

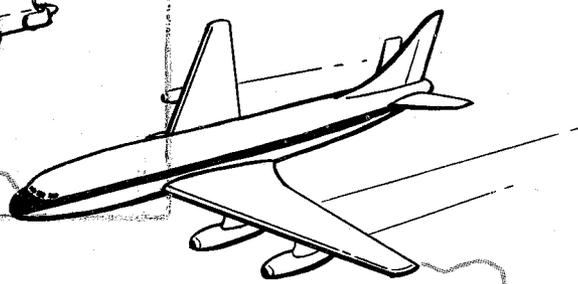
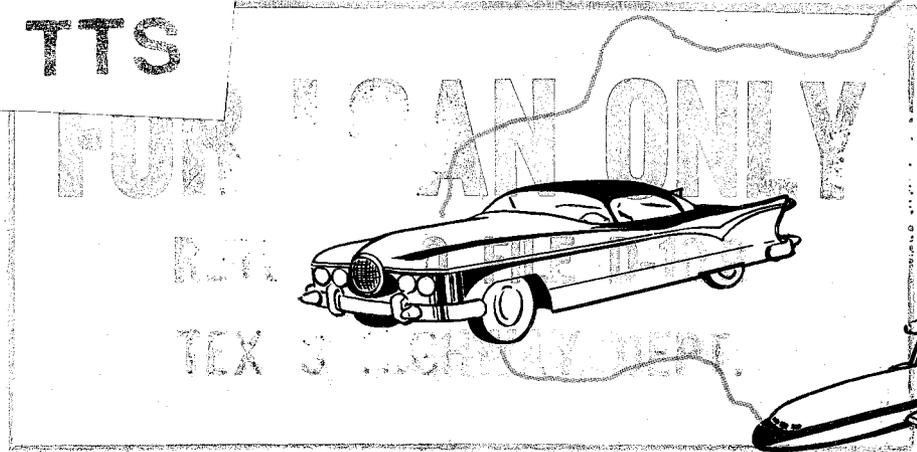
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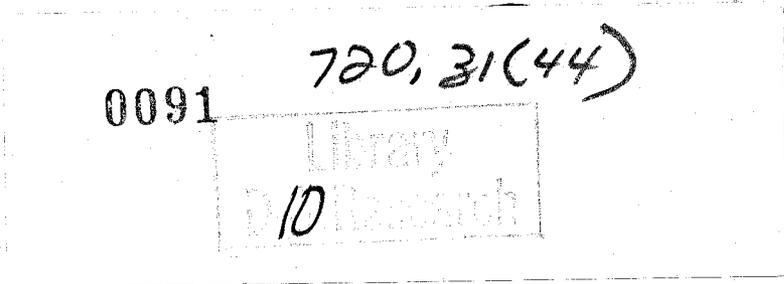
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ECONOMIC EFFECTS OF THE CAMP CREEK ROAD IMPROVEMENT

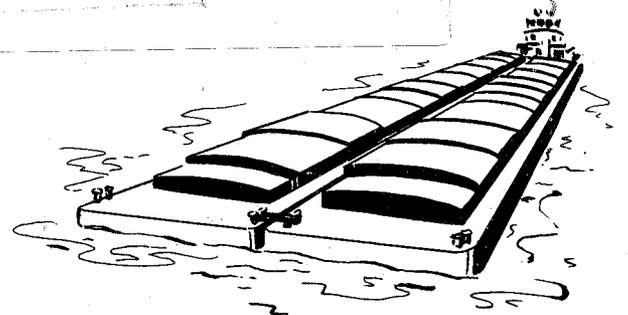
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COLLEGE STATION, TEXAS
SEPTEMBER, 1958



Texas
Transportation
Institute



ECONOMIC EFFECTS OF THE CAMP CREEK ROAD IMPROVEMENT

By

WILLIAM G. ADKINS

Texas Transportation Institute

A Special Report

to the

BUREAU OF PUBLIC ROADS

United States Department of Commerce

September, 1958

TEXAS TRANSPORTATION INSTITUTE

(A Part of the Texas A. & M. College System)

College Station, Texas

ACKNOWLEDGEMENT

This study was made under a cooperative research agreement with the Bureau of Public Roads, United States Department of Commerce. One of a series of investigations of the economic impacts of road improvements, the study was executed by the Texas Transportation Institute which bears full responsibility for its nature and contents.

Special acknowledgement is due to the Automotive Safety Foundation whose original grant and continued encouragement provided the impetus for the development of economic research at the Texas Transportation Institute.

The author is indebted to landowners and other citizens of Robertson County for their conscientious and whole-hearted cooperation. It is believed that the analysis is a conservative statement of their enthusiasm for rural road improvements.

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ECONOMIC EFFECTS OF THE CAMP CREEK ROAD IMPROVEMENT

A study of the effects of a rural road improved from dirt to all-weather on land values and land use.

That good roads serve land better than poor roads is not a novel observation. Nor is there reason to doubt that quality of road service affects the way that land is used and its value. The study reported here deals with the questions "how much?" and "in what manner?" do road improvements affect land use and land values?

The Camp Creek Road study is based on the experience and opinions of land owners whose road service was improved from dirt to all-weather, and also of owners in the same general locality who have not had their road service improved. The area of study is located in a rural county far removed from metropolitan and major urban influences.

Information on the economic effects of roads in rural areas has a variety of applications. One important use is in the field of right-of-way acquisition. Whereas the Camp Creek Road right-of-way was donated, free land for roads is becoming a thing of the past. Another extreme, that of excessive right-of-way costs, appears to be the tendency. There is a middle ground, a point of compromise between free and over-priced right-of-way. The realization and the general acceptance of "equitable" right-of-way costs rests heavily upon research dealing with road benefits and where and how they occur.

Knowledge of the effects of various road types in rural areas should be of utility also to tax and loan appraisers and for tax and mortgage loan policy. Another important need for information on road benefits is to test the overall justification for various road programs and thus to enlighten planning for the future.

The Camp Creek Road study is a contribution to the investigation of highway benefits as provided by the 84th Congress in the Highway Revenue Act of 1956. (Section 210b, Title II, H. R. 10660) For this purpose, the study has an indirect application. The Congress had as its primary intent the development of facts regarding benefits from Federal-aid highways, including benefits in rural areas. The Camp Creek Road is a State road and further is a land service facility devoid of many of the functions of a Federal-aid primary highway. It was chosen for study because it represents a rather pure rural road improvement serving a "grass roots" community. Its effects are basic and may well be anticipated in future studies of main highways although they stand to be obscured by a multiple of other factors.

The Camp Creek Road study was conceived as an exploratory endeavor in the sense of method development. As with most exploratory studies, certain alterations in approach would be made if it

were conducted again. Notwithstanding, the findings indicate how much and in what manner improved road service affects rural land. The results may be generalized with prudence for other areas similar in farm size, land use and number of farm families.

In the study, 43 land owners along improved Camp Creek Road and adjacent dirt roads were interviewed. In addition, realtors and persons in the Agricultural Extension Service, Soil Conservation Service, Agricultural Stabilization and Conservation Service and the Farmers Home Administration were interviewed as outside observers of road influences.

The following highlights of the study are based on changes from 1953 to 1958 as related by the persons interviewed:

1. Market value of land along Camp Creek was increased \$19.92 per acre, 57.9 per cent, by the road improvement.

2. Owners along adjacent dirt roads estimated that \$5.18 per acre, 8.3 per cent, was added to the values of their lands by the road improvement, and

3. They estimated that \$21.40 per acre more would be added to land value if farm-to-market road service was extended completely to their farms. Thus farmers on dirt roads felt that farm-to-market roads would add \$26.58 per acre (\$5.18 + \$21.40) to land values.

