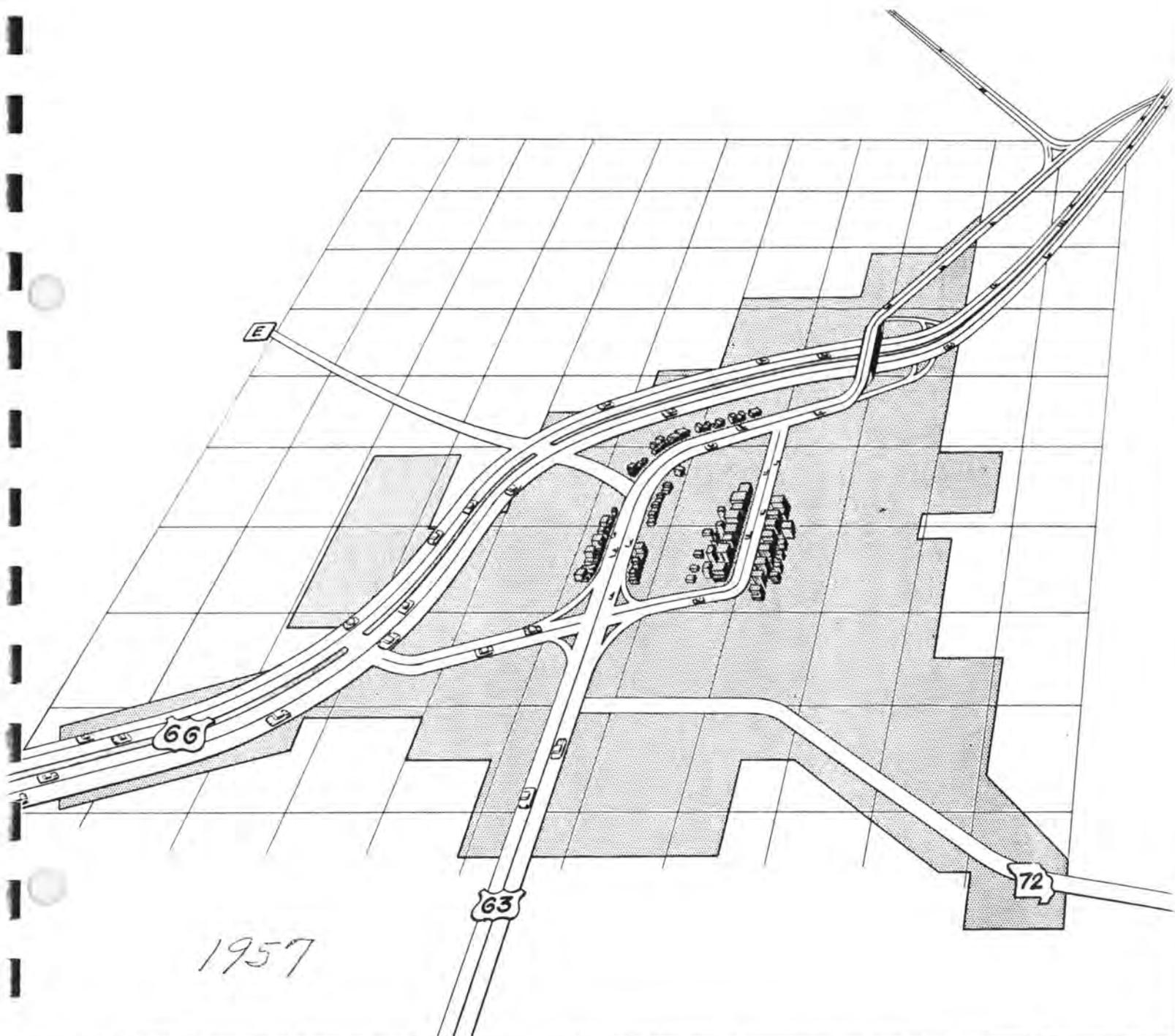


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ECONOMIC STUDY ROUTE U.S. 66 BY-PASS ROLLA, MISSOURI



ECONOMIC STUDY
ROUTE U. S. 66 BY-PASS
ROLLA, MISSOURI

BY

MISSOURI STATE HIGHWAY DEPARTMENT
DIVISION OF HIGHWAY PLANNING

IN COOPERATION WITH

U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

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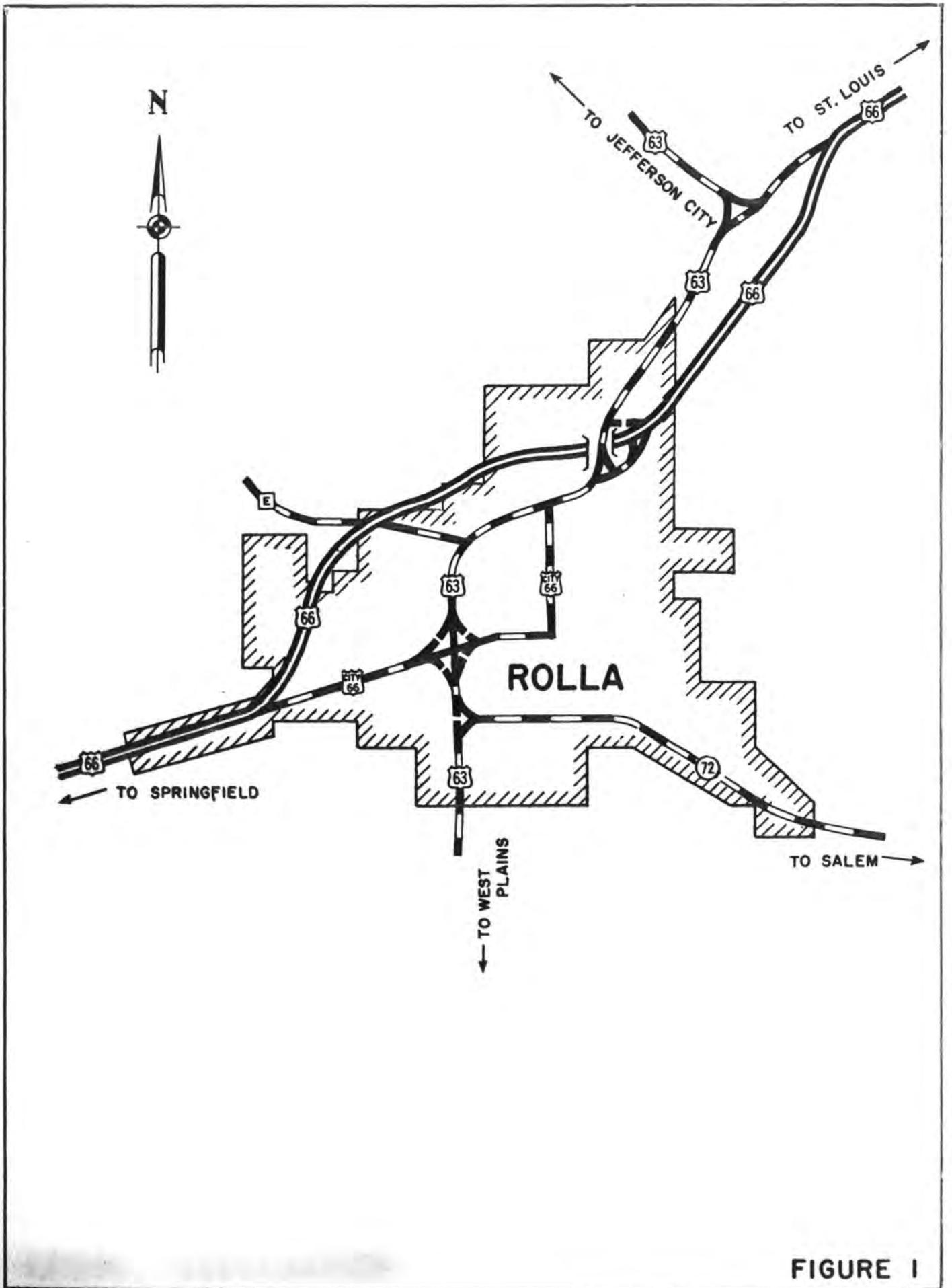


