

CHAPTER 3

THE GREAT DEPRESSION

Much has been written about the Depression of the 1930's and its devastation on the nation. The Gross National Product fell 46 percent from \$103.1 billion in 1929 to \$55.6 billion in 1933. Wages for all employees fell 42 percent from \$51.1 billion to \$29.5 billion during the same period. But, the agricultural sector was the hardest hit. Farmland values fell from \$78.4 billion in 1920 to \$57.7 billion in 1929 and to \$36.2 billion in 1933. The total value of national farm output, particularly significant to Nebraska, declined from \$13.8 billion in 1929 to \$6.8 billion in 1933. However, the greatest toll of the Depression was in human terms. At its worst in 1933, unemployment reached nearly 25 percent nationally.

Perhaps nothing is more illustrative of America's condition in 1932 than a glance at its military establishment. At that time, the U.S. had the 16th largest Army in the world, putting it behind, among others, Czechoslovakia, Turkey, Spain, Romania, and Poland. There were 132,069 Americans in Army uniform. On paper, they could have put up a stiff fight against Yugoslavia (138,934). In reality, they would have been torn to pieces because most of them were committed to desk work, patrolling the Mexican border, and protecting U.S. possessions overseas. The Army Chief of Staff, General Douglas MacArthur, was left with about 30,000 available troops, a force smaller than that sent by George III of Great Britain to tame the rebellious American Colonies in 1776.

President Herbert C. Hoover was desperately trying to improve the economy, sometimes resorting to psychological warfare: "What this country needs is a great poem." To singer Rudy Vallee (1901-1986), he said in the spring of 1932: "If you can sing a song that will make people forget the Depression, I'll give you a medal." Mr. Vallee didn't get the medal. Instead, he sang:

"They used to tell me I was building a dream,
And so I followed the mob.
When there was earth to plow or guns to bear,
I was always there right on the job.
Once I built a railroad, made it run,
Made it race against time.
Once I built a railroad, now it's done,
Brother, can you spare a dime?"

In Nebraska, a predominantly agricultural state, the Depression was severe. Agricultural prices declined 56 percent between 1929 and 1933 with total farmland values decreasing from \$2.5 billion to \$1.6 billion. It was inevitable that this sharp drop would affect almost every other aspect of Nebraska's economy with a devastating impact on employment levels even in non-agricultural areas. The number of persons employed in manufacturing decreased 30 percent during this period while manufacturing wages declined by 50 percent. In the retail trades, employment dropped 21 percent and wages 43 percent. The number of employees in the wholesale trades declined only 13 percent but wages decreased by over 63 percent. The decline in agriculture affected practically everything else:

"The condition of the farmers affected Nebraska merchants, lumber dealers, realtors, school teachers, laborers, and artisans. Housewives stocked their pantry shelves with the simplest necessities, construction lagged, and school administrators curtailed their programs as tax receipts went down. Day laborers, formerly sure of a place on Nebraska farms and in Nebraska industries, began the long trek of the unemployed."

Whatever the consequences of the Depression for Nebraskans, it proved ultimately beneficial to the continued development of the highway system. For Nebraska's highways, these years witnessed unprecedented progress. In 1930, the Bureau of Roads and Bridges had eight field divisions and the state highway system totaled 9,752 miles, of which only 6,882 miles were maintained. Of the latter, 4,760 miles were graveled, 1,725 miles had dirt surfacing, 368 miles were paved, and 29 miles were oiled.

Lower wages and depressed prices of construction materials, resulting from the economic conditions, contributed to this progress. Wages varied from 30 cents an hour for unskilled labor to 50 cents an hour for skilled

labor during 1930-32. While this was less than the department paid for comparable work just a few years before, most who were able to get a job were glad to have it regardless of how much their skills might otherwise have been worth:

"The Depression affected our ability to get jobs. I took electrical engineering at the University of Nebraska and graduated in 1934. None of my classmates were able to find jobs in electrical engineering and we considered ourselves very fortunate to get into any kind of engineering. When I got a testing job at the university in 1934 and was hired by the department as an engineer in 1935, I was one of the fortunate ones." (Orville L. Lund, 1985 Interview)

Mr. Lund, who became Materials and Tests Division Engineer in 1968, was indeed fortunate to find an engineering position soon after graduation. John W. Hossack, who served as the State Engineer from 1960-68, relates a similar experience:

