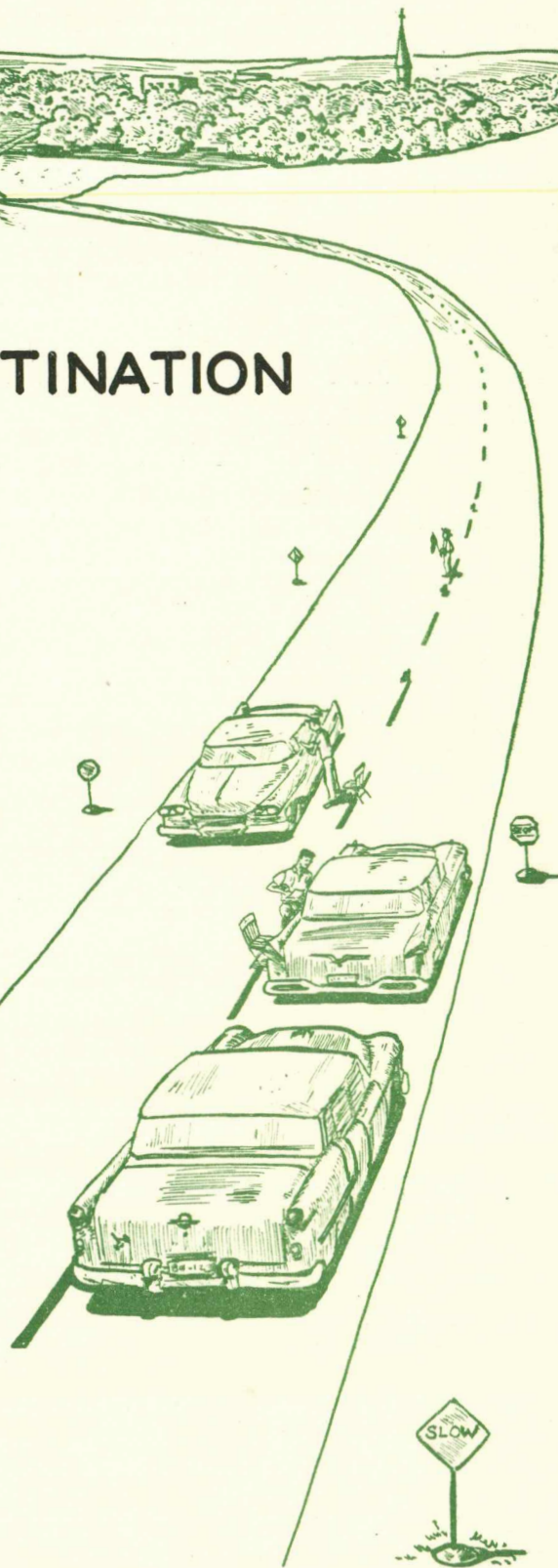


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# RED OAK

## ORIGIN AND DESTINATION STUDY

INTERVIEW  
STATION



Red Oak Urban Area  
Origin and Destination  
Traffic Survey

April 1959

Prepared By  
Highway Planning Section  
Safety and Traffic Department  
Iowa State Highway Commission  
In Cooperation With the  
United States Bureau of Public Roads

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## DEFINITIONS

### Urban Area

An area including and adjacent to a municipality or other urban place of 5,000 or more population as shown by the latest available census.

### Corporation Line

A hypothetical line delimiting the municipal area and often called the City Limits.

### Urban or Corporate Area Traffic Survey

A survey of highway travel designed to collect detailed information concerning trip origins and destinations within a selected urban or corporate area.

### External Survey

A study in which trip data is obtained by interviewing motor vehicle operators intercepted at external stations.

### External Station

An interview point located on a principal rural highway which crosses the corporation or urban area line. It is always set up outside of the urban or corporate area, but as close as is practical and possible to the line delimiting this area.

### Tract

One of the several homogeneous sections into which the study area is divided.

### Central Business District (CBD)

The section containing the concentrated commercial and retail business center, in most cases, tract 001.



Trip

A one-way journey between a point of origin and a point of destination.

Origin

The stated beginning point of a single trip.

Destination

The stated terminating point of a single trip.

External Local Trip

A trip with either the point of origin or the point of destination located within the corporate limits, the performance of which trip involves travel through an external interview station.

External Through Trip

A trip with both points of origin and destination located outside the corporate limits, the performance of which trip involves travel through an external interview station and into, through, and out of the corporate or urban area.