4. The most startling land use change attributable to improved Camp Creek Road occurred for dwellings. After the road development, dwellings increased from 24 to 30 in number and 140 per cent in value, these being far greater changes than occurred along dirt roads. Other land use changes brought by the new road were brush-clearing and an increase in cultivated land.

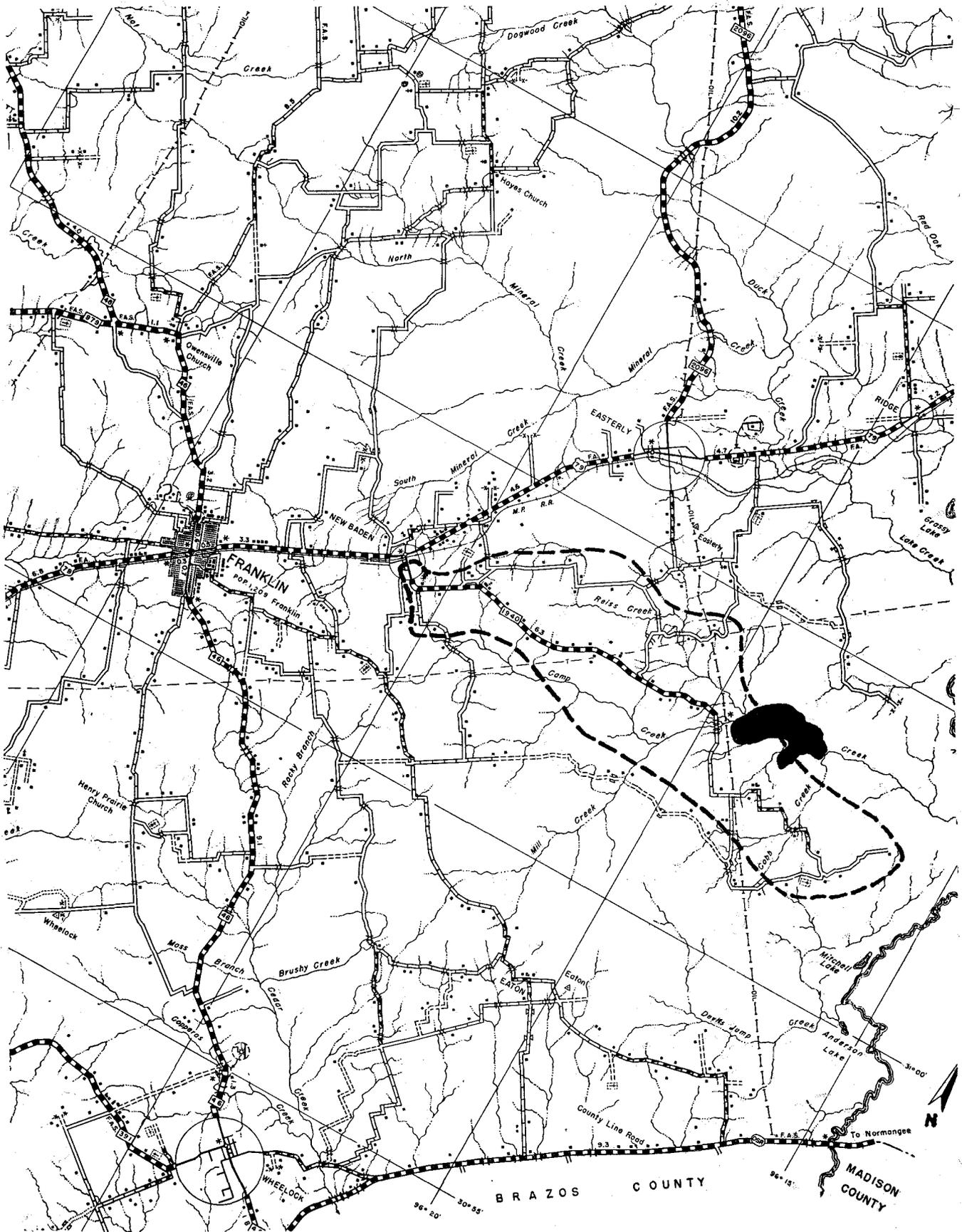
5. Owners along Camp Creek Road believed that gravel road service would have increased land values \$8.57 per acre or 24.9 per cent. Owners along dirt roads estimated that a good gravel road would add \$11.15 per acre or 17.8 per cent to the value of their lands.

6. Location of land on a state highway or trunk road over location on a "farm-to-market" was not highly valued by either group of owners.

7. Resident owners valued road improvements only slightly more than did non-resident owners.

8. Residents along Camp Creek Road indicated that the new road more than doubled their travel.

9. According to owners' experiences, much of the value attributed to the road improvement is immediately traceable to a variety of vehicular benefits such as less costly maintenance, better gas mileage and larger trucks for shipping and receiving.



A map showing Camp Creek Lake and its environs.



An aerial view of the Camp Creek Road and the adjoining countryside. The lake can be seen in the upper right hand corner.

10. The road improvement facilitated the marketing of farm production and thus raised potentials for increased farming efficiency.

11. The advantages and benefits of the new road had consciously been capitalized into land values by land owners.

The Camp Creek Road Improvement

Take a dirt road: deep sand in places, clay in others; muddy in winter, like a dusty washboard in summer; narrow with narrower bridges subject to near-misses, and misses, near-collapses and collapses; with high centers, with short-radius turns and with grades that must have encouraged the horse-power race. Such a road was Camp Creek Road in 1953. The farmers along this road say, "You take it; I took it about as long as I could."

But take such a dirt road. Add a little right-of-way, reduce the grades, remove the kink from the turns, construct concrete culverts, cover up the clay and sand with an all-weather dustless surface. The concoction yields a road that is a "farm-to-market" road, rather than a wagon trail, egg-breaker, vegetable-bruise, load-spiller, equipment-tester, patience-wrecker and money-loser.

The farmers along Camp Creek Road have experienced the transition wrought by such a recipe. This is a report of their experiences, their feelings and their estimates of its effects. This report also deals with the opinions of land owners along adjacent dirt roads, persons have yet to obtain one of the necessities of modern living and farming—good road service.

The term "farm-to-market" designates roads built and maintained by the State for the primary purpose of land service. First authorized in 1947, farm-to-market roads are of a standard proved to be adequate over the years. Some of the minimum specifications of such roads are as follows:

Surface:	20 Feet Surface-treated
Base:	24 Feet; 9000 Lb. Wheel Load
Right-of-Way:	80 Feet
Bridges:	24 Feet Width; 30,000 Pound Capacity (H 15)
Grades:	Seven Per Cent Maximum
Horizontal Curvature:	Six Degrees Maximum.
Design Speed:	45-50 MPH.

The Camp Creek Road improvement resulted, in part at least, from the joint efforts of land owners in the Camp Creek area and persons whose vested interest was access to Camp Creek Lake which is located at the terminus of the improved road. Required right-of-way was donated by land owners.

The presence of the lake and the traffic it generates pose the following question: Has the lake influenced land values along improved Camp Creek Road? Owners in the area report that the lake, while it helped them obtain the improved road, has had little influence on land values as compared to the change in road type. Some owners believe, however, that lake traffic has encouraged improvements in dwellings by awakening the pride of ownership of residents. The question of lake influence, while not completely answered in this report, receives further analysis in following sections.

Camp Creek Road was chosen for study for several reasons. Completed in 1954, the road improvement traverses an area which is definitely rural, that is, far from metropolitan influences. Also, the road was known to have a comparatively large number of owner-residents along its route. The fact that the improved road was on the same route as its dirt predecessor also favored its selection.

