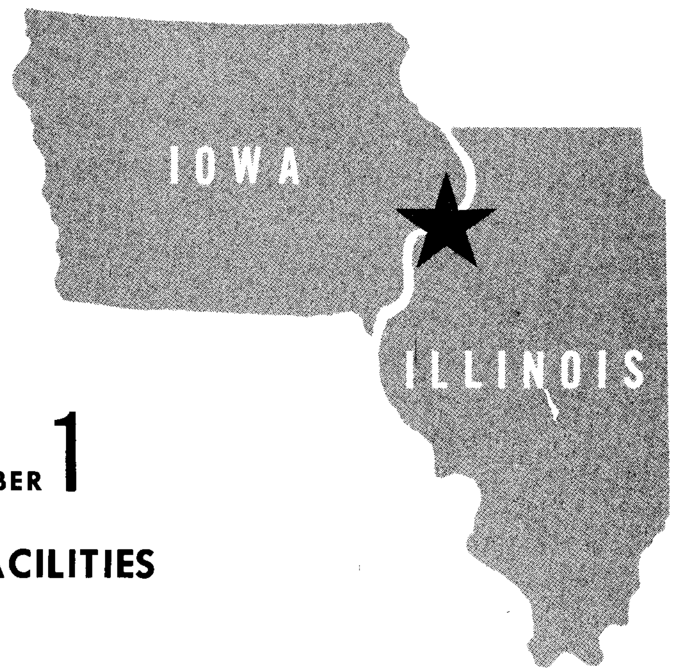
DAVENPORT - ROCK ISLAND - MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)



INTERIM REPORT NUMBER 1

TRANSPORTATION FACILITIES
INVENTORY
WORK ITEM 1-2

DE LEUW, CATHER & COMPANY • CONSULTING ENGINEERS
CHICAGO

IOWA PORTION

OF THE

DAVENPORT-ROCK ISLAND-MOLINE

URBANIZED AREA TRANSPORTATION STUDY

Interim Report Number 1

TRANSPORTATION FACILITIES INVENTORY

Item 1-2

Prepared for

CITY OF DAVENPORT
CITY OF BETTENDORF
TOWN OF RIVERDALE
SCOTT COUNTY

BI-STATE METROPOLITAN PLANNING COMMISSION
IOWA STATE HIGHWAY COMMISSION

in cooperation with the

UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

Prepared by:

DE LEUW, CATHER & COMPANY
CHICAGO, ILLINOIS

JULY 1968

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INTRODUCTION

The 1962 Federal Aid Highway Act specifies that, after July 1, 1965, highway projects in areas with populations exceeding 50,000 must be based on "a continuing comprehensive transportation planning process" in order to qualify for Federal funds. The planning process must take into consideration land use, economics, population, and other factors affecting traffic. These data must be coordinated with estimates of traffic volumes and related traffic engineering factors in assessing the transportation needs of the area. The comprehensive transportation plan based on such a study must include assurance of frequent review and modification to meet changing conditions.

The Iowa portion of the Davenport-Rock Island-Moline Urbanized Area Transportation Study includes all of Scott County. The study area encompasses approximately 465 square miles. Its population was 120,000 in 1960.

As an initial step in developing a comprehensive transportation plan for the study area, the following data were collected concerning existing transportation facilities:

a. Functional classification of streets and highways.

b. Physical inventory of streets and highways.

c. Inventory of traffic engineering features.

d. Speed and delay studies.

e. Traffic volume counts.

f. Accident studies.

g. Capacity analyses.

This interim report describes the methodology used and findings for each of the work elements listed above. Most of the required basic data were collected in 1966. These data were supplemented by statistics on experience prior to 1966, furnished by participating agencies.

FUNCTIONAL CLASSIFICATION

Present streets and highways were classified according to function. Classifications were based on the service provided by each facility, and were assigned by the Consultant with the advice and collaboration of participating agencies.

Standard categories were based on definitions by the National Committee on Urban Transportation, the American Association of State Highway Officials, and organizational policy of the Iowa State Highway Commission. They included: freeways; expressways; major, collector and local streets; and major, collector and local highways. Freeways and expressways were defined as both urban and rural facilities; streets as urban facilities; and highways as rural facilities. The classifications may be defined as follows:

Freeways. Freeways have divided roadways with full control of access. They serve high traffic volumes, usually at high speeds. Since the primary reason for using freeways is to save time, they generally serve trips longer than three miles.

Wide traffic lanes together with wide medians and grade separation of cross traffic contribute to low accident rates at speeds of 60 to 70 miles per hour in rural areas. Speeds may be somewhat lower in urban areas due to higher traffic volumes and more maneuvering. All cross roads are either grade-separated, closed or relocated.

There are no traffic signals on freeways. Interchange ramps allow entrance to and departure from freeways without cross traffic or left turns on main roadways. Where necessary, frontage roads on which parking is permitted are incorporated in the design for access to abutting land.

A freeway is usually designated as a U.S. and/or a state route.

Expressways. Expressways have divided roadways with partial control of access. They serve high traffic volumes at moderate to high speeds for trip lengths generally in excess of three miles--similar to the function of freeways. Expressways differ from freeways, however, in that they are generally built on narrower rights of way, and some at-grade intersections with major streets and highways may be permitted. The differences result in lower levels of service and reduced capacity as compared with freeways.

Although some access to abutting property is permissible, such land is generally served by frontage roads. Parking is not permitted on an expressway except in emergency, but can be allowed on frontage roads. An expressway is generally designated as a U.S. or state route. It may be designed for speeds of from 50 to 70 miles per hour, depending on topography and other factors.

No facility should be classed as a freeway or expressway, regardless of its physical characteristics, unless its principal function is to serve trips of appreciable length.

Major Streets. Major streets are high-type urban facilities which are continuous for a substantial distance. They have intersections at grade and generally provide direct access to abutting property. Geometric design techniques and traffic control measures are used, however, to safeguard movement of through traffic by minimizing roadside interference from driveways and parking facilities. Major streets may include such design features as medians, turning lanes and chanelization of intersections. In some cases, access to abutting property may be denied in order to improve design characteristics for high volume traffic. Parking lanes may be included but should be discouraged. Principal intersections should be signalized, and cross traffic on other intersecting streets should be required to stop at the major street.

Major streets, which may form boundaries of neighborhoods, should be spaced from one to two miles apart. Trip lengths on major streets generally average over one mile while speeds average 30 to 40 miles per hour.

Collector Streets. Collector streets are designed for medium to low volumes of traffic being gathered and distributed between major and local streets. They also serve secondary traffic generators such as schools, small shopping centers, churches and hospitals.

Collector streets are the main interior streets within a neighborhood, and are usually spaced 1/4 to 3/4 mile apart. Since they are intended to serve traffic destined to or originating within a particular neighborhood, through traffic should be discouraged from using collector streets.

All abutting property is afforded direct access. Parking lanes are permissible. Traffic on local cross streets should be controlled by stop signs at collector streets which are intended for average speeds of 20 to 30 miles per hour.

Local Streets. Local streets primarily afford access to abutting residential, industrial or commercial property. They assemble vehicles and lead them to higher type facilities such as collector or major streets. Traffic volumes on local streets are low and posted speeds are usually 20 to 30 miles per hour.

Local streets are usually spaced at one block intervals, except where one is displaced by a major or collector street. Through traffic is discouraged from using local streets by frequent stop signs. Parking may be permitted on one or both sides of local streets.

Local streets comprise a large portion of the total mileage of streets in any city. Traffic volumes are low, however, and hence vehicle-miles of travel on local streets are relatively small.

Major Highways. Major highways are high-type rural facilities handling large traffic volumes at medium to high speeds. They are usually the main roadways connecting cities and towns where traffic volumes do not justify freeways or expressways.

Major highways allow access to abutting property and have intersections at grade, but they are designed primarily for the safe movement of high-speed through traffic. Accordingly, control must be exerted over access to major highways in some cases so that they will retain their capacity and other features.

Major highways generally are designated either as U.S., state or county routes, alone or in combination. Speeds of 50 to 70 miles per hour can usually be maintained on such facilities.

Collector Highways. Collector highways are designed for moderate volumes of rural traffic. They extend for considerable distances, gathering and distributing rural traffic between major and local highways. All abutting property has the right of direct access, and all intersections are at grade. Traffic on collector highways has priority over that on local crossroads, however, and should be protected by stop signs except at intersections with major highways or expressways where traffic signals are required.

Collector highways are usually designated as state or county highways, and have posted speeds of 50 to 60 miles per hour.

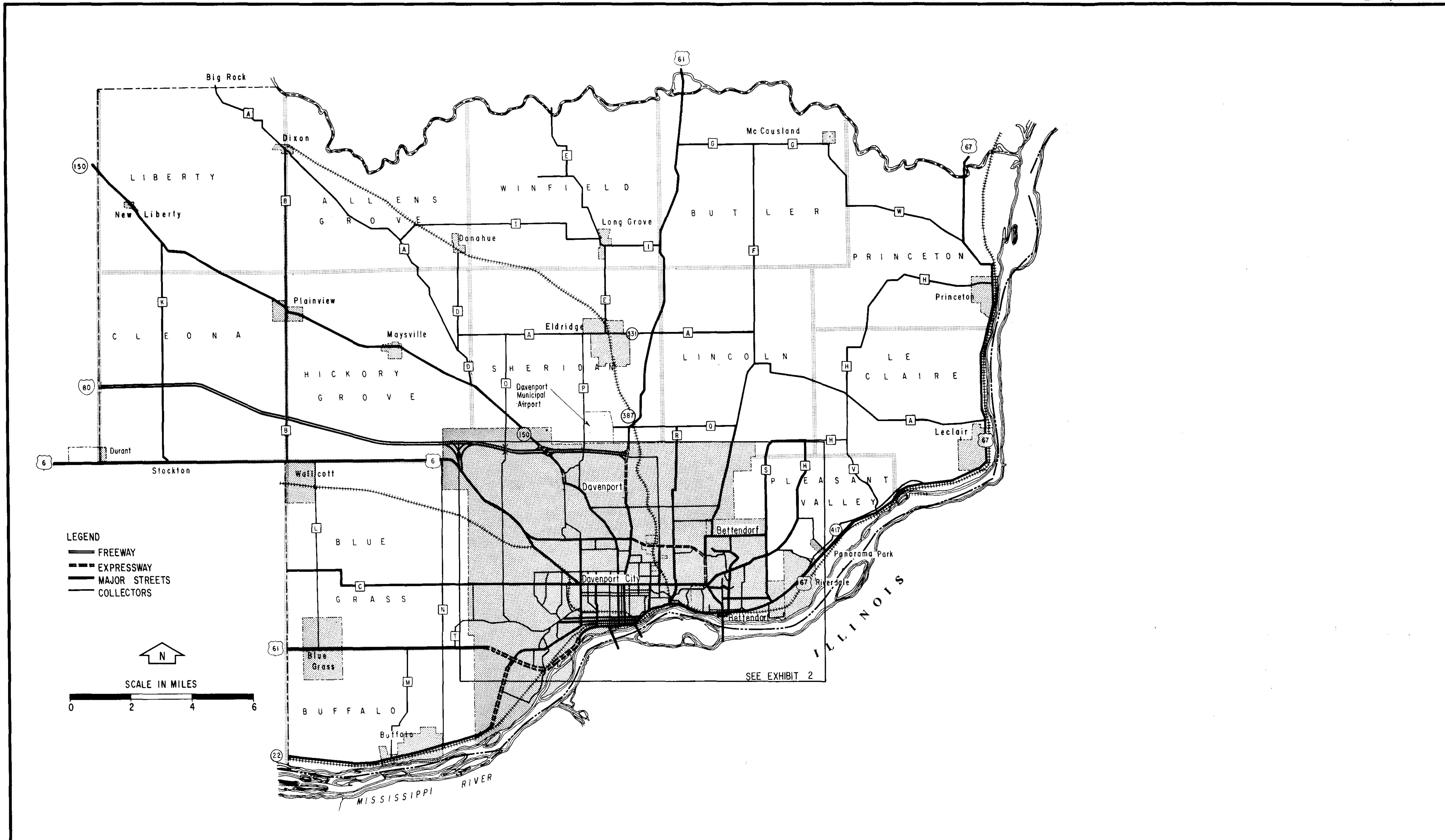
Local Highways and Roads. Local highways and roads serve low volumes of rural traffic and afford access to abutting property. All intersections are at grade and design speeds range from 30 to 50 miles per hour.

Local highways and roads comprise the largest part of any rural network since they provide access to all farmsteads, but they carry only a small proportion of total rural traffic. These highways are generally maintained by a county or township agency.

Streets and highways in Scott County classified as freeways, expressways, and major collector facilities are shown in Exhibits 1 and 2. These are referred to throughout the report as the Principal Street and Highway System. All other streets and highways were designated as "local" facilities. The classifications reflect conditions in 1964 which was taken as the base year the two separate studies in Illinois and Iowa were consolidated. Comprehensive studies of travel patterns in the Iowa portion were made in 1961.

The principal street and highway system was composed of 402 miles of road. Table 1 summarizes mileage of freeways, expressways, and major and collector streets and highways in the study area, by political jurisdiction.

Freeways and expressways made up only seven percent of the principal street and highway system. This reflects the incomplete status of the Interstate Highway System in the study area in 1964. As interstate routes and, perhaps, other urban highways with full or partial control of access are completed, an increase



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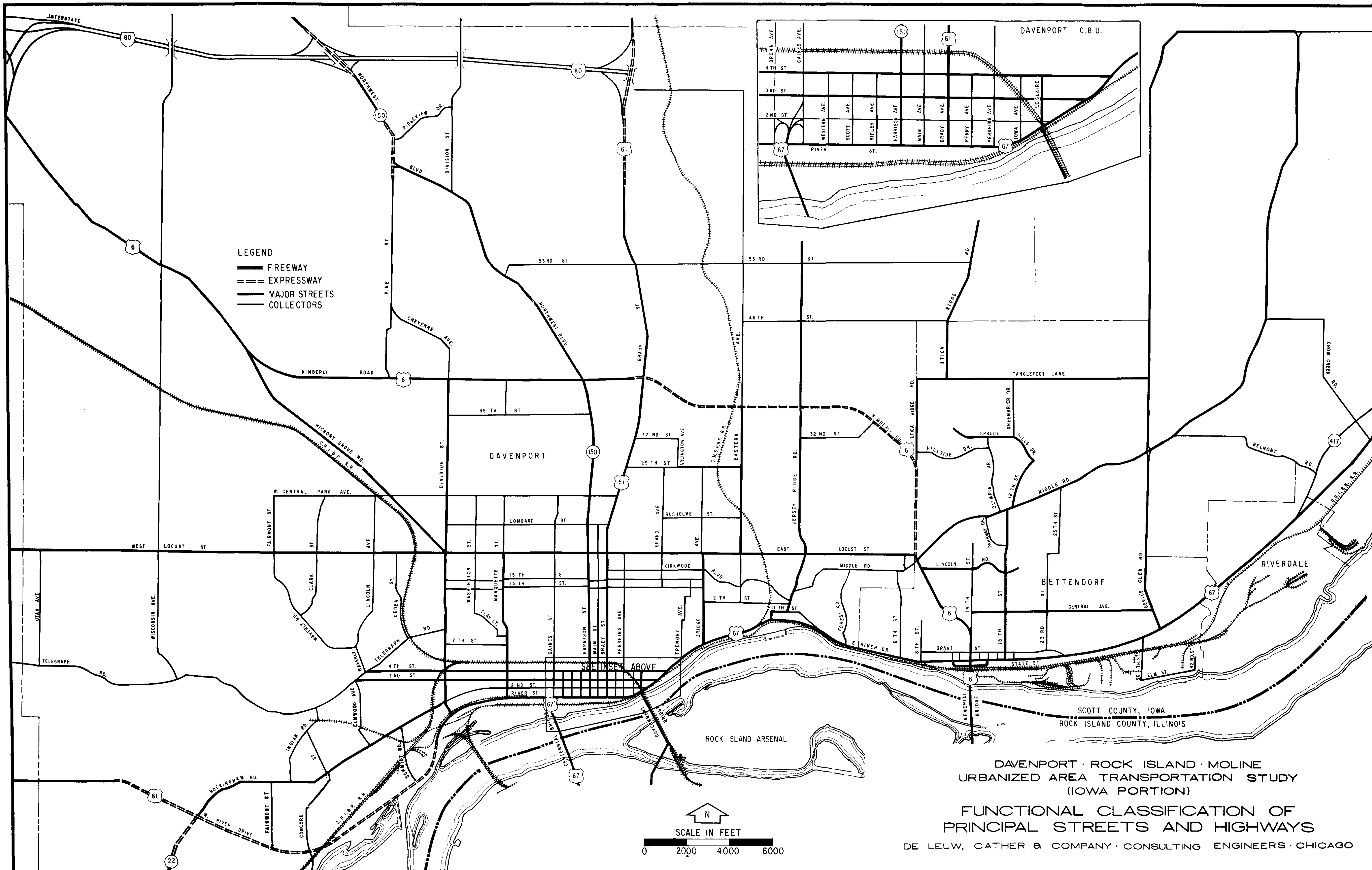
FUNCTIONAL CLASSIFICATION OF PRINCIPAL STREETS AND HIGHWAYS



See Exhibit I for remainder of study area

TABLE 1

MILEAGE OF PRINCIPAL STREETS AND HIGHWAYS
BY FUNCTIONAL CLASSIFICATION AND JURISDICTION
1964

Functional Classification	Total Length (Miles)			
	Davenport	Bettendorf	Remainder--Scott County	Total Study Area
Freeway	5.97	-	11.53	17.50
Expressway	12.32	0.17	0.39	12.88
Major Street	55.37	17.59	-	72.96
Collector Street	63.44	7.99	-	71.43
Major Highway	-	-	85.98	85.98
Collector Highway	-	-	141.02	141.02
Total	137.10	25.75	238.92	401.77

Note: Excludes local streets and highways.

can be expected in the mileage of freeways and expressways as a proportion of the total principal street and highway system. Table 2 compares principal street and highway mileage in Iowa with that in Illinois in the Davenport-Rock Island-Moline Urbanized Area.