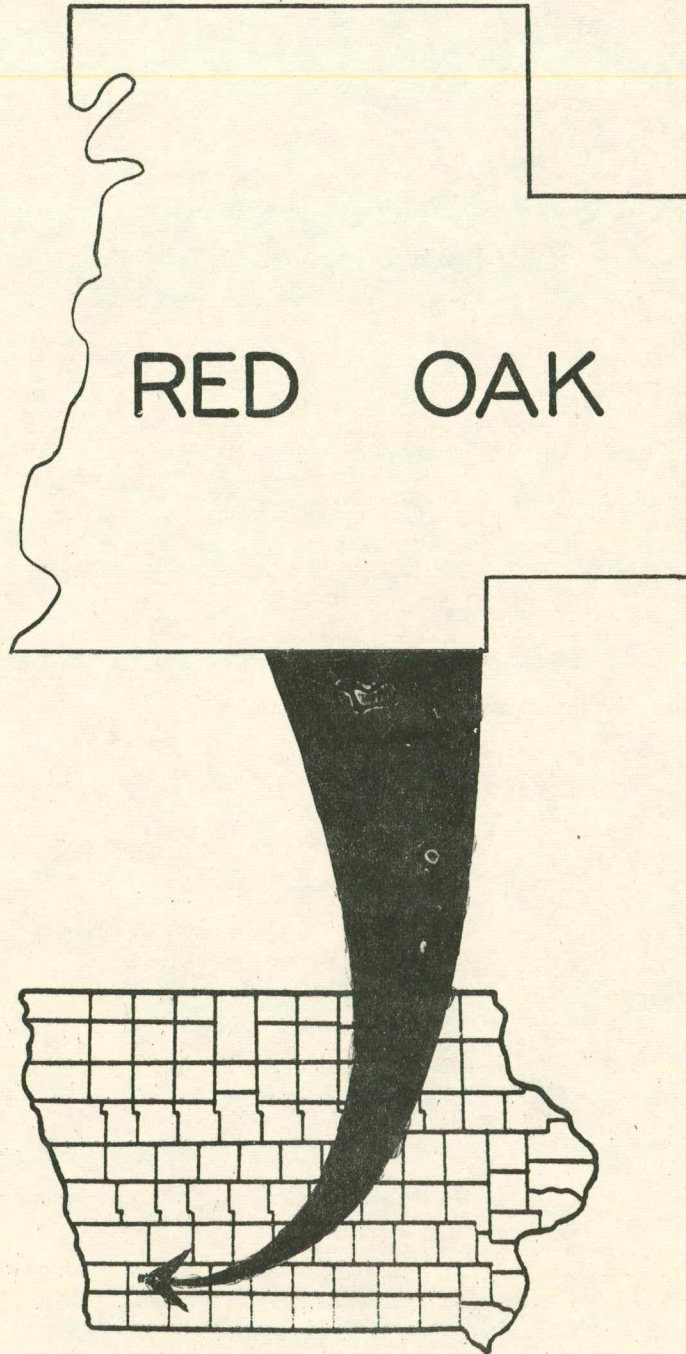
Duplicated Through Trips (Duplicates)

Trips traveling completely across the urban or corporate area, and thereby passing through two interview stations.

Average Weekday

This includes Monday through Friday inclusive.

PART I  
SUMMARY





This report of the Red Oak Urban Area Traffic Survey describes briefly the characteristics of the urban area pertinent to the local problem of highway transportation and presents and analyzes the data gathered in the survey. All trip data obtained in the survey are presented in terms of the number of trips per day. They are classified by the origins and destinations of these trips and by the areas within the city, to which and from which they were made. The only information obtained was from those trips crossing the city limits, and this was done by maintaining roadside interview stations at the entrances of the principal rural highways into the city. These trips, for which the data were obtained, may be defined as "rural trips." Knowledge of the number of "urban trips" or "intra-city trips" is not available in this external type survey.

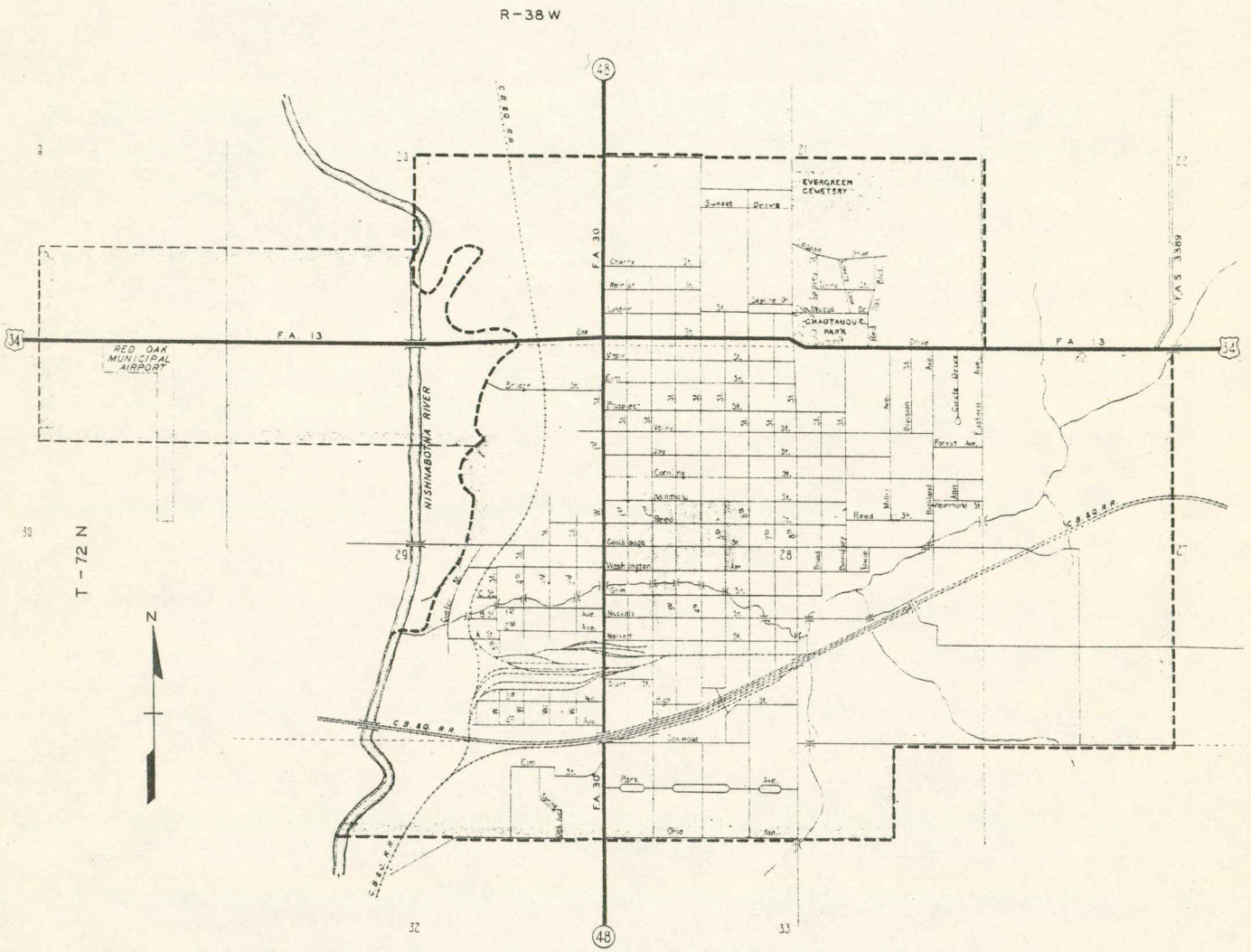
For this particular study, carried on in June, information was gathered by interviewing 69.61 per cent of the average weekday traffic. After the expansion of this information it was found that for an average weekday in June 1958, a total of 6,962 trips crossed the Red Oak city limits. Out of this total 24.23 per cent were classified as external through trips which traveled without passing via the central business district.