The improved road starts at the town of New Baden on State Highway 79 and extends east for 6.3 miles. It terminates as a farm-to-market road near Camp Creek Lake. From this point Camp Creek Road is a graded dirt road that stretches some six more miles into the countryside and stops. It does not furnish a through route, unless one primitive road some seven miles in length is considered an outlet.

The decision to use owners' estimates of road effects was encouraged by the fact that alternative approaches entail studies of much greater scope. For example the low turnover rate of real estate (there were eight sales of farms and tracts from 1953 to 1958 in the study areas) requires that a study should cover a broad geographic area and perhaps a long span of time to yield a sufficient quantity of sales. It is estimated that a study of road effects based on farm and ranch land sales in Robertson County would require five or more years of land sales for the county as a whole to assure significant results. Such an approach feasibly would compare land values along various type roads and would require the control of many factors (such as distance, productivity, land quality and farm improvements) to assure the proper measurement of road effects. The task involved is not insurmountable but is necessarily broader in scope than a limited survey of owners' opinions regarding a specific road improvement.

Owners were asked to estimate the 1958 value of their land with current road facilities. They were then asked to estimate the value of their ownerships assuming other types of road. They were instructed, in effect, to control factors other than the road improvement. To the extent that respondents were able to follow this instruction, their opinions cannot be questioned. What their opinions represent becomes another question. Certainly, such estimates are not exact measures of market value although some estimates were based on recent offers. Their estimates reflect the attitudes of owners of rural land toward road improvements stated in terms of dollar values of land. Land owners were told that the survey was for research purposes and that all personal information would be held confidential.

Future studies by the Texas Transportation Institute will involve comparative analyses of selling prices of land along various road types. Such studies will be conducted in a manner to assure a large number of sales so that the numerous factors affecting land values may be properly controlled.

Effects of the Camp Creek Road Improvement on Land Values

Land owners along improved Camp Creek Road estimated that the road improvement added \$19.92 per acre or 57.9 per cent to the market value of their



The beginning of improved Camp Creek Road at the small town of New Baden and its termination 6.3 miles southeast.

land. (Table 1) Out of 28 owners who made estimates, only one said that the value of his ownership was not increased by the road. One owner with a residential tract felt that his land had been increased in value three-fold. Other estimates ranged from 10 to 150 per cent. Estimates of the influence of the road improvement were obtained from only two non-resident owners. The average of their estimates was only slightly lower than that of resident-owners.

It might be expected that owners who were using their farms primarily as places of residence would think more highly of the road improvement than other owners and they did. Residents with residential-type farms estimated that \$23.76 per acre was added to the worth of their land. ("Residential" and "commercial" farms are defined in footnotes in Table 1.) The average estimate by commercial farmers was \$19.59 per acre, lower than that of residential-farm owners but near the over-all estimate of all owners along Camp Creek Road. The differ-

ence between estimates of owners of residential farms and commercial farms might well have been larger. Several of the residents of small tracts indicated that they would not live on the road if it were still dirt. Two of these owners stated that they bought their holdings because of the farm-to-market road. Residents of the larger commercial farms, however, felt very strongly about the advantages of residence on an all-weather road as well as the benefits to farm enterprises. Four of the latter owners would have resided in town had the road remained dirt. Indeed, two had built on their ownerships since the road improvement and another had made major repairs on his dwelling.

It should not be supposed that the influence of a road improvement is only as deep as the first band of ownerships abutting it, although it is true in many cases that road effects on land values diminish very rapidly with distance from the facility. When the Camp Creek Road was selected for study, it was observed that a number of ownerships in the area located along dirt roads were in position to make good use of the new farm-to-market road. Some of the owners of such tracts were interviewed, the purpose being two-fold. First, it was desirable to obtain their estimates of the effects of the Camp Creek improvement on their own ownerships. Secondly, their opinions and experiences would be useful to compare with opinions of owners along the farm-to-market road.

Owners along dirt roads were first asked to estimate the 1958 value of their lands. (This estimate was not to include buildings, but how well owners were able to follow this instruction isn't known.) They were then asked to estimate what the 1958 value of their land would be if Camp Creek Road had remained a dirt road. The difference between estimates was taken as the Camp Creek Road influence and the average difference between estimates (weighted by acreages owned) was \$5.18 per acre or 8.3 per cent. (Table 4) Of the 14 land owners, 8 felt that the road improvement had increased the value of their lands and estimated the increase at \$5 to \$35 per acre. Six reported that Camp Creek Road had not affected the value of their lands. Three of the latter owners said "the road helped

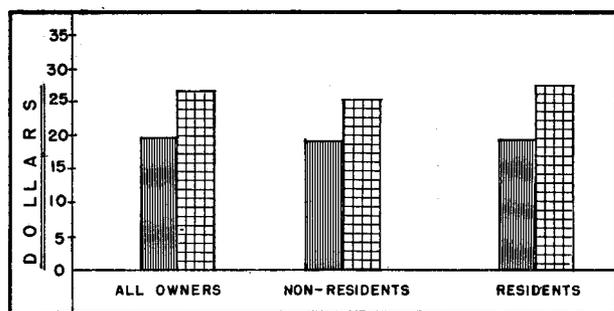
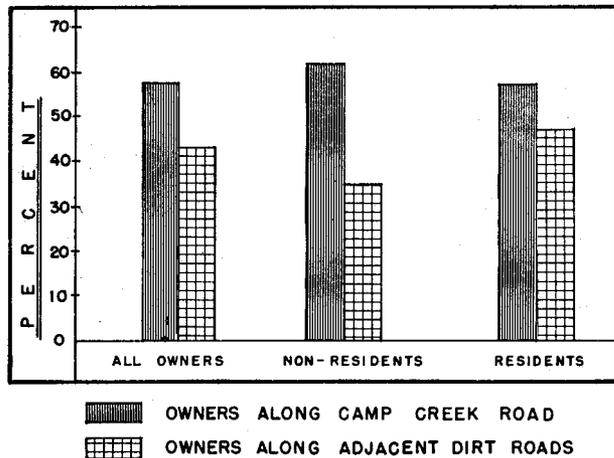
Table 1
ESTIMATES BY LANDOWNERS OF VARIOUS TYPES: VALUE ADDED TO LAND BY THE IMPROVEMENTS OF ROADS FROM DIRT TO FARM-TO-MARKET

Type of Landowner	Number of Estimates	Estimates of Value Added Per Acre Average Weighted by Acres Owned	
		Dollar	Percentage
Owners along Improved Camp Creek Road	28	\$19.92	57.9%
Non-Residents	2	19.45	61.0
Residents	26	19.93	57.6
Owning Residential Farms ¹	8	23.76	72.2
Owning Commercial Farms ²	18	19.59	56.0
Owners along Dirt Roads	14	26.58	42.9
Non-Residents	3	25.54	35.0
Residents	11	27.03	46.7
All Estimates	42	23.41	48.1

¹Sold less than \$250 of farm products in 1957 or had off-farm work of 100 days a year or more. There were three owners with off-farm work. Nonfarm income was a major source of income for two of these.

²Sold \$250 or more of farm products in 1957 and farm operator worked less than 100 days off of farm. (There were two commercial operators with nonfarm work.)

EFFECTS OF FARM TO MARKET ROADS ON LAND VALUES



Effects of the improvement on land values.

everybody." Two reported that their road service to the all-weather road was too poor for the Camp Creek Road improvement to help them. These two persons and another owner who was adamant in claiming no benefits owned land several miles from the farm-to-market road.