FIGURE I

INTRODUCTION

Rolla, a city of 9,354 population in 1950 according to the Bureau of the Census, is located 105 miles southwest of St. Louis, 65 miles south of Jefferson City and 110 miles northeast of Springfield. It is the county seat and principal city of Phelps County. Fort Leonard Wood, a permanent military base, is 30 miles southwest of the city.

The city is located in the Ozark region, which is one of the state's most scenic and popular recreational areas. The surrounding area contains many interesting geologic and historic features.

The City of Rolla and the surrounding area have been very aggressive in their industrial and agricultural development. The major agricultural income is from livestock, while the raising of beef cattle and dairy products take the lead.

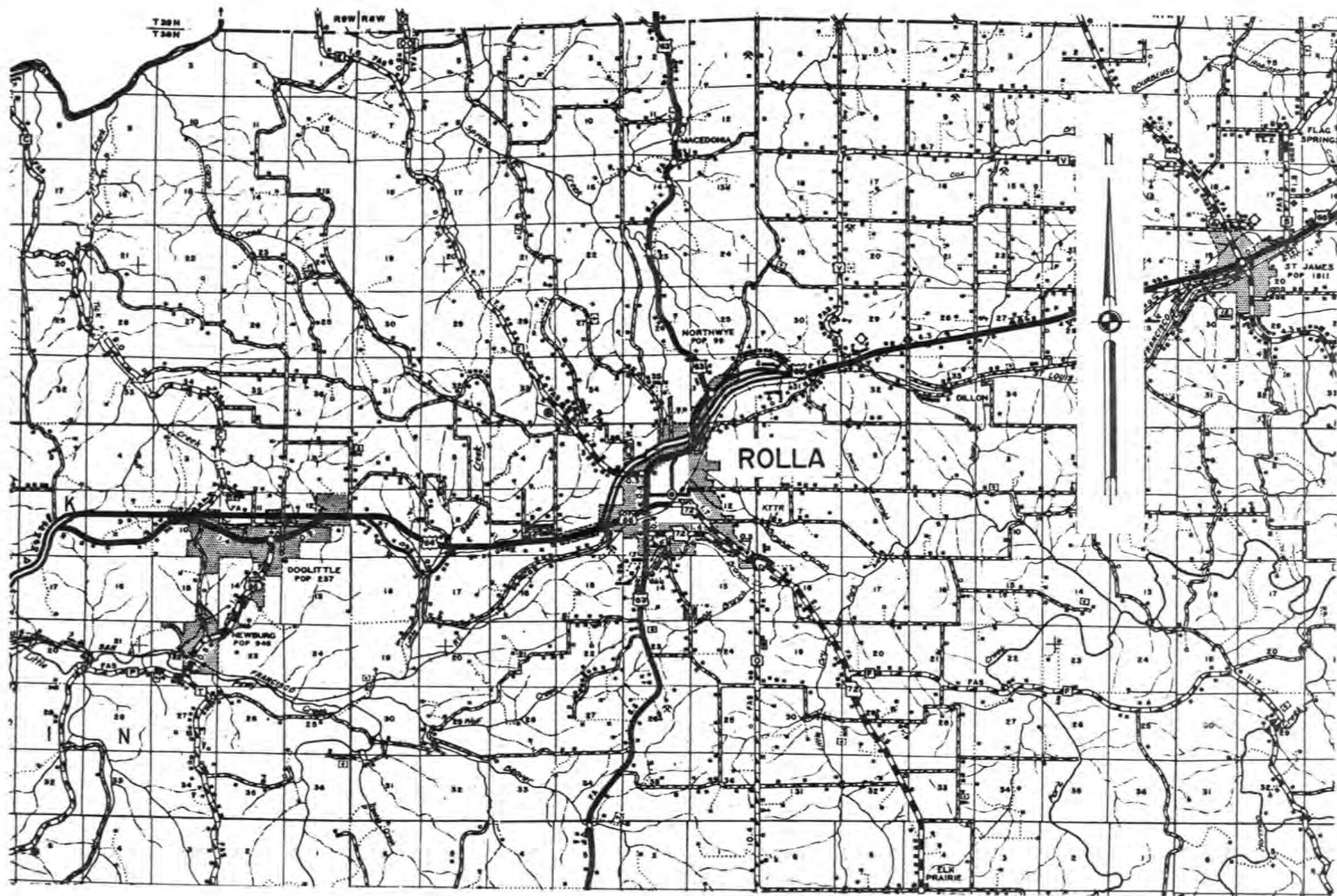
The University of Missouri, School of Mines and Metallurgy, a large engineering school founded in 1870, is located in Rolla. This university, the city's fine public school system, and the offices of several governmental agencies located in Rolla contribute much to the culture of the city.

Rolla is located on a main line of the St. Louis and San Francisco Railroad Company. Highway service is provided by U.S. Routes 63 and 66 and Missouri Route 72, together with a network of state supplementary highways and county roads. U.S. Route 66 is a

very important east-west route extending from Chicago to Los Angeles. It passes through the northern and western portions of the city, and follows generally along a line designated as Interstate Route 44 through Missouri.

Rapidly increasing traffic on this route, the usual ribbon development of business along the highway, and its obsolete alignment and construction features have created critical traffic and safety conditions. Studies were made of the various possibilities for relieving the condition and new construction of a by-pass line was decided on as the best solution. This new location by-passed the city to the north and west, touching the city limits for a short distance in the extreme north corner.

The Old Route U.S. 66 followed a common location with Route U.S. 63 for a major portion of the distance through the city. Through traffic on U.S. 63 was not changed by the construction of the by-pass highway. Traffic from the south on U.S. 63 desiring to follow U.S. 66 either east or west is still routed over the old location. Traffic from the north on U.S. 63 eastbound on U.S. 66 is not affected by the by-pass, while that westbound on U.S. 66 enters the by-pass in the northeast part of the city and follows the new route.



