop income decreased, study area operators were steadily increasing the use of feed raised as an input to their livestock enterprise. Control operators were doing just the opposite. It is obvious that 1965 was a bumper year in both areas as crop incomes rose sharply from 1963 levels and then fell back in 1967.

Cattle Income. - The gross cattle income reported here is that derived from sales of cattle during the years studied. Table 36 presents in detail the number of head and dollar value by type, year and area. Tables 34 and 35 present the totals and the percentage changes, respectively.

Most operators with cattle sold some during each year, but in a few cases, operators reported no sales. These operators were usually holding their cattle over to the next year for tax reasons or keeping their heifers to increase their breeding herds. Since most of the operators in both areas had cow-calf enterprises, calves from six to eight months of age (about weaning age) represented the bulk of the cattle sold each year. From Table 36, it can be seen that the number of operators selling cattle changed very little between years studied, regardless of area. But the operators of both areas increased the number of cattle sold between these years. On a dollar value basis,

Table 35

Percent Changes in Income and Operating Expenses of the
26 Study and 34 Control Area Operators for the Years 1963, 1965 and 1967

Receipts	Study Area			Control Area		
	Change Between Years			Change Between Years		
	1963-1965 (Percent)	1965-1967 (Percent)	1963-1967 (Percent)	1963-1965 (Percent)	1965-1967 (Percent)	1963-1967 (Percent)
Gross Income						
Crops	24.7	- 34.3	- 18.1	27.8	- 29.1	- 9.4
Cattle Sales	26.4	43.4	81.2	26.6	1.3	27.9
Government Payments	151.0	614.8	1694.0	-31.5	1082.7	710.4
Custom Work	58.5	- 41.7	- 7.5	- 8.2	- 51.0	- 55.0
Other Farm Income	99.8	36.1	171.9	- 9.3	22.6	11.2
Total Farm Income	28.3	- 9.5	16.1	25.3	- 13.1	8.9
Expenses						
Operating Expenses	20.2	- 13.7	3.7	4.5	0.8	5.3
Cattle Purchased	861.0	6.0	919.0	9.2	43.2	56.5
Total Expenses	30.9	- 11.9	15.3	4.6	1.8	6.4
Net Cash Operating Income						
Total	24.0	- 5.2	17.5	69.5	- 32.6	14.1

Table 36

Cattle Sales of the Study and Control Area
Operators in 1963, 1965 and 1967

	1963			1965			1967		
	Operators Number	Head Number	Value Dollars	Operators Number	Head Number	Value Dollars	Operators Number	Head Number	Value Dollars
Study Area									
Cows	4	11	1,633	9	147	21,840	9	96	14,357
Cows with Calves	1	7	1,100	2	54	9,830	3	48	9,819
Calves	18	816	79,849	17	744	69,299	19	891	112,155
Heifers							2	25	3,050
Bulls	2	2	417	4	7	3,968	6	38	11,025
Total	21	836	82,999	19	952	104,937	20	1,098	150,406
Control Area									
Cows	11	43	4,301	6	26	3,720	8	39	4,880
Cows with Calves				3	18	3,560	4	9	1,239
Calves	26	242	25,853	26	299	31,707	22	294	32,507
Heifers	1	1	150						
Bulls	3	4	811	2	2	400	3	4	1,275
Total	26	290	31,115	27	345	39,387	22	346	39,901

the 1963-65 percentage increase was about 27 percent for both areas. However, the 1963-67 percentage increase was 81 percent for the study area and 28 percent for the control area. Based on 1963-65 cattle sales for the two areas, there is no evidence that the highway caused operators along the route to increase their sales of cattle. However, certain small operators reported that they did so. The latter gain in sales reflects again that study area operators have accelerated their shift to cattle enterprises.

Other Farm Income. - Other farm income includes that from all other farm products that were sold by the two groups of operators. The only sizable operation included in this category was a poultryman in the study area. Such sales made up a large portion of his other farm income as shown in Tables 34 and 35. The balance of the income in this category came from two operators each selling a few head of hogs, horses or sheep, these being an insignificant part of their overall operations. Other farm income in the study area increased considerably between the years studied, while in the control area it decreased between 1963 and 1965 and then increased between 1965 and 1967 enough to give a small increase between 1963 and 1967.

Government Payments. - The amounts of and changes in government payments of all types are presented in Tables 34 and 35. The amounts of government payments showed a substantial increase in 1967 for both groups of operators. This is a result of a new cotton program. In the past, farmers received around 30 cents per pound for their cotton. In 1967, they received about 20 cents per pound at the market and then

were paid additional money for each pound harvested as well as for diverting any acreage from cotton production that particular year. This program, therefore, lowered the amount the farmer received for his cotton at time of sale, but the difference was made up by the government program.

These payments increased significantly between the years in the study area. In the control area, the payments declined between 1963 and 1965 and then increased between 1965 and 1967. Between 1963 and 1967, the study area had a 1694 percent increase, while the control area had a 710 percent increase. A greater proportion of control area operators (32 of 34) received payments in 1967 than did study operators reflecting the dominance of crop farming in the control area.

Custom Work Income. - Income from custom work was received by some of the operators. This usually consisted of income from hay baling or harvesting grains or cotton. But in the later years, as farm sizes in general continued to increase, more farmers were buying their own harvesting machinery in an effort to reduce the expense of harvesting their crops. Also, by having their own equipment, farmers could harvest crops at the most desirable time.

Between 1963 and 1965, as shown in Tables 34 and 35, study area income from custom work increased about 58 percent while such income in the control area decreased eight percent. Perhaps the study area increase was due to the reduction of acreages taken for right of way purposes. However, between 1963 and 1967, income from this source decreased in both areas but by only a small percentage in the study

area. The amounts of such income were relatively small and less than a third of the operators engaged in such work.

Net Income

The "net income" derived here does not take into account all the expenses that should be charged against the gross income of the farm operation. Depreciation of farm buildings and equipment generally could not be determined. Interest on the total investment, much of which was implicit, also was not readily determinable. Changes in indebtedness were not available and data on crop and livestock inventories could not be developed to a reliable degree. However, by having a control area to compare with the study area, the need for such adjustments is somewhat lessened. It is assumed that the control area was reasonably comparable to the study area during 1963 and that it experienced the same changes (relatively) as that experienced by the study area, except those caused by the highway.

After all expenses were subtracted from the gross income as shown in Tables 34 and 35, it was found that the study area operators had a higher yearly net income than those in the control area in 1963 and again in 1967. Between 1963 and 1965, the control area operators experienced a 69.5 percent increase in net income compared to a 24.0 percent increase for the study area operators. The difference is directly related to higher crop yields in the control area full operations. However, between 1965 and 1967, the control area experienced a 32.6 percent decrease in net income, while the study area experienced

only a 5.2 percent decline. Between 1963 and 1967, study area operators had a 17.5 percent increase and those in the control area had a 14.1 percent increase.

Because of the variations and size of the overall operations in relation to the amount of land affected by the relocation of the highway, it is difficult to isolate or to determine the effects that the highway had on the annual income from agricultural sources of the study area operators. However, based on the comparisons of study area and control area operations, it appears that the 26 study area operators increased their average income even though they lost acreage to the highway right of way. The amount of their increase may have been depressed by right of way takings, but the biggest factor in the difference appeared to be the smaller proportion of cropland acreage in the study area.

Changes in Travel Requirements

When a limited access type highway is routed through an area, one of the main concerns of operators along the route is the extent that travel in the area will be affected. Of particular interest to the operator is travel required to service his severed tracts or to reach nearby shopping areas. Therefore, this study will be primarily concerned with travel to the nearest shopping facilities and all travel connected with operating the right of way and other non-right of way tracts in an operation.

Travel to Nearest Shopping Areas

Distances were calculated from each operator's home to the nearest town and to Waxahachie, the county seat of Ellis County, on the before and after routes. Since eight of the study area operators lived in one of the four towns in the area, they were omitted from this phase of the study.

Travel patterns to nearby small towns were analyzed along with the travel to Waxahachie. The three small towns in the area (Forreston, Italy and Milford) offer some of the more common household items and farm supplies needed by the study area farms. These towns apparently have been hurt some by loss of through traffic which no longer use the old route U. S. Highway 77. A number of service stations and restaurants have closed making the towns less attractive to local residents.

