Some Effects of the Introduction of the Automobile on Highways and Land Values in Nebraska

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Article Summary: The beginning of the automobile era in the 1920s had negative effects in Nebraska. It brought both higher taxes and lower real estate values.

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Photographs / Images: mechanization on a Buffalo County farm, 1907; the Fred Lange family and automobile, Lowell, 1907

Charts of Nebraska Statistics:

- average acres per farm, 1900-1920
- annual acreage released by substitution of motor vehicles for the horse, 1920-1924
- price per acre of farm land sold in eleven counties, 1910-1920
- total farm mortgage debt, 1916-1925
- price per acre of farm land sold in seven counties, 1920-1925

SOME EFFECTS OF THE INTRODUCTION OF THE AUTOMOBILE ON HIGHWAYS AND LAND VALUES IN NEBRASKA

BY CLINTON WARNE

The coming of the automobile revolutionized the transportation system of America. For Nebraska, its advent was exceptionally dramatic. In this state of great expanses, the effects due to the automobile have been many and varied. The economy of Nebraska had developed in response to the availability and capacities of earlier modes of transportation. As a result of this new factor, the economy was modified. Representative changes are those occurring in roads, taxes, and real estate values.

Since no integrated system for road development was established at the time the state was settled, Nebraska roads were laid out for the most part by custom or circumstance. They were forced over hills, through marginal

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lands, and along farm lines. They acquired square corners as a result of the land survey system. Certainly they were established without considering the future needs of the state for an interconnected highway system.

At the turn of the century, horse-drawn traffic on rural roads was light and local in character, and road conditions were a matter of immediate concern only to the residents of a particular township. Since road expenditures were a large item in local taxes, the lower the expenditure for care and maintenance of the roads the smaller was the tax load. To reduce the amount of taxes paid in cash, it had been the practice to allow the individual to work out in labor his $3.00 individual road tax at $1.50 per day.[1] Inasmuch as this was fairly good pay for the time, and as it brought the neighborhood together for two days of social contact, the tax often was paid in this manner. It can be assumed, however, that much of the labor time devoted to the roads produced less improvement in the road system than might have been the case had the same cash amount been expended in properly supervised hired labor.

This was the status of the Nebraska road system in 1910 when the first real wave of statewide interest in automobiles began. Any individual who acquired one of the early automobiles immediately saw a need for a "better roads" movement. The first state legislative action which resulted from this interest was the State Aid Bridge Act, passed in 1911.[2] This act resulted in more state authority over local road administrators as well as in an increase in local expenditures and marked the beginning of planned improvement for the roads of the state.

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[1] M. O. Eldridge, *Public Roads of Nebraska: Mileage and Expenditures in 1904*, Office of Public Roads, U. S. Department of Agriculture (Washington, 1906), *Circular* No. 61, p. 2.

[2] Under this enactment a State Board of Irrigation, Highways, and Drainage was to contribute 50 percent of the expenditures for roads and bridges within the various counties. To finance this added expenditure, the legislature passed a statewide tax of one-fifth mill. (*Laws of Nebraska*, 32d sess., 1911, pp. 392-395.)

By 1914, 1,204.54 miles had been improved, but this was only 1.5 percent of the total mileage claimed within the state in that year.[3] A leading member of the good roads movement explained the lack of improved roads thus:

> . . . . . the States of Nebraska, Iowa and South Dakota do not appear to have as great a mileage of high type road as . . . . desirable. The explanation in this case is that these States have a well-defined policy in accordance with which they are expending their funds for the most part to grade and drain the native road bed with the fixed purpose of adding the surfacing material at the earliest possible date. The almost entire absence of roads with any improvement whatever, and the large mileage which required improvement, when the States set out upon their work of highway improvement only three or four years ago, makes this policy an eminently wise one.[4]

In keeping with this general policy, only 1,400 miles of improved road had been completed within the state by 1917.[5] Some persons were dissatisfied with this progress and felt that the object lesson presented by one mile of smooth, high type surface, easy driving road would do more to encourage the "good roads" movement than any amount of minor surface improvement.