LOCATION MAP

FIGURE 2

I. CONCLUSIONS:

Construction of the controlled access and dual lane U.S. Route 66 By-pass at Rolla has had a favorable effect on that city's over-all economy and has saved lives in the affected area.

1. Retail gross sales in Rolla and Phelps County made a continuous and rapid increase from 1953 through 1956. That increase was even more rapid than for the state as a whole. This indicates that the by-pass route has made some contribution to the business growth of the city and has benefitted the area economy.

2. Favorable effect upon business along the old highway route is most significant. Retail sales there showed a substantial increase in 1955 above that for the years 1953 and 1954. They then decreased some in 1956, but remained substantially higher than for either 1953 or 1954.

Over-all analyses indicate that business as a whole along the old route has been placed in a better position to compete on equal terms with business in other parts of the city. This condition exists because the separation of fast-moving, non-purchasing through traffic from the local traffic on the old route has improved facilities for parking and shopping and has attracted a greater number of purchasers to the area.

3. The new 4.9 mile facility contributed to an exceptional safety record during 1955-56. Five fewer traffic deaths were recorded on the combined highway routes in 1955-56 than on the old route in 1953-54 as proof of the increased safety. The number of accidents, injuries and property damage were greatly reduced providing additional economic benefits.

II. PURPOSE OF THE STUDY:

The purpose of the study is to determine:

1. The economic effects, both qualitative and quantitative, of the U.S. Route 66 By-pass on the City of Rolla, Missouri.
2. The economic effects on business along the old route.
3. The effect on traffic safety.

III. TYPE OF HIGHWAY IMPROVEMENT:

The by-pass consists of a modern high standard divided lane highway, with partially controlled access, on a completely new location through relatively unimproved property near the city limits.

IV. SURVEY PROCEDURE:

First a strip map of the old route was prepared on which was shown each business establishment at its approximate location. The type of business conducted at each establishment was determined. Businesses along the route were classified and placed into five groups in order that "like" businesses could be considered together. A total of 61 business establishments were considered in this portion of the survey:

1. Restaurants and Bars
2. Gasoline Service Stations
3. Hotels and Motels
4. Liquor Stores
5. All Others (Miscellaneous, not falling
in any of first four classes.)

Each business firm was contacted and given an explanation of the survey being conducted, and the operator was interviewed regarding certain details of the business during the four year period 1953-1956. To keep the interviews as consistent as possible, the form on page 10 was prepared for use by the interviewer.

The Chamber of Commerce gave our field representative a letter of introduction to local business people who were to be interviewed. This letter not only served as identification and assurance that the survey was completely in the public interest, but explained that the study had full support of the Chamber and urged the cooperation of all concerned.

MISSOURI STATE HIGHWAY DEPARTMENT
DIVISION OF HIGHWAY PLANNING

ECONOMIC SURVEY INTERVIEW FORM

Code No _____

Date _____

Location _____

Dates Covered By Data _____

Type of Business 1. _____ 2. _____ 3. _____

1. Length of time owner or lessee has been in tenancy _____

2. Gross Sales _____

3. Is it the opinion of the person being interviewed that certain conditions in the area have affected business trends? _____

4. Gallons of gasoline sold _____ Gallons of oil sold _____

Accessories _____

5. No. of units _____ Total Capacity _____ No. Days Filled _____ Total
Occupancy _____

6. If business is combination of two or more types state percentage each is of total 1. _____ % 2. _____ % 3. _____ %

7. Was any particular phase of your business affected more than another? _____

8. Is owner or lessee claiming loss or gain, if any, due to by-pass? _____

9. Do you feel that the change in highway location has been good or bad for your business? _____

Remarks: _____

The interviews in most cases provided a great deal of data and led to other sources of desirable material. Most of the service stations referred us to regional offices of major oil companies for more accurate information than the operator was able to give on total gasoline gallonage.

During and at the end of the period covered by the study, officials of the banks, Chamber of Commerce and utility companies were contacted. These organizations furnished such information as was considered to bear any relation to business trends. These officials were also asked for their opinions on the subject based on their observations during the study period.

The State Department of Revenue was contacted, and it furnished such information from its files as was not considered confidential. It of course could not furnish anything from the tax records of individuals or of individual firms.

From the data collected a series of tables and charts were prepared depicting the economic trends as indicated by these data.

V. STUDY AREA:

1. All businesses within the corporate limits of the city.
2. All businesses with direct access to the old highway and within the corporate limits of the city.

VI. PERIOD OF SURVEY

The survey covered the calendar years of 1953, 1954, 1955 and 1956. As the by-pass was completed and opened to traffic in November, 1954, the study covers approximately two years before and two years after the by-pass was constructed.

VII. TABULATIONS AND CHARTS:

Table 1 shows:

1. The total gross retail sales in Phelps County.
2. The total gross retail sales along the by-passed section of Old U.S. Route 66.
3. The total gross retail sales in the City of Rolla.

The figures were compiled from material obtained directly from management or others to whom they referred us, supplemented by information furnished by the State Department of Revenue.

Table 2 lists:

1. The total gross retail sales in the State of Missouri.
2. The total gross retail sales in Phelps County.
3. The total gross retail sales in Phelps County excluding the City of Rolla.
4. The total gross retail sales in the City of Rolla.

The tabulation covers the years 1953 to 1956, inclusive. These figures were obtained from sales tax records of the State Department of Revenue.

Table 3 is a tabulation of total gross sales by all businesses along the by-passed route, and the gross sales were divided into five different groups. The groups were formed in order to study like businesses together.

The following are the total bank deposits, as furnished by the two banks of Rolla, for each of the four years covered by the study:

1953 -	\$7,781,087.28
1954 -	\$9,053,674.02
1955 -	\$9,594,027.50
1956 -	\$9,569,354.45

Postal receipts, for each year from 1953 to 1956 inclusive, were obtained from the Rolla Post Office through the Chamber of Commerce. These figures, by years, are listed below:

1953 - \$ 96,444
 1954 - \$108,921
 1955 - \$109,491
 1956 - \$118,593

There was a continuous increase in the number of electric and water meters in service in the city during the four year period, as indicated by the following list:

YEAR	ELECTRIC METERS	WATER METERS
1953	3,447	2,299
1954	3,593	2,386
1955	3,696	2,441
1956	3,799	2,526

These figures were obtained from the utility company offices serving the city.

The manager of the local telephone office was contacted in an effort to obtain the number of phones in service. We were advised that they did not have a year by year list of phones; however, they assured us that there had been a continuous increase in phone service during the four year study period.

The manpower level at Fort Leonard Wood was checked through the office of the Deputy Chief of Staff and found to be very stable as indicated by the following tabulation:

YEAR	TOTAL PERSONNEL
1953	31,000
1954	36,000
1955	31,000
1956	30,000

These figures represent the yearly average tabulated to the nearest thousand.

Figure 9 covers location sketches and statistical data on traffic accidents. The table is divided into three parts:

1. Covering the old route for two years before opening of the by-pass.
2. Covering the old route for two years after opening the by-pass.
3. Covering the new route for the first two years of its operation.

These figures are taken from the official accident report records.