"I graduated in June 1933 from the University of Nebraska College of Engineering and there was no engineering work available. I was lucky to be hired by the department as a rodman in October at \$90 a month. This was much better than the 75 cents a day I'd been getting for temporary work here and there on farms." (John W. Hossack, 1985 Interview)

There was also nothing fancy about the hiring practices in those days. After being offered a job with the department, Mr. Hossack sent a one-line telegram from Sutherland, dated October 15, 1933, to A. T. Lobdell, Chief of the Bureau of Roads and Bridges in Lincoln: "JOB ACCEPTED - WIRE ME COLLECT WHEN AND WHERE TO WORK." Mr. Lobdell replied by collect telegram on the same day: "REPORT TO ENGINEER OSBORN - RAGAN - HARLAN COUNTY - TOMORROW." And that's the way it happened. Mr. Hossack reported to Project Engineer Vernon F. Osborn at the Village of Ragan the next day.

According to Geoffrey R. King, who was hired by the department as a chainman in 1935, the situation was worse for those without a college degree:

"Those who were not graduates or hadn't had engineering in college were hired at \$4 a day, when they needed us. They had a paving job in my hometown, Arapahoe, and they needed a man to help them do final measurements, the rough work. The engineer in charge of that project had a similar job at Cambridge and I went there with him. He started a third project at Franklin but a local fellow got the job. I went back to dance-band-trumpet and anything else I could find to pick up a little money. It was pretty rough in the thirties and there just weren't any jobs. People were desperate!" (Geoffrey R. King, 1985 Interview)

Malcolm A. Gabel, who was hired by the department as a chainman in 1937, states that if you didn't know how fortunate you were to have a job, you soon found out if you asked for a pay raise:

"I had made a sample drawing of some railroad crossings that the federal government wanted to improve. Anyway, we got a nice letter from the federal government saying that was a nice job. I took that down to the Personnel Director and was going to put a little pressure on him for a raise, I thought. Well, I went down there and sat and stewed a little bit first. Then, I went in and told him I deserved a raise and showed him this letter and the sketch that I made. He proceeded to tell me how lucky I was to have a job and said he had been laying-off all these married guys who had kids. Anyway, by the time I got out of there, I was damn glad I had a job. I didn't get a raise either." (Malcolm A. Gabel, 1985 Interview)

The salary picture was not always as bleak as it seemed, however. What appeared to be minimal pay often turned out to go much further because of the depressed economy:

"I started at a monthly salary of \$65 plus \$35 subsistence. The minimum wage was 50 cents an hour for skilled labor, 30 cents for unskilled, at a maximum of 30 hours a week. That doesn't sound like much but we used to eat three meals in a restaurant for a dollar a day and rent a sleeping room for three dollars a week. So, out of \$100, we still had a few dollars left at the end of the month." (Oliver W. Johnson, 1985 Interview)

And having some money often made those assigned to field work more than welcome in the small communities:

"As we went to these small towns to work, we were the people in town who had some money. We could rent a place and buy our food and the

local people were always glad to see us because we had some money to spend." (Orville L. Lund, 1985 Interview)

The depressed prices of goods greatly benefited the department's construction program. The cost of materials for highway construction began to decline after the stock market crash which occurred on October 24, 1929 (Black Thursday). State Engineer Robert L. Cochran reported that the average cost of highway construction for the 1929-30 biennium was 10 percent lower than during 1927-28, 15 percent lower than during 1925-26, and 30 percent lower than during 1923-24. While the size of the state highway system remained constant at 9,752 miles from 1930 to 1932, the mileage actually maintained increased 13 percent from 6,882 to 7,809. In 1932, Mr. Cochran reported that:

"Very favorable prices have permitted maximum construction for the dollars available. Due to reduced prices, total maintenance costs have not increased even though we had increased mileage to maintain and an unprecedented snowfall during the winter of 1931-32."

In addition, the continued research and development of highway materials in the testing laboratories proved that a bituminous surface would stand up to the weather and traffic in many areas of the state. This surfacing material was considerably less expensive than concrete paving. During most of the thirties, it was estimated to be over five times less expensive to pave with bituminous material than with concrete. In 1940, State Engineer Albert C. Tilley estimated that paving with bituminous material had cost \$4,727 per mile compared to \$24,745 per mile for concrete. In the same year, bituminous material accounted for almost 70 percent of the paved highways in Nebraska. However, economy had its price:

"In the thirties, we under-designed the asphalt highways and tried to do everything cheaply. We always seemed to be short of money. On highways where the soil was firm, we tried to eliminate the use of asphalt throughout the pavement depth. We called this soil aggregate base course. It would have been much better material had we added asphalt as a cementing agent to hold it together. Yet, that cost a lot of money so we tried it without. We placed a thin layer of asphalt on top which we called an 'armor coat'. It would be

one-half inch thick. Of course, we didn't get much performance and we might have to patch them the first year." (Orville L. Lund, 1985 Interview)

The armor coats described by Mr. Lund quickly became known as "slobber coats" among the engineers.