It was found that Interstate 35E did not significantly change the routes or length of trips for operators to the nearest town. Only Operator 16 experienced a noticeable change, because he is now forced to take a different route to Italy. No frontage road was constructed on the northwest side of the Interstate which would have been his nearest route to town.

Of the 30 operators living on their headquarters tracts, nine lived on farms located between Forreston and Waxahachie. These operators were unable to conveniently utilize the new route to Waxahachie, because there is no interchange on the Interstate between the two towns. Since they have to continue using the old route, U. S. 77, to Waxahachie, they experienced no changes in their travel to or from

town. However, now that through traffic has been diverted to Interstate 35E, U. S. 77 should be a safer and a much more convenient route for these operators as well as other local residents.

Four other operators living in the vicinity of Forreston were unable to save distance by using the new route when making trips to Waxahachie. Three of the operators had access to the new route at Forreston; but they reported that, due to the maneuvering required to get on and off of the facility, they found it more convenient to continue using the much less traveled U. S. 77. However, these operators reported that on longer trips such as trips north to Dallas or Hillsboro to the south, they used Interstate 35E and found the travel most enjoyable and time saving.

The other 16 operators experienced some changes in their trips to Waxahachie. The changes in trip lengths to Waxahachie by the various types of roads for the 16 operators are shown in Table 37. All of these operators are located 14 miles or more southwest of Waxahachie. The mileage to Waxahachie is shortened when they use the new route. Those operators (the first three in Table 37) living near of just southwest of Italy, the second town south of Waxahachie, were able to utilize 12 miles of the new route. By entering Interstate 35E near Italy, Operators 7, 8 and 10 could use the new route and save .7, .2 and 1.8 miles, respectively, on one-way trips to Waxahachie. The next seven operators in Table 37 reported that for trips to Waxahachie they usually got onto the new highway at an intersection just south and west of Italy, and drove the 13.4 miles which replaced from 14.2 to 18.3

Table 37

Mileage Changes in One-Way Distances to the County Seat, by Type of Road for Those Farmers Who had Their Travel Routes to Waxahachie Affected by the Construction of Interstate 35E[1]

Operator	Types of Roads										Distance Saved on Trips
	U. S. Highway		County Roads		Private Roads		Farm to Market Roads	Interstate Highway	Total		
	B[2]	A[3]	B	A	B	A	A	A	B	A	
7	14.2	1.4	1.5	.6			1.0	12.0	15.7	15.0	.7
8	14.2	1.4	.2	.8				12.0	14.4	14.2	.2
10	14.2	1.4	1.2	.2				12.0	15.4	13.6	1.8
11	14.2	1.4	1.2					13.4	15.4	14.8	.6
12	14.2	1.4	1.4	.2				13.4	15.6	15.0	.6
13	16.2	1.4	.1	.8				13.4	16.3	15.6	.7
5	16.2	1.4	.1	.8				13.4	16.3	15.6	.7
21	17.0	2.2		.8	.1	.1		13.4	17.1	16.5	.6
16	18.0	3.2		.8				13.4	18.0	17.4	.6
17	18.3	3.8		.8	.1	.1		13.4	18.4	18.1	.3
29	19.4	1.4	.5	.1				17.4	19.9	18.9	1.0
18	19.4	1.4	.1	.2				17.4	19.5	19.0	.5
19	19.4	1.4	1.0	.5				17.4	20.4	19.3	1.1
22	19.4	1.4	1.1	.6				17.4	20.5	19.4	1.1
20	19.4	1.4	1.2	.7				17.4	20.6	19.5	1.1
23	18.0	3.2	1.0	1.8				13.4	19.0	18.4	.6
Totals	271.7	29.2	10.6	9.7	.2	.2	1.0	230.2	282.5	270.3	12.2
Averages	16.98	1.82	.66	.61	NA	NA	NA	14.38	17.6	16.8	.76

1/The mileages shown are assumed distances. They are based on the shortest possible route that a given operator could take to Waxahachie before and after completion of the Interstate route.

2/Before

3/After

miles on the heavily traveled U. S. 77 required during the before period. To take advantage of the 13.4 miles of Interstate 35E, some of the seven operators had to drive slightly greater distances on other roads than previously. The overall saving in distances ranged from .3 to .7 miles. This decrease in mileage might be considered small, but the 13.4 miles of freeway travel is an improvement over their previous route. This group of operators reported that they rarely use old U. S. 77 now because of safety and time saved on the freeway facility. However, all operators using the Interstate route on trips to Waxahachie have to drive 1.4 miles on U. S. 77 in order to reach the business district.

The five operators living near Milford had to drive 19.4 miles from Milford on U. S. 77 and through two small towns to reach Waxahachie before the new highway was constructed. Now they can drive 17.4 miles on the new facility, saving about two miles.

During the first and second interviews, most of the operators voiced disapproval with the design of the highway because of limited access to the facility which provided only four interchanges for the local residents to get on or off the facility. However, by 1967, after driving on the facility for a year, the operators along the route were much more complimentary of the design, indicating its advantages in time saved, convenience and safety.

All the control area operators reported that they also considered Waxahachie as being their primary shopping center. Like the study area, they used the small towns for some of the more common household items

also. These operators lived from 1.5 to 25 miles from Waxahachie. The average trip length for the 34 control area operators was 12.1 miles of which all but about .2 of a mile was on paved roads.

Eight of the operators lived in one of the small towns south of Waxahachie. Five of these operators lived in one of the three towns near Interstate 35E; therefore, they had access to the highway if they wished to use it. Fifteen other operators, living south and east of Italy, can use either the Interstate 35E or old U. S. 77 to drive to Waxahachie. However, there are a number of paved farm-to-market roads serving the area and the operators make considerable use of these roads for local trips, but these roads are rather narrow and have sharp curves that make driving more difficult. Therefore, those operators living southeast of Italy frequently drive a mile or two farther in order to utilize 13 to 17 miles of Interstate 35E on trips to Waxahachie.

Travel to Tracts in Farm Operations

Since most operators travel frequently to the various tracts in their operations, it was considered desirable to establish whether the distances between tracts were affected by the new Interstate 35E. Table 38 presents total one-way distances traveled to the various tracts in the total operations of study and control area farmers before and after the construction of the new highway. Distances in the before period were computed from each operator's headquarters or from his home to the various tracts in his operation. The same was done in the after

Table 38

One-Way Mileage by Type of Road from Headquarters of 36 Study Area Operators and 34 Control Operators to All Tracts Operated Before and After the Highway

	Study Area Operators[1]		Control Area Operators[2]	
	Before	After	Before	After
Interstate 35E	0	30.0 (13)	0	0
U. S. Highways	119.5 (17)	104.4 (19)	17.5 (3)	18.0 (3)
Paved	250.6 (16)	248.2 (16)	73.5 (22)	88.2 (22)
County	178.9 (26)	194.3 (32)	36.3 (14)	40.1 (14)
Private	8.1 (5)	11.0 (9)	2.4 (3)	4.5 (4)
Total Mileage	557.1 (28)	587.9 (28)	129.7 (26)	150.8 (26)
Change Between Period	30.8		21.1	

1/ No mileage was recorded for eight study area operators in the before period as they had only one tract. Some were divided by highway and had extra miles in after period. The number of operators is in parentheses.

2/ No mileage was recorded for eight control area operators with only one tract.

period, except that the travel required to reach each severed tract being operated was also recorded for the study area operators.

Study Area Travel. - As shown in Table 38 in the before period, the 28 study area operators with more than one tract had to travel 557.1 one-way miles in order to reach the 62 tracts in their operations. Eight others had only the right of way tract in the before period, therefore had no travel requirements at that time. The 26 multitract control area operators had to travel 130 one-way miles to reach 57 tracts in the before period. Based on the changes in the distances between periods as shown in Table 38, it appears that distances to tracts were increased for both groups of operators. However, the 21.1 mile increase shown for the control group resulted entirely from two operators changing their headquarters. One operator added 25 miles to his travel, and the other operator reduced his travel by 3.9 miles.