ANNUAL GROSS RETAIL SALES

YEAR	CITY OF ROLLA	ALONG OLD RT. 66	PHELPS COUNTY
1953	9,443,808	3,685,143	13,966,784
1954	10,465,048	3,681,421	14,803,676
1955	11,678,822	4,275,361	16,160,228
1956	13,066,577	4,017,848	17,446,643

TABLE NO. 1

ANNUAL GROSS RETAIL SALES

YEAR	STATE OF MISSOURI	PHELPS COUNTY	PHELPS COUNTY EXCLUDING CITY OF ROLLA	CITY OF ROLLA
1953	4,515,617,730	13,966,784	4,522,976	9,443,808
1954	4,524,211,192	14,803,676	4,338,628	10,465,048
1955	4,926,550,665	16,160,228	4,481,405	11,678,823
1956	4,933,377,688	17,446,643	4,380,066	13,066,577

TABLE NO. 2

ANNUAL GROSS RETAIL SALES
BUSINESSES ALONG OLD RT. 66

YEAR	RESTAURANTS AND BARS	SERVICE STATIONS	HOTELS & MOTELS	LIQUOR STORES	ALL OTHERS
1953	569,613	845,084	276,725	54,872	1,938,848
1954	530,943	722,173	290,057	50,751	2,087,494
1955	493,222	698,219	305,615	71,719	2,706,583
1956	470,151	732,585	333,821	90,249	2,391,042

TABLE NO. 3

Tables 1, 2 and 3 provide the information for developing Figures 3, 4 and 5 which illustrate graphically the trends in retail sales during the four-year survey period. Figure 6 is also developed from the data contained in Table 3 and differs from Figure 5 in that it is divided into two-year periods. The two years before opening the by-pass represent one period and the two years after the new route was opened represent the other.

Figure 7 has been prepared to illustrate the trend of increase in bank deposits, postal receipts and utility meters.

Figure 8, a 1956 traffic flow map of the City of Rolla, shows the general traffic pattern for the streets and highways of the city. This map represents volumes for the months of March and April. We have found the annual average traffic on highways to be from 10% to 15% higher than the March and April averages. Therefore, for analysis purposes, any figures taken from the flow map should be increased by at least 10%.