Of all trips passing through the interview stations 31.41 per cent had termini in the central business district. However, another 23.05 per cent of the total had termini in the residential and intermediate areas between the station and the central business district. In addition to this, 2.95 per cent of the total trips passing through the interview stations had routes via and termini beyond the central



business district. The final consideration is given to the 1,278 trips, or 18.36 per cent of the total number of trips which passed through the stations, with routes not via but termini beyond the central business district.

PART II  
HISTORY AND CHARACTERISTICS  
RED OAK URBAN AREA

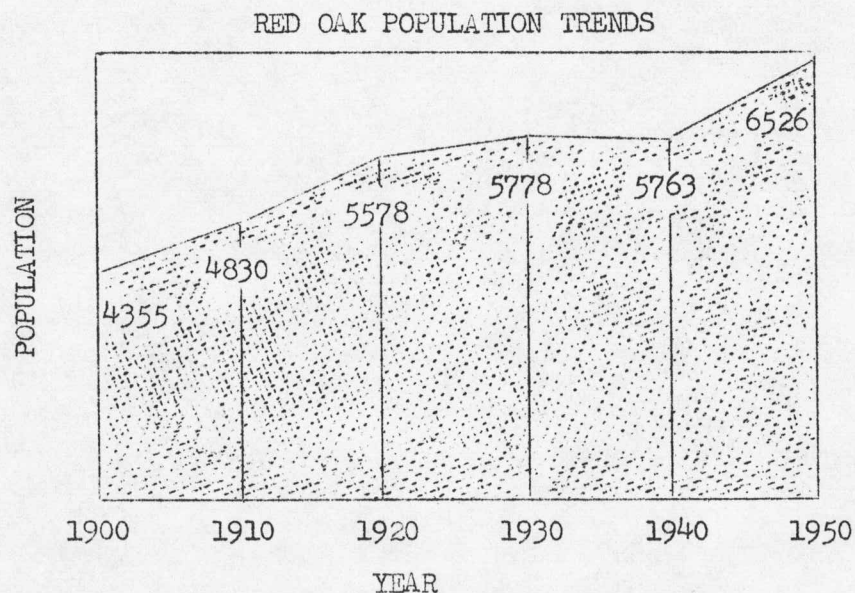




A. HISTORY

Alfred Hebard was the original founder of Red Oak Junction. This picturesque name was selected because of the abundance of red oak trees in and about the town-site. Among the first settlers arriving in the area were W. C. Mathews in 1851, Pleasant Jones in 1852, and James Shank in 1854. The county seat was moved from Frankfort to Red Oak Junction in 1865. Four years later the Burlington and Missouri River Railroad reached the town, connecting it with Villisca; also in 1869 Red Oak Junction was incorporated.

In 1889 Thomas Murphy and E. B. Osborne, two young Red Oak newspaper men, were looking for additional work for their paper's job printing plant and came upon the idea of art calendars. The next year the Hawkeye Printing Company was formed and calendar production was started. Red Oak Junction grew rapidly, and by 1900 there were 4,355 people residing there. In 1901 the city's name was changed to Red Oak. Its population trends since 1900 are illustrated below.





B. CHARACTERISTICS

Red Oak, County Seat of Montgomery County, is located in southwestern Iowa. It is in the second county east of the Missouri River and the second county north of the Iowa-Missouri border. The city is situated in the East Nishnabotna River valley, with the east portion of Red Oak located in hilly terrain.

The general configuration of the Red Oak Urban Area is a two mile by two and one-half mile rectangle with the longer dimension running east and west. About 17 square blocks compose the central business district near the middle of the city. Service and retail establishments and wholesale firms predominate this area.

Manufacturing firms producing batteries, calendars, concrete products, and leather novelties are located in Red oak. Popcorn processing and printing establishments are also important businesses within the city.

The main line of the Chicago, Burlington, and Quincy Railroad crosses the south one-half of the city. A north-south C.B. & Q. line crosses the west one-third of the incorporated area and approximately parallels the East Nishnabotna River. East-west route U.S. 34 crosses the north one-half of Red Oak. Ia. 48 runs north-south across the city and intersects U.S. 34 in the north part of Red Oak. A grade separation structure carries the mainline of the C.B. & Q. Railroad over Ia. 48.







#### A. INTRODUCTION

Part III of this report describes briefly the purposes and objectives, procedures, and findings of the Red Oak Urban Area Traffic Survey. Summaries and illustrations of the significant data classifications are included. All information was collected during the period of June 23 to 26, 1958, inclusive. It is reported in terms of the number of trips daily on an average June weekday in 1958 and classified by trip origins and destinations.