It appears that practically all of the 30.6 mile increase experienced by the study area operators was extra travel to serve tracts severed by Interstate 35E. However, confronted by a barrier such as the limited access highway, operators sometimes alter their use of other roads, too. In the before period, 17 operators used U. S. Highway 77 for 119.5 miles. In the after period, two additional operators reported using the old route but for fewer miles. These types of changes result from operators having to take alternate routes in an effort to reach the severed tracts across the highway. The frontage roads of the new facility are used extensively by the operators to reach their severed tracts, but the distances traveled are usually less

than a mile. The increase in mileage traveled on unpaved roads was directly related to the highway cutting through the farms. The operators had to use more of the county roads in order to reach one of the six crossovers or four interchanges in an effort to get to their land on the other side. For a more detailed presentation, Table A-7 in the Appendix A shows the changes in travel of each the 36 study area operators.

The operators in the study area were questioned regarding the number of trips required to maintain operations on the severed tracts in 1967. Table 39 presents trip frequencies and total miles driven annually in connection with crop and livestock operations on the severed tracts. The distances used represent the increase or decrease in miles required to reach the severed tracts after the highway route was completed.

Twenty-four operators reported that their travel connected with operating the remainder tracts was affected. Operators 3, 6, 8, 10 and 11 had two right of way tracts involved, while operator 14 had four tracts. All other operators had only one tract each in which extra travel was required.

The operators reported five different types of trips to their tracts. In crop production, movements with farm machinery create the most concern to the operators with other trips in a pickup or a car being of less importance. For those operators with livestock, trips to feed livestock were regarded as the most inconvenient.

Of the 24 operators shown in Table 39, 22 operators had extra

Table 39

Extra Travel Required Annually for 24 Study Area Operators of Severed Tracts in 1967

Operators	Mileage Factor[1]	Crop Production				Livestock Production						Totals	
		Farm Machinery		Inspect and Manage		Feeding		Inspection		Hauling		Number	One-Way
		Trips	Miles	Trips	Miles	Trips	Miles	Trips	Miles	Trips	Miles	of Trips	Miles
1	0.3	15	5	-	-	150	45	40	17	10	5	215	72
3	1.0	60	60	50	50	-	-	-	-	-	-	110	110
5	1.1	25	28	10	11	100	110	75	83	4	4	214	236
6	0.6	25	15	10	6	200	120	75	46	15	9	325	196
7	0.6	10	6	5	3	-	-	25	15	5	3	45	27
8	0.6	60	36	90	54	270	162	180	108	25	15	625	375
10	4.2	50	210	40	168	-	-	-	-	-	-	90	378
11	0.1	15	2	5	1	120	12	50	5	5	1	195	21
13	1.0	15	15	10	10	-	-	-	-	-	-	25	25
14[2]	3.5	60	210	80	280	-	-	-	-	-	-	140	490
15[2]	-0.9	10	- 9	30	- 27	-	-	-	-	-	-	40	- 36
16	0.8	75	60	10	8	-	-	-	-	-	-	85	68
17	0.9	15	14	10	9	-	-	-	-	-	-	25	23
20	2.3	35	81	10	23	150	345	75	173	15	35	285	657
22	2.1	25	53	20	42	-	-	40	84	12	24	97	203
23	2.5	-	-	-	-	40	100	25	63	5	12	70	175
29	0.2	-	-	-	-	50	25	25	12	10	5	85	42
33	0.1	15	2	10	1	-	-	-	-	-	-	25	3
34	0.5	20	10	15	8	-	-	-	-	-	-	35	18
35	2.5	30	75	40	100	-	-	-	-	-	-	70	175
37	1.0	100	100	50	50	150	150	150	150	10	10	460	460
40	0.7	50	35	40	28	-	-	-	-	-	-	90	63
41	1.9	4	8	-	-	125	238	200	380	20	38	349	664
43	0.5	25	13	30	15	-	-	-	-	-	-	55	28
Totals		739	1029	565	840	1355	1307	960	1136	136	161	3755	4473
Averages		34	47	28	42	136	131	80	95	11	13	156	186

[1] Amount of extra mileage required based on the "before" and "after" distance to tracts.

[2] This operator had his distance shortened to his tract.

travel connected with crop production and 12 had trips connected with their livestock operations. Ten operators had trips connected with both their crops production and livestock operations.

The 22 operators with crops reported making 1,304 trips amounting to 1,869 one-way miles in 1967 to produce and harvest their crops. A little over one-half of the trips was made with farm machinery which also includes the trips made in trucks used for hauling the harvested crops to market. Trips connected with crop production per operator ranged from a low of 4 trips to a high of 150 trips. Operators averaged about 60 trips each connected with crop production compared to about 200 trips for each livestock operator. Operators 6 and 8 had cattle on two severed tracts which are partly responsible for the large number of trips connected with the livestock operations.

The combined totals shown in Table 39 amount to 4,473 one-way or 8,946 round trip miles driven by the 24 operators in maintaining operations on the severed tracts. This is an average of 372 miles of extra travel required per operator. Ten of the operators with extra travel were renting one or more right of way tracts. These Operators were 6, 8, 10, 14, 16, 17, 33, 35, 40 and 43. Owner-operators are not as critical of the present conditions as those renters that find the divided tracts less desirable to operate after being cut up into smaller parcels. For example, Operator 14 has four rented right of way tracts that were severed. In his 1967 operations, he had to travel 756 extra round trip miles in connection with his crop production. This is an extreme case for this area, but the operator received no concessions

from the landlord for the inconvenience and expense encountered in operating the much smaller remainder tracts.

Control Area Travel. - Information was also gathered from the control area operators regarding their travel connected with multiple tract operations. Travel patterns of the 26 operators are shown in Table 40. Seven of the operators lived in one of the nearby towns and one on a rural tract which was not considered his headquarters. Therefore, the mileage was recorded to their headquarters. Five of the seven operators had only the one tract. For remaining operators, the distances were recorded from headquarters to all other tracts in the operations.

As mentioned earlier, the control area farmers, with the exception of a few, had operations that were much more concentrated. In only two cases, did the operators have to travel as much as 20 one-way miles in order to reach their various tracts in the before period. On the average, the 26 operators had to travel five miles each to reach their 57 tracts, making up their total operations. The eight operators not living on their headquarters tract, traveled an average of 3.6 miles to reach their headquarters tract. From the headquarters to all other tracts, 19 operators had to travel a little over five miles each to maintain operations.

The changes in mileages in the after period were caused by several operators adding or dropping tracts and the two operators changing their headquarters. Operators 5 and 15 moved their headquarters, thereby causing changes in mileages to the other tracts. Operator 5

Table 40

Travel Distances of 26 Control Area Operators
That had Multiple Tract Operations
in 1963 and 1967

Operator Number	Before Highway				After Highway				Change in Mileage
	Tracts Travel is Required To Reach Number	Distance to Headquarter Tract Miles	Distance to Other Tracts Miles	Total Miles	Tracts Travel is Required To Reach Number	Distance to Headquarter Tract Miles	Distance to Other Tracts Miles	Total Miles	
1 1/	1		1.0	1.0	2		1.3	1.3	+ .3
2 1/	8	2.0	19.5	21.5	6	2.0	15.5	17.5	- 4.0
3	1		2.3	2.3	0		0	0	- 2.3
4	0		0	0	5		15.0	15.0	+15.0
5 2/	4		9.0	9.0	4		18.0	18.0	+ 9.0
6 1/	3	.5	5.5	6.0	2	.5	3.0	3.5	- 2.5
7	2		2.6	2.6	2		2.6	2.6	0
8	1		.1	.1	1		.1	.1	0
9	1		2.0	2.0	2		2.5	2.5	+ .5
10 1/	1	2.5		2.5	1	2.5	0	0	0
11	4		24.1	24.1	5		33.1	33.1	+ 9.0
12	1		.5	.5	1		.5	.5	0
14 1/	1	8.4	0	8.4	1	8.4		8.4	0
15 3/	5		4.8	4.8	3		29.9	29.4	+25.1
16	2		1.0	1.0	3		1.6	1.6	+ .6
17	4	2.4	8.5	10.9	4	2.4	8.5	10.9	0
18 1/	1	3.0		3.0	2	3.0	1.5	4.5	+ 1.5
19 1/	1	7.0		7.0	1	7.0		7.0	0
20	4		2.7	2.7	4		2.7	2.7	0
21	1		2.0	2.0	2		4.3	4.3	+ 2.3
22	5		5.0	5.0	6		6.3	6.3	+ 1.3
23	1		2.8	2.8	1		2.8	2.8	0
24	0		0	0	2		6.1	6.1	+ 6.1
25 1/	1	3.2		3.2	1	3.2		3.2	0
26	1		.8	.8	1		.8	.8	0
27	2		6.5	6.5	1		2.5	2.5	- 4.0
Total	57	29.0	100.7	129.7	63	29.0	158.6	187.6	+57.9

1/ Operators live in town
2/ Operating same tracts but changed headquarters from Leased tract to their own tract
3/ Operator changed headquarters

built a new home on another tract from where he had been living, which shortened his travel. Operator 15 moved to an 800 acre tract located about 20 miles from his previous headquarters tract. The move increased his overall travel by 25.1 miles. All other changes resulted from adding or dropping tracts.