TABLE 2

COMPARISON OF STREET AND HIGHWAY MILEAGE
BY FUNCTIONAL CLASSIFICATION

Urban Area	Freeways and Expressways		Major Streets and Highways		Collector Streets and Highways		Total	
	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent
Rock Island-Moline	18.61	4.0	195.02	42.3	247.76	53.7	461.39	100.0
Davenport-Bettendorf	30.38	7.6	158.94	39.6	212.45	52.8	401.77	100.0
Total	48.99		353.96		460.21		863.16	
Weighted Average Percent		5.7		41.0		53.3		100.0

Note: Excludes local streets and highways.

PHYSICAL INVENTORY

An inventory was made of the physical features of all freeways, expressways, and major and collector streets and highways in the study area. Procedures used in this study were the same as those used in the Illinois portion, which are described in the Illinois Division of Highways publication, "Street Inventory and Classification Instruction Manual." Relevant data were taken from records of the Iowa State Highway Commission and local government agencies. Inventory items not obtainable from such records were measured in the field.

Information tabulated in this phase of the study included the following:

a. Functional classification (described earlier).
b. Type of operation (one-way or two-way).
c. Length of section (hundredths of miles).
d. Surfaced width (feet).
e. Median width (feet).
f. Right of way width (feet).
g. Type of parking.

To facilitate data tabulation and processing, numbers were assigned to each intersection on the principal street and highway system. Additional numbers were assigned to mid-block locations where changes occurred in any of the inventory items listed above. For uniformity, numbers assigned to intersections of two principal streets and highways were the same as those in the traffic assignment network.(1) Points where physical changes occurred were given other numbers in a higher range than those used in the assignment network. Names of cross streets or descriptions of mid-block locations where physical changes occurred were identified on field forms, but were represented on data processing cards only by the numbers associated with each such point. Base maps showing the numbering system were attached to complete tabulations of the physical inventory furnished to the Iowa State Highway Commission and local professional staff.

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(1)-The traffic assignment network will be described in detail in the Interim Report on Traffic Model and Assignment Techniques.

The inventory was uniformly coded from west to east or from south to north. Diagonal routes were inventoried from southwest to northeast or from northwest to southeast.

Figure 1C shows the data processing card format used in the physical inventory of the principal street and highway system.

These cards and complete tabulations of the physical inventory were furnished to the professional staffs of governmental agencies participating in the transportation study. One page of a typical computer printout of the physical inventory is shown in Figure 1A. Abbreviated column headings which appear on the computer printout as well as explanations of procedures used in defining some of the inventory items which are not self-explanatory are explained in Figure 1B. Codes used for various inventory items are defined in Figure 1C, Data Processing Card Format.

Tables 1 through 7 summarize data obtained in the physical inventory of principal streets and highways.

FIGURE 1A

DAVENPORT-ROCK ISLAND-MOLINE URBANIZED AREA TRANSPORTATION STUDY - IOWA PORTION

PRINCIPAL STREET AND HIGHWAY INVENTORY

CARD TYPE NO.	JUR	STREET NAME OR HIGHWAY NO.	DESIG	NODE A	NODE B	FUNC CLASS	OP TYPE	LGTH MI X.XX	WIDTHS IN FEET SURFACE	WIDTHS IN FEET MEDIAN	WIDTHS IN FEET ROW	PARKING TYPE
13	6	INT 80	IR	8088	8089	0	1	047	048	60	800	0
13	6	INT 80	IR	8089	9259	0	1	082	048	60	999	0
13	6	INT 80	IR	9259	9260	0	1	174	048	60	350	0
13	6	INT 80	IR	9260	8090	0	1	039	048	60	674	0
13	6	INT 80	IR	8090	9261	0	1	028	048	60	674	0
13	6	INT 80	IR	9261	8187	0	1	072	048	60	400	0
13	6	INT 80	IR	8187	9262	0	1	097	048	60	400	0
13	6	INT 80	IR	9262	8012	0	1	058	048	60	699	0
13	6	ARLINGTON AV	AV	2246	2432	3	1	024	024		055	0
13	6	BRADY ST	ST	2210	2208	2	1	007	055		080	1
13	6	BRADY ST	ST	2208	2207	2	1	007	056		080	1
13	6	BRADY ST	ST	2207	2205	2	1	007	056		080	1
13	6	BRADY ST	ST	2205	8310	2	1	007	056		080	1
13	6	BRADY ST	ST	8310	2204	2	1	007	056		080	4
13	6	BRADY ST	ST	2204	8042	2	1	017	056		080	4
13	6	BRADY ST	ST	8042	8011	2	1	026	050		070	0
13	6	BRADY ST	ST	8011	2202	2	1	014	050		070	0
13	6	BRADY ST	ST	2202	2201	2	1	007	048		070	0
13	6	BRADY ST	ST	2201	2200	2	1	007	043		060	0
13	6	BRADY ST	ST	2200	2199	2	1	015	041		060	0
13	6	BRADY ST	ST	2199	2198	2	1	025	035		050	0
13	6	BRADY ST	ST	2198	2197	2	1	026	040		060	0
13	6	BRADY ST	ST	2197	2196	2	1	024	040		060	0
13	6	BRADY ST	ST	2196	2195	2	1	025	037		060	0
13	6	BRADY ST	ST	2195	8102	2	1	012	048		075	0
13	6	BRADY ST	ST	8102	2193	2	1	040	048		075	0
13	6	BRADY ST	ST	2193	9070	2	1	004	048		132	0
13	6	BRADY ST	ST	9070	9071	2	1	011	048		140	0
13	6	BRADY ST	ST	9071	9072	2	1	003	048		160	0
13	6	BRADY ST	ST	9072	9073	2	1	015	048		135	0
13	6	BRADY ST	ST	9073	9074	2	1	018	048		130	0
13	6	BRADY ST	ST	9074	9075	2	1	009	048		115	0
13	6	BRADY ST	ST	9075	9076	2	1	009	048		130	0
13	6	BRADY ST	ST	9076	9077	2	1	008	048		115	0
13	6	BRADY ST	ST	9077	2397	2	1	024	048		207	0
13	6	BRADY ST	ST	2397	9078	2	1	011	048		207	0
13	6	BRADY ST	ST	9078	9079	2	1	015	048		135	0
13	6	BRADY ST	ST	9079	8280	2	1	032	048		145	0
13	6	BRADY ST	ST	8280	9081	1	1	009	048	04	345	0
13	6	BRADY ST	ST	9081	9082	1	1	012	048	32	310	0
13	6	BRADY ST	ST	9082	9083	1	1	004	048	60	415	0
13	6	BRADY ST	ST	9083	2396	1	1	026	048	60	999	0
13	6	BRADY ST	ST	2396	8012	1	1	050	048	60	999	0
13	6	BRADY ST	ST	8012	9084	1	1	014	048	60	999	0
13	6	BRADY ST	ST	9084	9085	1	1	019	48	60	165	0
13	6	BRADY ST	ST	9085	8018	1	1	004	48	41	155	0
13	6	BRADY ST	ST	8018	8016	2	1	012	036		130	0
13	6	BRIDGE AVE	AV	2262	2261	2	1	021	030		060	4
13	6	BRIDGE AVE	AV	2261	8268	2	1	008	030		060	4
13	6	BRIDGE AVE	AV	8268	2260	2	1	007	030		060	1

FIGURE 1B

PRINCIPAL STREET AND HIGHWAY INVENTORY

EXPLANATION OF COLUMN HEADINGS

Column Heading	Explanation
CARD TYPE NO.	Identifies the cards as street inventory cards.
JUR	Indicates jurisdiction. 6 = Davenport, 7 = Bettendorf, 8 = Remainder of Scott County.
STREET NAME OR HIGHWAY NO.	Name or number of section being inventoried.
DESIG	Section type. AV = Avenue, BL = Boulevard, CR = Circle, CT = Court, DR = Drive, HY = Highway, LN = Lane, RD = Road, PL = Place, PK = Parkway, RP = Ramp, ST = Street, TR = Terrace, I. R. = Interstate Route.
NODE A	Location of beginning of link indicated by number - refer to node map.
NODE B	Location of end of link indicated by number - refer to node map.
FUNC CLASS	Functional class based on the service the facility provides. 0 = Freeway, 1 = Expressway, 2 = Major Street, 3 = Collector Street, 4 = Local Residential, 5 = Local Commercial, 6 = Local Industrial, 7 = Major Highway, 8 = Collector Highway, 9 = Local Highway.
OP TYPE	Type of operation. 1 = Two-Way, 2 = One-Way (AtoB), 3 = One-Way (BtoA).
LGTH MI X. XX	Length of link between Node A and B in hundredths of miles.

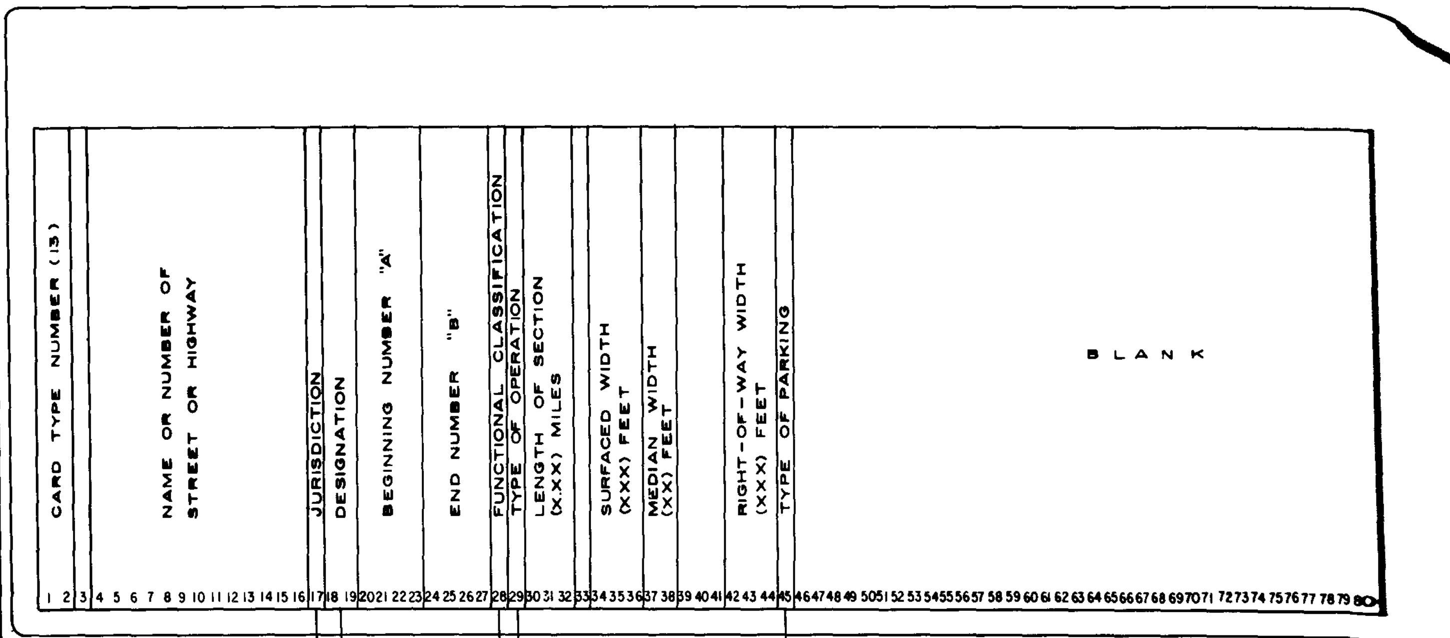
FIGURE 1B (Concluded)

PRINCIPAL STREET AND HIGHWAY INVENTORY

EXPLANATION OF COLUMN HEADINGS

Column Heading	Explanation
WIDTHS IN FEET	
SURFACE	Curb to curb or width of pavement to nearest foot. An asterisk (*) preceeding the width indicates that the street was not paved at the time of inventory.
MEDIAN	From curb face to curb face or between traffic lane pavement edges to nearest foot.
ROW	The total width between the right of way limits to the nearest foot.
PKG TYPE	Type of parking. 0 = None, 1 = Parallel, 2 = Diagonal, 3 = Right Angle, 4 = Parallel (One Side), 5 = Diagonal (One Side).

CARD FORMAT STREET INVENTORY



JURISDICTION (COL. 17)

6 - DAVENPORT
7 - BETTENDORF
8 - REMAINDER OF SCOTT CO.

FACILITY DESIGNATION (COLS. 18-19)

AV - AVENUE
BL - BOULEVARD
CR - CIRCLE
CT - COURT
DR - DRIVE
HY - HIGHWAY
LN - LANE
PL - PLACE
PK - PARKWAY
RD - ROAD
RP - RAMP
ST - STREET
TR - TERRACE
I.R. - INTERSTATE ROUTE

FUNCTIONAL CLASSIFICATION (COL. 28)

0 - FREEWAY
1 - EXPRESSWAY
2 - MAJOR STREET
3 - COLLECTOR ST.
4 - LOCAL RESIDEN.
5 - LOCAL COMMERCIAL
6 - LOCAL INDUSTRIAL
7 - MAJOR HIGHWAY
8 - COLLECTOR HIGHWAY
9 - LOCAL HIGHWAY

TYPE OF OPERATION (COL. 29)

1 - TWO-WAY
2 - ONE-WAY (A TO B)
3 - ONE-WAY (B TO A)

TYPE OF PARKING (COLUMN 45)

0 - NONE
1 - PARALLEL
2 - DIAGONAL
3 - RIGHT ANGLE
4 - PARALLEL (ONE SIDE)
5 - DIAGONAL (ONE SIDE)

NOTE: AN ASTERISK (*) IN COLUMN 34 INDICATES THAT THE STREET WAS NOT PAVED AT THE TIME OF INVENTORY.

TRAFFIC ENGINEERING FEATURES INVENTORY

An inventory was made of traffic engineering features such as signals, stop or yield controls, and turn restrictions at all intersections of functionally classified freeways, expressways, and major and collector streets and highways in the study area. Signal locations and descriptions were obtained from the local agencies while other features related to parking regulations and traffic controls were recorded in the field.

Information tabulated in this phase of the study included the following:

a. Parking regulations.
b. Traffic controls (signals and stop and yield signs).
c. Traffic flow (turn restrictions).

A basic intersection numbering system was set up for the physical inventory and used for tabulation and processing. Where capacity considerations did not change for several successive physical inventory links, however, they were combined into one operational characteristics link. These links were then coded on field forms. Names of cross streets and descriptions of mid-block spots where changes occurred were identified on these same forms. These points are represented on data processing cards by appropriate numbers.

Figure 2C shows the data processing card format used in the traffic engineering features inventory of the principal street and highway system. These cards and complete tabulations, as well as node maps, have been furnished to the professional staffs of governmental agencies participating in the transportation study.

One page of a typical computer printout of the traffic engineering features inventory is shown in Figure 2A. Figure 2B explains abbreviated column headings appearing on the computer printout as well as procedures used in defining some of the inventory items which are not self-explanatory. Codes used for various inventory items are defined in Figure 2C--Data Processing Card Format.