#### B. PURPOSE AND OBJECTIVES

The purposes of this survey were to determine the origin, destination, and number of daily trips into, out of, and through the urban area. Ultimate objectives were to assemble and present, as clearly as possible, the traffic patterns and volumes as they exist. This presentation reveals the amount of street congestion which may be attributed to through highway travelers, and the exact routes by which these travelers enter and exit the urban area. It will also assist city officials and highway administrators in determining the location and type of street or highway improvements necessary to alleviate particular traffic problems.

#### C. PROCEDURES

The data for the determination of the origin and destination of all trips were gathered through roadside interviews of motor vehicle operators. These interviews were obtained at the external stations located on each rural road entrance to the city. All vehicles were stopped as they passed through the station and the motor vehicle operator was asked the purpose, origin, and destination of this



particular trip. The interviewers also recorded for each vehicle, from visual inspection, other data such as the type, the place of registration, and the number of passengers.

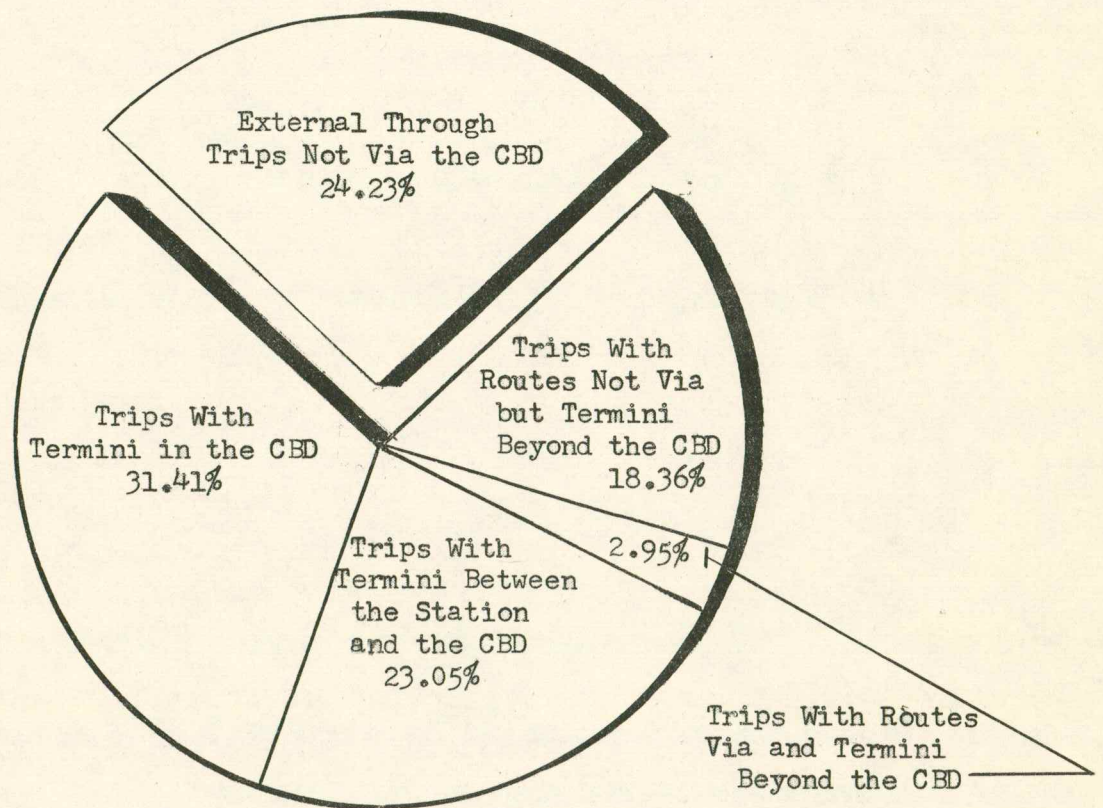
Each interview station was operated for 16 hours starting at 6 AM and ending at 10 PM. This scheme of operation provided for coverage of all but a small portion of the trips passing through each station in the twenty-four hour day. This small portion of traffic was accounted for by portable automatic traffic recorders which were operated continuously at each station for the entire period of the survey. Factors obtained by using these recorder tapes provided means for converting all of the data to average twenty-four hour weekday values. The information gathered was then coded and punched on I.B.M. cards to expedite tabulation.

#### D. FINDINGS

Most of the significant findings of this survey have been summarized in the ensuing tables and charts. Any other combinations of related material may be found by referring to the trip tabulation sheet in the appendix.

Three traffic flow diagrams will be found in appropriate locations throughout the presentation of the findings. The first one encountered merely gives a pictorial view of the entire traffic pattern within the area. A traffic flow map depicting all external through trips will be found next, immediately following the external through trip table. The third and final flow diagram is found following the group of tables relating all of the external local trips to their termini.

The following illustration represents a net total trip summarization and percentage distribution of the termini for all trips passing through the external interview stations on an average weekday in June 1958. It should be noted that the few external through trips having termini on non-primary rural roads, as listed on the trip tabulation sheet in the appendix, are all included with the external local trips.