Control area operators reported that they made from 20 to 50 trips a year with farm machinery to a tract depending on the variety of crops planted and size of tracts. The livestock operators reported that, in most cases, the cattle were kept on the headquarters tract. Therefore, very little travel was required, except in a few cases where cattle on other tracts had to be cared for. In these cases, the trips average about 100 per year.

BENEFITS DERIVED FROM HIGHWAY CONSTRUCTION

Right of Way Sales

Study Area Sales. - Between 1963 and 1967, eight owners of tracts affected by right of way acquisition for Interstate 35E sold parts of or all of the remainder. Five owners sold their entire remainders of which four are shown in Table 41. The other operator, owner of a 72 acre tract before the Texas Highway Department acquired 15 acres for right of way, sold the remaining 24 acre and 33 acre tracts to a member of his immediate family. This sale was not considered a bona fide market sale, so it was not included in the analysis. The three other operators sold small tracts for rural residences.

The land in the four tracts presented in Table 41 remained in

Table 41

Sale of Land Affected by Right of Way Acquisition for Interstate 35E

Tract Identification and Tenure[1]	Before Highway		Right of Way Taking			Sale of Remainders		
		Appraised		Payment				
	Acres	Value of Whole	Acres	Land	Damages	Date	Acres	Value
3a (R)[2]	202	$ 53,000	34	$ 8,280	$ 9,355	9/64	69	$ 20,754
						1/65	38	11,525
						3/65	61	18,288
19 (0-0)	74	26,025	13	2,575	7,225	6/64	40	7,500
						7/66	21	7,500
42 (R)	123	32,500	3	930	0	1/66	120	42,000
23 (0-0)	160	38,080	26	4,860	10,440	8/67	88	22,737
							46	
Totals	559	$149,605	76	$16,645	$27,020		483	$130,304
Average Value Per Acre		268		219	74[3]			270
Size of Tracts								
Average Per Tract	139						60	
Average Per Owner	139						69	

1/Refers to tenure at time of sale. (0-0) stands for Owner-Operator, (R) stands for Renter-Operator.

2/This tract of land is Case 266 in the "Texas Right of Way Remainder Parcel Report", conducted by the Right of Way Division of the Texas Highway Department.

3/Refers to damage per acre of remaining land.

agricultural land before and after the right of way acquisition. The new owners plan to continue using the land for agricultural production. Tracts 3a and 42 were in crop production before and after the property changed hands. Most of tracts 19 and 23 were in crop production before right of way was acquired. But after the highway bisected each of these tracts, the owners began converting the cropland on the remainders to improved pastures for livestock. The new owners are continuing to use them for livestock production.

At the time of right of way acquisition, the 559 acres in the four tracts were appraised at an avarage of $268 per acre. Seventy-six acres were acquired for right of way at a total cost of $16,645 or an average of $219 per acre for the land. Three of the owners received an

additional $27,020 in damages to their seven remaining tracts which contained 363 acres. This amounts to $74 per acre for the 363 acres. A large portion of the damages was based on the tracts being severed or divided by the highway.

As shown in Table 41, the four owners sold all eight remaining tracts containing 483 acres of land to seven different individuals for a total of $130,304 or an average of $270 per acre. This compares favorably to the $268 per acre appraised value of the whole properties before the right of way was acquired. When the $16,645 payment for the right of way takings is added to $130,304 received for remainders, the total amount received is $146,645. This is only 1.8 percent less than the appraised value of the original whole right of way tracts. On a per acre basis, this amounts to $5.30 per acre less than the before value. However, when the $27,020 that the owners received for damages is included, the total amount received for the 559 acres is $173,969 or an average of $311 per acre. This value is 16 percent greater than the appraised values of the four original tracts.

According to a land value study conducted by the Texas Agricultural Experiment Station and Extension Service, agricultural land in the area of Ellis County increased 82 percent in value from 1960 to 1965 and increased 34 percent from 1963 to 1965.[1/] The increase was based on land sales of tracts of 20 or more acres of land selling in Ellis County during 1960, 1963 and 1965. Per acre land prices increased

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[1/] Bulletin 1063. Trends in Texas Farm and Ranch Land Market, Texas A&M University, Texas Agri, Exp. Sta. and Extension Service, April, 1967.

from $149 in 1960 to $202 in 1963 and then to $271 in 1965. These values indicate the market value trends of the general area.

The 34 percent increase in land values in the Ellis County area from 1963 to 1965, tends to indicate that the increase of only 16 percent in value of right of way tracts from 1963 to time of sale was not in line with the average increase in land values throughout the county. One must also consider, however, that the average value per acre of the right of way tracts was about 32 percent greater in 1963 than the county average. Comparing the sales value of the right of way tracts to the $271 county average in 1965, the difference is only 15 percent.

Individually, the right of way tracts varied in value depending on the fertility of the soil, type of improvements, size and shape of tracts and suitability for other uses. Tracts 3a and 42, located in the northern part of the study area and of deep black soil, were considered by operators in the area as excellent farm land. The other two tracts, located in the southern part of the study area and of lighter soil, were not as desirable for farming.

A detailed study of Tract 3a was conducted as Case Study Number 266 in the "Texas Right of Way Remainder Parcel Report", published by the Texas Highway Department in 1965. The original tract was bisected in such a manner that three remainders were left. The original operator of the tract released it after the highway route was established. He reported that it would be too difficult to farm the triangular

shaped tracts with his six-row equipment and inconvenient to get from one tract to others. Each of the remaining tracts sold to different parties in 1964 and 1965. The three new owners rented all three tracts to one operator.

Case Study 266 reported that each tract sold for an average of $300 per acre for a total of $50,567 for the three tracts. This value is greater than the $44,720 appraised value of the remainders at the time of acquisition. According to the analysis of the case study, the $5,847 or 13.1 percent difference indicated that the remainders were not damaged by right of way activity. This was based on the assumption that there had been practically no change in land values in the county which is contrary to the 34 percent increase in land prices in the county from 1963 to 1965 as indicated by the Texas Agricultural Experiment Station study.

Tract 42 in Table 41 was being operated by a renter when three acres were acquired from one corner of the tract for right of way. The 123 acre tract was appraised for $264 per acre before acquisition. In 1966, the remaining 120 acres sold for $350 per acre to Operator 35 of the study area. The previous operator had farmed the tract for a number of years before the right of way acquisition, but he released it when the new owner gained title. Based on the before and after value, the value of this property increased $86 per acre or almost 33 percent. This tract was excellent cropland and the new owner plans to continue cultivating the entire acreage.

Tract 19 in Table 41 contained 74 acres before 13 acres was acquired for right of way. The highway bisected the tract leaving 40

acres across the highway from the headquarters which contained 21 acres. The tract had been purchased for about $125 an acre two years before right of way acquisition. The property appraised for $350 per acre in 1963, with the improvements, and an old peach orchard was the major factor influencing the high value. The owner was paid $200 per acre for the acreage acquired and $97 per acre damages to the remaining 61 acres. About $1,300 of the $7,225 received in damages was for peach trees. The $1,300 was not included in the $97 damage per acre mentioned above. The owner sold the 40 acre remainder in 1964 for $7,500 or about $187 per acre. The tract has been idle since purchase, because the new owner has it in the government soil bank program. The other 21 acre remainder with home and barns was sold for $7,500 in 1966. The new owner has been using the place primarily as a rural residence but also has a few head of livestock.