FIGURE 2A

DAVENPORT-ROCK ISLAND-MOLINE URBANIZED AREA TRANSPORTATION STUDY - IOWA PORTION

TRAFFIC ENGINEERING FEATURES INVENTORY

JUR	STREET NAME OR HIGHWAY NO.	DESIG	NODE A	NODE B	FUNC CLASS	OP TYPE	LGTH MI X.XX	AREA	-NODE A- FLOW	-NODE A- TRACON	PARKING TYPE	PARKING REG	MIN WDTH	-NODE B- FLOW	-NODE B- TRACON	ADT HDS	ADT CODE
6	INT 80	IR	8088	8089	0	1	047	5			0		48	1	8	76	2
6	INT 80	IR	8089	8090	0	1	295	5	1	8	0		48	1	8	92	1
6	INT 80	IR	8090	8012	0	1	255	5	1	8	0		48	1	8	89	1
6	ARLINGTON AV	AV	2246	2432	3	1	024	4	0	7	0		24	4	7	5	4
6	BRADY ST	ST	2210	2208	2	1	007	1	0	2	3	1	55	1	2	60	1
6	BRADY ST	ST	2208	2207	2	1	007	1	1	2	3	1	56	1	2	86	1
6	BRADY ST	ST	2207	2205	2	1	007	1	2	2	3	1	56	2	2	124	1
6	BRADY ST	ST	2205	8310	2	1	007	1	1	2	3	1	56			149	1
6	BRADY ST	ST	8310	2204	2	1	007	2			2	1	56			149	1
6	BRADY ST	ST	2204	8042	2	1	017	4			2	1	56			149	1
6	BRADY ST	ST	8042	8011	2	1	026	4			0		50			150	4
6	BRADY ST	ST	8011	2202	2	1	014	3			0		50	1	4	150	4
6	BRADY ST	ST	2202	2201	2	1	007	3	2	4	0		48	2	34	170	3
6	BRADY ST	ST	2201	2200	2	1	007	3	1	34	0		43	0	6	150	4
6	BRADY ST	ST	2200	2199	2	1	015	3	0	6	0		41	0	1	194	1
6	BRADY ST	ST	2199	2198	2	1	025	3	0	1	0		35	2	6	180	1
6	BRADY ST	ST	2198	2197	2	1	026	4	1	6	0		40	0	4	180	1
6	BRADY ST	ST	2197	2196	2	1	024	4	0	4	0		40	1	1	178	1
6	BRADY ST	ST	2196	2195	2	1	025	4	2	1	0		37	1	6	179	1
6	BRADY ST	ST	2195	8102	2	1	012	3	2	6	0		48			145	1
6	BRADY ST	ST	8102	2193	2	1	040	3			0		48	0	4	145	1
6	BRADY ST	ST	2193	2397	2	1	101	5	0	4	0		48	0	6	190	1
6	BRADY ST	ST	2397	8280	2	1	058	5	0	6	0		48			139	1
6	BRADY ST	ST	8280	2396	1	1	051	5			0		48			139	1
6	BRADY ST	ST	2396	8012	1	1	050	5			0		48	0	8	139	1
6	BRADY ST	ST	8012	8018	1	1	037	5	0	8	0		48			83	1
6	BRADY ST	ST	8018	8016	2	1	012	5			0		36			83	1
6	BRIDGE AVE	AV	2262	2261	2	1	021	4	0	7	5	0	30			48	3
6	BRIDGE AVE	AV	2261	8268	2	1	008	4			5	0	30			48	3
6	BRIDGE AVE	AV	8268	2260	2	1	007	4			3	0	30	0	6	48	3
6	BRIDGE AVE	AV	2260	2259	2	1	012	4	0	6	3	0	30	3	7	42	3
6	BRIDGE AVE	AV	2259	2258	2	1	007	4	3	7	3	0	30	2		27	3
6	BRIDGE AVE	AV	2258	2257	2	1	008	4	1		3	0	30	0	7	19	3
6	BRIDGE AVE	AV	2257	2256	2	1	013	4	0	7	3	0	30			37	3
6	BRIDGE AVE	AV	2256	2255	2	1	016	4			3	0	30			22	3
6	BRIDGE AVE	AV	2255	2254	2	1	014	4			4	0	30	0	7	22	3
6	BRIDGE AVE	AV	2254	2253	2	1	044	4	0	7	3	0	30	4	7	5	4
6	BROADLAWN AVE	AV	2302	2303	3	1	013	4	4	7	3	0	30	0	7	5	4
6	CAREY ST	ST	8236	2250	3	1	007	4			3	0	24	1	7	5	4
6	CEDER ST	ST	2084	2105	3	1	076	4	0	67	3	0	18	0	1	28	3
6	W CENTRAL PK	AV	2430	2108	3	1	044	4	0	8	0		20	1	8	5	4
6	W CENTRAL PK	AV	2108	8196	3	1	025	4	1	8	0		20			20	1
6	W CENTRAL PK	AV	8196	2109	3	1	012	4			0		41	1	8	20	1
6	W CENTRAL PK	AV	2109	2110	3	1	012	4	2	8	0		41	0	7	20	1
6	W CENTRAL PK	AV	2110	2112	3	1	009	4	0	7	0		37			21	1
6	W CENTRAL PK	AV	2112	8195	3	1	013	4			0		37			21	1
6	W CENTRAL PK	AV	8195	2119	3	1	022	4			0		37	0	1	21	1
6	W CENTRAL PK	AV	2119	2125	3	1	025	4	0	1	0		31	0	6	21	3
6	W CENTRAL PK	AV	2125	2130	3	1	025	4	0	6	0		37	0	67	36	3
6	W CENTRAL PK	AV	2130	2134	3	1	047	4	0	67	0		37	1	6	36	3

FIGURE 2B

TRAFFIC ENGINEERING FEATURES INVENTORY

EXPLANATION OF COLUMN HEADINGS

Column Heading	Explanation
JUR	Indicates jurisdiction. 6 = Davenport, 7 = Bettendorf, 8 = Remainder of Scott County.
STREET NAME OR HIGHWAY NO.	Name or number of section being inventoried.
DESIG	Section type. AV = Avenue, BL = Boulevard, CR = Circle, CT = Court, DR = Drive, HY = Highway, LN = Lane, RD = Road, PL = Place, PK = Parkway, RP = Ramp, ST = Street, TR = Terrace, IR = Interstate Route.
NODE A	Location of beginning of link indicated by number - refer to node map.
NODE B	Location of end of link indicated by number - refer to node map.
FUNC CLASS	Functional class based on the service the facility provides. 0 = Freeway, 1 = Expressway, 2 = Major Street, 3 = Collector Street, 4 = Local Residential, 5 = Local Commercial, 6 = Local Industrial, 7 = Major Highway, 8 = Collector Highway, 9 = Local Highway.
OP TYPE	Type of operation. 1 = Two-Way, 2 = One-Way (A to B), 3 = One-Way (B to A).
LGTH MI X.XX	The length of each street or highway section was measured along its centerline in hundredths of miles between centerlines of terminal intersections.
AREA	Location of facility by type of area. 1 = Central Business District, 2 = Fringe, 3 = Outlying Business District, 4 = Residential, 5 = Rural.

FIGURE 2B (Continued)

TRAFFIC ENGINEERING FEATURES INVENTORY

EXPLANATION OF COLUMN HEADINGS

Column Heading	Explanation
NODE A	
FLOW	Type of turning movements permitted at intersection going from B to A. 0 = All moves permitted, 1 = Right turn and through, 2 = Left turn and through, 3 = Through traffic only, 4 = Right and left turns, 5 = Left turn only, 6 = Right turn only.
TRA CON	Type of traffic control at the intersection. 0 = Flashing signal, 1 = Isolated Fixed Time Signal, 2 = Interconnected Signal, 3 = Pedestrian-Actuated Signal, 4 = Vehicle semi-actuated Signal, 5 = Vehicle fully-Actuated Signal, 6 = Stop Signs on Cross Street, 7 = Stop Signs on Inventory Street, 8 = Yield Signs on Cross Street, 9 = Yield Signs on Inventory Street.
PARKING	
TPE	Type of parking permitted along the streets and highways between Nodes A and B. 0 = No Parking, 1 = No parking on left side, 2 = No parking on right side, 3 = Parallel-both sides, 4 = Parallel-right side, 5 = Parallel-left side, 6 = Diagonal-both sides, 7 = Diagonal-left side, 8 = Diagonal-right side.
REG	Type of Parking Regulations along the streets and highways between Nodes A and B. 0 = No restriction, 1 = Meter parking, 2 = One-hour parking (No meters), 3 = Two-hour parking (No meters), 4 = AM peak removal (both sides), 5 = AM peak removal (one side), 6 = PM peak removal (both sides), 7 = PM peak removal (one side), 8 = Both peak removal (both sides), 9 = Both peak removal (one side).

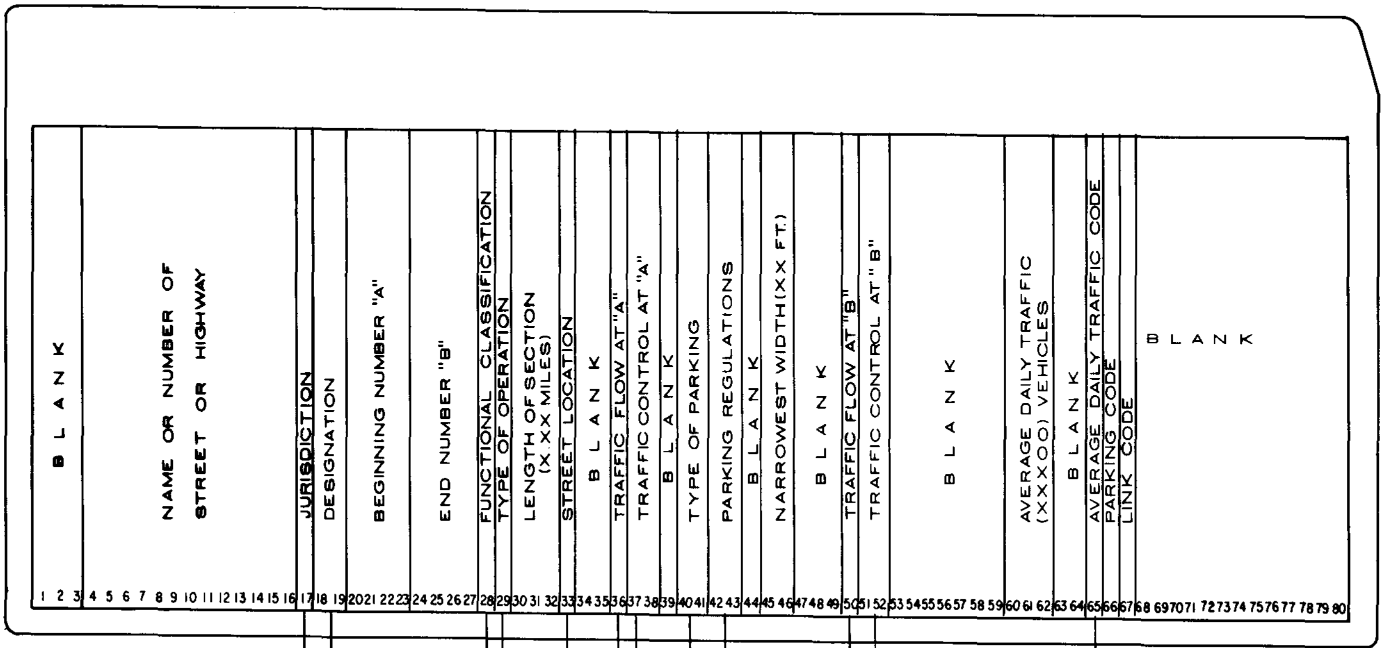
FIGURE 2B (Concluded)

TRAFFIC ENGINEERING FEATURES INVENTORY

EXPLANATION OF COLUMN HEADINGS

Column Heading	Explanation
MIN WDTH	The distance in feet (xx) from curb to curb, or from edge of pavement to edge of pavement.
NODE B	
FLOW TRA CON	See NODE A
ADT HDS	The average daily traffic (in hundredths) on each street or highway section.
ADT CODE	Indicates the source of estimated ADT. 1 = 1966 urban area ground counts by Iowa State Highway Commission, 2 = 1966 rural area ground counts by ISHC, 3 = 1961 - 1964 Traffic Assignment Volumes, 4 = Consultant's estimates based on the location and type of street and volumes on similar nearby links.

CARD FORMAT
TRAFFIC ENGINEERING FEATURES INVENTORY



(COL. 17)
6 - DAVENPORT
7 - BETTENDORF
8 - REMAINDER OF SCOTT CO.

(COL. 18-19)
AV - AVENUE
BL - BOULEVARD
CR - CIRCLE
CT - COURT
DR - DRIVE
HY - HIGHWAY
LN - LANE
PL - PLACE
PK - PARKWAY
RD - ROAD
RP - RAMP
ST - STREET
TR - TERRACE
IR - INTERSTATE ROUTE

(COL. 28)
0 - FREEWAY
1 - EXPRESSWAY
2 - MAJOR STREET
3 - COLLECTOR STREET
7 - MAJOR HIGHWAY
8 - COLLECTOR HIGHWAY

(COL. 29)
1 - TWO-WAY
2 - ONE-WAY (A TO B)
3 - ONE-WAY (B TO A)

(COL. 33)
1 - CENTRAL BUSINESS
2 - FRINGE AREA
3 - OUTLYING BUSINESS
4 - RESIDENTIAL
5 - RURAL

(COL. 40-41)
0 - NO PARKING
1 - NO PARKING ON LEFT SIDE
2 - NO PARKING ON RIGHT SIDE
3 - PARALLEL - BOTH SIDES
4 - PARALLEL - RIGHT SIDE
5 - PARALLEL - LEFT SIDE
6 - DIAGONAL - BOTH SIDES
7 - DIAGONAL - LEFT SIDE
8 - DIAGONAL - RIGHT SIDE

(COL. 42-43)
0 - NO RESTRICTION
1 - METER PARKING
2 - ONE-HOUR PARKING (NO METERS)
3 - TWO-HOUR PARKING (NO METERS)
4 - AM PEAK REMOVAL (BOTH SIDES)
5 - AM PEAK REMOVAL (ONE SIDE)
6 - PM PEAK REMOVAL (BOTH SIDES)
7 - PM PEAK REMOVAL (ONE SIDE)
8 - BOTH PEAK REMOVAL (BOTH SIDES)
9 - BOTH PEAK REMOVAL (ONE SIDE)

(COL. 36 & 50)
0 - ALL MOVES PERMITTED
1 - RIGHT TURN & THROUGH
2 - LEFT TURN & THROUGH
3 - THROUGH TRAFFIC ONLY
4 - RIGHT & LEFT TURNS
5 - LEFT TURN ONLY
6 - RIGHT TURN ONLY

(COL. 37-38 & 51-52)
0 - FLASHING SIGNAL
1 - ISOLATED FIXED-TIME SIGNAL
2 - INTERCONNECTED SIGNAL
3 - PEDESTRIAN-ACTUATED SIGNAL
4 - VEHICLE SEMI-ACTUATED SIGNAL
5 - VEHICLE FULLY-ACTUATED SIGNAL
6 - STOP SIGNS ON CROSS STREET
7 - STOP SIGNS ON INVENTORY STREET
8 - YIELD SIGNS ON CROSS STREET
9 - YIELD SIGNS ON INVENTORY STREET

(COL. 65)
1 - 1966 ADT
2 - 1965 ADT
3 - 1961-1964 ASSIGNED VOLUME
4 - ESTIMATED VOLUME

SPEED AND DELAY STUDY

This section of the report describes study procedures and findings of surveys made to obtain travel time information on individual sections of the principal street and highway system. These were used for estimating the present level of service performed by each facility as well as average speeds. The latter were used in assigning traffic to the highway network.

It has been established by many studies that the average automobile driver measures desirability of a route principally in terms of total travel time. Thus, in evaluating the service performed by the street and highway system, time must be given appropriate weight. In fact, time is the only yardstick of the quality of street and highway service that is uniformly understood and free from serious differences in interpretation.(1)

Time lost in traversing an area is a measure of congestion and may be translated into costs more readily than any other index devised to date. As such, present travel time on principal streets and highways defines the comparative level of service between segments of the system and on the entire system in various time periods. Travel time measurements are also extremely valuable in estimating the amount of use that a new facility will receive, as well as in computing the benefits to be derived from such facilities.

Using procedures described in Procedure Manual 3B, National Committee on Urban Transportation, travel time studies were made on all freeways and expressways as well as on representative sections of major and collector streets and highways.

One afternoon peak hour run and one off-peak run was made in each direction on each test section. The study was conducted by a two-man survey team driving a vehicle in the traffic stream at the "average" speed. It is possible to approximate average speed by maintaining a ratio of about 55-45 between the number of vehicles passed and the number of vehicles passing the test vehicle. It has been found, however, that best results are obtained by relying primarily on the driver's judgment, using the above ratio as a guide rather than as an inflexible rule.

(1)-Procedure Manual 3B, Determining Travel Time, National Committee on Urban Transportation, page 7.

An aggressive driver, of course, can exceed the average rate of travel on a route. Drivers of the test vehicle were instructed to drive at the average speed, therefore, rather than at the highest possible speed. The average travel speed, however, may be lower on certain streets and highways than could be attained under existing travel conditions. This is particularly true during off-peak periods because of the prevalence of short trips on which many drivers are not overly speed-conscious. The observers were particularly careful, therefore, to maintain a ratio of about 55-45 between the number of vehicles passed and the number of vehicles passing the test vehicle, during off-peak periods. Observance of rules of the road was, in all cases, at the same level as that prevailing in the study area.