Reduced costs also allowed the purchase of additional equipment. In 1930, the state was able to purchase 38 new trucks which it equipped with snow blades. Perhaps the most ingenious device developed by the Division of Maintenance was the road magnet, built as an experiment to clean the highways of nails and metal parts which inevitably shook loose or bounced off farm wagons, machinery, and motor vehicles. This was no small matter and in its first year of operation, it cleaned 2,105 miles, picking up a total of 6,022 pounds of metal, an average of 2.9 pounds per mile:

"It was quite successful and picked up a lot of nails from the highways. Tires lasted longer and people liked to see it come. It was mounted under a truck and at the end of the mile, they would put a canvas down underneath this big magnet, turn off the juice, and the metal would drop down on it. It sure saved a lot of punctures." (Stephen R. Gilbert, 1985 Interview)

The magnets continued to prove their worth, picking up 7,643 pounds in 1933, 8,569 pounds in 1934, and 20,226 pounds in 1935. In the latter year, a pick-up of 18.9 pounds per mile occurred on Highway 82 (now N-103) between Wilber and Crete, a distance of only 10 miles.

From 1929-33, the department conducted a special study of the cracks in concrete pavement. It was found that concrete made from sand-gravel aggregate is subject to considerably more cracking than concrete made from sand and crushed limestone. The study showed that at a pavement age of 2.5 years, the average distance between transverse cracks was 20 feet for the sand-gravel aggregate mix as compared to 93 feet for the sand and crushed limestone mix.

Federal funding played a significantly greater role in highway construction in the thirties. In 1931, the federal government made

\$80 million in emergency federal-aid available to the states to supplement their required matching expenditures to receive regular federal-aid. This greatly relieved the burden on state appropriations and allowed highway construction to continue uninterrupted. State Engineer Robert L. Cochran reported that in 1931-32, Nebraska received \$4.25 million in emergency federal-aid. He noted that "for the first time in many years, all federal-aid apportioned to Nebraska has either been spent for construction or has been placed under contract." This allowed more construction than would otherwise have taken place since Nebraska had generally been unable to appropriate enough money in previous years to match the full amount of federal-aid available to the state.

The impetus behind the Emergency Federal-Aid Act of December 1930 was to create and maintain as high a level of employment as possible to offset increasing unemployment. A second Emergency Federal-Aid Act was passed by Congress in July 1932, which set forth stipulations and requirements to guarantee that end. States were required to adhere to minimum wage rates of 30 cents per hour for unskilled labor and 50 cents for skilled labor. In order to place as many people as possible on the job, workers were prohibited from working more than 30 hours a week. Preference was to be given to local labor and to ex-servicemen with dependents. With few exceptions, most work was to be done by hand, even mixing concrete. According to John W. Hossack, the department attempted to comply with these requirements:

"Within two weeks after we arrived on the job, we had hired 200 local people to work for us. We wanted to put as many men to work as possible. The work was done with teams of horses to pull the Fresnos and the dump wagons that hauled the dirt. We did the finishing work with shovels, rakes, and wheelbarrows. We hired the farmers' horses... rented three and four-horse teams. The only mechanized equipment that we had were two Caterpillar tractors. By today's standards, they would be little but they were considered fair-sized then... CAT 60's... and they pulled the elevating grader that loaded the dirt into the wagons to be hauled to where they needed it for the grade... and they also pulled the blade grader." (John W. Hossack, 1985 Interview)

The new requirements also meant more paperwork, according to George J. Welty, who later served as the department's Controller:

"The contracts required the contractor to use at least a stipulated number of man-hours on the job. If he didn't use that many man-hours, penalties were assessed. The contractors were also required to give us certified copies of their payrolls showing names, job classifications, hours worked, rate per hour, and amounts paid as proof of required pay rate and man-hour requirements. These large sheets, which we called 'horse blankets', became a part of the project documents and were a basis for assessing penalties, if necessary." (George J. Welty, 1985 Interview)