The original owner of Tract 19 received a total of $24,800 for the land from all sources. This is $1,250 or 4.8 percent less than the appraised value of the whole property. Based on this comparison, the owner of the property lost money on the transactions. However, considering that the owner actually received $15,550 or 168 percent more than he paid for the tract in 1962, it is evident that land must have been enhanced by the new highway. This operator was actually trying to avoid the new interstate highway when he purchased this tract in 1962. The new highway had been tentatively located about one mile west of this location. The operator owned a tract of land in the area and the highway was routed through his land. He reported that he didn't want

the highway cutting up his place, so he sold out and bought the 74 acre tract. To his regret, the route was shifted to the east, bisecting his new farm. In his opinion, the highway ruined the tract, but he was $15,550 better off financially.

The fourth tract selling was originally a 160 acre tract listed as Tract 23 in Table 41. The highway severed the tract leaving 88 acres on one side and 46 acres on the other. At the time of right of way acquisition, the appraised value of the 160 acres was $38,080 or $238 per acre. The owner received $4,860 or $186 per acre for the 26 acres of land acquired for right of way and $10,440 in damages to the two remaining tracts, containing 134 acres. The $15,300 received from the Texas Highway Department for the 26 acres plus damages represent 40 percent of the $38,080 appraised value of the whole property.

The owner-operator continued using the two remainder tracts but reduced the acreage in cash crops and concentrated more on livestock farming. The two tracts were separated by the highway, but the operator was permitted an equipment and livestock pass under two bridges of Interstate 35E spanning a creek running through the farm. In dry weather, the operator can move farm equipment along the bank of the creek from one tract to another. Livestock can move through any time.

In 1967, the owner sold the two remainders to a local resident for $22,737 or about $170 per acres. This combined with the $15,300 received from the Texas Highway Department, makes a total of $38,037 that Operator 23 received for the 160 acres. Therefore, he received $43 less than the appraised value of the whole tract before any right

of way was acquired. However, during the construction of the highway, the operator also sold about $8,000 of rock from the tract to the contractor.

Normally, in a 20 mile section of a new interstate route with four intersections, one would expect to find some traffic-serving businesses acquiring land at or near the interchanges. However, by the end of 1967, no such activity had begun in this area. It appears that the service station and restaurant industries had concentrated more on the by-pass routes around Waxahachie to the north and at Hillsboro to the south. These two cities are approximately 30 miles apart, and access to abutting properties is permissible from frontage roads around both of the cities. This is not the case for the 20 mile study section of Interstate 35E.

All but one of the small tracts selling in the area were for rural residence sites. The other tract selling was an 11 acre remainder of Operator 18. The tract was severed from the original 204 acre tract that was appraised for $274 per acre. The 11 acre tract was purchased for $200 per acre by the same operator that purchased the 21 acre remainder from Operator 19 as shown in Table 41. The two tracts join each other forming a long narrow tract about 2,800 feet by 500 feet in size. The tract has 2,800 feet frontage on Interstate 35E on one side and a county road on the other. However, there is no frontage road access on this side of Interstate 35, so the property does not have access.

The other two operators sold small tracts of less than two acres

in size. Operator 1 sold eight lots containing 9.5 acres of land from the remainder with frontage on the east side of Interstate 35 (but no access) and U. S. Highway 77. With an average depth of 350 feet and water provided by a rural water system, the owner was able to sell lots for home sites from the remainder with practically no development cost. The price ranged from $1,000 per acre for the larger plots to $1,500 per acre for the smaller lots. Thus, the average selling price for this 9.5 acres was $1,140 per acre.

Operator 34 located just south of Operator 1 and having a remainder of similar shape, sold a half acre lot fronting Highway 77 for $1,500. This tract was also purchased for a rural residence.

Other small tracts for home sites will probably be sold within the next few years, but the sales will probably occur along Highway 77 due to the no access limitation on properties abutting Interstate 35E.

Control Area Sales. - During the five year period of study (1963 to 1967) only two of the control area tracts sold. This refers to those tracts touching the hypothetical line drawn through the area. Two other control area operators purchased two additional tracts and one operator sold a tract, but these tracts did not touch the control line. The five transactions involved 664 acres of land. The tracts ranged from 68 acres to 187 acres in size with the average being 135 acres.

Sales information was not available on one tract as the seller would not reveal the sale price. This was one of the two tracts touching the control line.

The four other transactions involved 664 acres selling for an average $221 per acre. The price on the four tracts ranged from $190 to $260 per acre. One of the sales occurred in 1964, two in 1965 and two in 1966. The $221 average price per acre was $50 an acre less than the county average of $271 per acre in 1965 as mentioned earlier in the report. Based on general descriptions of the properties changing hands, it appears that only the 119 acre tract selling for $260 per acre in 1965 was classed as good farm land. Of the other tracts selling, two were considered land subject to several overflows per year, and one tract was in an eroded condition at time of sale.

Sod, Rock and Fill Dirt Sales

Owner-Operators. - Five owner-operators (7, 10, 20, 34 and 41) sold a total of 9.5 acres of right of way tract grass sod to the contractors for $2,345. The sales ranged from $150 for one-half acre of sod to $795 for two acres. The price depended on the quality of the sod.

Three owner-operators (10, 11 and 27) sold a total of $6,490 of fill dirt from their right of way tracts. This dirt was used primarily at elevated crossings. Another owner-operator sold $8,000 of white rock which was used as base material for the highway. In each case, the excavation of dirt and rock from the four operators formed lakes from one-half to three surface acres in size.

One owner-operator permitted the contractor of the highway to drill a deep well and install necessary equipment to pump water in

exchange for water from the well. At the end of construction, a new pump was also installed by the contractor. The owner-operator now has a well that would have cost $2,000 to $3,000 to drill and equip.

Landlord-Renter. - Three landlords of Operators 17, 21 and 35 sold 31 acres of grass sod for $3,675. Two of the landlords that sold 8 acres and 21 acres gave the renters $500 and $360 respectively, for their loss in grazing benefits, since it usually takes two to three years to establish another grass cover. Another landlord sold about $8,000 of white rock. No lake was formed in this case, since the rock was removed in strips from the side of a hill.

APPENDIX A - DATA ON A PER OPERATOR AND PER RIGHT OF WAY TRACT BASIS

Table A-1

Size of the Right of Way Takings Related To Individual Tracts and to Operator's Total Operations

Operator and Tract Number	Total Operation at Time of Taking		Right of Way Tract		Right of Way Taking		
	Number of Tracts	Number of Acres	Number of Acres	Percent of Total Operation	Acres Acquired	Percent of ROW Tract	Percent of Total Operation
1	1	231	231	100.0	31	13.4	13.4
2	5	1,049	47	4.5	12	25.5	1.1
3a	14	3,167	201	6.3	34	16.9	1.1
3b			194	6.1	17	8.8	.5
3c			111	3.5	16	14.4	.5
4a	2	240	81	34.0	14	17.3	5.9
4b			159	66.8	16	10.1	6.7
5	1	100	100	100.0	12	12.0	12.0
6a	4	2,131	211	9.9	30	14.2	1.4
6b			300	14.1	2	.6	.1
6c			741	34.8	59	8.0	2.8
7	1	69	69	100.0	9	13.0	13.0
8a	5	638	76	11.9	5	6.6	.8
8b			183	28.7	25	13.7	3.9
8c			205	32.1	14	6.8	2.2
10a	6	588	75	12.8	9	12.0	1.5
10b			75	12.8	7	9.3	1.2
11a	5	353	54	15.3	2	3.7	.6
11b			50	14.2	12	24.0	3.4
12	2	181	160	88.4	2	1.3	1.1
13	3	998	235	23.5	22	9.4	2.2
14a	5	298	73	24.5	9	12.3	3.0
14b			50	16.8	7	14.0	2.3
14c			25	8.4	9	36.0	3.0
14d			83	27.9	17	20.5	5.7
15	2	220	133	60.5	1	.8	.5
16	1	135	135	100.0	26	19.3	19.3
17	3	474	197	41.6	27	13.7	5.7
18	2	361	204	56.5	9	4.4	2.5
19	1	74	74	100.0	13	17.6	17.6
20	4	383	104	27.2	6	5.8	1.6
22	1	70	70	100.0	4	5.7	5.7
23	3	461	162	35.1	26	16.0	5.6
26	1	512	512	100.0	1	.2	.2
28	5	839	92	11.0	27	29.3	3.2
29	1	514	514	100.0	20	3.9	3.9
38a	4	342	83	24.3	11	13.3	3.2
38b			75	21.9	9	12.0	2.6
39	1	312	312	100.0	21	6.7	6.7
Total 26 Operators	83	14,738	6,456	43.8	593	9.2	4.0