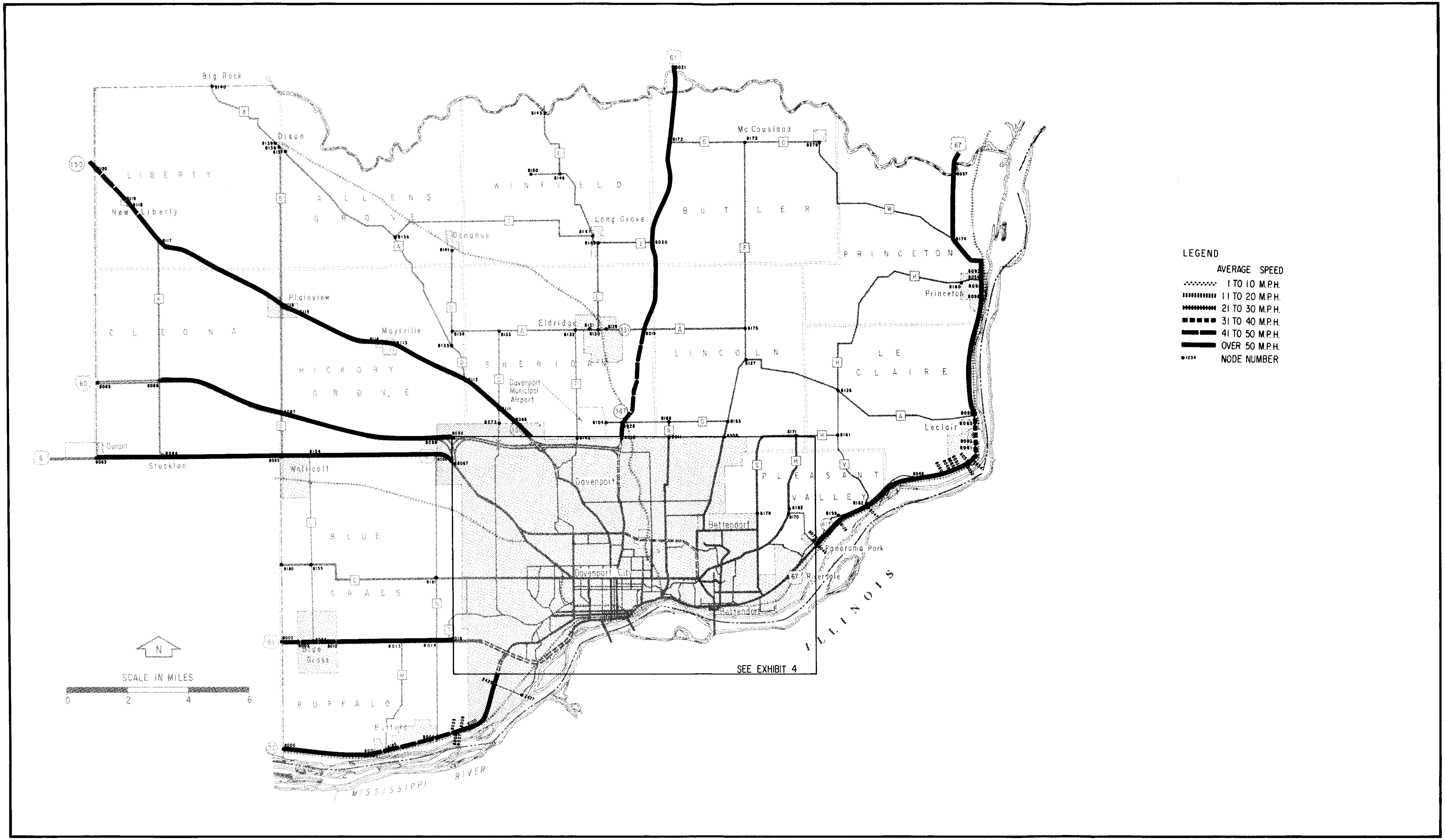
Field forms for each test run were prepared in advance. These established the route to be followed and designated intersections or other checkpoints at which time and distance were to be recorded. Travel time was recorded from stopwatch readings at each checkpoint. In addition, the odometer reading of the test vehicle was recorded at the checkpoint. Later, in the office, distances between checkpoints were verified by measurement on a map.

Segments of streets and highways on which travel time studies were made are shown in Exhibits 3 and 4. The test sections were approved by the Transportation Study Technical Committee prior to making test runs. They included approximately 30 miles or 100 percent of freeways and expressways; 143 miles or 90 percent of major streets and highways; and 34 miles or 16 percent of collector streets and highways.

Exhibits 3 and 4 also show numbers assigned to various intersections and other checkpoints for purposes of the speed delay study and capacity analysis described later in the report.

Peak and off-peak speeds were combined to represent average daily values. The following formula, suggested in Highway Assignment Manual, Bureau of Public Roads, was used:

$$\text{ADT speed} = \frac{2\ (\text{off-peak speed}) + 1\ (\text{peak speed})}{3}$$



DAVENPORT · ROCK ISLAND · MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)
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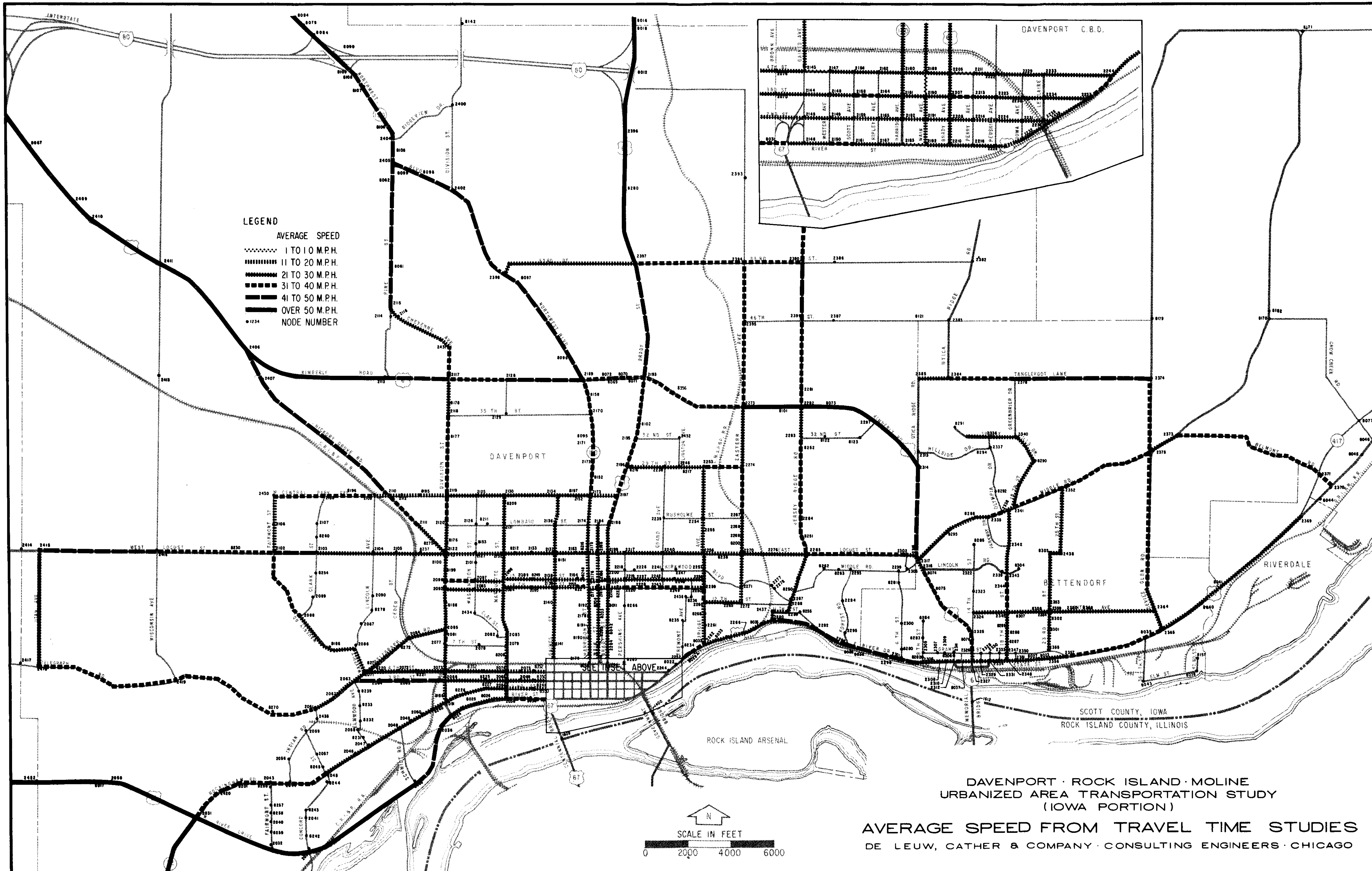
AVERAGE SPEED FROM TRAVEL TIME STUDIES

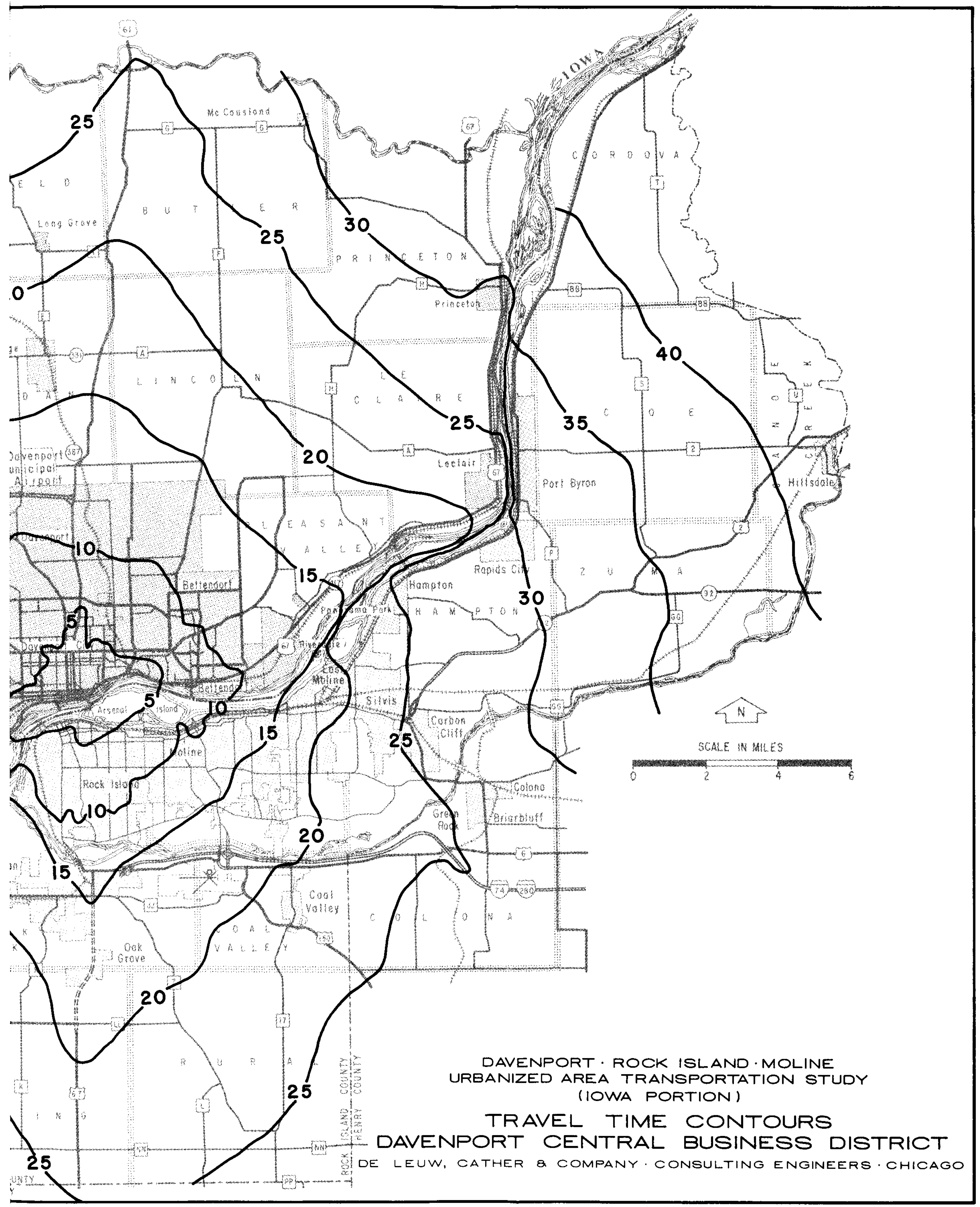


See Exhibit 3 for remainder of study area

Average speeds from the travel time study were coded in the preparation of the highway assignment network for computer application. Based on the results of the travel time studies, speeds were also estimated for all segments of the system on which test runs were not made. Similar procedures were followed in the Illinois portion of the study area to complete the coding of speeds on all segments of the assignment network.

Using both observed and estimated speeds, a computer analysis was made of test or sample trees from both central business districts in the study area. Exhibits 5 and 6 show travel time contours or isochronal lines radiating from the two central business districts. The isochronal lines represent points equidistant in terms of travel time from each of the business districts in five-minute increments. This analysis was made before the application of speed adjustments required to calibrate the assignment network in terms of travel volume.

EXHIBIT 5



DAVENPORT · ROCK ISLAND · MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)
TRAVEL TIME CONTOURS
DAVENPORT CENTRAL BUSINESS DISTRICT
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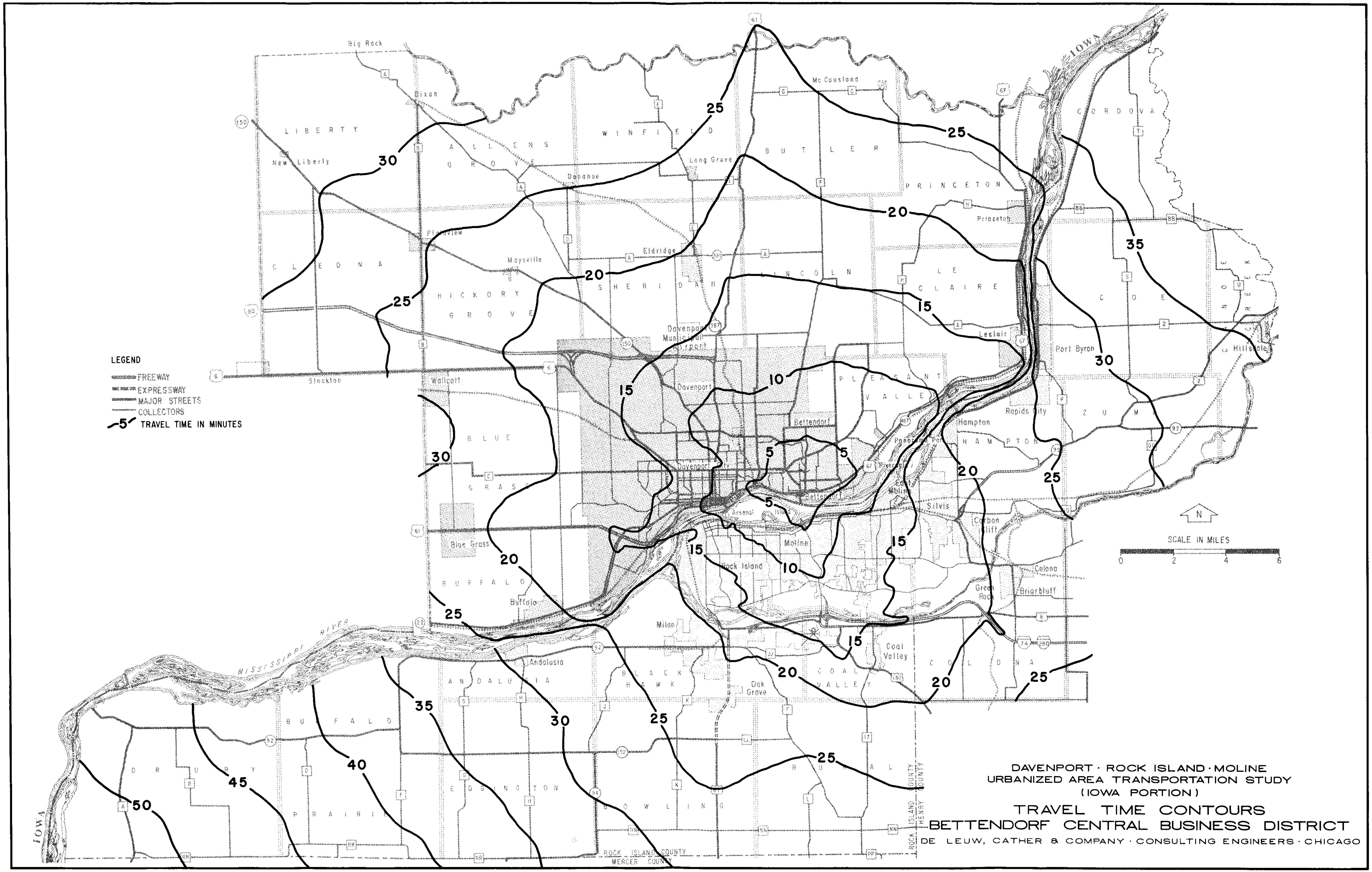

DAVENPORT · ROCK ISLAND · MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)

TRAVEL TIME CONTOURS
BETTENDORF CENTRAL BUSINESS DISTRICT

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VOLUME STUDY

Studies of traffic volumes and trends were required to estimate present level of service performed by the street system; to define existing street and highway deficiencies; to calculate accident rates and capacity; and later, in the planning process, to establish priorities for the ultimate program of transportation improvements. Volume counts were also needed in the traffic assignment process for calibration of the existing highway network.