Owners along dirt roads also were asked to estimate the value of their ownerships if the road on which they were located was farm-to-market rather than dirt. All 14 owners estimated land value increases with estimates ranging from \$5 to \$75 per acre in benefits. The average of the estimates was \$21.40 per acre or 34.6 per cent. Adding this to the \$5.18 per acre attributed to Camp Creek Road, the average estimate of land value effects was \$26.58 per acre or 42.9 per cent attributable to improvement of a road from dirt to farm-to-market. (Table 1)

The dollar estimate exceeds the \$19.92 figure given by Camp Creek Road owners significantly but the estimated percentage influence is smaller than the 57.9 per cent estimate of owners on the improved road. This is explained by the fact that owners on dirt roads reported higher dollar values than did Camp Creek Road owners for each road type assumed. (Whether or not higher quality lands indeed existed along the dirt roads selected for study was not proved, but a larger number of improved prairie pastures was observed along dirt roads than along the Camp Creek Road.)

Resident owners along dirt roads thought more highly of a farm-to-market road improvement than

did non-resident owners but the number of the latter interviewed was small as was the difference in estimates.

Referring again to Table 1, it may be seen that the combined estimates of owners along both the improved and dirt roads average \$23.41 per acre or 48.1 per cent that the improvement of a road from dirt to farm-to-market would increase the value of land.

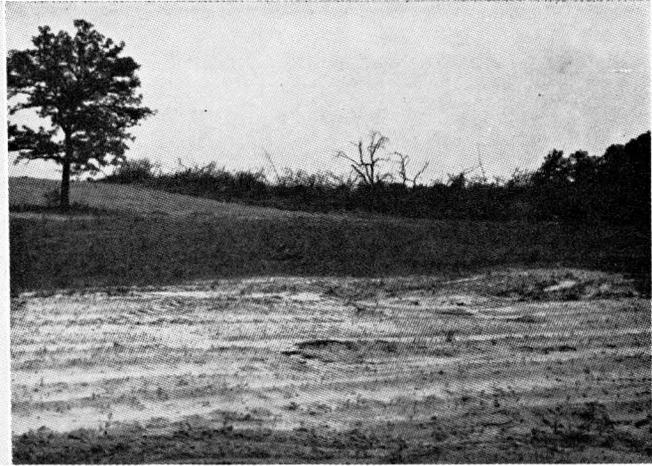
Why did owners believe that the road improvement had greatly increased land values? Several said that the land was worth more to them in the amount of their estimates and many had observed differentials in the values of land located on all-weather and dirt roads. More basically, owners said that the improved road saved them time and money. It gave them timeliness in marketing and prevented damage to produce and livestock that had occurred on the old dirt road. The road brought school closer and churches and places of recreation. It presented the opportunity for more profitable land uses. It gave residents a better chance to supplement income with nonfarm work. Vehicular savings resulted both through decreases in operating costs and in wear and tear and the increased use of larger trucks. This latter factor is discussed more fully in a later section of this report.

What effect did Camp Creek Lake, located at the terminal of the new road, have on land values? This lake was constructed in 1948 and 1949 by a nonprofit corporation and covers a surface area of 750 acres at spillway level. A total of 455 lots, representing shares, were platted around the lake and 205 of these lots were improved by 1958. Some of the cabins are used regularly during the week or on the weekends while others are inhabited only occasionally or not at all. Only four families have a permanent residence at the lake. The lake was opened for fishing on November 1, 1949, four years before the farm-to-market road was completed.

The general feeling was that the lake had had some influence but evidence to this effect is not readily discernible. Some owners said that more potential buyers pass by their lands on the way to the lake. Yet, none of the "lake people", as they are called, had bought land along improved Camp Creek Road. A few owners suggested that the "lake people" bought farm products from farmers and thus contributed to land values. Contrarily, persons who sold farm products at the roadside reported a total of only \$940 of such sales in 1957 of which, they said, lake travelers bought a minor portion. Most such sales were made to customers from nearby towns and to erstwhile county residents from larger cities who bought for canning or freezing purposes.

Land Use Effects of the Camp Creek Road Improvement

The most obvious change in land use that may be attributed to the Camp Creek Road improvement is the startling addition and improvement of dwellings. In 1953, there were 24 dwellings along Camp Creek Road. In 1958, there were 30 dwellings along the facility. (Table 2) The difference of six houses is a net change. Actually eight homes were added



Brush cleared for pasture improvement is shown on the left. Land "pushed-off" for cultivation (watermelons in 1958) is shown on the right; in the foreground, is an example of the deep sand that plagued travelers on old Camp Creek Road.

after the road was built. Seven new homes were built. One house was moved to the road and remodeled. Two dwellings were removed, an old residence which became a barn and another which was wrecked. Simple numbers fail to describe the change in quality of dwellings. About half of the old houses had received major repairs and alterations; some had new rooms and others new siding. Two resident-owners expressed plans to build new homes along the road in 1958 and another said his family was saving for such a project.

In relation to the road's influence on dwellings, five residents were actually retired from nonfarm jobs. Two of these persons indicated that they definitely would not have built new retirement residences on a dirt road. Only one of the retired residents used Camp Creek Lake for recreation.

Some additions of farm buildings had occurred mostly in the form of poultry houses and equipment sheds. The dollar value of improvements in 1953 and 1958 provides a summary of this land use effect of the road. In 1953, ownerships along the old road had improvements with a value of \$1650 per farm; in 1958 the value of improvements was \$3960 per farm. These values are estimates of owners and thumbnail appraisals of the writer based on observations and the statements of owners. They are not represented as exact measures of values and value change. They do offer an approximate indicator of a significant influence of the Camp Creek Road on improvements.

The existence of the farm-to-market road to Camp Creek reversed the tendency for the farm neighborhood to move to town and the disintegration of the rural community. Owners along the road verified this observation. Five of the owners of new homes declared that they would not have built along a dirt road. Two other residents were certain that they would have moved to town to escape the mud, dust, roughness, and risk and uncertainty of travel on the old dirt road.

Land along dirt roads is not claimed as a "control" for land along improved Camp Creek Road. Notwithstanding, a comparison of certain changes in areas served by the two road types

allows a cautious inference as to the effects of the new Camp Creek Road. In the case of dwellings, there was evidently more change along the farm-to-market road than along adjacent dirt roads. (Table 2) Both areas registered gains in improvements which are adverse to the general trend of decrease in rural areas in population and residences. Most of the increase along dirt roads was due to the addition of an expensive dwelling while, as already described, the increase along Camp Creek Road was well distributed.

Except for influences on dwellings (and number of residents), owners along Camp Creek Road were somewhat in disagreement as to land use effects of the road improvement. When asked about changes in land use attributable to the road improvement, many owners (13 of 29), said the road had no such effects. Some of these said "but it helps get to market." Ten owners believed that there were more truck crops than there would have been if the road had remained dirt. Six said that the road

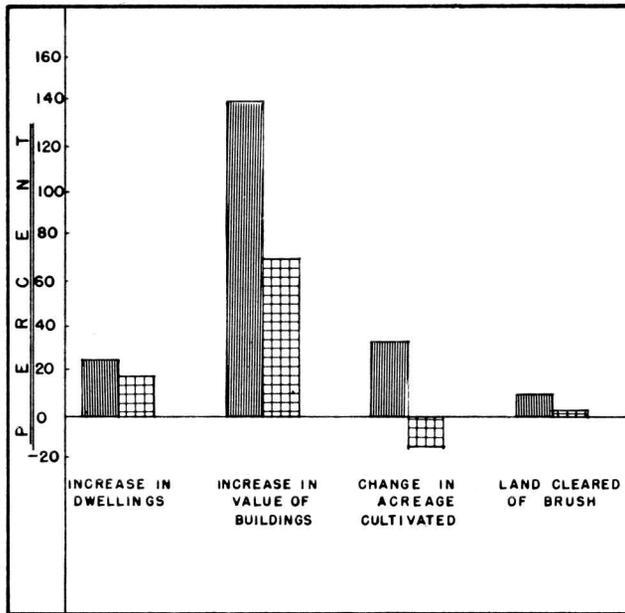
Table 2
LAND USE CHANGES ALONG IMPROVED CAMP CREEK ROAD AND ADJACENT DIRT ROADS, 1953 TO 1958