An important private group spearheading this interest in high quality roads in Nebraska was the Lincoln Highway Association. A "seedling" section of concrete highway was completed near Grand Island on November 3, 1915 and soon was followed by another section of concrete near Kearney. Later, the Lincoln Highway Association completed six miles of concrete highway near Fremont. This last was the longest section constructed under the "seedling" program, and it was one of the first projects under the new Federal Aid Road Act of July 11, 1916.[6]

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[3] L. W. Page, *Public Road Mileage and Revenues in the United States, 1914*, U. S. Department of Agriculture (Washington, 1917), *Bulletin* No. 390, p. 11.

[4] T. H. MacDonald, "Character of Federal Aid Roads Consistent with Traffic Demands," *Public Roads*, III (1921), No. 29, 18.

[5] A. P. Anderson, "$280,000,000 Put into Highways and Bridges by States in 1917," *Public Roads*, I (1918), No. 3, 28.

[6] Lincoln Highway Association, *The Lincoln Highway* (New York, 1935), pp. 130-135.

Before 1916, state road improvements usually had been made in response to individual pressures. The interest and initiative of individual commissioners dictated the location and condition of a particular county's roads. No central organization was empowered to achieve co-operation in making extensive plans for better routings, for new road locations, for inter-county improvement or for surfacing projects. Originally-laid-out road patterns continued; only the surfaces were improved or made smoother.

However, with the passage of the Federal Aid Road Act in 1916 a concept of post roads evolved. These roads were similar in purpose to the overland trails that had crossed Nebraska in an earlier period. The coming of the railroad had spelled the doom of these early trails, but with the development of the automobile, an effective demand for through roads was again created. These roads were designated as important interstate throughways and were to be the recipients of special attention. The federal plan was to develop a complete, integrated, national road system that would allow easy intercommunication throughout the country.

In 1919 the Nebraska legislature passed the Civil Administrative Code Bill, creating a cabinet form of government for the state. One of the departments so constituted was the Department of Public Works, the most important division of which was the Bureau of Roads and Bridges, which was to have charge of the construction of all state and federal-aid roads and the building of all state bridges.[7] The same legislative act established a system of state highways of approximately 4,500 miles in length which connected county seats.[8] These routes were among the 5,619.04 miles of road designated as post roads in 1921 and were included within the allowed 7 percent of local