Federal programs incorporated numerous requirements that increased the workload for administrative personnel, who found some of the requirements curious:

"Besides the limited number of hours that you worked a man and the fact that you had to pay him a minimum wage, the government set a lot of jobs up with man-hour requirements. They would require the grading contractor to employ at least so many hundred or thousand man-hours and the culvert contractor had to employ so many men for so many hours. That meant the grading contractor was limited on the machinery he could use. If he used too much machinery, he would have to put these men out there and give them rakes. They would go out and put in time raking and fine grading. And, the same way with the culvert contractor. If he was too efficient and got the job done without using his required number of man-hours, he had to give his men coarse rubbing stones and they went out and polished the concrete. They rubbed it so it was smoother than it would have otherwise been, just to get in his number of man-hours because his payroll had to document that he had employed that many men for that many hours." (Oliver W. Johnson, 1985 Interview)

Nebraska's most famous bridge (based upon beauty, uniqueness of design, compatibility with its surrounding environment, age, durability, and national recognition) is the Bryan Bridge, which spans the Niobrara River on US-20 southeast of Valentine. In May 1995, a State Historical Marker with the following inscription was installed in a small parking area near the east end of the bridge:

"This arched cantilever truss bridge, connected in the center with a single pin, is the only one of its kind in the United States. It was built in 1932 by the Department of Public Works and named by the local

citizenry in honor of Governor Charles Wayland Bryan. The bridge is 289 feet long, has a 24-foot roadway, and cost \$55,564. It was designed by Josef Sorkin, who immigrated from Russia in 1923 and graduated from the University of Nebraska College of Engineering in 1929. This particular design was chosen because it was aesthetically compatible with the surrounding environment of the Niobrara River Valley. The Bryan Bridge was selected as the 'Most Beautiful Steel Bridge of 1932 in Class C' by the American Institute of Steel Construction and was the first bridge between Wisconsin and the Pacific Coast to receive such an award. In 1988, the bridge was listed in the National Register of Historic Places and, in 1995, it was designated as a State Historic Civil Engineering Landmark by the Nebraska Section of the American Society of Civil Engineers."

According to designer Josef Sorkin (age 89 in 1995), when the Bryan Bridge was dedicated on September 30, 1932, dignitaries came from far and wide, including Governor Bryan and a number of Sioux Indians dressed in full regalia. At the beginning of the ceremony, the Sioux Chief, Jake Left-Hand-Bull, met Governor Bryan at the center of the bridge and offered him a "pipe of peace" to smoke, thus making the governor a member of the Sioux tribe and symbolically welcoming the white man to the land west of the Niobrara River. Then, to the syncopated beat of the tom-toms, the Indians chanted and danced on the bridge, joined by Governor Bryan. At that point, State Engineer Robert L. "Roy" Cochran said (in a low voice) to Chief Bridge Engineer John G. "Glen" Mason that this was "a good test to see if the S.O.B. would collapse." Mr. Cochran was, of course, referring to the bridge and not Governor Bryan. An original steel historical plaque is attached to the bridge and reads:

"Bryan Bridge - Named in honor of Governor Charles W. Bryan - September 30, 1932 - By the Valentine Chamber of Commerce, the Cherry County Board of Commissioners, and the Sioux Indians."

As the Depression continued in 1933, Nebraska and other states found it increasingly difficult to maintain wage and employment levels on public works projects and began trimming budgets severely. The Nebraska Legislature lowered motor vehicle registration fees, a move designed to lessen the tax burden on individuals, but which at the same time reduced the amount of funds available for highway construction. In addition, the Legislature increased the counties' share of the gasoline tax by one-half

cent. Designed to help alleviate the revenue problems in the counties, this also compromised funds that would normally have been allocated to state highway construction. Also in 1933, the Legislature changed the name of the Department of Public Works to the Department of Roads and Irrigation, and provided that the title of Secretary be discontinued and the official in charge of the department would be known as the State Engineer.

The concern over unemployment continued throughout the thirties. With the inauguration of President Franklin D. Roosevelt on March 4, 1933, there was an increase in federal legislation designed to meet this problem. Public works programs and state highway departments were natural beneficiaries of much of this activity. For the man on the street, there was renewed hope of finding a job and an entire generation of Americans had a new anthem:

"Happy days are here again!
The skies above are clear again!
Let's all sing a song of cheer again,
Happy days...are...here...a-gain!"