Table A-1 (con't)

Operator[1] and Tract Number	Total Operation at Time of Taking		Right of Way Tract		Right of Way Taking		
	Number of Tracts	Number of Acres	Number of Acres	Percent of Total Operation	Acres Acquired	Percent of ROW Tract	Percent of Total Operation
21	2	151	74	49.0	12	16.2	7.9
25	2	278	267	96.0	6	2.2	2.2
27	2	129	72	55.8	15	20.8	11.6
33	3	452	115	25.4	15	13.0	3.3
34	12	2,563	123	4.8	15	12.2	.6
35	4	578	106	18.3	16	15.1	2.8
36	5	812	126	15.5	1	.8	.1
37	4	916	270	29.5	19	7.0	2.1
40	6	1,145	197	17.2	17	8.6	1.5
41a	3	281	113	40.2	14	12.4	5.0
41b			87	31.0	7	8.0	2.5
42	3	531	123	23.2	3	2.4	.6
43a	5	598	53	8.9	5	9.4	.8
43b			84	14.0	26	31.0	4.3
44a	9	815	120	14.7	4	3.3	.5
44b			102	12.5	6	5.9	.7
Total 13 Others	60	9,249	2,032	22.0	181	8.9	2.0
Total Operators	143	23,989	8,488	35.4	783	9.1	3.2

[1] Operators 33, 34, 35, 36, 37, 40, 41, 42, 43 and 44 did not furnish complete operational data on non-Right of Way Tracts in 1963.

Table A-2

Number. Size, Land Use, and Arrangement of 33 Rented Right-of-Way Tracts Operated by 16 Operators Before and After the Location of Highway

Operator and Tract Number	Acres in ROW Tract Before Taking			Acres Acquired For Right of Way			Acres in Remaining Tracts East of IS		West of IS	
	Total	Crop-land	Pasture-land	Total	Crop-land	Pasture-land	Crop-land	Pasture-land	Crop-land	Pasture-land
3a	201	197	5	34	29	5	67-39		62	
4a	81	80		14	14		51		15[5]	
4b	159	137	19	16	16		26		98	19
6a	211	81	127	30	2		30	4	49	95
6b	741	447	263	59	10	28		68	464	146
8a	76	75		5	5	49	25		46	
8b	183	180		25	25		31		124	
10a	75	70		9	9		59		2	
11a	54	54		2	2		52			
12	160	154		2	2				152	
13	235	209	19	22	15	7	176	12	25	
14a	73	66	7	9	9		42	7	15	
14b	50	49		7	7		26		16	
14c	25	25		9	9		5		11	
14d	83	78	4	17	17		26	4	30	
16	135	130	4	26	26		48		57	4
17	197	172	23	27	24	3	98	8	54	
18	204	171	22	9	9		161	22	12[1]	
23	162	75	82	26	16	10	30	58	15	29
26	512	400	112	1		1			400	111
38a	83	59	22	11	6	5	49	14	4[2]	3[2]
39	312	260	49	21	16	5	19[5]		225	44
21	74	63	6	12	8	4	49	2	6	
25	267	137	129	6		6	137	114	0	9
33	115	106	5	15	10	5	91		3	2[1]
35	106	99	4	16	16		75	4	8	
36	126	121		1	1				120	
40	197	159	23	17	16	1	78	22	65	
42	123	121		3	3				118	
43a	53	53		5	5				48	
43b	84	67	13	26	26		26	13	15	
44a	120	78	37	4		4	78	33		
44b	102	85	16	6		6	85	9		1[2]
TOTAL	5376	4258	991	492	353	139	1679	394	2259	463

1/ Idle.
2/ Idle land - also land locked.
3/ Cropland used for grazing only.
4/ Releases tract.
5/ Operators traded land - 15 acres and 19 acres.

Table A-3

Number, Size, Land Use, and Arrangement of 22 Owner-Operated Right of Way Tracts Before and After Location of Highway

Operator and Tract Number	Acres in ROW Tract Before Taking			Acres Acquired For Right of Way			Acres in Remaining Tracts East of IS		Acres in Remaining Tracts West of IS	
	Total	Crop-land	Pasture-land	Total	Crop-land	Pasture-land	Crop-land	Pasture-land	Crop-land	Pasture-land
1	231	184	41	31	21	10		8[1]	40	133
2	47	47	0	12	12		35			
3b	194	184	10	17	17		114	37	25	
3c	111	87	24	16	16		26	56	7	
5	100	86	12	12	8	4	40		28	17
6c	300	279	20	2		2	279	18		1[2]
7	69	56	9	9	9		24[3]		19[3]	15
8c	205	158	38	14	14		16		148	23
10b	75	75	0	7	6	1	1		62	3
11b	50	45	5	12	7	5	2[3]		22	10
15	133	116	17	1	1				115	17
19	74	60	10	13	13		40		8[3]	10
20	104	60	44	6	5	1	42	47	8[3]	
22	70	44	25	4	3	1	37	21		6
27	72	50	22	15	8	7	24		18[3]	15
28	92	89	0	27	27		56[3]		9[1]	
29	514	232	279	20		20		22	232[3]	237
34	123	119	4	15	15		15		60	30
37	270	268	0	19	19		40		165	35
38b	75	73	0	9	9		60		4[2]	
41a	113	88	19	14		14	53[3]	12		16
41b	87	81	6	7		7	75	5		
Totals	3109	2481	585	282	210	72	979	226	970	568

[1] Idle land.
[2] Idle land - also land locked.
[3] Cropland used for grazing only.

Table A-4

Changes in Agricultural Land Use of Right of Way Study and Control Tracts of 36 Study Area and 34 Control Area Operators[1/]

	Study Acres	Control Acres	Study Acres	Control Acres	Study Acres	Control Acres
Cropland	6420(36)	7238(34)	5836(36)	7046(34)	5620(35)	7033(34)
Harvested	4965(35)	5781(31)	4136(34)	5838(31)	3691(34)	5008(31)
Grazed	1036(13)	656(13)	1367(15)	529(14)	1322(16)	729(12)
Gov't Program	244 (5)	639(13)	256 (5)	465(11)	559(19)	1036(33)
Idle and Waterways	175(10)	162 (8)	77(10)	214(16)	48 (9)	260(11)
Pastureland	1606(20)	1421(16)	1582(22)	1415(16)	1749(21)	1389(15)
Woodland	101 (6)	118 (4)	98 (6)	118 (4)	94 (5)	95 (2)
Cleared	1309(17)	716(10)	1021(15)	371 (5)	754(13)	316 (5)
Improved	148 (8)	514 (6)	398(15)	846(10)	860(16)	882(10)
Other Pastureland[2/]	48 (4)	73 (2)	65 (5)	80 (2)	41(41)	96 (3)
Total Acreage	8026	8659	7418	8461	7369	8422

1/ Figures in parentheses represent number of operators.

2/ Includes idle and other unaccounted for pastureland.

Table A-5

Changes in the Operating Expenditures[1/] for Each of the 26 Study Area Operators in Ellis County from 1963 to 1965 and 1963 to 1967

Operators	Amount of Expenditure			Change Between Years			
	1963	1965	1967	1963-1965		1963-1967	
	Dollars	Dollars	Dollars	Dollars	Percent	Dollars	Percent
1	10,446	14,311	13,034	3,865	37.0	2,588	24.8
2	29,164	23,075	22,262	-6,089	-20.1	-6,902	-23.7
3	51,600	71,180	66,400	19,580	37.9	14,800	28.7
4	4,026	5,765	4,807	1,739	43.2	781	19.4
5	4,469	1,298	2,535	-3,171	-71.0	-1,934	-43.3
6	23,357	16,663	21,384	-6,694	-28.7	-1,973	-8.5
7	367	829	931	462	125.9	564	153.7
8	14,465	16,908	18,260	2,443	16.9	3,795	26.2
10	16,611	28,108	26,530	11,497	69.2	9,919	59.7
11	7,494	6,104	8,629	-1,390	-18.5	1,135	15.1
12	2,946	2,605	2,469	-341	-11.6	-477	-16.2
13	18,438	23,871	19,419	5,433	29.5	981	5.3
14	3,185	3,891	10,623	706	22.2	7,438	233.5
15	1,123	1,125	0	2	.2	-1,123	-100.0
16	3,310	4,899	4,090	1,589	48.0	780	23.6
17	2,686	2,005	1,386	-681	-25.4	-1,300	-48.4
18	4,020	3,039	4,362	-981	-24.4	342	8.5
19	415	120	0	-295	71.1	-415	-100.0
20	2,865	4,066	2,715	1,201	41.9	-150	-5.2
22	1,662	2,670	1,204	1,008	60.6	-458	-27.6
23	7,215	820	2,278	-6,395	-88.6	-4,937	-68.4
26	6,579	10,836	3,608	4,257	64.1	-2,971	-45.2
28	11,300	3,650	14,415	-7,650	-67.7	3,115	27.6
29	5,443	4,835	4,595	-608	-11.2	-848	-15.6
38	783	1,586	500	803	102.6	-283	-36.1
39	2,892	4,973	4,274	2,081	72.0	1,382	47.8
Totals	236,861	259,232	260,710	22,371	9.4	23,849	10.4
Averages	9,110	9,970	10,027	860	9.4	917	10.4

[1/] Include all major operating expenses except rent, equipment and livestock purchases.