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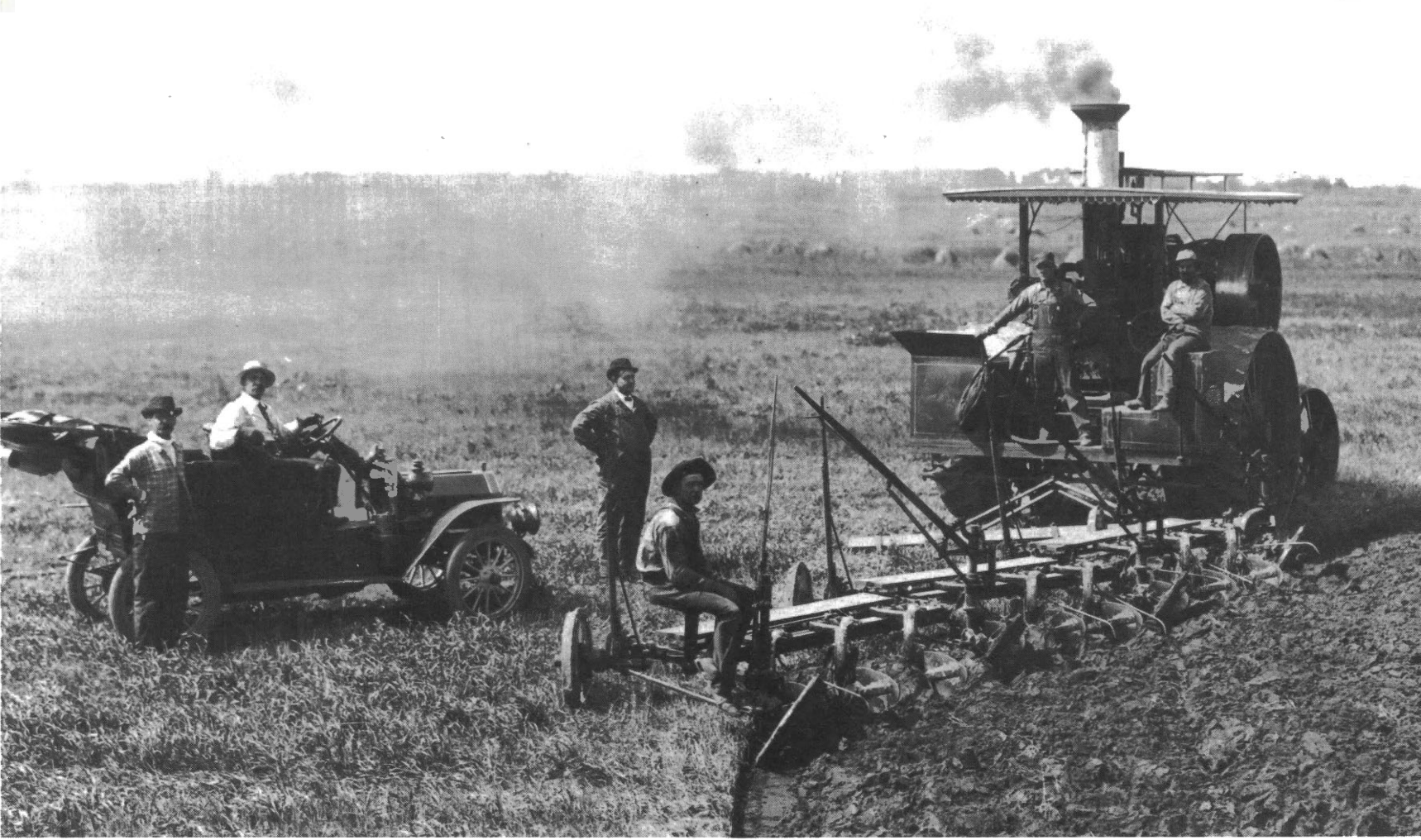
[7] *Thirteenth Biennial Report of the Department of Public Works*, State of Nebraska, 1919-1920, p. 535.

[8] *Laws of Nebraska*, 37th sess., 1919, p. 803; Nebraska Highway Advisory Committee, *Nebraska Highway Needs* (Lincoln, 1948), p. 17.



Mechanization reaches the Nebraska farm. Buffalo County, 1907.

Rural families early discovered the convenience of motor transportation.
The Fred Lange family, Lowell, Nebraska, 1910.

roads in each state that might receive federal aid under Federal Aid Road Acts.[9] In time these became the major highways of the state.

Between the years 1920 and 1930, the state of Nebraska, aided by matched funds from the federal government, improved these post roads approximately twice. In the first part of the decade, the policy of "grading only" continued. Unfortunately these graded earth surfaces were not all-weather roads. It was aptly said: "When it rained west of Omaha, the way out was four-legged horsepower."[10] The condition of the highways aroused owners whose vehicles by now had become fairly reliable in all weather. General indifference to road conditions disappeared, and there was a decided intensification of interest in obtaining as much road improvement as possible. The result was that in 1924, the Department of Public Works undertook the graveling of the major roads of the state. Enthusiasm for the graveling projects effectively drowned the protests of those who opposed them; outspoken opponents included retired farmers, stable owners, and other conservative residents of the state.