Item	Land along Improved Camp Creek Road	Land along Adjacent Dirt Roads
Number of Dwellings		
1953	24	11
1958	30	13
Value of Buildings Per Farm*		
1953	\$1650	\$2500
1958	\$3960	\$4250
Percent Change	+139.9	+70.0
Cultivated Acres		
1953	504	306
1958	671	253
Percent Change	+33.1	-17.3
Wooded Land, Acres		
1953	1897	2558
1958	1513	2442
Percent Change	-20.2	-4.5
Land Cleared, 1953 to 1958		
Acres	384	106
Percent of Total	9.5	2.4
Average Cost Per Acre	\$27.40	\$29.95

*Based on 23 estimates for ownerships along Camp Creek Road and 10 estimates for ownerships along dirt roads.

improvement had helped to spur land-clearing. Three respondents said that more poultry products were raised because of the road and three stated that more cattle were raised. The most common supporting statement for road effects on production was that the farm-to-market road saved the quality of products including livestock and the time of farmers and truckers.

**LAND USE CHANGES ALONG
(A) ██████████ CAMP CREEK ROAD &
(B) ▤▤▤▤▤▤▤▤ ADJACENT DIRT ROADS
FROM 1953 TO 1958**



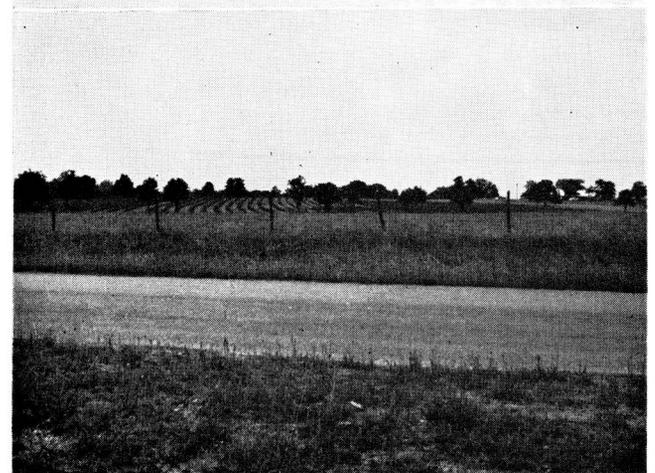
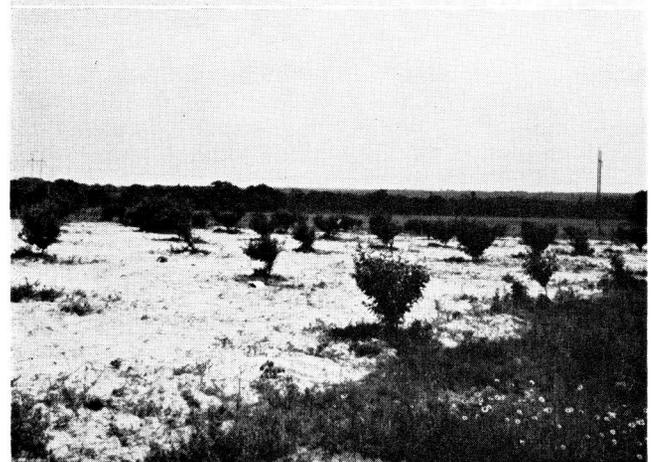
Effects of the improvement on land use.

A comparison of cultivated and cleared land in the Camp Creek Road area and along dirt roads supports the opinions of land owners. Table 2 shows that cultivated land increased in the Camp Creek Road area but decreased along dirt roads from 1953 to 1958. Land clearing was substantially greater along the Camp Creek Road.

Outside observers, personnel in government services and realtors, believe that more land clearing has occurred in Robertson County along all-weather roads than along dirt roads. These persons also indicated that more watermelons are grown along good roads; they stated, however, that they had not observed increases in land clearing and watermelon production along improved Camp Creek Road specifically. The reason for this, they believe, is the ease of marketing via good roads versus the quality losses and impassability that dirt roads may offer.

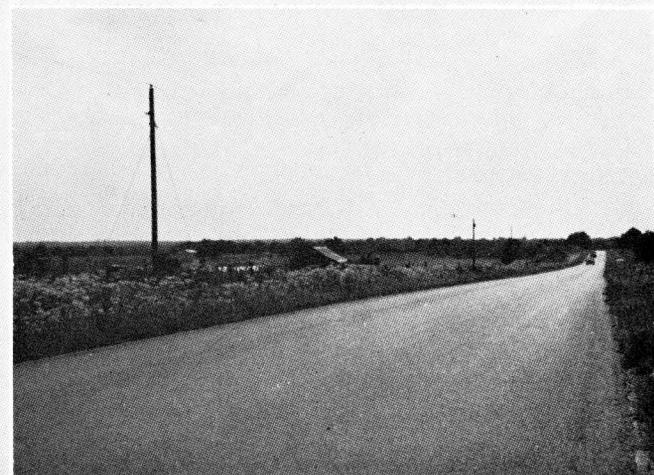
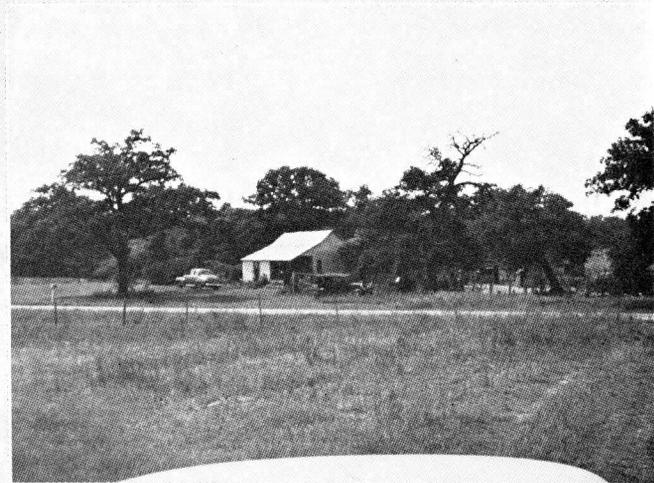
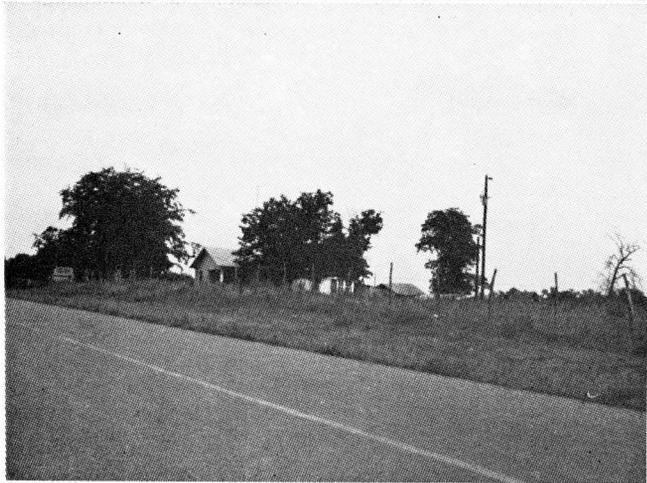
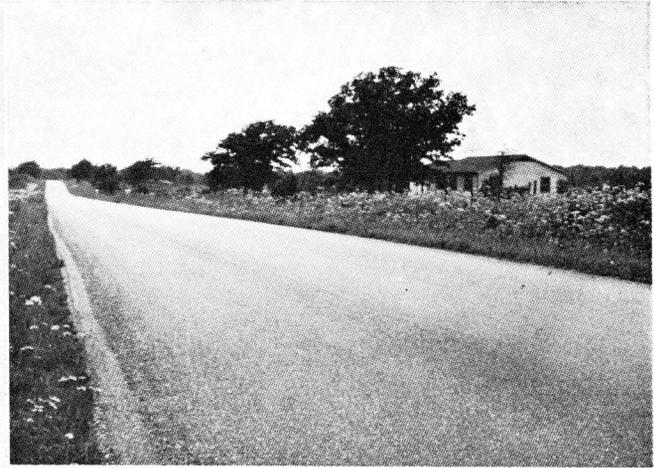
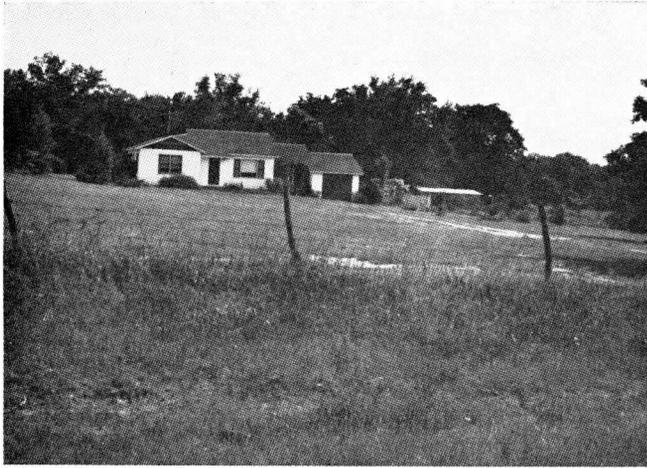
Travel and Vehicular Benefits