Table A-6

Changes in Some of the Major Operating Expenditures[1/] for Each of the 34 Control Area Operators in Ellis County from 1963 to 1965 and 1963-1967

Operators	Amount of Expenditures			Change Between Years			
	1963	1965	1967	1963-1965		1963-1967	
	Dollars	Dollars	Dollars	Dollars	Percent	Dollars	Percent
1	7,511	7,481	6,153	-30	-0.4	-1,358	-18.1
2	23,092	21,961	18,745	-1,131	-4.9	-4,347	-18.8
3	4,055	4,087	4,094	32	0.8	39	1.0
4	2,462	2,449	4,381	-13	-0.5	1,919	77.9
5	19,238	11,927	19,756	-7,311	-38.0	518	2.7
6	22,710	21,577	19,961	-1,133	-5.0	-2,744	12.1
7	4,776	1,896	2,941	-2,880	-60.3	-1,835	-38.4
8	5,969	2,653	2,977	-3,316	-55.6	-2,992	-50.1
9	10,220	10,682	14,890	462	4.5	4,670	45.7
10	2,614	2,347	2,505	-267	-10.2	-109	-4.2
11	6,393	8,768	8,584	2,375	37.2	2,191	34.3
12	20,973	20,035	19,183	-938	-4.5	-1,790	-8.5
13	4,446	2,015	1,663	-2,433	-54.7	-2,783	-62.6
14	11,205	12,350	11,495	1,145	10.2	290	2.6
15	15,012	12,558	16,456	-2,454	-16.3	1,444	9.6
16	557	464	654	-93	-16.7	97	17.4
17	3,433	7,625	2,953	4,192	122.1	-480	-14.0
18	17,193	21,644	20,583	4,451	25.9	3,390	19.7
19	6,474	4,506	8,897	-1,968	-30.4	2,423	37.4
20	9,165	6,489	5,165	-2,676	-29.2	-4,000	-43.6
21[2/]	-	-	-	-	-	-	-
22	4,399	8,237	3,459	3,838	87.2	-940	-21.3
23[2/]	800	-	-	-800	-100.0	-800	-100.0
24	5,760	2,471	4,222	-3,289	-57.1	-1,538	-26.7
25	7,803	9,079	9,257	1,276	16.4	1,454	18.6
26	7,564	7,523	9,943	-41	-0.5	2,379	31.5
27	24,223	19,863	18,470	-4,360	-18.0	-5,753	-23.8
28	7,901	5,106	5,244	-2,795	-35.4	-2,657	-33.6
29	6,989	8,626	13,065	1,637	23.4	6,076	86.9
30	2,270	3,320	3,818	1,050	46.3	1,548	68.2
31	5,794	1,307	1,454	-4,487	-77.4	-4,340	-74.9
32	1,826	1,363	5,821	-463	-25.4	3,995	218.8
33	2,952	4,940	2,476	1,988	67.3	-476	-16.1
34	85	466	1,140	381	448.2	1,055	1,241.2
Totals	275,864	255,809	270,405	-20,051	-7.3	-5,459	-2.0
Average expense per operator	8,596	7,994	8,450	-602	-7.0	-146	-1.7

[1/] Include all major operating expenses except rent, equipment and livestock purchases.

[2/] Operator 21 had land in soil bank all three periods, operator 23 - the last two periods and these operators are not included in the averages.

Table A-7

Changes in Distance from Each of the 36 Operator's Headquarters Tract to Other Tracts in His Operation After Construction of Interstate 35E Through Ellis County

Operators[4]	Number of Tracts Before	Number of Tracts After Total	Created by Severance	No. (1) Affected	No.(2) Not Affected	Distance to Tracts Before	Distance to Tracts After	Change in Total Distance	Change on Paved Roads	Change on Gravel Roads
1	1	2	1	1	1	-	.3	.3	-	.3
33	3	4	1	1	3	10.2	10.3	.1	-	.1
34	13	14	1	1	13	94.0	94.5	.5	.4	.1
35	4	5	1	1	4	17.0	19.5	2.5	.8	1.7
2	4	5	1	-	5	9.5	9.5	-	-	-
36	6	6	-	-	6	14.3	14.3	-	-	-
37	5	6	1	1	5	17.5	18.5	1.0	1.0	-
38 (3)	5	7	2	2	5	36.0	36.0	-	-	-
3[5]	12	14	2	2	12	46.9	47.9	1.0	-	1.0
4[4]	5	5	1	-	4	1.3	1.3	-	-	-
39[4]	2	2	1	-	2	-	-	-	-	-
40	6	7	1	1	6	22.4	23.1	.7	-	.7
41 (3)	5	6	1	1	5	4.9	6.8	1.9	1.8	.1
42 (3)	4	4	-	-	4	18.8	18.8	-	-	-
43	8	9	1	1	8	27.9	28.4	.5	-	.5
44	7	7	-	-	7	30.6	30.6	-	-	-
6	6	9	3	2	7	15.0	15.6	.6	.2	.4
26	4	4	-	1	3	18.5	18.5	-	.8	- .8
7	1	2	1	1	1	-	.6	.6	.1	.5
8	6	8	2	2	6	7.5	10.4	2.9	1.4	1.5
10	10	12	2	6	6	17.0	21.2	4.2	3.0	1.2
14	6	10	4	4	6	2.7	6.2	3.5	1.5	2.0
11	5	6	1	2	4	3.0	3.1	.1	.6	- .5
12	1	2	1	1	1	.8	.9	.1	-	.1
13	3	4	1	1	3	2.7	3.7	1.0	.4	.6
5	1	2	1	1	1	-	1.1	1.1	.5	.6
15	2	2	-	1	1	30.4	29.5	- .9	-2.0	1.1
16	2	4	2	1	3	5.5	6.3	.8	-	.8

Table A-7 (Continued)

Operators	Before	After Number of Tracts Total	Created by Severance	No (1) Affected	No.(2) Not Affected	Distance to Tracts Before	Distance to Tracts After	Change in Total Distance	Change on Paved Roads	Change on Gravel Roads
17	3	4	1	1	3	18.0	18.9	.9	.5	.4
28	8	9	1	1	8	66.1	66.2	.1	-	.1
29 5/	1	2	1	1	1	-	.2	.2	-	.2
18 5/	2	2	1	-	2	8.0	8.0	-	-	-
19 5/	1	1	1	-	1	-	-	-	-	-
22	1	2	1	1	1	-	2.1	2.1	1.0	1.1
20	4	5	1	1	4	10.5	12.8	2.3	1.1	1.2
23	1	2	1	1	1	-	2.5	2.5	1.2	1.3
Total	158	195	41	41	153	557.0	587.6	30.6	14.3	16.3

1/ This column refers to the number of tracts to which distance was increased or decreased due to the construction of Interstate 35E. It does not refer to the number of right of way tracts.

2/ This column refers to the number of tracts to which distance was not affected by Interstate 35E.

3/ These operators live in town so distances were measured from their residence to their various tracts.

4/ Operators of rented tracts that traded remainders resulting operations all on the same side of highway.

5/ Operator had one additional right of way tract in 1963, tract sold in 1964 so is not included in Table.

6/ Severed tract sold no extra miles.