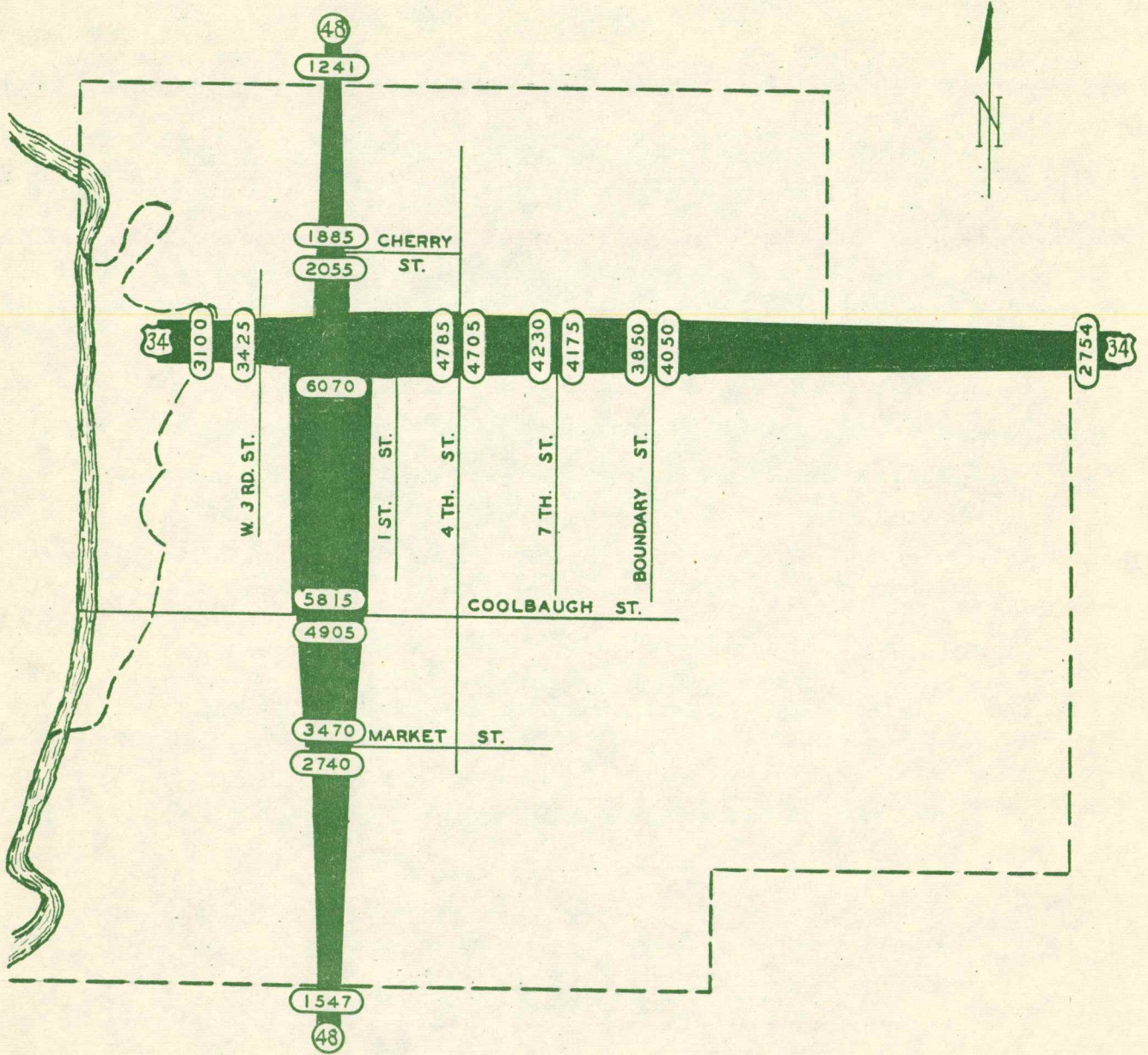


1. Traffic and Interview Summary:

By using the above explained procedures the information in the following table was obtained. The external stations are listed with the total traffic passing each station on an average June weekday 1958, the total number of interviews taken at each station, and the per cent that this interview figure is of the total traffic figure.

External Station Locations	Average Weekday Traffic-June 1958				No. of Interviews Taken	Per Cent Interviewed
	Passenger Cars and Pick-Ups	Single Unit Trucks	Truck Combinations	Total		
Ia 48 N	1,149	89	10	1,248	1,137	91.11
US 34 E	2,466	157	131	2,754	2,304	83.66
Ia 48 S	1,416	94	37	1,547	1,348	87.14
US 34 W	2,658	287	155	3,100	1,232	39.74
Total	7,689	627	333	8,649	6,021	69.61