Twenty residents out of 26 along Camp Creek Road reported that their travel had been materially increased by the road improvement. Most of them



From top to bottom, a laying house attributable to the road improvement, a new plum orchard encouraged by the improved road, and a field of tomatoes. Some tomato growers said that their plantings were larger than they would have been if Camp Creek Road had remained dirt.

felt that the number of trips made was doubled and some said that they made three times as many trips. Persons reporting increases in travel indicated that total mileage driven increased proportionately more than did trips. The longer trips were explained by more frequent trips to Houston (129 miles) and



Seven new homes ranging in 1958 replacement cost from \$3,000 to \$10,000 were found along the improved road. One old dwelling had been moved to the road and repaired. Several of the old homes had received renovations and additional rooms. Old homes without recent notable repairs were in the minority among dwellings.

to several points 30 to 40 miles distant. It is probable that some of the mileage increase to the nearer destinations was due to a general shifting in markets rather than to the road improvement.

Directly and indirectly, however, the road accounted for a predominate increase in both trips and mileage traveled. It should be noted that the

road also had a tendency to decrease travel of farmers. The new road permitted the economic use of larger, nonfarm vehicles for dealer deliveries and buyer loadings at the farms.

Of the six resident farmers who did not report travel increases, two stated that they traveled the same amount but at less cost. Four simply reported



The replacement of weak and narrow bridges with substantial concrete culverts eliminated an obstacle to the use of heavy trucks in the Camp Creek area. Opinions in the area held that this was a causal factor in increased watermelon production.

that the road did not affect their travel habits; two of these lived near the intersection of the road with State Highway 79.

Of the three non-resident owners, one said that he made more frequent trips to his farm. The other two thought highly of the road but said it had not changed their travel habits.

Owners along dirt roads leading to the improved road generally reported little change in their travel. Those reporting significant changes had ownerships near Camp Creek Road.

The Camp Creek Road now has a traffic volume of 210 vehicles daily. As a dirt road it carried about 60 vehicles daily. About 40 per cent of the travel in each instance is attributable to Camp Creek Road farmers and their visitors.

That vehicular benefits have been capitalized into land values along improved Camp Creek Road to a marked degree is obvious in the farmers' statements regarding savings in time and repairs. Typical statements in this regard are:

"Road has kept pick-ups and cars from wearing out so quickly."

"I ruined a car on a quarter of a mile of road in one winter." (From a resident near the state highway intersection.)

"People needed an old car to mud it in. Don't need two cars now."

"Cars used to be torn up by the dozens."

"Ruined a pick-up in one winter trying to take care of cattle." (From a non-resident owner.)

"Road commissioner burned his car up. Ruined his car on old Camp Creek Road."

"Cheaper trips. Used to take a lot more gas."

"Can go to town in less than half the time."

"Loaded trucks couldn't pull hills and broke in the bridges."

One of the most interesting effects of the improved road was the increased use of larger trucks including semi-trailers. Farmers stated that they could obtain better prices on larger lots of feed and fertilizer because of deliveries in large trucks. Also, they were relieved of many trips in pick-ups to haul

supplies and produce. A further factor was that at least one loading operation is avoided in marketing in large trucks. No longer do Camp Creek farmers have to haul to a hard-surface road and then transfer their loads to large trucks which in turn proceeded to market. Now the larger trucks load at the farm and unload at the place of marketing.

This study did not include the determination of the dollar value of vehicular benefits. If this task were attempted for Camp Creek Road, one of the factors that would require evaluation is that the new road prevented the tremendous losses in quality that truck produce, poultry products and livestock suffer on rough roads with steep grades and sharp turns.

Value Added to Land by Gravel Roads and State Highways

Land owners were asked to estimate the value of their lands assuming dirt, gravel, farm-to-market roads and state highways. The land values they attributed to the improvement of a road from dirt to farm-to-market already have been discussed.

Residents stated that some parts of the old Camp Creek Road were little better than this deep sand lane which joins the improved road.





Scenes along an unimproved road described by residents as similar to parts of the old Camp Creek Road. Clay roads are all but impassable in wet weather but provide a firm but sometimes rough surface when dry. Deep sand roads, in contrast, are generally at their worst in dry weather and at their best during rainy periods.

All but one owner along Camp Creek Road believed that a gravel road would add to the value of land and estimated up to \$25 per acre of benefits. (Table 3.) The average of the estimates per farm (acreage weighted) was that \$8.57 per acre, or 24.9 per cent, would be the value of a gravel road versus a dirt road. Many respondents cautioned, however, that a gravel road was of such value only if it was well-maintained. Without proper maintenance, they said, its benefits as reflected in land values would be negligible.

Improvement of their dirt road service to gravel would add \$11.15 per acre to land values according to owners along dirt roads. This average resulted from thirteen estimates as one owner stated that a gravel road would help but didn't wish to estimate the amount. Three of the 13 who made estimates gave no advantage to gravel roads. Their main concern was better bridges. Also they doubted that the gravel road would be as smooth as a dirt road. Although more passable in wet weather, the gravel road was discounted for its roughness, its dustiness, and its reputation as a destroyer of windshields and headlights.

The term "state highway" connotes a through road, either primary or secondary, whose basic purpose is to connect cities and towns. Although farm-to-market roads are also state roads, they are in purpose land service roads and are so recognized by farm people. As was done for other road types, owners were asked to estimate the value of their lands as if the road on which they were located were the same." More than half of the owners along Camp Creek Road indicated no premium for one type of location over the other. The remainder estimated up to \$150 per acre in favor of a location on a state highway. The average of the estimates weighted by the acreage owned was \$3.65 per acre or a seven per cent higher value for land located on state highways. (Table 3)

Estimates by land owners along dirt roads were much smaller as they placed a premium of only 19 cents per acre on state highway locations. (Table 4) In fact, one owner preferred that his land be situated along a farm-to-market road and discounted a state highway location by \$2.00 an acre.

The improved Camp Creek Road (FM 1940) has a junction with U. S. 79 at the small town of New Baden.