The following traffic volume studies are described in this report:

a. Control Counts
b. Coverage Counts
c. Peak Hour Turning Movement Counts
d. Screen Line Counts
e. Cordon Counts

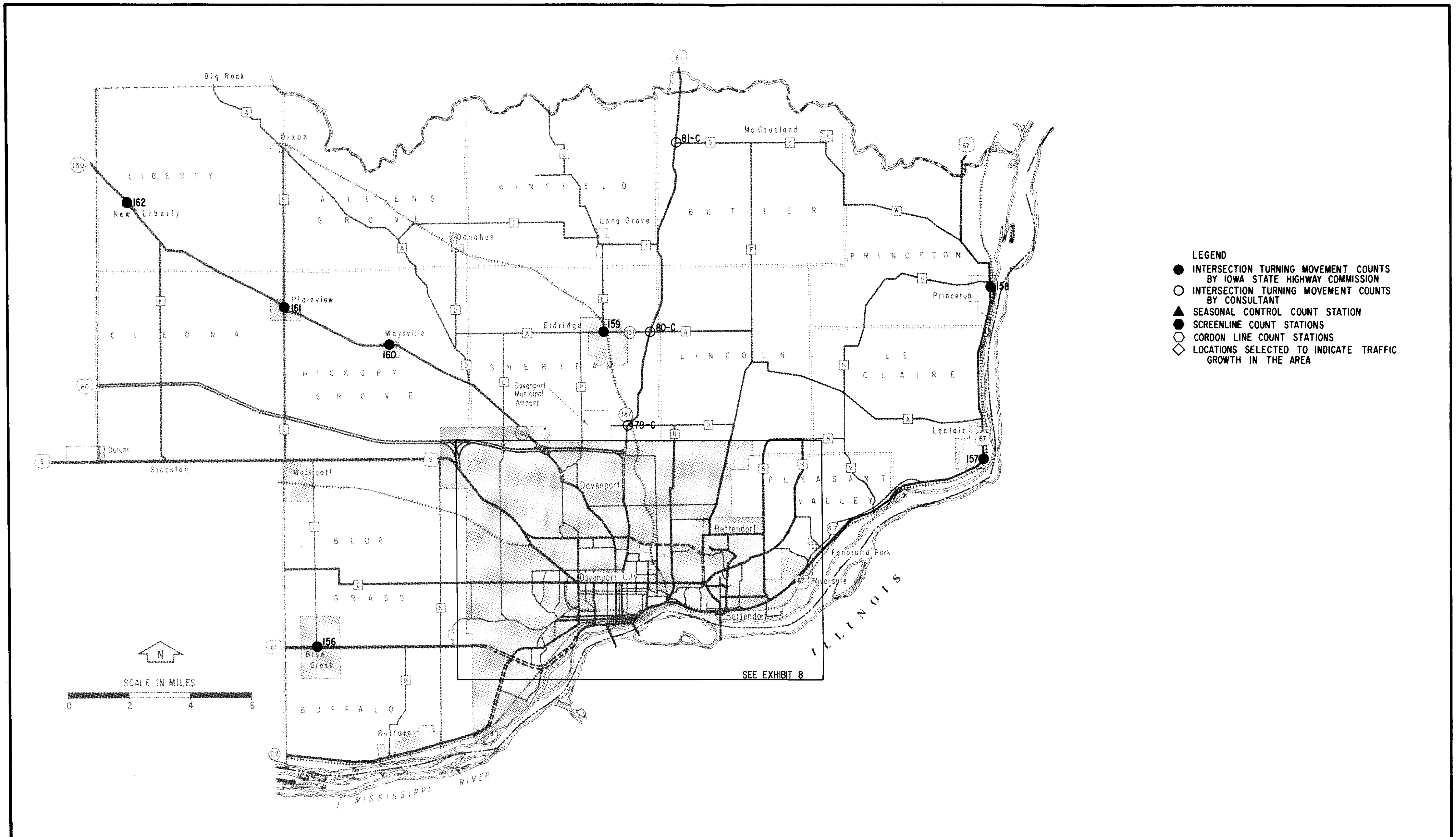
Data were obtained from the Iowa State Highway Commission, unless specifically referenced otherwise.

Control Counts

The Iowa State Highway Commission maintains numerous automatic traffic recording stations throughout the state. The stations are on rural and urban streets and highways as well as on county trunk and local roads. Data collected at these stations are used to monitor traffic volumes and to establish trends. Locations of these stations are shown on Exhibits 7 and 8.

One such control station (Sta. 710-82) is on East Locust Street just west of Spring Street, Davenport, as shown on the volume study location map, Exhibit 8. Daily and monthly variations of traffic volumes at this station are shown in Figures 3 and 4. While the daily volumn pattern remained constant (Figure 3), there were seasonal variations from year to year as shown by Figure 4. These seasonal fluctuations were caused by construction and traffic detours on Locust Street during summer months of the 1964-1966 period. Average annual daily traffic at this location increased from 9,074 in 1961 to 10,878 in 1966, or 20 percent in five years.

Station 710-82 is the only permanent control station in the study area. Since traffic volumes through this station have fluctuated widely due to construction or other detours, the data are not suitable for



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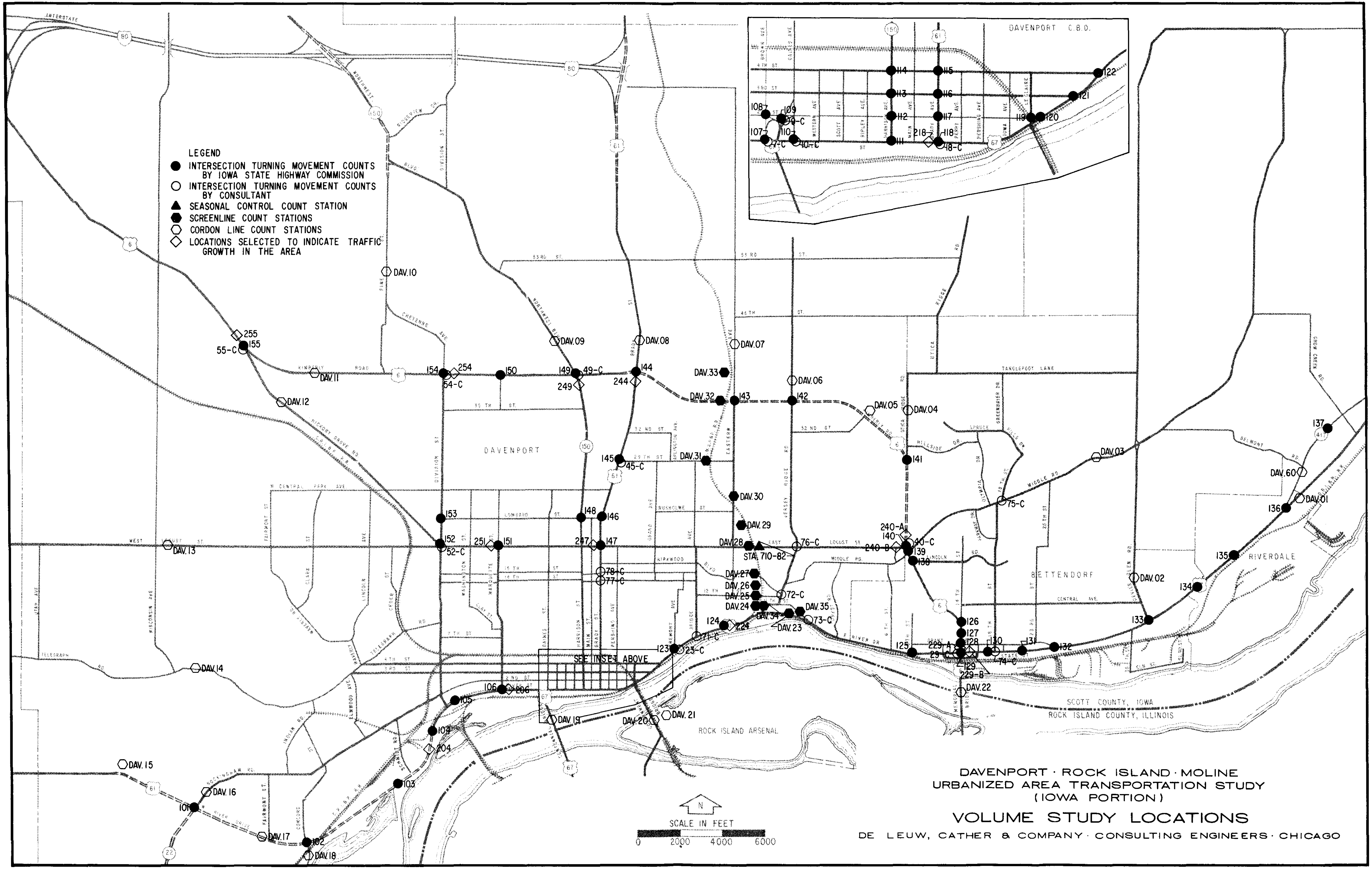
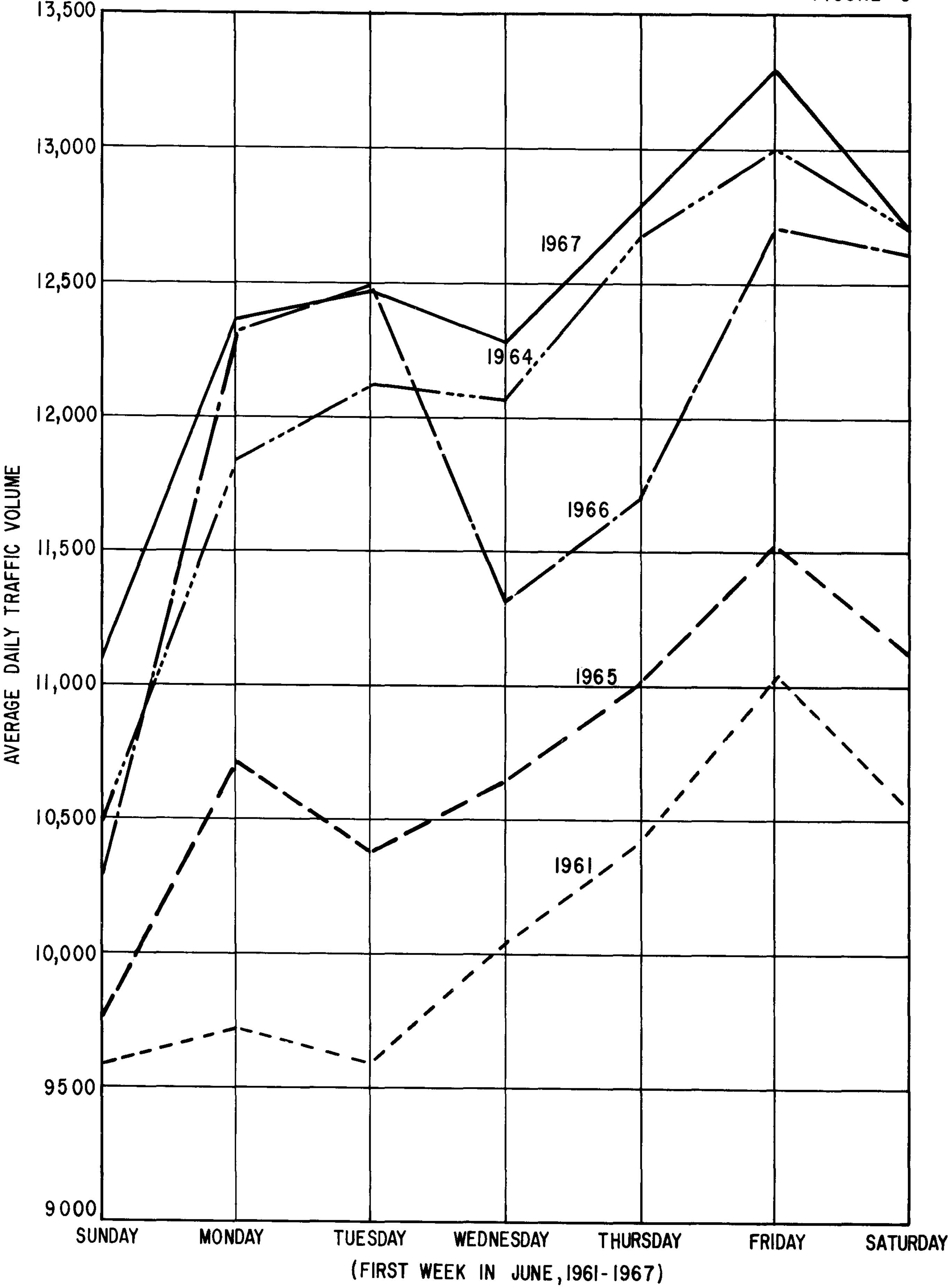
VOLUME STUDY LOCATIONS



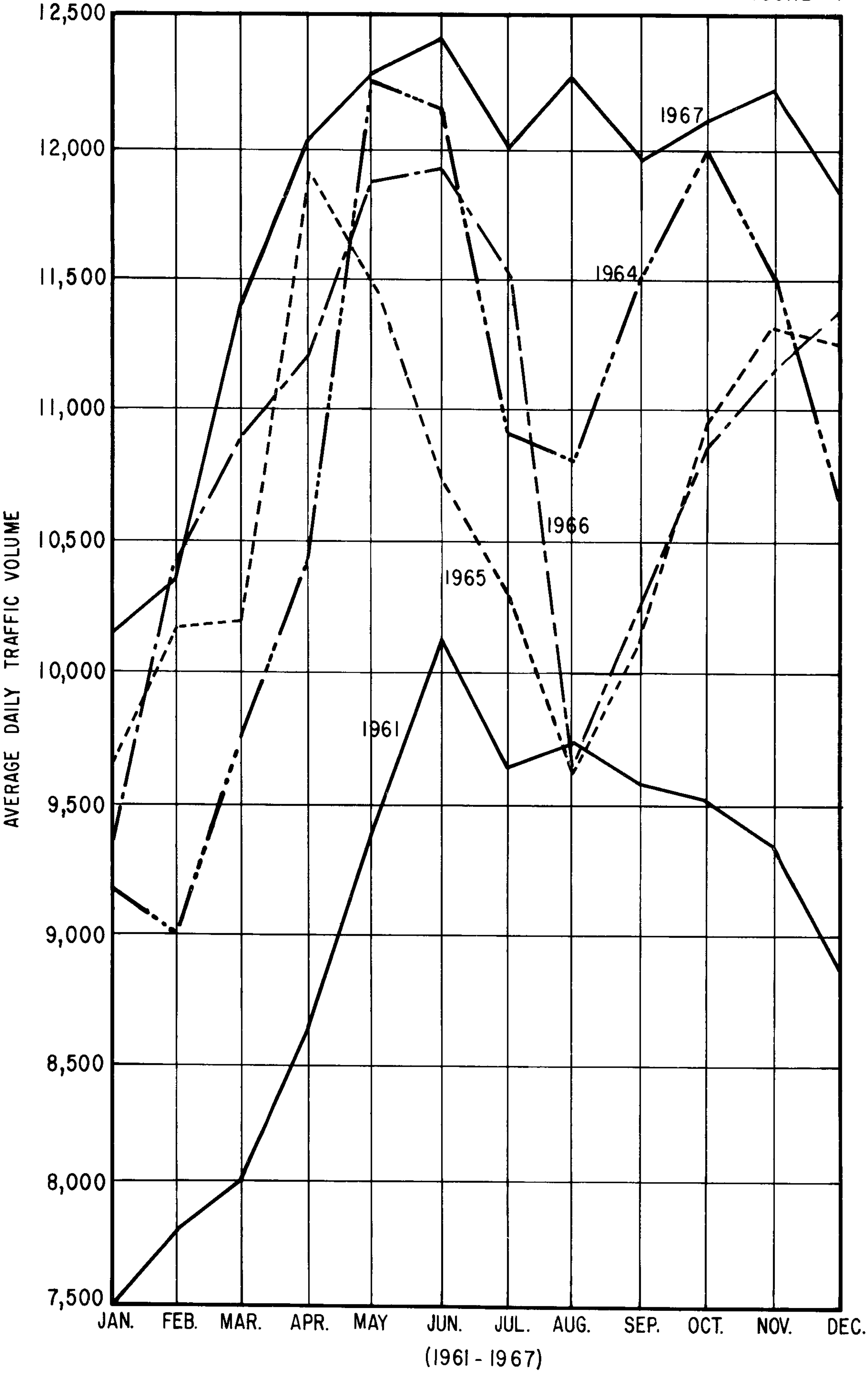
See Exhibit 7 for remainder of study area.