ANNUAL GROSS RETAIL SALES ALL BUSINESS

FROM 1953 TO 1956
SHOWN AS A PERCENTAGE OF 1953

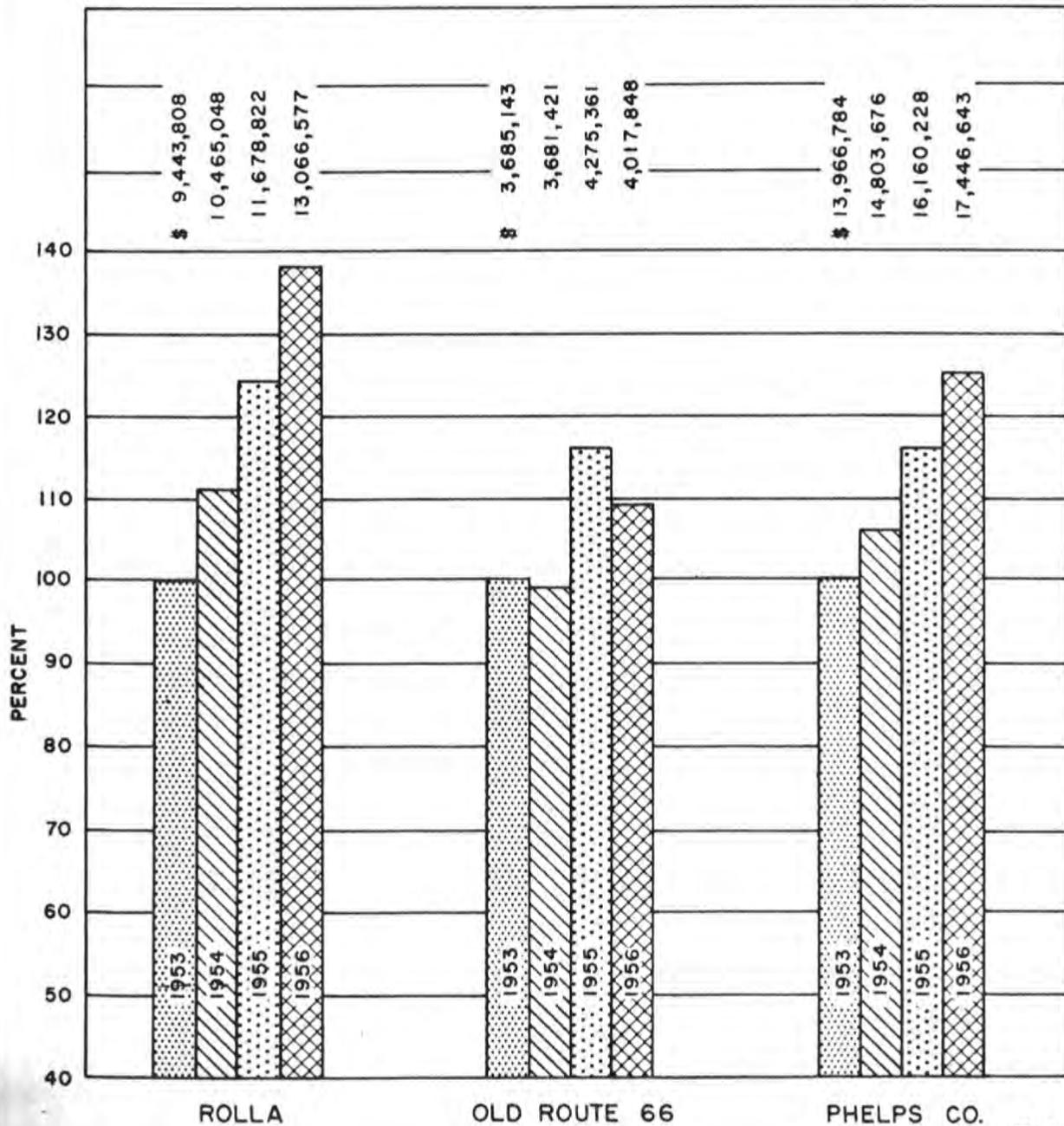


FIGURE 3

ANNUAL GROSS RETAIL SALES ALL BUSINESS

FROM 1953 TO 1956
SHOWN AS A PERCENTAGE OF 1953

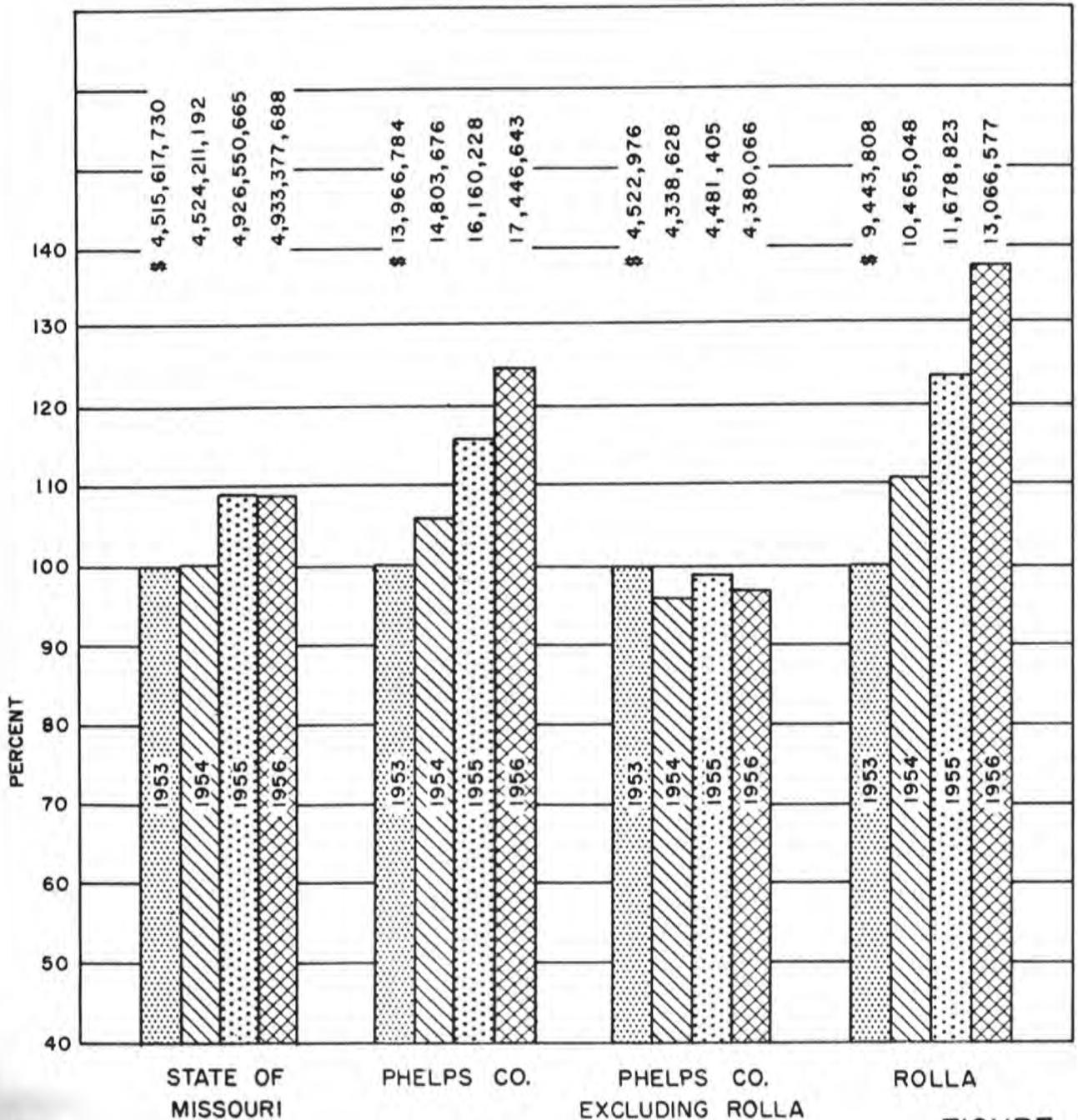


FIGURE 4

ANNUAL GROSS RETAIL SALES BUSINESSES ALONG OLD U.S. ROUTE 66

FROM 1953 TO 1956
SHOWN AS A PERCENTAGE OF 1953

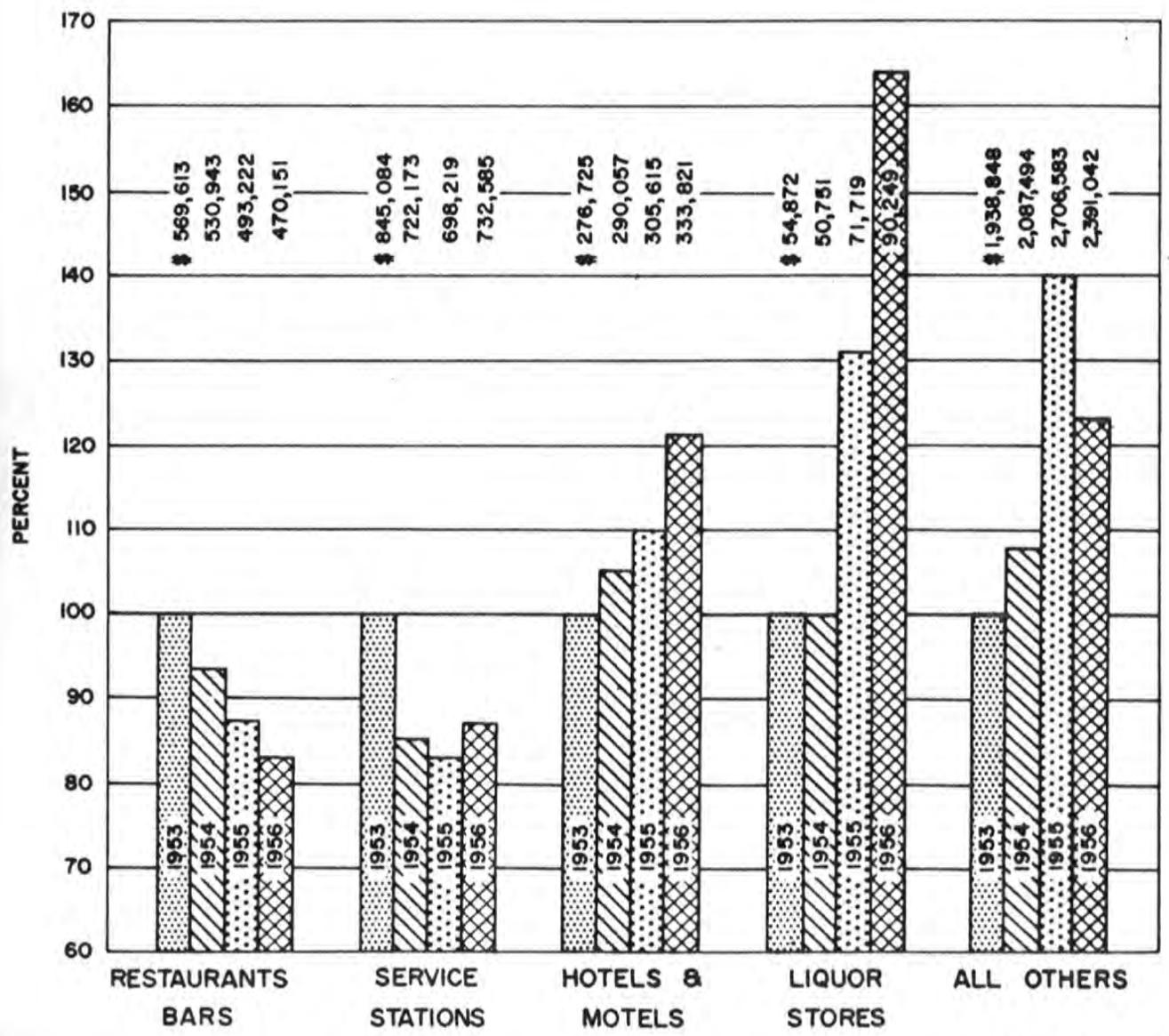


FIGURE 5