APPENDIX B - FREQUENCY DISTRIBUTIONS OF OPERATORS AND RIGHT OF WAY TRACTS BY VARIOUS CHARACTERISTICS

Table B-1

Distribution of 39 Study Area Operators Based on the Relative Importance of Right of Way Tracts to Total Operation

Percentage Range of Acres	ROW Tracts as a Percent of Tracts in Total Operation Number of Operators	Acreage in ROW Tracts as a Percent of Acres in Total Operation Number of Operators
0 - 20	5	7
20.1 - 40	12	10
40.1 - 60	8	6
60.1 - 80	4	4
80.1 - 100 [1/]	10	12

[1/]The ROW tract represented the entire operation for 10 operators in this percentage range.

Table B-2

Distribution of 39 Study Area Operators Based on Right of Way Taking from 55 Tracts as a Percent of Acreage in Right of Way Tracts and in Total Operation

Percentage Range of Acres	ROW Taking as a Percent of Acres in Right of Way Tracts Number of Operators	ROW Taking as a Percent of Acres in Total Operation Number of Operators
0 - 2.5	6	15
2.5 - 5.0	3	8
5.0 - 10.0	8	8
10.1 - 15.0	12	6
15.1 - 20.0	6	2
20.1 - 25.0	2	
25.1 - 30.0	2	

Table B-3

Frequency Distribution of Remaining Right of Way Tracts
Based on the Size of the Original Tract Before Taking

Original Tracts		Remainder Tracts Number of Tracts by Acreage Groups								
Size Group in Acres	Number	0-5	6-10	11-20	21-40	41-80	81-160	161-320	321-640	Totals
20-40	1	1		1						2
41-80	15	5	1	2	10	9				27
81-160	21	2	5	3	4	11	13			38
161-320	15	1	1	3	5	4	6	8		28
321-640	2				1				2	3
641-1280	1					1			1	2
Totals	55	9	7	9	20	25	19	8	3	100

Table B-4

Frequency Distribution of the Remaining Right of Way Tracts Based on Tenure and Size of the Original Tract at Time Taking

Original Tracts		Remainder Tracts								
		Number of Tracts by Acreage Groups								
Size Group in Acres	Number	0-5	6-10	11-20	21-40	41-80	81-160	161-320	321-640	Totals
Owned Tracts										
40-80	8	3	1		8	3				15
81-160	9		3	1	1	5	4			14
161-320	4	1		1	2			4		8
321-640	1				1				1	2
641-1280										0
Subtotal	22	4	4	2	12	8	4	4	1	39
Rented Tracts										
20-40	1	1		1						2
41-80	7	2		2	2	6				12
81-160	12	2	2	2	3	6	9			24
161-320	11		1	2	3	4	6	4		20
321-640	1								1	1
641-1280	1					1			1	2
Subtotal	33	5	3	7	8	17	15	4	2	61
Totals	55	9	7	9	20	25	19	8	3	100

Table B-5

Frequency Distribution of the Remaining Right of Way Tracts Based on the Size of Original Tract at Time of Taking and Designation of Remaining Tracts by Operator as to the Main and Severed Portion of the Original Tract

Original Tracts			Remainder Tracts								
			Number of Tracts by Acreage Groups								
Size Group in Acres	Number		0-5	6-10	11-20	21-40	41-80	81-160	161-320	321-640	Totals
Main Portion											
20-40	1		1								1
41-80	15		1	1		6	7				15
81-160	21		1	2		1	7	10			21
161-320	15					2	2	5	6		15
321-640	2									2	2
641-1280	1									1	1
Totals	55		3	3	0	9	16	15	6	3	55
Severed Portion											
20-40	1				1						1
41-80	15	(3)*	4		2	4	2				12
81-160	21	(6)	1	3	3	3	4	2			16
161-320	15		1	1	3	3	2	2	2		14
321-640	2	(1)				1					1
641-1280	1						1				1
Totals	55	(10)	6	4	9	11	9	4	2		45

*Numbers in parentheses represent number of original tracts that were not divided by the highway.

Table B-6

Frequency Distribution of 28 Study and 30 Control Area Operators Based on Acreage Harvested from Right of Way Tracts in 1963 and 1967

Acreage	Study Area Operators[1]				Control Area Operators[2]			
	Before		After		Before		After	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
641 and Over	0	0	0	0	1	3.3	0	0
320 - 640	2	7.1	1	3.6	3	10.0	5	16.7
161 - 320	6	21.4	6	21.4	9	30.0	6	20.0
81 - 160	15	53.6	9	32.1	9	30.0	8	26.7
41 - 80	4	14.3	6	21.5	5	16.7	6	20.0
21 - 40	1	3.6	3	10.7	3	10.0	4	13.3
0 - 20	0	0	3	10.7	0	0	1	3.3
Totals	28	100.0	28	100.0	30	100.0	30	100.0

Average change in acreage harvested per operator:

[1] Study Area - 28 operators averaged 22 acres less.
24 operators with fewer acres in 1967 - 30 acres.
4 operators with more acres in 1967-29 acres.

[2] Control Area - 30 operators averaged 13 acres less.
23 operators with fewer acres in 1967 - averaged 25 acres less.
7 operators with more acres in 1967 - averaged 22 acres more.

Table B-7

Frequency Distribution of 28 Study and 30 Control Area Operators Based on the Change in Acreage Harvested Per Operator from Right of Way Tracts Between 1963 and 1967

Acreage	Study Area		Control Area	
	Number of Operators	Percent of Operators	Number of Operators	Percent of Operators
+ Over 40	1	3.6	1	3.3
+ 21 - 40	1	3.6	1	3.3
+ 0 - 20	2	7.1	5	16.7
- 0 - 20	9	32.2	13	43.4
- 21 - 40	10	35.7	9	30.0
- 41 - 60	3	10.7	0	0
- Over 60	2	7.1	1	3.0
Totals	28	100.0	30	100.0

Table B-8

Frequency Distribution of 28 Study and 30 Control Area Operators Based on the Change in Value of Crops Harvested Per Operator from the Right of Way Tracts Between 1963 and 1967

Range	Study Area		Control Area	
	Number of Operators	Percent of Operators	Number of Operators	Percent of Operators
+$4,001 - $6,000	0	0	1	3.3
+ 2,001 - 4,000	0	0	2	6.7
+ 1 - 2,000	5	17.8	6	20.0
-$ 1 - $2,000	13	46.4	11	36.7
- 2,001 - 4,000	6	21.4	6	20.0
- 4,001 - 8,000	2	7.2	1	3.3
- Over $8,000	1	7.2	3	10.0
Totals	28	100.0	30	100.0

Table B-9

Frequency Distribution of the 26 Study Area and 34 Control Area Operators Based on Percent of Their Incomes from Agriculture

Percent of Income from Agriculture	Study Area Number of Operators		Control Area Number of Operators	
	1963	1967	1963	1967
100 -	15	13	25	22
81 - 90	4	4	1	1
71 - 80	0	0	1	1
61 - 70	0	0	1	1
51 - 60	3	2	0	1
41 - 50	0	1	1	3
31 - 40	0	0	0	0
21 - 30	2	3	1	1
10 - 20	2	3	4	4
0 - 10	0	0	0	0

Table B-10

Frequency Distribution of the 26 Study Area and 34 Control Area Operators Based on Value of Crops Raised in 1963, 1965 and 1967

000 Dollars	Study Area			Control Area		
	1963 Number	1965 Number	1967 Number	1963 Number	1965 Number	1967 Number
80 - 120	1	1	1	0	0	0
40 - 80	2	3	1	2	5	0
20 - 40	2	2	3	6	8	9
10 - 20	8	7	6	12	9	8
5 - 10	3	3	3	3	3	6
2.5 - 5	2	3	3	5	2	4
Less - 2.5	5	5	6	3	5	4
None	3	2	3	3	2	3
Total	26	26	26	34	34	34

Table B-11

Frequency Distribution of Study Area and Control Area Operators Based on Increases and Decreases of Breeding Herds

Change Head	1963-1965		1965-1967		1963-1967	
	Study	Control	Study	Control	Study	Control
Over 40	2				2	
21-40	1				1	
11-20	2	1		3	2	1
6-10	0	2	2	1	0	3
+1-5	7	6	4	8	5	7
No Change	2	10	6	1	2	0
- 1-5	6	6	5	7	3	8
6-10	1	2	1	4	2	5
11-20	1		3	1	2	1
21-40	0		1		1	
Over 40	1				1	