As the Depression of 1929 swept the nation, its effect was intensified by a drought period in Nebraska. The combination resulted in an increase of federal aid expended within the state to assist the general economy by adding to the effective purchasing power of the citizens of the state. The federal administrators singled out the highways as one area in which they could render a legitimate public service that did not compete with private enterprise. The federal projects brought about greatly improved road surfaces. Since local grading would have had a very limited impact on the economy, and since graveling did not have

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[9] *Twenty-sixth Biennial Report of the Department of Roads and Irrigation*, State of Nebraska, 1945-46, I, 1.

[10] H. Borland, "From Pup Tents to Motels," *New York Times*, Magazine Section, September 16, 1951, p. 24.

a really significant "multiplying" effect on the general economy, federal aid specifications for highway development recommended concrete or some other high type surface. In this way, the basic cement and steel industries as well as the local construction groups were aided by federal government largess.

During the three-year period from 1933-1936 about one-twentieth of the total mileage within the state post road system was surfaced with rigid pavement. In addition, over two thousand miles of grading and regrading and over two thousand miles of graveling were completed, giving a sum total of improvements for these few years approximately equal to the original mileage claimed in the basic system in 1921. [11]

It should be noted that the cost of this dynamic road improvement program was being borne by groups other than the local property tax payer. The gasoline tax was the beginning of a series of tax laws characterized by the implication that the motorist not only had the money to pay, but was willing. The fact is that the motorist did not raise serious objections to paying. Aside from simple inertia, this may have been due in part to the fact that the motorist experienced greater ease in driving on improved roads, or he may have been aware of possible savings in the operation of his vehicle. Whatever the reason, he paid increasingly higher taxes.

The magnitude of the change in financing may be illustrated by comparing the allotment figures for the 1920's with those of the 1930's. In the 1920's, the monies spent on the highways included about seven millions from state property taxes, about three and one-half millions from registration fees, about one and one-half millions from the

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[11] Compiled by the author from Department of Roads and Irrigation records, State of Nebraska, State Capitol, Lincoln, Nebraska.

federal government in matching funds, and three millions from miscellaneous sources, especially bonds.[12] During the 1930's, this pattern changed. In 1929 state gasoline tax receipts for the first time were larger than the property tax receipts utilized for road expenditures. These expenditures from gasoline taxes averaged about nine millions; federal aid rose to about four millions in matching funds plus seven hundred thousand in special payments; and registration fees amounted to about two millions. Property tax receipts fell to about three millions, and miscellaneous sources averaged about one million.[13]

Therefore, during this period when the through highways of the state were being improved, taxes paid by the owner and operator of the motor vehicle and federal government grants were being substituted for the money receipts from property taxes. In fact it might be stated that the few within many counties who used local roads were benefiting greatly from the many who used the main highways.

The introduction and utilization of the automobile in Nebraska had another profound influence on the citizens of the state. During the early part of the 1920's there was a startling change in Nebraska's attitude towards land owning. For a time, the ownership and operation of an automobile appears to have been a greater aspiration than the acquisition and possession of land.

Before this period the goal of the self-sufficient Nebraska homesteader usually had been to hold a mortgage-free quarter section. During depressions, it had been his aim to curtail expenditures to the minimum and to hold his land if possible, while during prosperous years he had attempted to expand his holdings. Thus the size of the average farm had been constantly increasing.

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[12] Nebraska Highway Advisory Committee, *op. cit.*, appendix.
[13] *Ibid.*

AVERAGE ACRES PER FARM IN NEBRASKA [14]

1900	246.1
1910	297.8
1920	339.4

This was sound economic practice. In a closed economic system with a limited quantity of usable land and an increasing population, there should be a sustained inflation of land values. The phenomenal rise in the price of Nebraska lands substantiates this general tenet. [15] Citizens who owned land in the state had accumulated credit at a rapid rate, not so much from the prices received for farm products as from the rapidly appreciating value of the acres which they owned. Whether he realized it or not, the average landowner had gained largely from the unearned increment that came with the ownership of farm lands.