GROSS RETAIL SALES BUSINESSES ALONG OLD U.S. ROUTE 66

SHOWING TOTAL FOR 1955 AND 1956
AS A PERCENTAGE OF TOTAL FOR 1953 AND 1954

TWO YEAR VOLUME 1953-1954
TWO YEAR VOLUME 1955-1956

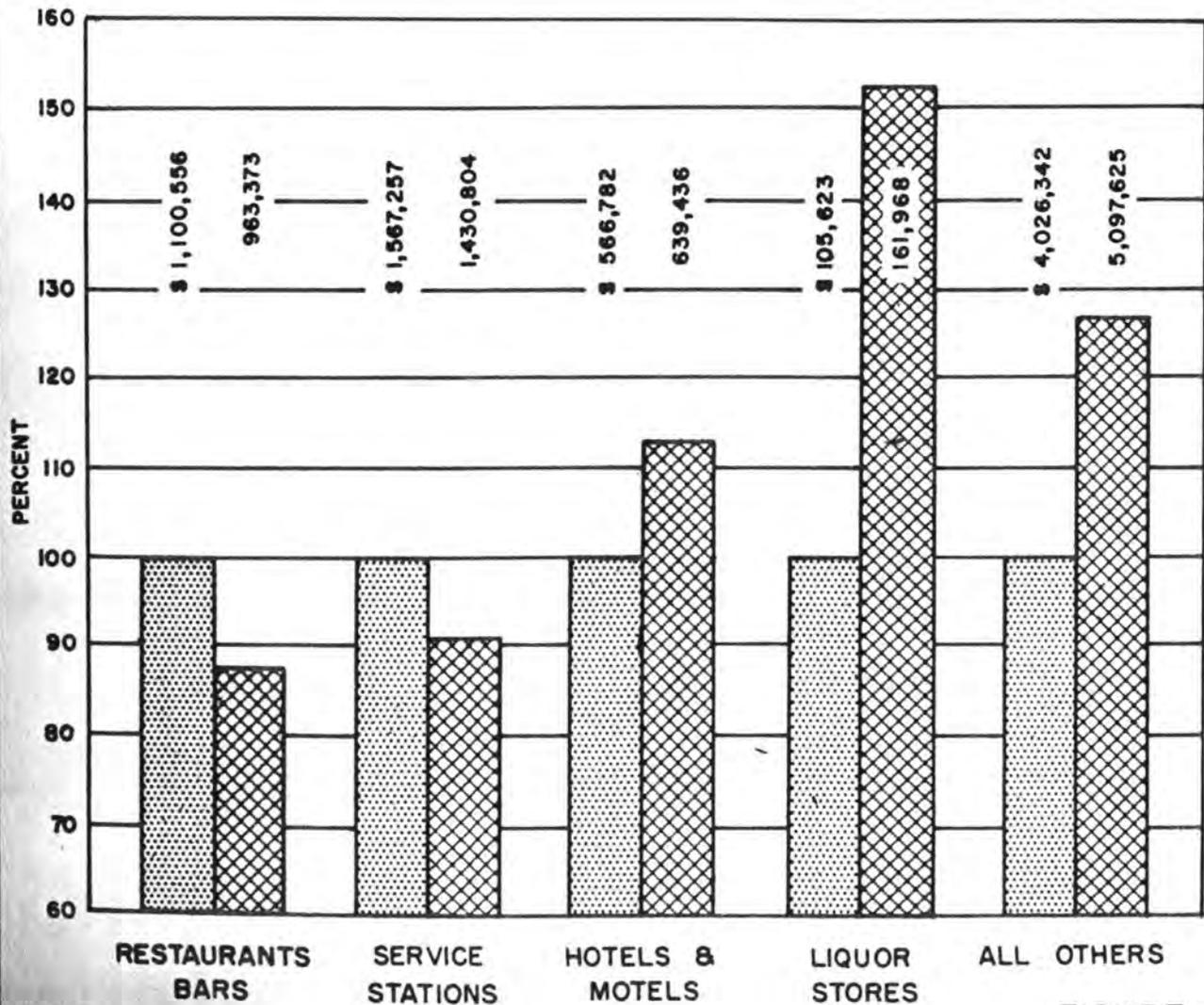


FIGURE 6

BANK DEPOSITS, POSTAL RECEIPTS, NUMBER OF ELECTRIC AND WATER METERS

FROM 1953 TO 1956
SHOWN AS A PERCENTAGE OF 1953

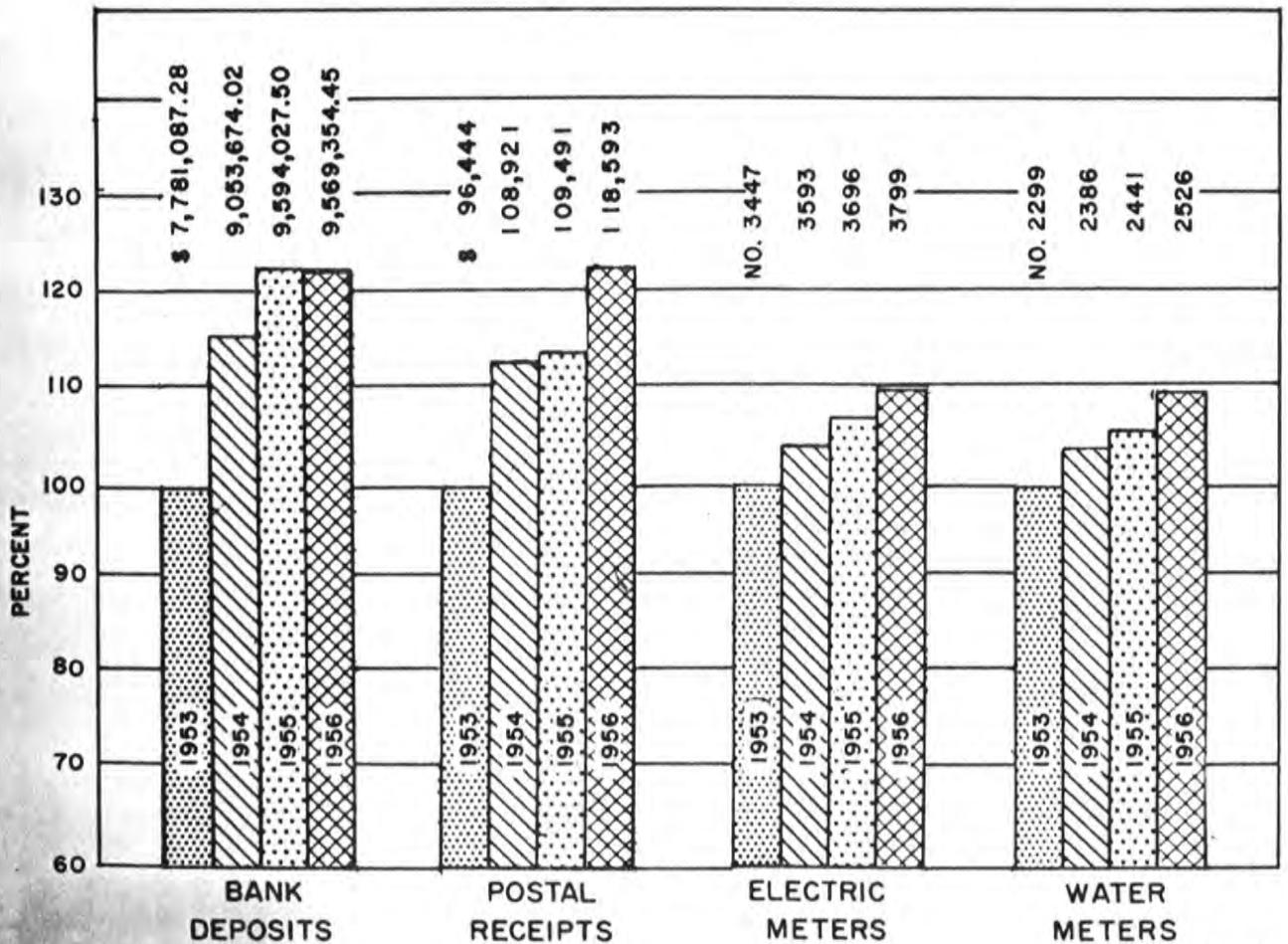
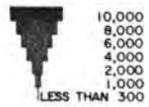