Early "New Deal" legislation such as the National Industrial Recovery Act (NIRA) of June 1933, and the Civil Works Administration (CWA) of November 1933, contributed to the further development of Nebraska's highways while seeking to reduce unemployment. Under the NIRA, Nebraska received \$7.8 million for the improvement of state highways. This money did not require state matching funds and was put into use almost immediately. In June 1934, Nebraska received an additional grant of \$3.9 million under the Hayden-Cartwright Act, which also required no state matching funds.

Nebraska benefited from the CWA, which provided funds for hiring laborers to engage in maintenance and repair work that would not normally have been done for lack of funds. These jobs ranged from ditch cleaning and bridge repair to tree planting. Although CWA work was suspended on March 31, 1934, the monthly average on state CWA projects was 6,065 men.

W. H. Mengel, a 1922 graduate of the University of Nebraska College of Engineering who was hired by the department as an engineer in 1931 and became Design Division Engineer in 1952 and Right-of-Way Division Engineer in 1959, commented on the ability of the CWA to put people to work:

"The CWA recognized the highway departments as operating organizations that could put people to work in short-order on direct-labor projects where plans were available, but had not been used due to a lack of funds. These plans were used all over the state for the beginning of work for local people." (W. H. Mengel, 1985 Interview)

A long period of drought in the thirties created a new challenge for highway construction personnel. David O. Coolidge, who was hired by the department as a chainman in 1928 and served as the State Engineer from 1977 to 1983, described how difficult it was to be at a construction site during the dust storms that plagued Nebraska:

"It was very uncomfortable to be working in those conditions of dust and dirt. You couldn't see and it was a complete blackout. You just couldn't be out in it. It was pretty rough!" (David O. Coolidge, 1985 Interview)

Arthur B. Chaplin agreed. He recalls the devastating wind while working in the Platte Valley:

"If the wind was blowing strongly from the northwest, you knew you were going to have to put on a new windshield because it was just like glazed glass after those wind storms with that sand and gravel blowing. Tumbleweeds, the fences were full of them. Drifts and dirt buried all of the fences and those tumbleweeds would break the fences down. They were so thick and heavy in those days, and dry... then the dirt would drift over. We didn't have modern air cleaners on the engines and the fellows operating them just didn't realize what dirt did to an engine. I went out many times when they couldn't get them started and the filter would be clogged with dirt. You had to dig it out with a putty knife." (Arthur B. Chaplin, 1985 Interview)

Even the materials and techniques of highway construction were affected, according to Oliver W. Johnson:

"The dustbowl years made work harder because in grading, you had to use water to get compaction. Concrete would also dry out. If you were doing any paving, you had to keep the surface wet for so many hours and in that dry, dusty, windy weather, it took more work."
(Oliver W. Johnson, 1985 Interview)

John W. Hossack also recalled what it was like to work under those conditions in the thirties:

"One day, I was at Beaver City when the dust rolled in. We quit about 5:00 and went to town. Three of us were going into the restaurant to eat supper and all at once we looked out and couldn't see across the street. They turned on the street lights and you couldn't see them in front of the restaurant. One fellow and I, we were single at the time, roomed about three or four blocks away and we had to walk home after supper because we didn't have a car. By the time we got home, we were covered with dirt. From then on that spring, it was dust, dust, and more dust. The dust storms would roll in sometimes in the middle of the afternoon, sometimes around noon. We had to shut the paving down because the visibility was so poor." (John W. Hossack, 1985 Interview)

In 1934, the federal government became involved in highway beautification. Under the National Recovery Act, the federal Bureau of Public Roads required "the appropriate landscaping of parkways or roadsides ... involving not less than one percent of the total apportionment to each state." This program was intended to become an integral part of road construction. The preservation of scenic features was addressed during the field location of highways and involved soil conservation, selective tree cutting, rounding slopes, seeding, and planting. When possible, roads were designed to conform with the natural setting.

The department's first Landscape Engineer, William L. Younkin, was hired in February 1934 and placed in charge of the new Roadside Improvement Unit in the Construction Division. Born at Iowa City, Iowa in November 1885, he graduated from high school at San Diego, California and attended Columbia University in New York City. From 1922-33, Mr. Younkin served as the Supervising Architect of the Nebraska State Capitol Commission and was directly in charge of the capitol's construction. In 1938, he became a Registered Professional Architect in Nebraska and was assigned license

number A-18. He died in February 1947 while still employed by the department.