However, between 1920 and 1925 an abrupt change occurred. The average number of acres per farm decreased from 339.4 to 329.0, [16] while at the same time the number of motor vehicles registered in the state increased almost half again from 205,000 to 301,716. [17]

When the farmer of Nebraska began to purchase an automobile, his expenditure was of a type essentially different from any in which he had previously engaged. The difference lay in the fact that the new acquisition was a depreciating capital good not directly connected with the productive capacity of the farm. Before 1900, the representative farmer had eagerly installed the equipment necessary to the settling of the region, but the purchase of

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[14] United States Bureau of the Census, *Fifteenth Census of the United States, 1930, Agriculture*, II, Part I, 1204.

[15] J. S. Hicks ("The Western Middle West," *Agricultural History*, XX, 66) reports that land values rose as much as 231.8 percent.

[16] United States Bureau of the Census, *Fifteenth Census of the United States, 1930, Agriculture, loc. cit.*

[17] The figures on registrations are from official records of the Motor Vehicle Division, Department of Roads and Irrigation, State of Nebraska, State Capitol, Lincoln, Nebraska.

nonbasic capital items calculated to assist in making the house or farm easier to operate had met with resistance. Nevertheless, by 1925 the automobile had been accepted. It no longer was considered to be a dangerous curiosity, and the horse was becoming a relic of the past.

The enormity of this change in values can be forcefully emphasized by contrasting the costs for purchase, replacement, and maintenance of the previously used horse with those of the new automobile. A good horse could be purchased in the early 1920's for an average price of $90.[18] On the other hand, a new automobile had an average wholesale price of $700.[19] It is to be noted, however, that about half of Nebraska car sales were for new Fords which sold for as little as $260.[20]

Horses, once they were purchased, might be expected in time and with proper management to produce more horses. Naturally the automobile could not reproduce itself. The horse subsisted on the products of the farm; the automobile did not. How expensive this was can be shown by comparing the cost of maintaining a horse with that of buying gasoline for a motor vehicle. To feed a horse for one year ". . . required about 50 bushels of oats or corn and 2 tons of hay . . .".[21] At the prices prevailing at the time, this feed list converted to cash and carefully spent would have purchased for the farmer approximately 180 gallons of gasoline. This amount of gasoline would allow about 2700 miles of automobile travel per year,[22] extremely limited driving even considering the relatively little long distance travel by automobile common in the 1920's. The automobile tended to increase its mileage. An owner operat-

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[18] Calculated from figures given by A. E. Anderson, *Nebraska Agricultural Statistics* (Lincoln, 1925), p. 160.

[19] Calculated from figures given in *Automotive News 1956 Almanac.*

[20] Philip Van Doren Stern, *A Pictorial History of the Automobile* (New York, 1953), p. 44.

[21] A. N. Johnson, "The Impact of Farm Machinery on the Farm Economy," *Agricultural History,* XXIV (1950), 59.

[22] The cost equivalent varied for each year according to what the indivual farmer might feed his animals. The price of oats was lower than that of corn.

ing his vehicle very quickly discovered additional uses for it far exceeding those feasible with a horse, and he usually developed an urge to drive purely for pleasure. Therefore, car operating costs quickly ran beyond their "horse equivalent."

At this point in the technical development of the automobile, repairs and other operating costs besides gasoline were major items of consideration though they varied for each owner. The mechanically-minded individual might spend most of the winter with the parts of the vehicle covering the barn floor without incurring any greater expenditure for upkeep than his horses might have required. However, for most owners maintenance meant a visit to a local garage and a repair bill.

The necessary shift in the allocation of personal income on the part of the representative Nebraska citizen when he became a regular motor vehicle purchaser created a land situation for a few years that might best be described as chaotic. The shift in land values was further aggravated because the replacement of the horse with an automobile brought about a major change in land usage by freeing pasturage and winter feed acreage for crop production. This land previously had had to be set aside for the horses.