FIGURE 7

GRAPHIC SCALE

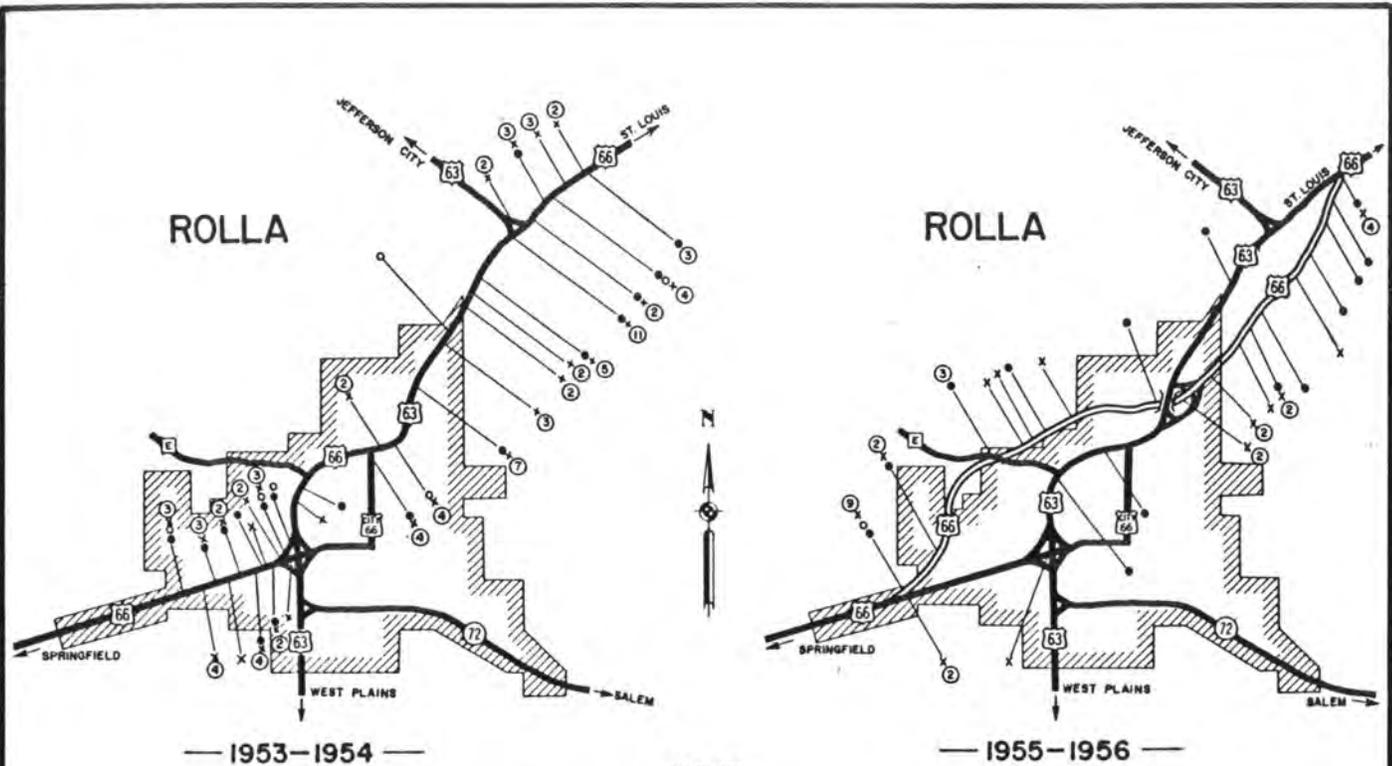


1956
TRAFFIC FLOW MAP
ROLLA

24-HOUR WEEKDAY TRAFFIC VOLUME DURING MARCH AND APRIL



FIGURE A



- 1953-1954 —
- 1955-1956 —
- LEGEND
- — TWO OR MORE ACCIDENTS
 - — INJURY & PROPERTY DAMAGE
 - — FATALITY & PROPERTY DAMAGE
 - x — PROPERTY DAMAGE ONLY

ROUTE U.S. 66 BEFORE OPENING BYPASS

YEAR	NUMBER OF ACCIDENTS	FATALITIES	INJURIES	PROPERTY DAMAGE
1953	51	4	32	\$33,915
1954	39	2	24	\$27,465

OLD ROUTE 66 AFTER OPENING BYPASS

1955	1	0	0	\$ 20
1956	5	0	6	\$1,570

ROUTE U.S. 66 BYPASS

1955	18	1	8	\$8,165
1956	17	0	17	\$9,900

ACCIDENT RECORD
ROLLA MO.

FIGURE 9

VIII. SUMMARY

The original U.S. Route 66 passed through the downtown business district, over the location indicated on Figure 1, as City Route 66. Later it became necessary to by-pass the business district. This was accomplished by constructing a by-pass to the north and west on the location marked U.S. Route 63, Figure 1.

In keeping with the laws, standards and practices at that time, the by-pass route was constructed on narrow right-of-way and with uncontrolled access. Following the pattern of such routes throughout the country, extensive business developed along the by-pass route with traffic entering and leaving the main traffic stream at almost any point along the route. Through a period of years, traffic conditions became so serious that in the interest of safety and service a new by-pass route became necessary.

To protect the highway user and local business alike the latest by-pass was constructed on wide right of way with controlled access.

Prior to opening of the by pass, the traffic at a point in this business district was 9,500 vehicles daily, while after the by-pass was opened the daily volume at this same point was only 5,000. The nearly 50% decrease in traffic resulted in a substantial traffic improvement through the section, in addition to the relief for through traffic provided by the by-pass.