FIGURE 3



DAILY VARIATION IN TRAFFIC VOLUME AT CONTROL STATION

FIGURE 4



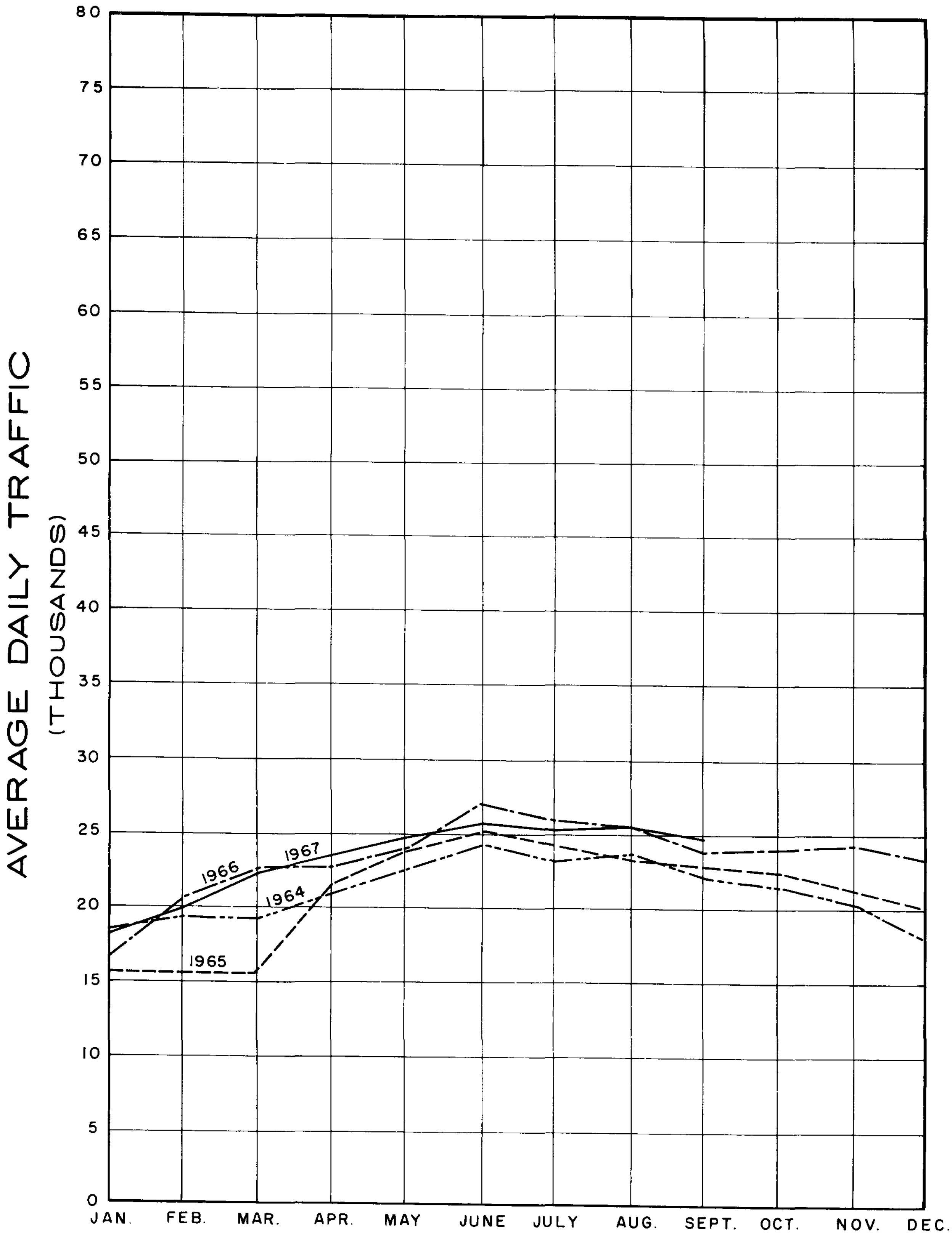
MONTHLY VARIATION IN TRAFFIC VOLUME AT CONTROL STATION

TABLE 8

AVERAGE ANNUAL DAILY TRAFFIC AT SELECTED LOCATIONS

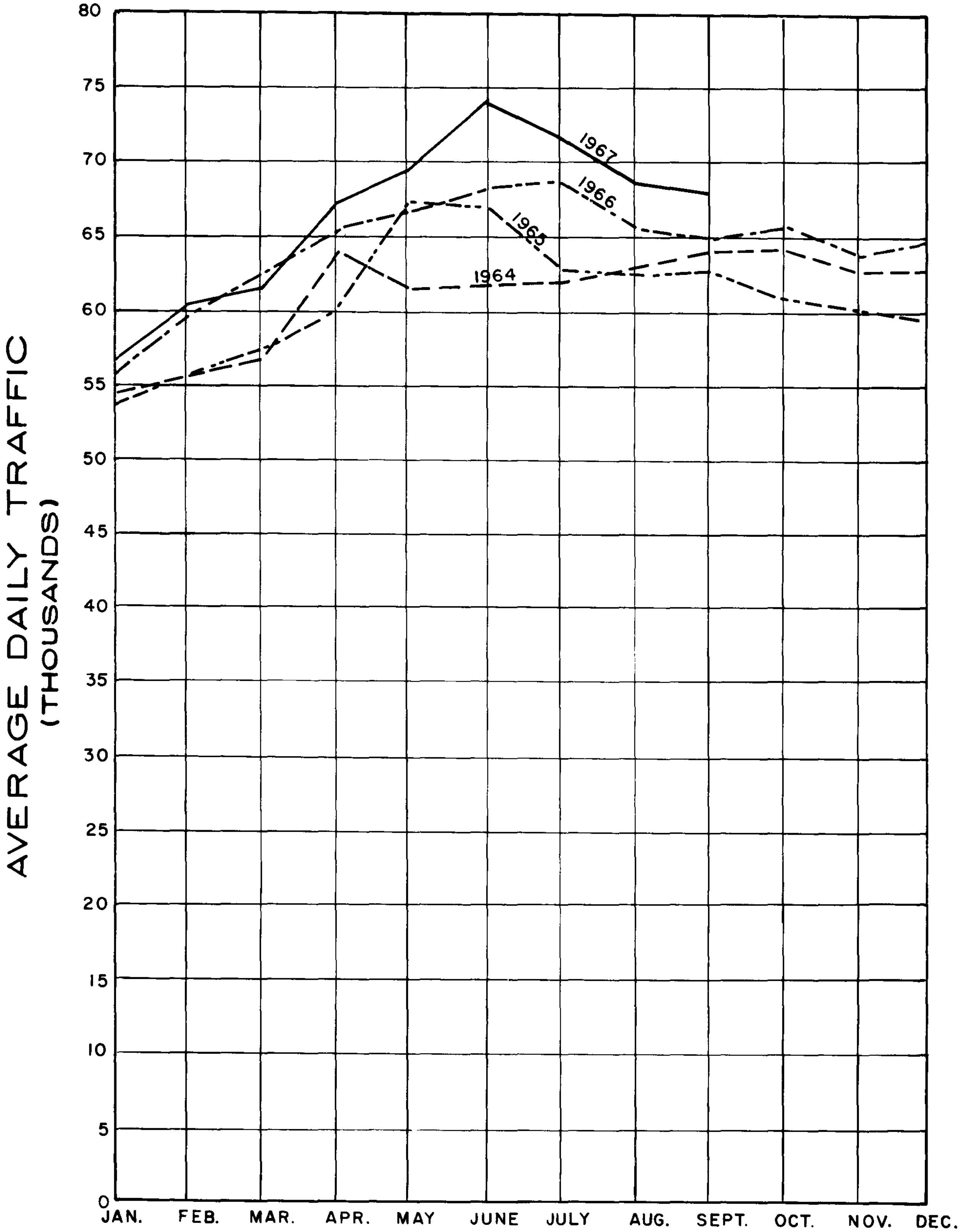
Location	Year 1954	1958	1961	1963	1966
204	-	-	12,120	14,300	15,410
206	14,085	11,960	16,140	17,980	17,630
218	13,620	14,670	15,400	17,480	18,590
224	16,037	23,710	28,070	26,350	27,470
229-A	5,898	9,825	9,410	10,470	14,070
229-B	11,659	16,105	15,680	18,350	19,930
240-A	-	6,900	8,180	11,630	18,060
240-B	-	5,585	6,630	9,500	11,590
244	4,219	6,805	7,890	11,390	14,530
247	11,104	12,275	13,570	14,750	12,730
249	2,948	5,015	5,500	7,940	8,080
251	9,921	11,690	11,250	13,570	14,480
254	5,458	6,580	6,860	6,180	9,940
255	-	4,560	3,900	4,560	4,730
TOTAL			160,600	184,450	207,240

RURAL COUNTY TRUNK AND LOCAL ROADS
(TOTAL OF SIX COUNTING STATIONS)



SOURCE: IOWA STATE HIGHWAY COMMISSION

MUNICIPAL STREETS AND HIGHWAYS
(TOTAL OF TEN COUNTING STATIONS)



SOURCE: IOWA STATE HIGHWAY COMMISSION

TABLE 9

TRAFFIC CROSSING THE MISSISSIPPI RIVER IN THE STUDY AREA

Bridge	On Route	Annual Average Daily Traffic 1953	1956	1959	1962	1963	1964
Memorial	U.S. 6	10,400	11,500	11,700	15,200	16,400	18,500
Government	To U.S. 150	18,500	19,000	17,200	18,700	19,600	19,600
Centennial	U.S. 67	11,200	12,000	12,900	12,600	13,300	14,500

Source: Traffic Characteristics on Illinois Highways--1964, Illinois Division of Highways

These data are shown graphically in Figure 8. Seasonal, monthly and daily variations of traffic as well as traffic classification counts are available in varying degrees. Records of such items are not kept for the Government Bridge which is the only toll-free facility of the three. Monthly traffic and revenue reports of the Rock Island Centennial Bridge Commission give total traffic but do not show breakdowns by vehicle classification or day of the week. Summaries of daily traffic by type of vehicle are available for the Memorial Bridge. Tables 10 through 14 present 1964 travel data for the Centennial and Memorial Bridges with the limitations noted.

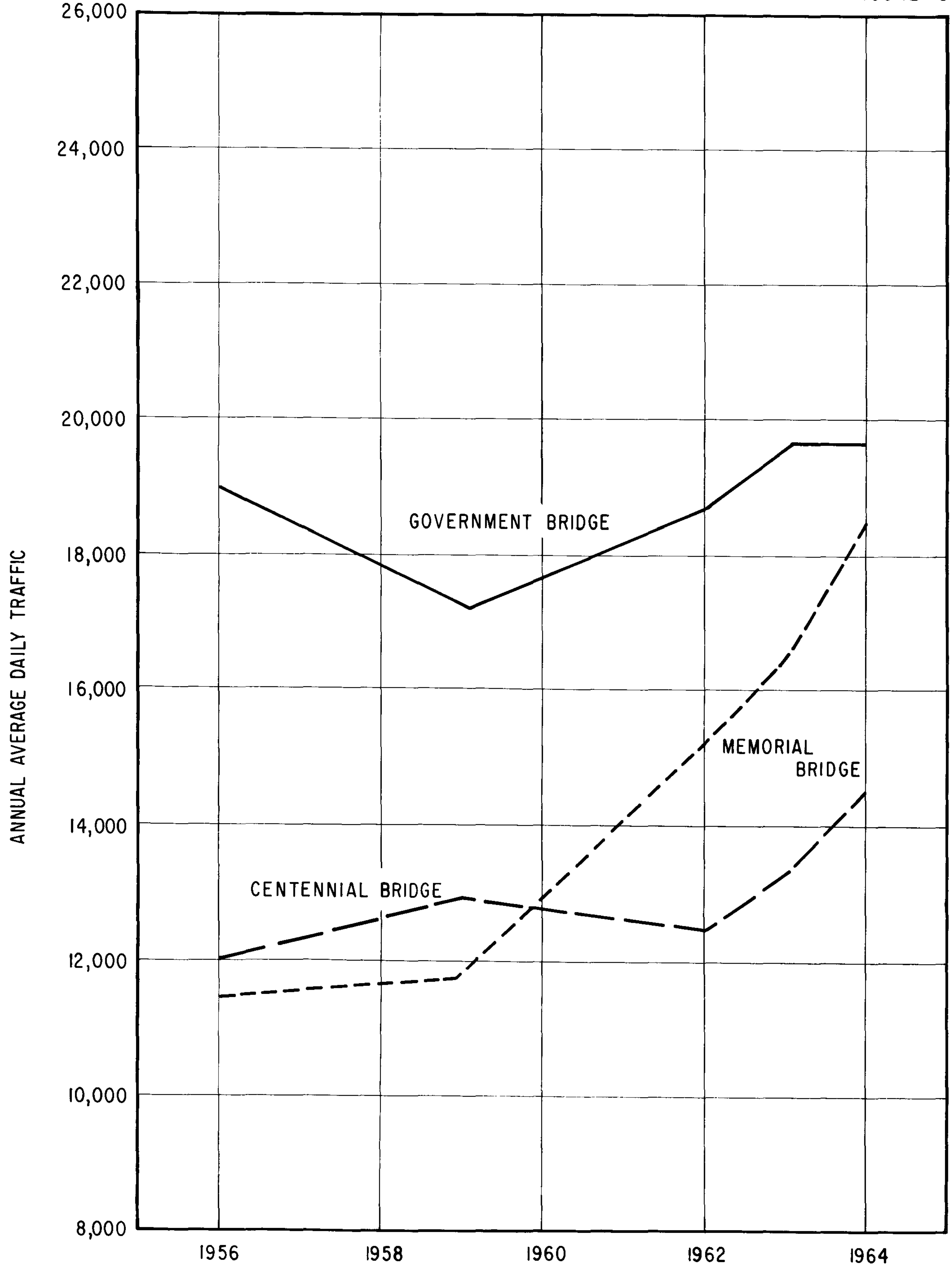
Coverage Counts

Besides maintaining continuous counting stations, the Iowa State Highway Commission conducts a well-established traffic counting program. Extensive intersection turning movement information is collected every five years in rural areas and every third year on streets and highways in urbanized areas.

Both manual and machine volume counts are made. Manual counts of turning movements and of vehicle classifications cover eight hours (7:00-11:00 a.m. and 2:00-6:00 p.m.) at each selected intersection. These are supplemented with mechanical traffic recorders which are set up on one leg of each intersection and operated for approximately four days, which always includes the period during which the manual counts are taken.

During the summer of 1966, counts were made at 62 intersections in Scott County. Eight-hour manual counts were expanded to 24-hour volumes based on machine counts. The seasonal adjustment factor, as determined from information collected at the control count stations, was then used to arrive at the average annual daily traffic (AADT) volumes presented in Exhibit A-1 of the Appendix. The locations of these intersections are shown in Exhibits 7 and 8 (pages 36 and 37).

The coverage was such that general traffic flow patterns could be determined from the data. Exhibits 9 and 10 show 1965 average daily traffic (ADT) in the rural part of Scott County and 1966 ADT in the urbanized Davenport-Bettendorf area. Traffic volumes on segments of the classified street and highway system which were not covered by these counts were determined from assignments of combined 1961-1964 Origin-Destination Survey trips



TRAFFIC CROSSING
THE MISSISSIPPI RIVER

TABLE 10

CENTENNIAL BRIDGE MONTHLY TRAFFIC VARIATIONS--1964

Month	Cars, Trucks and Cycles	Buses	Total
January	352,588	3,817	356,405
February	341,120	3,586	344,706
March	397,984	3,889	401,873
April	422,455	3,789	426,244
May	470,664	3,804	474,468
June	485,410	3,759	489,169
July	474,000	3,873	477,873
August	494,592	4,226	498,818
September	460,425	4,501	464,926
October	460,826	4,631	465,457
November	458,806	4,598	463,404
December	420,605	4,618	425,223
Total	5,239,475	49,091	5,288,566

Note: Excludes pedestrians.
Source: Rock Island Centennial Bridge Commission.

TABLE 11

MEMORIAL BRIDGE SUMMARY OF VOLUME OF TRAFFIC BY MONTHS
1964

Month	Weekdays	Saturdays	Sundays & Holidays*	Total	Percent of Total Year
	Number of Vehicles				
January	376,727	57,143	42,798	476,668	7.0
February	338,479	73,080	45,256	456,815	6.7
March	338,781	61,229	64,637	514,647	7.6
April	415,443	67,868	54,329	537,640	7.9
May	421,425	69,854	92,909	584,188	8.6
June	468,633	77,393	66,328	612,354	9.0
July	487,766	56,911	79,235	623,912	9.2
August	466,076	102,061	89,469	657,606	9.7
September	445,216	72,344	75,924	593,484	8.8
October	451,627	88,618	61,788	602,033	8.9
November	417,764	67,861	75,498	561,123	8.3
December	441,578	63,905	55,237	560,720	8.3
Total	5,119,515	858,267	803,408	6,781,190	100.0

* - Holidays include: Memorial Day, July 4th, and Labor Day

Source: Traffic Characteristics on Illinois Highways--1964, Illinois Division of Highways

TABLE 12

MEMORIAL BRIDGE

AVERAGE DAILY TRAFFIC BY MONTHS

Month	Number of Vehicles				
	Average Weekday	Average Saturday	Average Sundays & Holidays *	Adjusted Daily Average	Average Weekday Percent of Average Day Of the Year
January	16,379	14,286	10,700	15,269	88.3
February	16,924	14,616	11,314	15,793	91.3
March	17,672	15,307	12,927	16,656	95.3
April	18,884	16,967	13,582	17,853	101.9
May	20,068	17,464	15,485	19,041	108.2
June	21,301	19,348	16,582	20,348	114.9
July	21,207	18,970	15,847	20,121	114.4
August	22,194	20,412	17,894	21,325	119.7
September	21,201	18,086	15,185	19,896	114.4
October	20,529	17,724	15,447	19,402	110.7
November	19,894	16,965	15,100	18,791	107.3
December	19,199	15,976	13,809	17,968	103.6
Annual Average	19,621	17,176	14,489	18,539	-

* - Holidays include: Memorial Day, July 4th, and Labor Day

Source: Traffic Characteristics on Illinois Highways--1964, Illinois Division of Highways

TABLE 13

MEMORIAL BRIDGE

VOLUME AND PERCENT OF TRAFFIC ANALYZED BY DAY OF WEEK
1964

Day of Week	Number of Days in Year	Volume of Traffic	Average Per Day	Percent of Annual Traffic
Sundays & Holidays*	55	803,408	14,607	11.2
Mondays	51	971,973	19,058	14.7
Tuesdays	52	1,011,293	19,448	15.0
Wednesdays	53	1,031,211	19,457	15.0
Thursdays	53	1,030,560	19,445	15.0
Fridays	52	1,074,478	20,663	15.9
Saturdays	50	858,267	17,165	13.2
Total	366	6,781,190	-	100.0

* - Holidays include: Memorial Day, July 4th, and Labor Day.