In the summer of 1934, the department built a roadside park (rest area) on the south side of US-20 near the east end of the Bryan Bridge southeast of Valentine. This marked the first time that the department used state highway funds for this purpose. The land for the park was leased by the department in March 1934 and measured 230 feet by 280 feet (1.478 acres). The lease expired in March 1939 and although the department had an option to purchase the tract, it did not exercise the option or renew the lease. Therefore, the department's legal interest in the property ended in 1939. According to the department's 1933-34 Biennial Report:

"The area has been fenced and provided with benches, trails, a foot-bridge, and a well. Some cedar trees and many native shrubs have been planted in it, making the park a pleasant place for highway travelers to stop for an outdoor meal or for a fine view of the Niobrara River."

Spring flooding in the Republican River Valley in 1935, severe cold and deep snow during the winter of 1935-36, flooding in the spring of 1936 in the Elkhorn and Lower Platte Valleys, and drought again in the summer of 1936 made the problems of the Depression even worse. For the Department of Roads and Irrigation, the elements of nature created a severe drain on available resources. In addition to 94 persons drowned and three tornado deaths, the 1935 Republican River flood damaged 341 miles of highways and destroyed 307 bridges. Also lost were 3,227 cattle, 1,007 buildings, 290 horses, and 46,507 chickens. A total of 54,479 acres of cropland and an additional 617 buildings were damaged. Geoffrey R. King recalls the suddenness with which the flood began on May 31:

"In the spring of 1935, my future wife had just bought a new car out of her teacher's savings. The night of the flood, she, her mother, and I took a ride between Holbrook and Cambridge over a state highway that had just been built and graveled. We noticed that the water was almost up over the railroad tracks and so we went back to Holbrook. By dark, the town was under water. It hit just like that. This new

highway simply disappeared along with the railroad tracks."
(Geoffrey R. King, 1985 Interview)

There were many miraculous escapes and heroic rescues. In addition, the department was quick to offer assistance to the people affected, according to Arthur B. Chaplin, who worked at Grand Island:

"I took a number of our men and trucks and we helped get the families out. Then, we'd go back and get what personal things they wanted out of their houses. There were three men with every truck and we had trucks there from Hastings and Grand Island. We sent everything that we could to help out." (Arthur B. Chaplin, 1985 Interview)

In bringing order out of chaos, the highways of the region played an important part. Detours were established around washouts and temporary bridge repairs were made so that mail and supplies could move by truck. Materials and men were trucked-in to start repair work on the railroad and telephone lines. Trucks also brought men of the Civilian Conservation Corps to hunt for bodies, bury animals, and perform other emergency sanitation work.

The floods in the Elkhorn and lower Platte River valleys also caused substantial destruction to highways and bridges. While Congress allotted \$276,000 to Nebraska in an Emergency Flood Relief Appropriation, repairs and reconstruction necessitated by these disasters absorbed most of the state's resources for new highway construction in these years. W. H. Mengel recalls working on the highway surveys after the 1935 flood in the Republican River Valley:

"A day or two after the Republican River Valley flood, I was told to stop the job I was on near David City and go to the McCook Division and start some surveys to relocate Highway 6 because of flood damage. My first assignment was at Cambridge. I also had to go up and down the river and get an inventory of the damage to the bridges over the Republican." (W. H. Mengel, 1985 Interview)

In addition to the expenses incurred because of the flood, heavy snows during the winter of 1935-36 also taxed the department's resources. From January 15-28, 1936, the eastern half of the state received approximately

24 inches of snow. Snow removal during the winter of 1935-36 cost \$270,000, compared to \$58,000 for 1934-35 and \$13,000 for 1933-34. The normal problem of drifting was compounded by the failed corn crops of 1935. Normally, rows of standing cornstalks provided a natural snow fence which helped control drifting. And because of the dust storms, the man-made snow fences in other areas had been buried in dust, making them ineffective. George J. Welty recalls the problems of keeping the highways open during the winter of 1935-36:

"It was one-way traffic for long stretches between Tekamah and West Point with passing provided about every half-mile. The snow was over 10 feet deep in places. It was just like going down a trench, an open tunnel. A lot of that snow removal was done by hand-shovel. In many cases, a group of shovelers would toss the snow up the side to another group who would toss it higher. It wasn't until 1937 that the department used rotary snow blowers." (George J. Welty, 1985 Interview)

Due to the sub-zero temperatures which prevailed from January 22 to February 19, 1936, the Division of Road Construction and Maintenance was severely handicapped in its efforts to open and clear the highways of snow. All available equipment was transferred to the snow area from those sections of the state where no snow had fallen. Approximately 150 trucks and tractors equipped with snow plows were in action day and night. These units were assisted by over 200 regular maintenance tractor units and about 3,000 men were employed for shoveling.