The fundamental reason given for preferring locations along state highways was that such roads connect urban places. Land owners were little concerned with the additional traffic on state highways; in fact some thought traffic was a hindrance. Instead, owners preferred not "to travel north to go south"; a state highway being a through road would give them two alternatives of travel.

REFERENCES AND FINDINGS OF OTHER STUDIES

In the early stages of the Camp Creek Road study, a search was made for reports of similar studies made elsewhere. Table 5 summarizes findings from some of the previous studies that were found. A study published in Oklahoma in 1954, is the most comparable to the Camp Creek Road study from the standpoint of geographic nearness.

Table 3
ESTIMATES BY OWNERS OF LAND ALONG IMPROVED CAMP CREEK ROAD: VALUE ADDED TO LAND BY ROAD IMPROVEMENTS

Road Improvement	Number of Estimates	Estimates of Value Added Per Acre					
		Unweighted Average		Average Weighted by Acres Owned		Range of Estimates	
		Dollar	Percentage	Dollar	Percentage	Dollar	Percentage
Dirt to Gravel	28	\$ 8.46	25.3%	\$ 8.57	24.9%	\$0-25	0-60%
DIRT TO FARM-TO-MARKET*	28	26.70	71.4	19.92	57.9	0-75	0-300
Dirt to State Highway	25	35.68	125.9	23.66	81.5	0-180	0-900
Gravel to Farm-to-Market	28	18.24	39.8	11.35	26.4	0-70	0-186
Gravel to State Highway	25	26.82	72.0	14.89	39.3	0-170	0-567
Farm-to-Market to State Highway	25	8.00	16.0	3.65	7.0	0-150	0-300

*The Camp Creek Road improvement.

Table 4
ESTIMATES BY OWNERS OF LAND ALONG DIRT ROADS: VALUE ADDED TO LAND BY ROAD IMPROVEMENTS

Road Improvement	Number of Estimates	Estimates of Values Added Per Acre					
		Unweighted Average		Average Weighted by Acres Owned		Range of Estimates	
		Dollar	Percentage	Dollar	Percentage	Dollar	Percentage
Improved Camp Creek Road*	14	\$ 7.50	12.3%	\$ 5.18	8.3%	\$0-35	0-140%
Dirt to Gravel	13	13.19	21.4	11.15	17.8	0-38	0-150
Dirt to Farm-to-Market	14	30.10	49.5	26.58	42.9	5-75	10-200
Dirt to State Highway	14	30.28	49.8	26.76	43.2	5-75	10-190
Gravel to Farm-to-Market	13	17.88	23.9	15.84	21.5	5-50	10-67
Gravel to State Highway	13	18.08	24.2	16.04	21.8	5-50	10-67
Farm-to-Market to State Highway	14	2.50	0.2	0.19	0.2	-2 to +5	-0.3 to +0.5

*Estimates are of the influence of the Camp Creek Road improvement upon value of land on dirt roads leading to Camp Creek Road.

Table 5
ROAD EFFECTS ON RURAL LAND VALUES AS REPORTED IN OTHER STUDIES

Study Location and Date	Reference ¹	Type of Data Used	Value Added by Improving Dirt Roads to All Weather	
			Dollars Per Acre	Percentage
Minnesota, 1922	(3)	Sale Prices	\$21.92	15%
Pennsylvania, 1926	(11)	Farmers' Estimates ²	24.50	20
New York, 1928	(11)	Farmers' Estimates	28.08	50
Illinois, 1928	(11)	Sale Prices	18.73	8
Missouri, 1935	(4)	Sale Prices	2.12	21
New York, 1936	(2)	Farmers' Estimates	21.00	45
New York, 1949	(2)	Farmers' Estimates	52
Nebraska, 1954	(2)	Farmers' Estimates	15.00
Oklahoma, 1954	(10)	Sale Prices	15.39	76
Washington, 1955	(2)	Sale Prices	11.00-25.00
Montana, 1956	(6)	Farmers' Estimates	12-13

¹Studies reviewed by Stewart (Reference 11) from which data were adapted are:

Mordecai Ezekiel, **Factors Affecting Farmers' Earnings in Southeastern Pennsylvania**, U. S. D. A. Bulletin 1400, 1926.

J. L. Tennant, **The Relationship between Roads and Agriculture in New York**, Cornell University, Agriculture Experiment Station, Bulletin 479, 1929.

J. L. Jordan, **Factors Affecting the Selling Price of Farm Land, with Special Reference to Champaign County, Illinois, 1913-1927**, unpublished thesis, University of Illinois, 1928.

Data adapted from Garrison (Reference 2) are from the following studies:

W. M. Curtiss, **Use and Value of Highways in Rural New York**, Cornell University, Agriculture Experiment Station, Bulletin 656, 1936.

W. M. Allred, "Value of Improved Roads to Property in Rural Areas of New York State", **Farm Economics**, March 1953, Department of Agriculture Economics, College of Agriculture, Cornell University.

H. W. Ottoson, A. R. Aandahl and L. B. Kristjanson, **Valuation of Farm Land for Tax Assessment**, University of Nebraska Agriculture Experiment Station, Bulletin 427, 1954.

Information from the Highway Research Board Special Report 28 (Reference 6) is from the Montana Farm Property Study, unpublished at the time, as reported by Dr. Maurice Taylor of Montana State College.

²Estimates of farmers as reported in Census of Agriculture.

Parcher (Reference 10) found that during 1941-45 land along all-weather roads sold for 76 per cent more than land located along unimproved dirt roads. This finding was based on 1060 land sales in seven counties.

Several of the other studies listed made use of farmers' estimates of effects of road improvements. The most recent such study was made in Montana in 1956 (Reference 6) where the value added by improvement of a road from dirt to all-weather was reckoned at 12 to 13 per cent. In a Nebraska study in 1954 (Reference 2), farmers' estimates were that \$15 per acre was added to land value by the improvement of dirt roads to all-weather.

The eleven studies cited in Table 5 stretched over a period from 1922 to 1956. Some studies used "all-weather" roads and others "paved" roads as the type of road improvement. An interesting comparison, nevertheless, is that several of these studies reported road improvement influences on land values comparable to the 57.9 per cent increase estimated by owners along improved Camp Creek Road and the 42.9 per cent increment reported by owners along dirt roads.

Characteristics of the Study Areas

The extent to which findings in the Camp Creek Road study may be generalized for other areas depends of course, upon the characteristics of the Camp Creek area and of Robertson County. The remainder of the report was prepared to afford the reader additional information regarding the "setting."

Table 6 deals with some of the characteristics of ownerships in the study areas. The ownerships included in the study averaged 145 acres in size in the Camp Creek Road area and 314 acres along dirt roads. The size of holdings along Camp Creek Road was bi-modal with eight ownerships of 20 to 35 acres and nine of near 100 acres. Ownerships along dirt roads were concentrated at 100, 200 and 400 acres in size. The study areas had large proportions of resident-owners and low tenancy rates. Both areas averaged almost three persons per occupied farm. The 1957 marketings of \$3870 per Camp Creek Road farm are lower than average since 1957 was a poor crop year.

The areas have considerable variation in land types. Capability classes vary from Class II to Class VII (Soil Conservation Service classifications). The most common use capability classes are Class III, which is cultivable but should be terraced, and Class VII, which should be used for limited grazing only. There are, however, large acreages of land in other classes.

Soil types range from highly permeable deep sands to very tight clays but these extremes are not the typical case. More often sandy clays with a fairly shallow sub-base and fairly good water holding characteristics are found.

The climax vegetation for much of the area is hardwood. Prairie islands and sandy soils, however, have native grasses as climax growth. The study areas are in the Forested Coastal Plain Problem Area of the Soil Conservation Service.