The acreage released by the substitution of the automobile for the horse can easily be discerned. By comparing the number of horses in the state during a base period — 1910 to 1913 — (the last pre-automobile period) with the number present during the years 1920-1925, the relative number of Nebraska horses that might be expected to have economic use can be determined. Since each of these horses consumed the product of about five acres of land a year, [23] a simple multiplication will determine the number of acres released by the substitution of the automobile for the horse. The following table shows this:

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[23] A. L. Barber, *Story of the Automobile* (Chicago, 1917), p. 168.

APPROXIMATE ANNUAL ACREAGE RELEASED BY SUBSTITUTION OF MOTOR VEHICLES FOR THE HORSE, NEBRASKA 1920-1924 [24]

Year	Average Number of Horses in State	Decrease from 1910-1913 Average of 916,371	Acres Released for Commercial Crops by Decline in Number of Horses
1920	879,763	36,608	183,040
1921	841,095	75,276	376,380
1922	806,520	109,851	549,255
1923	793,977	122,394	601,970
1924	763,145	153,226	766,130

The figures indicate that some two million acres had been released during the period 1920-1924 by the substitution of the automobile for the horse. These acres were therefore available for commercial crop production. Since it had been customary to set aside the most productive acreage to assure winter feed for the horses, this change affected the potential production of commercial crops in an amount more than proportionate to the greater acreage allotted to a given crop. This condition allowed many farmers a sufficiently increased crop output to provide the needed cash outlay to purchase his first motor vehicle.

In addition to effecting this increase in the number of acres devoted to commercial crops of already settled farms, the automobile allowed the reopening of the crop frontier. Although the concentration of favorable ecological factors had made a successful agrarian economy most

[24] A. E. Anderson, *Nebraska Agricultural Statistics* (Lincoln, 1925), pp. 146, 160, for average number of horses in state. The other figures were computed by the author.

easily attainable in the southeastern section of the state, there were adequate ecological factors under normal conditions to support agriculture in the lands to the north and west of this prime region.

Prior to the adoption of the automobile, transportation problems had made agricultural marketing in these regions too expensive and too time-consuming to be economically practicable. An 1896 report by the Agriculture Department showed that the average length of haul in the prairie states was 8.8 miles, with an average weight or load of 2,409 pounds at an average cost of twenty-two cents per mile. This made the average cost per ton for the whole length of haul $1.94.[25] Few items could economically afford so large a haulage charge. Thus, the area at a distance from transportation facilities was dependent for trade exports upon commodities that either had a high value in relation to bulk in their natural or processed form or were self-portable to market.

Additional problems for these remote areas were the economic costs of 1) enforced idleness for men and animals during certain portions of the year, 2) inability to reach markets with perishable goods when prices were good, and 3) wear and strain on equipment and animals as the local road user attempted to cope with the problems encountered on a muddy road by a wagon heavy enough to carry a full load on a good surface. In actual practice the quality of local roads limited feasible settlement to a zone within twenty miles of the terminus of a through transportation facility.[26]

With the introduction of the automobile and the consequent faster service and lower haulage charges for small loads, the margin of crop cultivation was extended. Need-

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[25] Roy Stone, "Traffic of the County Roads," Office of Public Road Inquiries, U. S. Department of Agriculture (Washington, 1896), *Circular* No. 19, p. 1.

[26] A. L. Craig, *The Railroads and the Wagon Roads*, Office of Public Road Inquiries, U. S. Department of Agriculture, (Washington, 1904), *Circular* No. 37, p. 2.

less to say, bringing these lands into crop use further increased the supply of marketable agricultural commodities. Eventually this increased supply lowered the price received by each farmer for his output. The market price break was accentuated further as each farmer felt encouraged to expand his production to the limit in an effort to increase the size of his own particular return. The larger the total crop marketed the lower the price per unit; yet the individual farmer could not control the total units of output. He had to increase his own share at all costs. [27]

This market situation caught many a Nebraska farmer in serious straits. In many cases, he had purchased land