While the decade of the thirties, taken as a whole, witnessed a substantial increase in mileage added to the state highway system, over 70 percent of the construction took place in the years of emergency federal funding. In the last four years of the decade, annual construction activity was only two-thirds of what it had been previously. With the resumption of regular federal-aid in 1936, Nebraska was again faced with the problem of appropriating enough state dollars to match federal funds on a 50-50 basis. Still committed to "pay as we go" highway construction, the state continuously fell short of the full amount of federal funds apportioned to it. By the end of the decade, State Engineer Albert C. Tilly reported that Nebraska was unable to match some \$2 million in federal

highway funds, representing \$4 million in terms of actual construction dollars when or if matched by the state. In a 1940 report to the Governor, he campaigned vigorously for the state to find a way to provide the necessary funds.

In 1937, the Legislature passed a law which created the state Board of Examiners for Professional Engineers and Architects. Composed of three engineers and two architects appointed by Governor Robert L. Cochran, the board was responsible for registering qualified engineers and architects, and revoking registrations when necessary, in conformity with law. Of course, the board initially had to formulate criteria and make judgments on candidates who could automatically be registered by virtue of education and/or experience, and also those candidates who would be required to pass an examination. This was no easy task. After assigning registration numbers (E-1, A-1, etc.) to the initial group of engineers and architects, the board members suddenly realized that they had forgotten to assign numbers to themselves. They solved the problem by assigning themselves B-1 thru B-5, the "B" meaning "board." The engineers on the board were Roy M. Green (B-1), Lincoln; David L. Erickson (B-3), Lincoln; and Albert L. Turner (B-5), Omaha. The architects were William L. Steele (B-2), Omaha; and Charles W. Steinbaugh (B-4), Omaha. Governor Cochran received E-1 and James C. Stitt of Norfolk received A-1. In December 1938, there were 184 engineers and architects in the department who had received professional registration.

The average number of Registered Professional Engineers (PE's) at the department has fluctuated over the years as shown below:

<u>Year</u>	<u>PE's</u>	<u>Year</u>	<u>PE's</u>
1940	180	1970	148
1945	118	1975	114
1950	107	1980	100
1955	106	1985	114
1960	143	1990	125
1965	145	1995	134

The 1937 Legislature also created within the department, the Division of Highway Safety and Patrol, to be known as the Nebraska Safety Patrol. By law, the State Engineer was the Director of the Motor Vehicle Division and the State Sheriff was the chief officer of the Safety Patrol. The latter position was first assigned to Raymond F. Weller, who had previously served as the field Division 1 Engineer and who would later become the Chief Highway Engineer of the Department of Roads and Irrigation. In order that he might acquire a thorough knowledge of the requirements, duties, and functions of a traffic control organization, Mr. Weller attended the Iowa Highway Safety Patrol training camp, assuming the role of a candidate for the seven-week training period. This practical experience was of great value in planning the organization of the Nebraska Safety Patrol. Captain Weller was assisted by one lieutenant, one sergeant, and four corporals. Approximately 3,500 men applied for positions as patrolmen. After five weeks of training, 44 patrolmen were assigned to the field on November 22, 1937 wearing distinctive uniforms tailored at the State Penitentiary. Equipped with 28 patrol cars and six motorcycles, their primary mission was to reduce the number of motor vehicle accidents on Nebraska's highways.

Legislation in 1941 provided that the chief officer of the Nebraska Safety Patrol shall be the Superintendent of Law Enforcement and Public Safety. However, the administration and approval for expenditures of funds by the Safety Patrol was still, by law, the responsibility of the Director of the Motor Vehicle Division (State Engineer).

In 1940, the Bureau of Roads and Bridges had eight field divisions and the state highway system totaled 11,220 miles, of which only 9,000 miles were actually maintained. Of the latter, 4,784 miles were graveled, 3,804 miles were hard-surfaced, and 412 miles had dirt surfacing.