Source: Traffic Characteristics on Illinois Highways--1964, Illinois Division of Highways

TABLE 14

MEMORIAL BRIDGE
CLASSIFICATION OF 24-HOUR AVERAGE TRAFFIC
1964

Type of Vehicle	Average 24-Hour Weekday Traffic				Annual 24-Hour Average Weekday		Annual 24-Hour Average Day	
	Winter	Spring	Summer	Fall	Number of Vehicles	Percent of Total	Number of Vehicles	Percent of Total
Passenger Cars	14,145	15,308	17,722	16,530	15,926	81.2	15,410	83.1
Commercial Vehicles	3,356	3,567	3,845	4,011	3,695	18.8	3,128	16.9
Total Vehicles	17,501	18,875	21,567	20,541	19,621	100.0	18,538	100.0

	Seasonal Percent of Weekday Traffic			
Passenger Cars	22.2	24.0	27.8	26.0
Commercial Vehicles	22.7	24.2	26.0	27.1
Total Vehicles	22.3	24.0	27.5	26.2

Source: Traffic Characteristics on Illinois Highways--1964, Illinois Division of Highways.

to the network or estimated by the Consultant as explained in Figure 2B (page 26), under ADT code. These traffic volumes, which were necessary for accident and capacity analyses, are shown in parentheses in Exhibits 9 and 10.

Peak Hour Turning Movement Counts

In the design of traffic improvements, estimates of total annual traffic volumes do not constitute sufficient basic data. These data should be supplemented by estimates of the volume and direction of traffic flow at the peak hour as well as the number or percentage of commercial vehicles making each movement.

Accordingly, manual p.m. peak hour turning movement counts were made at 21 intersections considered critical by the local agencies. Traffic volumes were recorded in 15-minute increments and vehicles were classified as cars or trucks (including buses)(1) by direction on each approach to the intersection. The total volume during the four highest consecutive 15-minute intervals was defined as the peak hour volume.

Exhibit A-1 in the Appendix includes graphic summaries of peak hour traffic at these critical intersections. Where both the peak hour and average annual daily traffic were available for the same intersection, both have been shown on one page. Location of these intersections is identified in Exhibits 7 and 8 (pages 36 and 37).

Screen Line Counts

A screen line was established in 1961 for evaluation of origin-destination studies in a portion of the study area. Location of this screen line is shown in Figure 8 (page 47). The line was designed to bisect the internal study area--that area within which home interviews were made. Thirteen screen line stations were established at points of intersection with streets and highways. Manual traffic counts were made at each station in 1961 to estimate the volume, classification and direction of traffic flow.

---

(1)-Highway Capacity Manual, 1965, Highway Research Board, Special Report 87, page 15.

Much of the 1961 screen line data was not available for detailed analysis when the present transportation study was initiated in 1966. Such factors as hourly variations in traffic, directional flow, and peak hour characteristics, therefore, could not be re-evaluated.

Available 1961 data included average summer weekday traffic volumes classified by vehicle type. Volumes recorded at each screen line station are tabulated in Table 15. These data indicate that commercial vehicles accounted for approximately 11 percent of total traffic.

Cordon Counts

During the origin-destination studies in 1961, interview stations were established on 19 streets and highways at intersections with a cordon line bounding the internal study area. Other interview stations were established at the Iowa approaches to the Centennial, Government and Memorial Bridges.

All drivers passing cordon stations were interviewed during a 16-hour period, from 6:00 a.m. to 10:00 p.m. Mechanical traffic recorders were placed at each station and operated for a minimum of five weekdays, including the interview period. Manual vehicle classification counts were taken at a later date. This information was used to estimate 24-hour average summer weekday traffic for 1961 and to expand the interview samples. Average summer weekday traffic at external survey stations is shown in Table 16.

TABLE 15

AVERAGE SUMMER WEEKDAY TRAFFIC BY VEHICLE TYPE
AT CONTROL LOCATIONS ON SCREEN LINE--1961

Control Station	Location	Area Total	Single Unit Trucks 4-Tire	Single Unit Trucks 6 or More	Buses	Truck Bus Total	Tractor Trucks (Semitrailers)	Total Traffic
Dav. 23	E. River Drive	14,272	969	618	48	1,635	485	16,392
Dav. 24	E. 11th Street	540	66	31	-	97	-	637
Dav. 25	E. 12th Street	1,777	129	41	74	244	2	2,023
Dav. 26	E. 13th Street	316	17	8	-	25	-	341
Dav. 27	Kirkwood Boulevard	2,260	115	44	-	148	-	2,408
Dav. 28	E. Locust Street	9,272	526	162	43	731	5	10,008
Dav. 29	Elm Street	1,638	97	31	44	172	-	1,810
Dav. 30	Eastern Avenue	1,984	114	78	6	198	1	2,183
Dav. 31	E. 29th Street	1,110	46	20	1	67	-	1,177
Dav. 32	Kimberly Road	6,980	487	225	5	717	594	8,291
Dav. 33	E. 39th Street	342	28	5	-	33	-	375
Dav. 34	Mound Street	4,525	271	180	5	456	15	4,996
Dav. 35	River Street	1,950	135	37	1	173	6	2,129
		46,966				4,696	1,108	52,770
		89.0%				8.9%	2.1%	100%

TABLE 16

AVERAGE SUMMER WEEKDAY TRAFFIC BY VEHICLE TYPE AT EXTERNAL SURVEY STATIONS ON CORDON LINE 1961

Control Station	Location	Auto Total	Single Unit Trucks 4-Tire	Single Unit Trucks 6 or More	Buses	Truck Bus Total	Tractor Trucks (Semitrailors)	Total Traffic
Dav. 1	U. S. 67	3,259	262	130	-	392	91	3,742
Dav. 2	Devils Glen Road	440	63	15	-	78	-	518
Dav. 3	Middle Road	489	45	7	-	52	-	541
Dav. 4	Utica Ridge Road	241	24	18	-	42	2	285
Dav. 5	E. 32nd Street	101	14	10	-	24	2	127
Dav. 6	Jersey Ridge Road	781	66	26	-	92	-	873
Dav. 7	Eastern Avenue	234	21	4	-	25	-	259
Dav. 8	Brady Street	6,434	447	355	12	814	300	7,548
Dav. 9	Harrison Street	2,571	181	74	1	256	23	2,850
Dav. 10	Pine Street	2,598	187	88	-	275	12	2,885
Dav. 11	U. S. 6	2,373	168	107	38	313	399	3,085
Dav. 12	Hickory Grove Road	2,393	192	87	-	279	99	2,771
Dav. 13	W. Locust Street	931	76	38	-	114	1	1,046
Dav. 14	Telegraph Road	445	68	13	-	81	3	529
Dav. 15	Ricker Hill Road	204	25	5	-	30	-	234
Dav. 16	Rockingham Road	2,960	252	136	8	396	34	3,390
Dav. 17	W. River Drive	4,982	428	328	15	771	303	6,056
Dav. 18	Concord Street	1,466	120	61	-	181	12	1,659
Dav. 19	Centennial Bridge	11,146	688	378	133	1,199	342	12,687
Dav. 20	U. S. Government Bridge	14,381	889	399	42	1,330	21	15,732
Dav. 21	U. S. Government Bridge	3,725	83	26	42	151	2	3,878
Dav. 22	Memorial Bridge	13,035	909	588	16	1,513	1,099	15,647
Dav. 60	Ia. 417	1,316	188	43	2	233	-	1,549
		76,505				8,641	2,745	87,891
		87.1%				9.8%	3.1%	100%

Definitions of Location and Severity

Accidents which could be ascribed to the influence of an intersection were classified as intersectional accidents; others were non-intersectional accidents.(1) The point of impact was not always the determining factor in accident assignment. For example, a rear-end collision 100 feet or more from an intersection was still attributed to the influence of the intersection. In most instances, location assignments had been made by the local law enforcement agency and were recorded on the accident reports.

Accident severity was another important factor considered in the analysis. Three classifications were established, as defined below:

Property Damage (PD)--accidents which resulted only in damage to property, regardless of number of vehicles involved or magnitude of damage.

Personal Injury (PI)--accidents in which one or more persons were injured, but in which there were no fatalities.

Fatal (F)--accidents which resulted in one or more fatalities.

Normally, accidents had been classified as to severity by local law enforcement agencies and assignments were recorded on accident reports.

Number of Accidents--1964 and 1965

Accidents reported in 1964 and 1965 in the study area were tabulated according to severity. Totals for each jurisdiction are shown on Table 17. Reports indicate a 15 percent increase in total number of accidents--from 3,850 in 1964 to 4,441 in 1965. There was a decrease, however, in the total number of fatal and personal injury accidents.

Similar tabulations were made of accidents which occurred on the principal street and highway system in 1964 and 1965. Totals by jurisdiction are shown on Table 18. These data were obtained from accident reports.

(1)-Maintaining Accident Records, Procedure Manual 3-E, National Committee on Urban Transportation, 1958, page 12.

TABLE 17

SUMMARY OF MOTOR VEHICLE ACCIDENTS
ON ALL STREETS AND HIGHWAYS IN THE STUDY AREA
1964-1965

Governmental Jurisdiction	Number of Accidents by Severity: Property Damage	Personal Injury	Fatality	Total
	1964			
Davenport	2,268	888	13	3,169
Bettendorf	290	98	0	388
Remainder of Scott County	172	113	8	293
TOTAL	2,730	1,099	21	3,850
	1965			
Davenport	2,608	968	9	3,585
Bettendorf	362	107	1	470
Remainder of Scott County	238	143	5	386
TOTAL	3,208	1,218	15	4,441

Source: Iowa State Highway Commission

EXHIBIT 9

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AVERAGE DAILY TRAFFIC—1965

TABLE 19

SUMMARY OF MOTOR VEHICLE ACCIDENTS
ON LOCAL STREETS AND HIGHWAYS IN THE STUDY AREA
1964-1965

Governmental Jurisdiction	Number of Accidents by Severity: Property Damage	Personal Injury	Fatality	Total
	1964			
Davenport	765	373	3	1,141
Bettendorf	84	53	0	137
Remainder of Scott County	108	64	2	174
TOTAL	957	490	5	1,452
	1965			
Davenport	868	467	0	1,335
Bettendorf	117	59	0	176
Remainder of Scott County	127	67	1	195
TOTAL	1,112	593	1	1,706

Traffic volumes used to estimate accident rates were based on 1965 traffic counts in the rural area and 1966 counts in urban Davenport and Bettendorf. Thus, estimated 1965 accident rates in the rural area reflect actual experience. Rate comparisons should be made with caution since traffic volumes may have differed between 1964 and 1965.

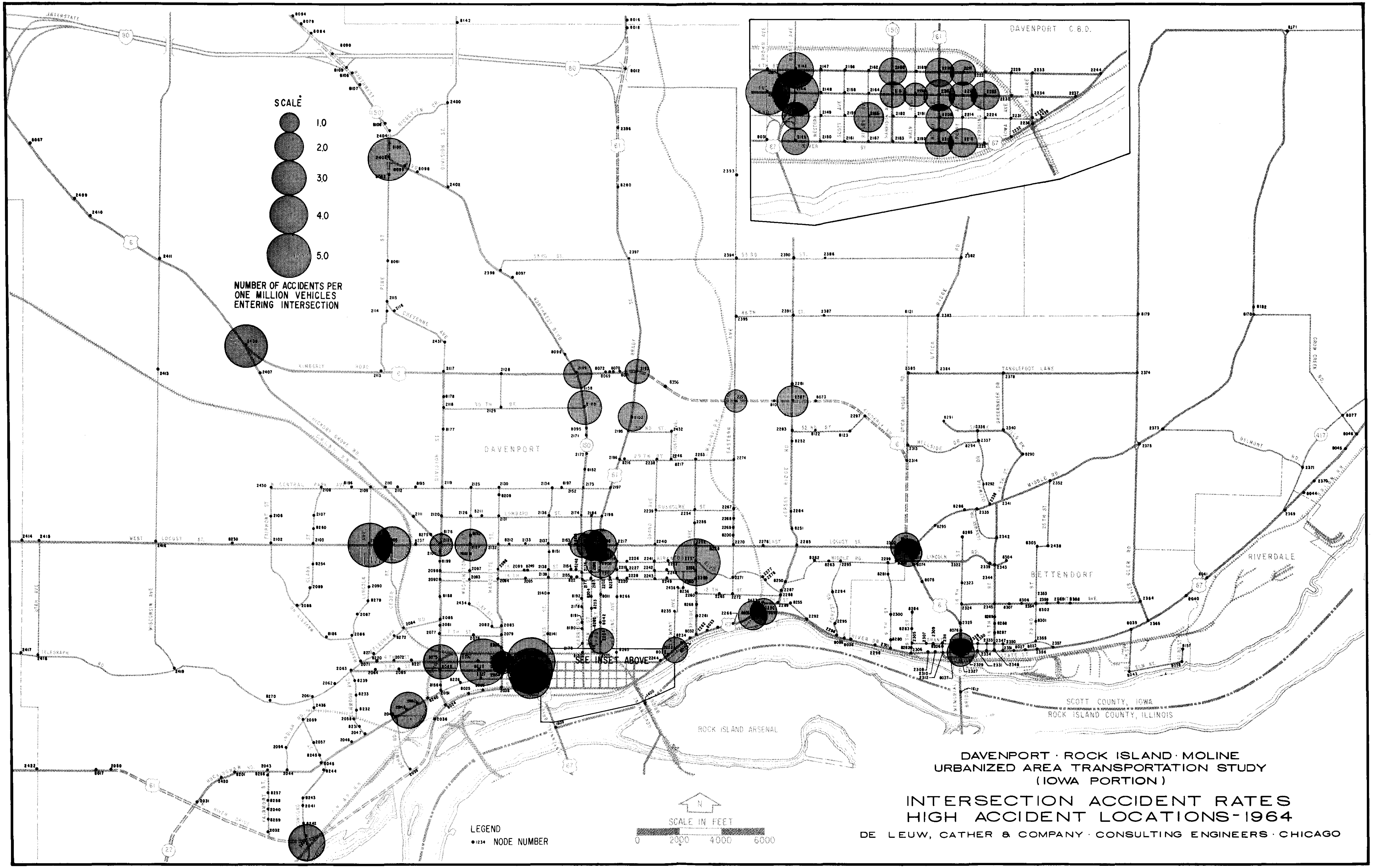
Accident rates for urban intersections with ten or more accidents and rural intersections with five or more accidents are depicted graphically on Exhibits 11 and 12. Since graphic presentation would indicate a high apparent rate for low volume intersections with even a few accidents, these rates were excluded from the exhibits.

Accident Rates by Section of Road

High accident locations were evaluated on the basis of the number of accidents per 100 million vehicle miles of travel on specific road sections. Each principal street and highway was subdivided into control sections. Intersections between principal streets were defined as terminal intersections; see Figure 9. A control section was defined as that segment of the principal street and highway system between two terminal intersections. Accidents charged against each control section included those which occurred at one of the two terminal intersections; at intersections of local streets and highways with the principal facility; and all non-intersectional accidents from one terminal intersection up to, but not including, the other terminal intersection.

On north-south streets, the north terminal intersection was defined as the starting point of a control section. The west terminal intersection of an east-west control section was considered its beginning point.