PRICE PER ACRE OF FARM LAND SOLD IN ELEVEN NEBRASKA COUNTIES, 1910-1920 [28]

Year	7 South-eastern Counties	2 East-central Counties	1 Sand-hill County	1 High-plains County
1910	$ 91	$ 82	$12	$17
1911	96	85	11	16
1912	104	93	11	15
1913	106	100	12	14
1914	110	100	9	12
1915	106	101	8	11
1916	109	103	8	14
1917	119	113	7	18
1918	128	110	13	23
1919	152	133	15	31
1920	180	165	23	43

[27] It should be emphasized that this farm condition was not exclusively a Nebraska problem. The glutted postwar agricultural market was affecting all regions. Each area had felt the pressure to expand its output of agricultural crops to the fullest extent.

[28] Eleanor H. Hinman, *History of Farm Land Prices in Eleven Nebraska Counties—1873-1933*, University of Nebraska, College of Agriculture, Experiment Station, *Research Bulletin* No. 72 (1934), pp. 24-25.

at the high prices prevailing during the latter part of the land boom, the peak of which was reached in 1920 when the 1910 value had approximately doubled. During this spiral in land value, part of the farmer's land was cash purchased. However, other portions were acquired with banker's extended credit. Usually this credit was granted in the form of five year mortgages. Since these mortgages were issued on a factor of production that in the past had always appreciated in value, even the most conservative banker did not hesitate to allow high credit margins—in fact up to as much as 60 percent was common.[29] Therefore, when World War I ended the Nebraska farmer found himself holding extensive farm land, much of it bought with expensive term credit. The yearly totals of money borrowed in Nebraska are given in the following table:

TOTAL FARM MORTGAGE DEBT IN NEBRASKA, 1916-1925[30]

1916	$229,557,000	1921	$615,310,000
1917	266,528,000	1922	678,934,000
1918	318,545,000	1923	691,732,000
1919	378,855,000	1924	683,482,000
1920	466,690,000	1925	612,437,000

When agricultural prices began to fall, the farmer was in a serious position. Not only did he have to offer more bushels of wheat or other units of agricultural crops on a declining market to pay the fixed interest on his mortgage; at the same time he was continuing to purchase and operate motor vehicles that required a large cash out-

[29] Wayne M. Smith, "The Effects of World War I and the New Era on Custer County, Nebraska" (M. A. Thesis, University of Nebraska, 1951), p. 63.

[30] D. C. Horton and H. D. Umstott, *Revised Annual Estimates of Farm Mortgage Debt by States, 1930-1943* (Washington, 1944), p. 19.

lay throughout the year. As conditions worsened, land-holding for its own sake ceased to be appealing.

Formerly, individuals with good holdings of land had been able to count on the appreciation of land values to sustain their credit. However, during the early 1920's this condition no longer held. The price per acre for farm land in seven counties of Nebraska is given below:

PRICE PER ACRE OF FARM LAND SOLD IN SEVEN NEBRASKA COUNTIES [31]

Year	7 Southeastern Counties
1920	180
1921	165
1922	136
1923	129
1924	126
1925	126

These figures show that in these highly populated southeastern counties land values experienced a marked and consistent depreciation during this five year period. This area clearly demonstrates the effect on land values created by the substitution of the automobile for the horse. The farm land in this area had in part been allocated to garden farms close to the cities which supplied the food for city horses that were no longer used. When the commercial farmers of the region were unable to utilize these released acres in other ways, prices slipped.

The willingness of the ordinary Nebraska citizen to purchase, maintain, and operate an automobile thus changed his basic attitude toward the acquisition and possession of land. Though this change had its advantages, during the first part of the 1920's it was violently deterimental to many residents of the state. These years were a

[31] Hinman, *loc. cit.*

turning point in the sense that they marked the beginning of an era that looks upon the automobile as an essential piece of equipment for daily living. In the years since 1925, the automobile has become increasingly indispensable to a major segment of the population not only in Nebraska but in the entire United States.