Of the traffic transferred from the old route to the by-pass, there were about 850 combination trucks and 150 single unit trucks. This large number of heavy commercial units being removed from the old route is very important and makes the traffic relief along the old section of highway much greater than would be indicated by volume counts alone.

By observations along the old route, the conditions indicate that the traffic is now more of a one purpose type, resulting in less tension and confusion. Under previous conditions, local traffic had a slower desired travel speed than the through traffic, with one group being pushed and the other retarded.

Figure 1 shows an outline of the City of Rolla and the State Highways into and through the city. This drawing pictures all of the State Routes, including the U.S. 66 By-Pass and its location with respect to the city and other routes.

A location map identified as Figure 2 covers a section of the highway map of Phelps County. This section of the map shows roads and highways in the area around Rolla, as well as other topographic details of the area.

Under Section VII, "Tabulations and Charts," our principal findings in this survey have been tabulated and illustrated graphically. Total gross retail sales, as illustrated by Figure 3, reveals that there has been a continuous and rapid increase in the City of Rolla from 1953 through 1956. The increase each year was a little greater than the increase for the previous year. From this we can see no indication that highway changes and improvements affected the over-all retail sales in the city.

Additional study of this chart indicates that retail sales of businesses along Old Route 66 had about leveled off by 1953 and remained at that level through 1954. In 1955 and 1956 this business showed a substantial increase over the two previous years, with 1956 showing a decline from the 1955 peak.

Analyzing this trend, it was found that the large increase in sales in 1955, the first year after opening the by-pass, was as much a product of ordinary shifting of business in the city as of highway improvement. A large super market, service station and restaurant opened on the old route in 1955 and developed a large business. This was followed by development of a large shopping center in the south part of the city in 1956, several blocks from the Old Route 66 location. Another shift in business followed and retail sales along the old route location in 1956 dropped about 7%, but remained well above the 1953 and 1954 level.

The chart also reveals that retail sales in Phelps County increased steadily through the four-year period, though not as rapidly as in the City of Rolla.

Following the study in trends of retail sales, Figure 4 provides a comparison of trends throughout the state with those in the City of Rolla and Phelps County, as well as a comparison of Phelps County exclusive of Rolla.

The total gross sales for the entire state was nearly the same for 1953 and 1954. The years 1955 and 1956 had about the same level of business, which was nine per cent higher than for the two previous years.

It can be readily seen from the comparisons that the City of Rolla has had a much more rapid and steady increase than the statewide trend. Retail sales in the City of Rolla represents such a large portion of the total volume in Phelps County that the city trend controls the county trend. Excluding Rolla, the county shows very nearly the same total business through the four-year period of study, as there is a variation of only a few percentage points.

A more detailed study of total gross retail sales along Old Route 66, as tabulated in Table 3 and illustrated by Figure 5, reveals some oddities. Each of the first four groups of specific types of businesses represents from ten to twenty different firms, except the Liquor Store group which represents only three. The fifth group represents 18 firms that did not fit into classes suitable for breakdown and further detailed study.

The steady loss in total business by the group of "Restaurants and Bars" is not completely explained or understood.

Since the decline started at least two years before the by-pass was opened or the traffic pattern changed, it would indicate some other influence was largely responsible. Actually the largest drop in this business came before the highway changes had been completed, and during a period when the several million dollars worth of highway work was under way, contributing to the local payrolls.

It seems likely that some of this trend reflected a shift in business to modern restaurant facilities established outside of the city but near the city limits. The decrease in 1956, being smaller than during the previous years, possibly has some significance; however, considerably more time will be required to tell if a change in the pattern is starting.

The group of "Service Stations" along the old route shows a heavy loss between 1953 and 1954, both years being before the by-pass was opened. Their business has been rather stable since 1954, with 1956 being about 2% above 1954 which was the last year before opening of the new route.

The "Hotel and Motel" group along this old highway location has shown a uniform increase throughout the entire four-year period with 1956, the second year after opening of the by-pass, showing the greatest gain. Some of the motels have increased their capacity since the highway relocation was completed. It seems logical to expect this development to bolster the restaurant business along the route.

The "Liquor Stores" which have been studied as a group could be misleading. The very rapid increase in volume by this group in 1955 and 1956 represents a shift in business within the

area. Prior to construction of the Route 66 By-pass, there were only two "Liquor Stores" on the location. After the improvement was completed and opened, a third store opened on the old route, leading to a shift in business to the old highway location.

The group identified as "All Others" consists of 18 miscellaneous businesses. Their pattern indicates a uniform increase similar to the business trend indicated for the entire city of Rolla, with the exception of 1955. This reflects the temporary shift of business to a super market established in 1955 on the old route, as discussed earlier.

The trend in bank deposits, postal receipts and utility meters, as pictured on Figure 7, seems to tell the same story of growth and business increase. Bank deposits and postal receipts show almost the same percentage increase between 1953 and 1956. Observing that the pattern of increase in bank deposits had been a little erratic, we contacted officials of the two banks in the city to see what might have caused this trend. Officials of both banks stated that they could see nothing in the bank's operations to indicate that construction of the by-pass highway had affected the economy of the city. They offered an explanation for the rapid increase in deposits starting in 1953 and leveling off in 1956; namely, that one of the banks is a new institution opened near the end of 1952. They explained that the history of banking indicates that this is a rather typical trend. When a new bank is opened, it can be expected to pick up certain local business which has for personal or other reasons deserted the older banks, and to induce a reasonable amount of other new business for a few years. After this adjustment period, the total

deposits of all banks of the city will return to a more uniform pattern. Both banks reported that the highway improvements have not led to any changes in their loan or other operational policies.

The increase in the number of electric and water meters in the city has followed practically the same pattern of steady increase through the four years studied.

A large military installation near a city the size of Rolla can, of course, have an effect on the economy of the city. After finding that the manpower level, both military and civilian, at Fort Leonard Wood has been quite stable during the study period, it was decided that no further study of that phase was necessary.

The 1956 traffic flow map of the City of Rolla, identified as Figure 8, shows the traffic pattern as established the second year after opening of the new limited access highway by-pass. At several points on the map along the old location of Route 66, the 1954 traffic volume has been shown in heavy figures underscored. In 1955 with the by-pass in operation, the traffic along the old route near 7th Street dropped from 9,500 daily trips to approximately 5,000. In 1956, the traffic at this same location had increased to about 7,000, and the traffic on the by-pass had increased to over 5,000. Any attempt to move the more than 12,000 daily trips on the two routes over the old facility would create a completely intolerable traffic congestion. Local business on such a street would be paralyzed. The sufficiency rating would drop below 30 points out of a possible 100 points.

It would not be practical to undertake in this report to cover a complete and detailed analysis of all traffic accidents along the section being studied. However, Figure 9, an accident

tabulation and location chart, provides a general picture of what congested streets and highways are costing the highway user, and the people of population centers through which they pass.

The reduction in accidents and their severity along the old route, as well as the combined record from both the old and new routes, is most impressive.