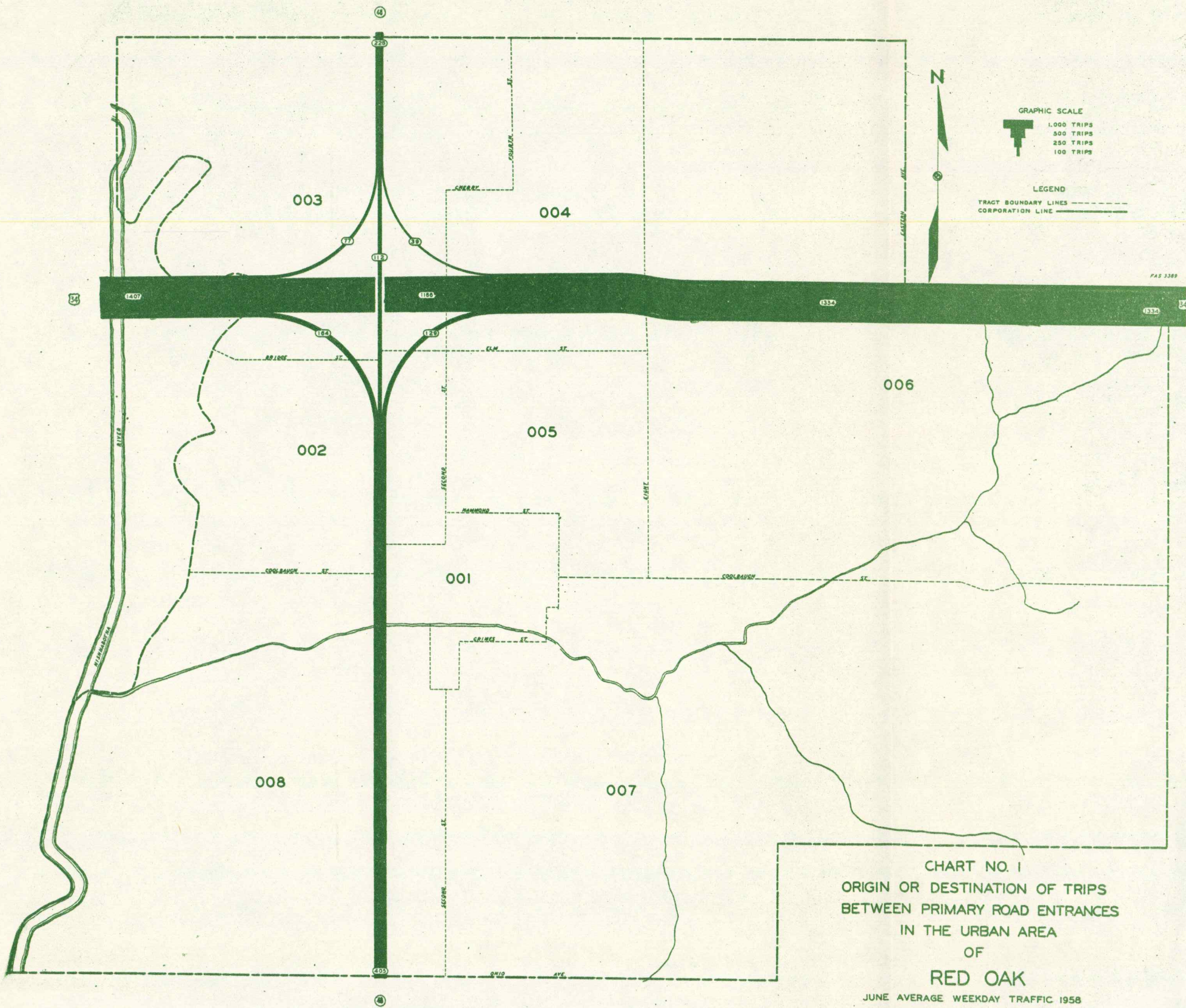
TRAFFIC FLOW MAP  
 CITY OF RED OAK  
 MONTGOMERY COUNTY  
 AVERAGE WEEK DAY TRAFFIC JUNE-1958

2. External Through Trips Not  
Via the Central Business District:

The following table reveals the exact relationship between all trips passing through each external station and the percentage of these trips which pass directly on through and out of the urban area, but not via the central business district. This same comparison is also presented for the total of all external through trips passing through all external stations. From Table 2 it is then noted that this figure is 24.23 per cent.

External Station Location	Total Trips Through Station	Through Trips Not Via the CBD	
		Number	Per Cent of Total
Ia 48 N	1,248	228	18.27
US 34 E	2,754	1,334	48.44
Ia 48 S	1,547	405	26.18
US 34 W	3,100	1,407	45.39
Less Duplicates	1,687	1,687	100.00
Total	6,962	1,687	24.23







3. Trips Through Each Station With  
Termini in the Central Business District:

Table 3 compares the total trips passing through each station with the percentage of these respective trips having termini in the central business district. It also relates the total of all trips passing through all of the stations to the number of these same trips having termini in the central business district. On this comparative basis 31.41 per cent of the total trips passing through all external stations fall into the above explained category.

Table 3 Trips Through Each Station With Termini in the Central Business District on an Average in June 1958			
External Station Location	Total Trips Through Station	Termini in the CBD	
		Number	Per Cent of Total
Ia 48 N	1,248	450	36.06
US 34 E	2,754	583	21.17
Ia 48 S	1,547	463	29.93
US 34 W	3,100	691	22.29
Less Duplicates	1,687	---	-----
Total	6,962	2,187	31.41

4. Trips Through Each Station With Termini  
Between the Station and the Central Business District:

The information contained in Table 4 reveals a comparison of the total trips passing through each station and the percentage of these trips having termini in the residential and intermediate areas between that station and the central business district. In addition to this, the summation of the total trips passing through all of the external stations is compared to the percentage of these total trips having termini as explained above. These comparisons are pointed out both numerically and on a percentage basis. As can be seen from the table, 1,605 trips or 23.05 per cent of the total trips follow this pattern.

Table 4 Trips Through Each Station With Termini Between the Station and the Central Business District on an Average Weekday in June 1958			
External Station Location	Total Trips Through Station	Termini Between Station and CBD	
		Number	Per Cent of Total
Ia 48 N	1,248	413	33.09
US 34 E	2,754	490	17.79
Ia 48 S	1,547	265	17.13
US 34 W	3,100	437	14.10
Less Duplicates	1,687	---	-----
Total	6,962	1,605	23.05



5. Trips Through Each Station With Routes Via  
and Termini Beyond the Central Business District:

In Table 5 a comparison is made between the total trips passing through each external station and the number and percentage of these trips which pass directly via and have their termini beyond the central business district. It can also be seen from the following table that 205 trips, or 2.95 per cent of all trips passing through all stations, travel directly via the central business district and have their termini beyond it. These comparisons are made both numerically and on a percentage basis for all of the routes listed.