Much of the description of land and soil types in study areas applies also to Robertson County in which they are located. In fact, the study areas are a fairly representative cross section of the county's uplands. Robertson County is located in the Post-Oak type-of-farming area of Texas. One of the 18 major type-of-farming areas of the state, the Post-Oak area has mostly sandy soils in its uplands.

Table 6
CHARACTERISTICS OF OWNERSHIPS ALONG IMPROVED CAMP CREEK ROAD AND ADJACENT DIRT ROADS

Characteristics	Ownerships Along Improved Camp Creek Road	Ownerships Along Adjacent Dirt Roads
Number of Ownerships:	35	Not Determined
Resident Owners	26	11
Nonresident Owners	9	3
Number of Farm Dwellings	30	13
Tenant-Occupied Dwellings	2	1
Unoccupied Dwellings	2	1
Number of Ownerships Studied ¹	29	14
Total Acres in Ownerships	4050	4393
Average Size in Acres	145	314
Population of Farms, Total	73	28
1957 Marketings, Per Farm ²	3870	Not Obtained

¹Twenty-five owner-residents along improved Camp Creek Road were interviewed and 4 non-resident owners.

²Based on data for 23 ownerships along improved Camp Creek Road; general information on operations on the other six farms was obtained but could not be reduced to dollar terms. For the 14 ownerships located along dirt roads, detailed marketing information obtained likely would not yield an accurate index of farm operations.

Table 7
FARM CHARACTERISTICS, ROBERTSON COUNTY AND TEXAS, 1954*

	Robertson County	Texas
Number of Farms	1622	292,947
Average Size (Acres)	264	498
Percent of Farms Commercial	55.6	62.3
Percent of Farms Part-time	15.7	15.6
Percent of Farm Tenancy	32.7	25.9
Percent of Farms with Operator-Residents	84.6	86.8
Land in Farms (Acres)	427,927	145,812,733
Percent of Land in Cropland	40.8	25.1
Percent of Land Pastured	76.4	77.8
Percent of Land in Woodland	33.9	13.7

*Source: United States Census of Agriculture: 1954. Volume I, Part 26, Texas.

Table 8
POPULATION AND EMPLOYMENT, ROBERTSON COUNTY AND TEXAS, 1950*

	Robertson County	Texas
Total Population	19,908	7,711,194
Percent Urban	37.3	62.7
Percent Rural	62.7	37.3
Rural Nonfarm	27.0	20.5
Rural Farm	35.7	16.8
Total Employment	6,303	2,758,443
Percent Nonfarm	56.7	84.6
Percent Farm	43.3	15.4
Farmers and Farm Managers	23.6	9.1
Other Farm	19.7	6.3

*Source: United States Census of Population: 1950. Volume II, Part 43, Chapter B.

Table 9
ROAD FACILITIES OF FARMS, ROBERTSON COUNTY AND TEXAS, 1950*

	Robertson County	Texas
Kind of Road		
Number of Farms Reporting	1605	313,097
Hard-Surfaced, Per Cent	28.7	30.7
Gravel (Shell or Shale), Per Cent	19.6	19.8
Dirt or Unimproved, Per Cent	51.7	49.5
Distance over Dirt or Unimproved Roads to Trading Center Visited Most Frequently		
Number of Farms Reporting	1384	288,044
0.0 to 0.2 Miles, Per Cent	31.6	38.5
0.3 to 0.9 Miles, Per Cent	6.3	9.8
1.0 to 4.9 Miles, Per Cent	34.9	36.7
5.0 Miles and Over, Per Cent	27.2	15.0
Average Distance, Miles	3.1	2.1

*Source: United States Census of Agriculture: 1950. Volume I, Part 26, Texas.

Dark productive clays are found in the river and creek bottoms and in small islands in the upland. The climax growth of much of the area is hardwood timber and approximately a third of land is wooded. Cotton, corn, truck crops and beef cattle are grown. There is some dairying, and poultry production has been expanded in recent years. Except in the bottomlands cotton production continues to decrease. Much pasture improvement has been accomplished in recent years.

The Post Oak area is situated roughly parallel to the Gulf Coast about 100 miles inland on its near side. Robertson County is about 100 miles northwest of Houston which is the nearest large metropolitan area. Despite this distance, Houston buyers exert an influence in the land market in Robertson County. Such buyers desire land for a variety of reasons but the use they contemplate is almost always grazing.

Tables 7, 8 and 9 present several comparisons of Robertson County and Texas with an emphasis on rural aspects. Robertson county has smaller farms than the State as a whole and has a large proportion of land used for crops. Fewer of the farms in the county are commercial compared to the State and its tenancy rate is greater. (Table 7)

Table 8 shows that Robertson County is much more rural and farm oriented than Texas as a whole. The county had 62.7 per cent rural population in 1950, whereas the same percentage of the Texas population was urban. Robertson County's farm population was 35.7 per cent in 1950, much higher than the 16.8 per cent for the State. The importance of farming to Robertson County is also seen in employment data as more than 40 per cent of its employed people worked on farms while the Texas ratio was about 15 per cent.

In 1950, the road service available to farms in Robertson County and Texas was highly comparable with slight advantages for the State. (Table 9) The State had a slightly higher percentage of farms on hard-surfaced roads. Also Robertson County farmers on dirt roads were an average of one mile further from hard-surfaced roads.

REFERENCES

- Adkins, W. G. and Southern, J. H., "Texas Farm and Ranch Land Market, 1954", Report 1800, Texas Agricultural Experiment Station, Texas A&M College System.
- Garrison, W. L., **The Benefits of Rural Roads to Rural Property**, Washington State Council for Highway Research, 1956.
- Haas, G. C., **Sale Prices as a Basis for Farm Land Appraisal**, Technical Bulletin 9 Agricultural Experiment Station, University of Minnesota, 1922.
- Hammar, C. H., **Factors Affecting Farm Land Values in Missouri**, Research Bulletin 229, Agricultural Experiment Station, University of Missouri, 1935.
- Highway Research Board, **Developing Concepts of Land Acquisition**, Bulletin 169 Washington, 1957.
-, **Economic Impact of Highway Improvement**, Special Report 28, Washington, 1957.
- Isard, Walter, **Location and Space-Economy**, Technology Press, Massachusetts Institute of Technology, and John Wiley and Sons, Inc., New York, 1956.
- Moore, E. H. and Barlowe, Raleigh, **Effects of Suburbanization Upon Rural Land Use**, Technical Bulletin 253, Agricultural Experiment Station, Michigan State University, 1955.
- Murray, W. G., **Farm Appraisal**, Iowa State College Press, Ames, Iowa, 1950.
- Parcher, L. A., **The Influence of Location on Farmland Prices**, Bulletin B-417 Agricultural Experiment Station, Oklahoma State University, 1954.
- Stewart, C. L., "Farm Land Values as Affected by Road Type and Distance", **Journal of Farm Economics**, Vol. XVIII, No. 4, November, 1936.
- Taylor, C. C. and Aull, G. H., **Improving Farm Real Estate Assessment**, Bulletin 450, Agricultural Experiment Station, Clemson Agricultural College, 1957.
- U. S. Dept. of Agriculture, Bureau of Agricultural Economics, **The Land Market**, May 1946.
- U. S. Dept. of Commerce, Bureau of the Census, **Census of Agriculture: 1954, Volume I Part 26, Texas**, 1956.
-, **Census of Agriculture: 1950, Volume I Part 26, Texas**, 1952.
-, **Census of Population: 1950, Volume II, Part 43, Texas**, 1952.
- U. S. Dept. of Interior, Bureau of Reclamation, **Central Valley Project Studies, Economic Effects, Problem 24**, Washington, 1949.