Table 5 Trips Through Each Station With Routes Via and Termini Beyond the Central Business District on an Average Weekday in June 1958			
External Station Location	Total Trips Through Station	Route Via-Termini Beyond CBD	
		Number	Per Cent of Total
Ia 48 N	1,248	---	----
US 34 E	2,754	---	----
Ia 48 S	1,547	90	5.82
US 34 W	3,100	115	3.71
Less Duplicates	1,687	----	----
Total	6,962	205	2.95

6. Trips Through Each Station With Routes Not Via but Termini Beyond the Central Business District:

The following table reveals the exact relationship between all trips passing through all external stations, and the percentage of these trips which had termini beyond but routes not via the central business district. As can be seen below, 1,278 trips, or 18.36 per cent of the total trips passing through all of the external stations, fall into the above category. This same comparison for each individual station is also clearly presented in the table.

External Station Location	Total Trips Through Station	Route Not Via Termini Beyond CBD	
		Number	Per Cent of Total
Ia 48 N	1,248	157	12.58
US 34 E	2,754	347	12.60
Ia 48 S	1,547	324	20.94
US 34 W	3,100	450	14.51
Less Duplicates	1,687	---	-----
Total	6,962	1,278	18.36



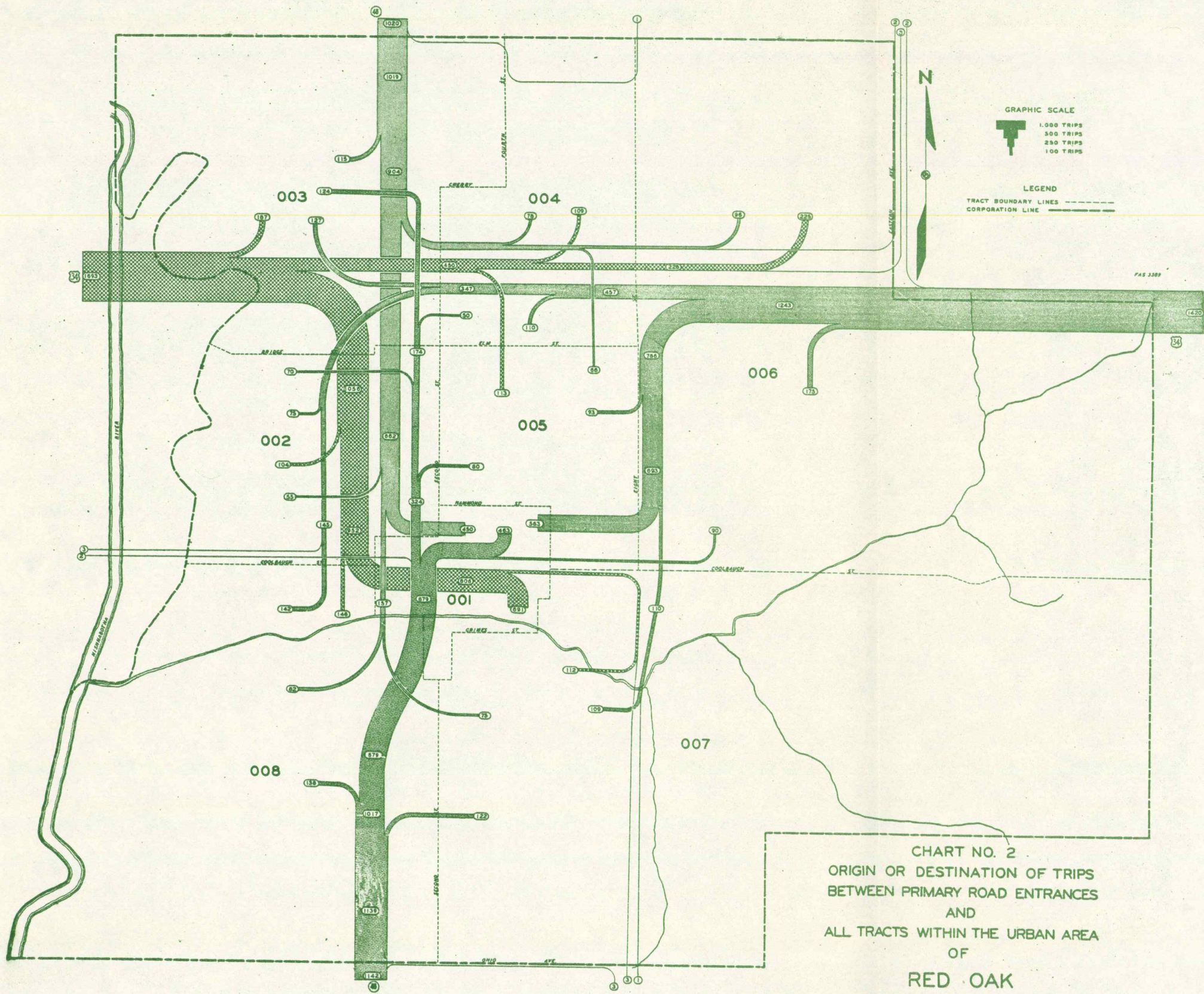
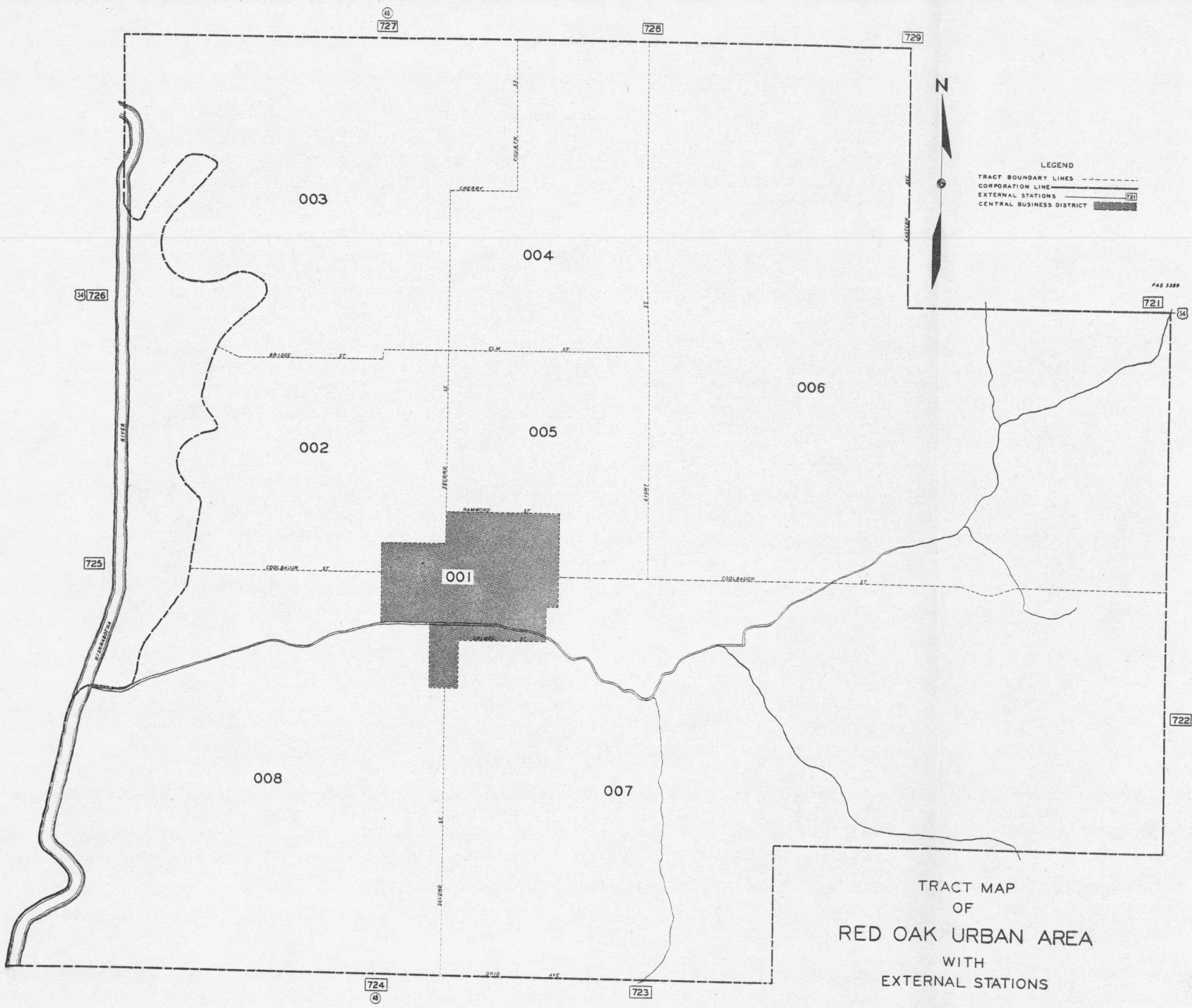


CHART NO. 2  
 ORIGIN OR DESTINATION OF TRIPS  
 BETWEEN PRIMARY ROAD ENTRANCES  
 AND  
 ALL TRACTS WITHIN THE URBAN AREA  
 OF  
 RED OAK  
 JUNE AVERAGE WEEKDAY TRAFFIC 1958



A P P E N D I X





TRACT MAP  
 OF  
 RED OAK URBAN AREA  
 WITH  
 EXTERNAL STATIONS

1950 Red Oak Origin and Destination  
 Total Trips Through Stations Located on Primary's  
 Ia. 48 N., Ia. 48S., U.S. 34E., U.S. 34W. Average Weekday Traffic in June

		Red Oak Urban Area									External Area											
		Central Business District	West	Northwest	North	North-Central	North and East	South and East	South and West	Red Oak Total	Ia. 48 North	U.S. 34 East	Ia. 48 South	U.S. 34 West	Loc. Rd. East	Loc. Rd. South	Loc. Rd. West	Loc. Rd. North	Loc. Rd. North	External Total	GRAND TOTAL	
TRACT		001	002	003	004	005	006	007	008		727	721	724	726	722	723	725	728	729			
TRACT		Trip Origin									Trip Destination											
Red Oak Urban Area	001	Central Business District									207	253	228	338							1026	1026
	002	West									32	49	37	49							167	167
	003	Northwest									59	59	62	70							250	250
	004	North									42	55	23	72							192	192
	005	North-Central									31	50	42	70							193	193
	006	North and East									47	81	45	146							319	319
	007	South and East									41	49	67	73							230	230
	008	Southwest									45	75	69	79							268	268
		Red Oak Total									504	671	573	897							2645	2645
External Area	727	Ia. 48 N.	243	23	56	36	35	49	34	37	513		17	54	50				1	122	635	
	721	U.S. 34 E.	330	26	68	55	43	94	60	67	743	22		64	573			2	2	663	1406	
	724	Ia. 48 S.	235	33	62	27	38	45	55	69	564	58	65	83		3	1			210	774	
	726	U.S. 34 W.	353	55	117	37	43	79	39	67	790	27	593	81		3			3	707	1497	
	722	Local Road East																			1	1
	723	Local Road South											1								2	2
	725	Local Road West											1	1							1	1
	728	Local Road North										1									1	1
	729	Local Road North										1									1	1
		External Total	1161	137	303	155	159	267	188	240	2610	109	677	200	706		6	3		6	1707	4317
		GRAND TOTAL	1161	137	303	155	159	267	188	240	2610	613	1348	773	1603		6	3		6	4352	6962