Through this procedure, accidents at the intersection of two principal streets or highways were attributed to both control sections. This dual assignment avoided arbitrary assignment of accidents to one of the two facilities. The all-accident rate for each control section of the principal street and highway system was computed as follows: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(IOWA PORTION)
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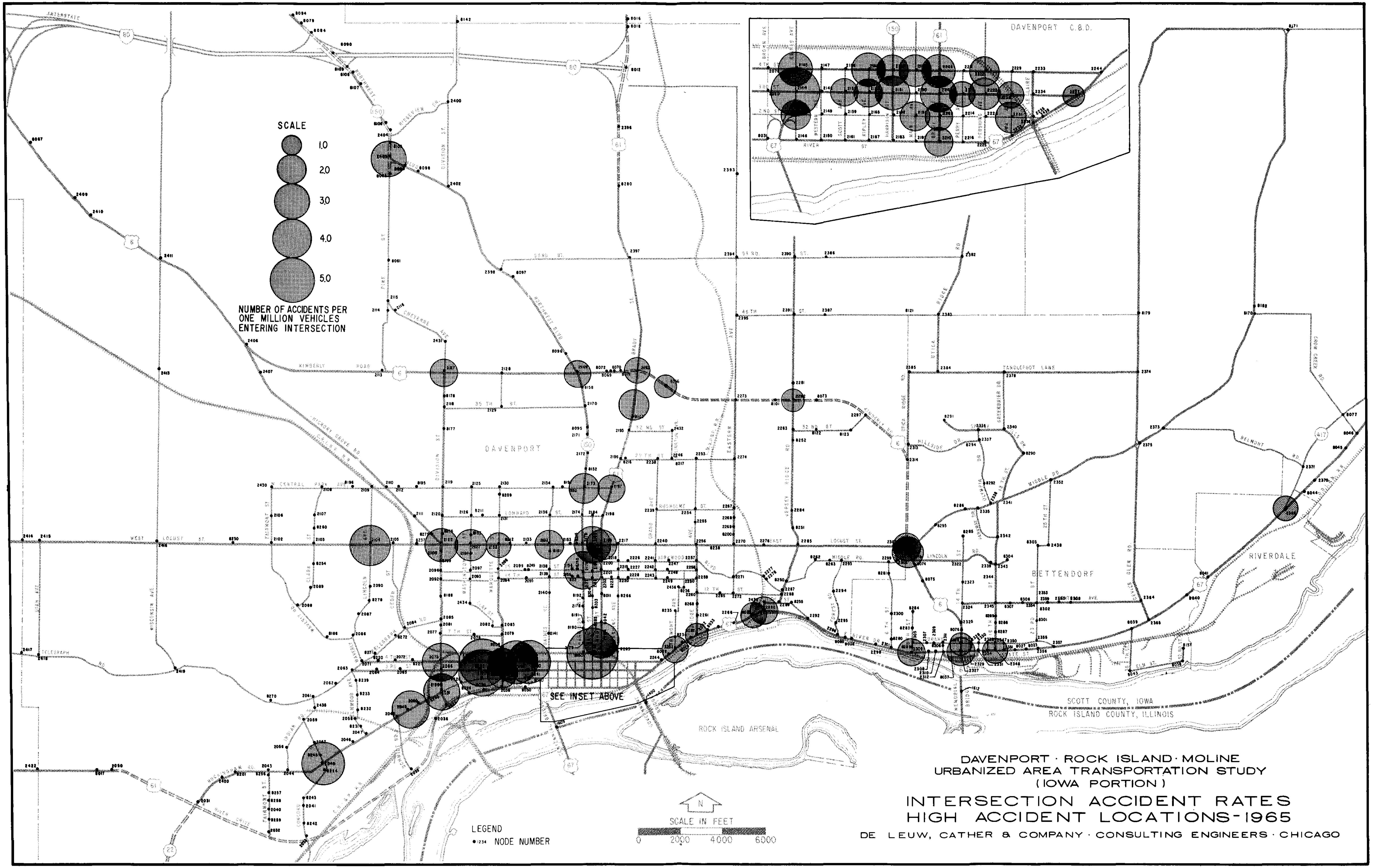
HIGH ACCIDENT LOCATIONS-1964
DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO
SCALE
1.0
2.0
3.0
4.0
5.0
NUMBER OF ACCIDENTS PER ONE MILLION VEHICLES ENTERING INTERSECTION
DAVENPORT C.B.D.
SEE INSET ABOVE
LEGEND
1234 NODE NUMBER
SCALE IN FEET
0 2000 4000 6000
N
DAVENPORT
BETTENDORF
RIVERDALE
ROCK ISLAND ARSENAL
SCOTT COUNTY, IOWA
ROCK ISLAND COUNTY, ILLINOIS
WEST LOCUST ST.
KIMBERLY ROAD
CENTRAL PARK AVE
TELEGRAPH RD
MIDDLE RD
BELMONT
INTERSTATE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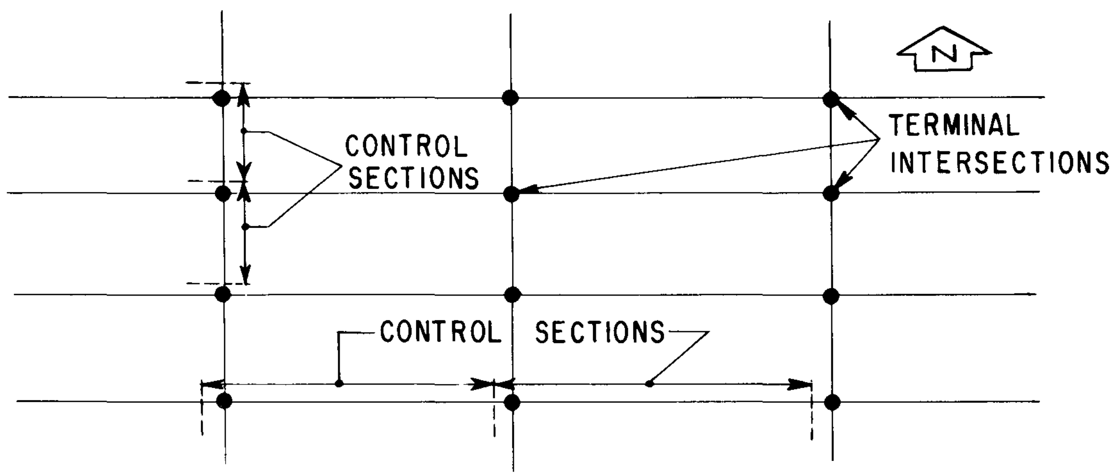
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)
INTERSECTION ACCIDENT RATES
HIGH ACCIDENT LOCATIONS - 1965
DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO
SCALE
1.0
2.0
3.0
4.0
5.0
NUMBER OF ACCIDENTS PER ONE MILLION VEHICLES ENTERING INTERSECTION
LEGEND
NODE NUMBER
SCALE IN FEET
0
2000
4000
6000
DAVENPORT C.B.D.
SEE INSET ABOVE
DAVENPORT
BETTENDORF
RIVERDALE
ROCK ISLAND ARSENAL
SCOTT COUNTY, IOWA
ROCK ISLAND COUNTY, ILLINOIS
INTERSTATE
KIMBERLY ROAD
WEST LOCUST ST.
EAST LOCUST ST.
TELEGRAPH RD.
DIVISION ST.
BRADY ST.
EASTERN AVE.
MIDDLE RD.
BELMONT RD.
TANGLEFOOT LANE
RIVER DR.



DEFINITION OF CONTROL SECTIONS

$$R_2 = \frac{A \times 100,000,000}{365 \times B \times L}$$

Where:

R_2 = all-accident rate per 100,000,000 vehicle-miles of travel for one year.

A = all intersection and non-intersection accidents in the control section for one year.

B = average daily traffic for the control section.

L = length of the control section in miles.

On high volume roads, accident rates expressed in terms of accidents per 100 million vehicle-miles of travel may tend to obscure a hazardous operational condition. Conversely, on low volume roads, the rate expressed in terms of vehicle-miles may over-emphasize the importance of a small number of accidents. To partially compensate for this, an all-accident rate per mile was computed as follows:

R_3 = all-accident rate per mile for one year.

A = all intersection and non-intersection accidents in the control section for one year.

L = length of control section in miles.

Since both rates may have merit in specific applications, each was applied independently to evaluate accident experience throughout the principal street and highway system.

Accident data for each control section were keypunched on data processing cards and processed by computer. The data processing card format is shown in Exhibit C-1. Column headings on the computer printout are explained in Exhibit C-2. Exhibit C-3 is the computer printout of the major street accidents. Exhibits C-1, C-2, and C-3 are in the Appendix.

Ten intersections and ten street sections with the greatest number of accidents in 1964 and 1965 have been listed in Tables 20-23.

TABLE 20

TEN HIGHEST ACCIDENT INTERSECTIONS

1964

Location	Type of Accident: Property Damage	Personal Injury	Fatality	Total
1. Gaines Street--3rd Street Davenport	24	9	-	33
2. Brady Street--Locust Street Davenport	21	6	-	27
3. 14th Street--State Street Bettendorf	20	5	-	25
4. Spring Street--East River Drive Davenport	13	7	-	20
5. Gaines Street--4th Street Davenport	14	6	-	20
6. Brady Street--3rd Street Davenport	15	5	-	20
7. Brady Street--4th Street Davenport	15	5	-	20
8. Kimberly Road--Locust Street Bettendorf	18	1	-	19
9. Concord Street--West River Drive Davenport	11	7	-	18
10. Jersey Ridge--Kimberly Road Davenport	11	7	-	18

Table 21

TEN HIGHEST ACCIDENT
PRINCIPAL STREET SECTIONS

1964

	Location			Type of Accidents			
	Street Name	Node A	Node B	Property Damage	Personal Injury	Fatality	Total
1.	Brady Street--Davenport	2202	2205	46	17	-	63
2.	Brady Street--Davenport	2193	2195	42	14	-	56
3.	4th Street--Davenport	2074	2143	36	15	-	51
4.	Harrison Street--Davenport	2177	2180	34	9	2	45
5.	4th Street--Davenport	2073	2074	33	12	-	45
6.	3rd Street--Davenport	2068	2144	24	14	-	38
7.	2nd Street--Davenport	2054	2145	23	14	-	37
8.	E. River Drive--Davenport	2252	2262	29	7	-	36
9.	Gaines Street--Davenport	2144	2145	24	9	-	33
10.	3rd Street--Davenport	2144	2148	24	9	-	33

TABLE 22

TEN HIGHEST ACCIDENT
INTERSECTIONS

1965

Location	Type of Accident: Property Damage	Personal Injury	Fatality	Total
1. Gaines Street--3rd Street Davenport	26	11	-	37
2. Brady Street--3rd Street Davenport	27	2	-	29
3. 14th Street--State Street Bettendorf	22	6	-	28
4. Brady Street--4th Street Davenport	22	6	-	28
5. Harrison Street--3rd Street Davenport	19	8	-	27
6. Brady Street--Locust Street Davenport	18	6	-	24
7. Harrison Street--4th Street Davenport	19	3	-	22
8. Brady Street--Kimberly Road Davenport	16	5	-	21
9. Division Street--Locust Street Davenport	17	4	-	21
10. Brady Street--6th Street Davenport	20	1	-	21

Table 23

TEN HIGHEST ACCIDENT
PRINCIPAL STREET SECTIONS

1965

	Location			Type of Accidents			
	Street Name	Node A	Node B	Property Damage	Personal Injury	Fatality	Total
1.	Harrison Street--Davenport	2177	2180	46	11	-	57
2.	Brady Street--Davenport	2202	2205	43	12	-	55
3.	4th Street--Davenport	2073	2074	46	8	-	54
4.	Brady Street--Davenport	2193	2195	37	15	-	52
5.	E. River Street--Davenport	2262	2280	41	11	-	52
6.	Kimberly Road--Davenport	2193	2273	32	10	-	42
7.	4th Street--Davenport	2074	2143	38	3	-	41
8.	Gaines Street--Davenport	2144	2145	26	11	-	37
9.	3rd Street--Davenport	2144	2148	26	11	-	37
10.	3rd Street--Davenport	2066	2068	28	9	-	37

Rates in terms of accidents per 100 million vehicle miles of travel are summarized in Table 24. This table includes 1964 and 1965 rates classified by accident severity and location. Caution should be exercised in comparing 1964 and 1965 rates, since counts were made only of 1965 rural travel volumes. Rates for major and collector streets and highways were approximately four times greater than rates for freeways and expressways.

Figure 10 depicts accident rates per 100 million miles of travel as related to average daily traffic on each control section. Except for some very-small-volume roads, the rate of accidents generally increased with volume. The reduction in accident rate for facilities carrying between 10,000 and 20,000 vehicles per day resulted from the influence of freeways and expressways in this range of traffic volume.

A graph relating the accident rate per mile to average daily traffic is shown in Figure 11.

In order to define dangerous segments of the principal street and highway system, accident rates expressed in terms of accidents per 100 million vehicle miles of travel were plotted against total system mileage. See Figures 12 and 13.

The approximate inflection point of each curve was taken as the arbitrary division between relatively safe and dangerous conditions. In urban areas, rates in excess of 4,000 accidents per 100 million vehicle-miles--representing 14.5 percent and 13.2 percent of total system mileage in 1964 and 1965, respectively--were considered representative of dangerous conditions. In rural areas streets and highways with more than 1000 accidents per 100 million vehicle-miles were considered dangerous. These represented 11.2 percent and 12.0 percent of total rural mileage in 1964 and 1965, respectively. Exhibits 13 through 16 show segments of the principal street and highway system evaluated as dangerous in 1964 and 1965.

Rates expressed in terms of accidents per mile of road were similarly analyzed. Table 25 summarizes these data by functional classification and accident severity. The table includes local streets and highways as well as the principal street and highway system. Total mileage of local streets and highways in the study area was estimated at 920 miles for purposes of this summary.[1]

---

(1)-This is equivalent to a ratio of about three and one-half to one for local to principal facilities in urban areas and a ratio of three to one in rural areas.

TABLE 24

SUMMARY OF ACCIDENT RATES
ACCIDENTS PER 100,000,000 VEHICLE--MILES OF TRAVEL
1964-1965

Severity of Accident	Functional Classification--Principal Streets and Highways				
	Freeway	Expressways	Major	Collector	All
	1964				
Property Damage	12	313	620	1,388	623
Personal Injury	-	132	215	423	209
Fatality	-	9	4	5	4
All Accidents	12	454	839	1,816	836
	1965				
Property Damage	14	315	737	1,654	735
Personal Injury	15	122	212	428	210
Fatality	-	2	4	10	4
All Accidents	29	439	953	2,092	949

ACCIDENT RATE RELATED TO AVERAGE DAILY TRAFFIC (1965-1966)

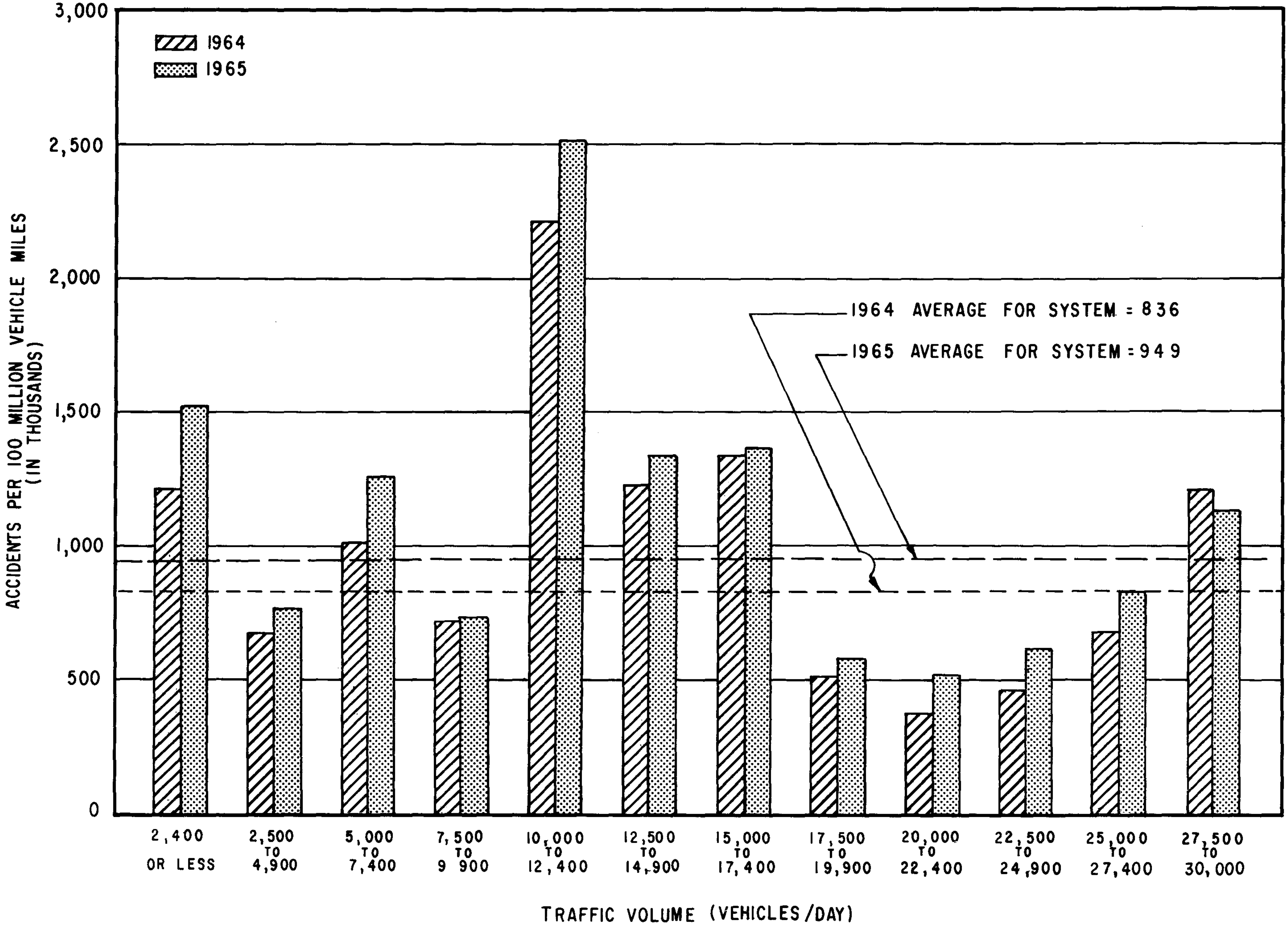


FIGURE 10

ACCIDENT RATE PER MILE RELATED TO AVERAGE DAILY TRAFFIC (1965-1966)

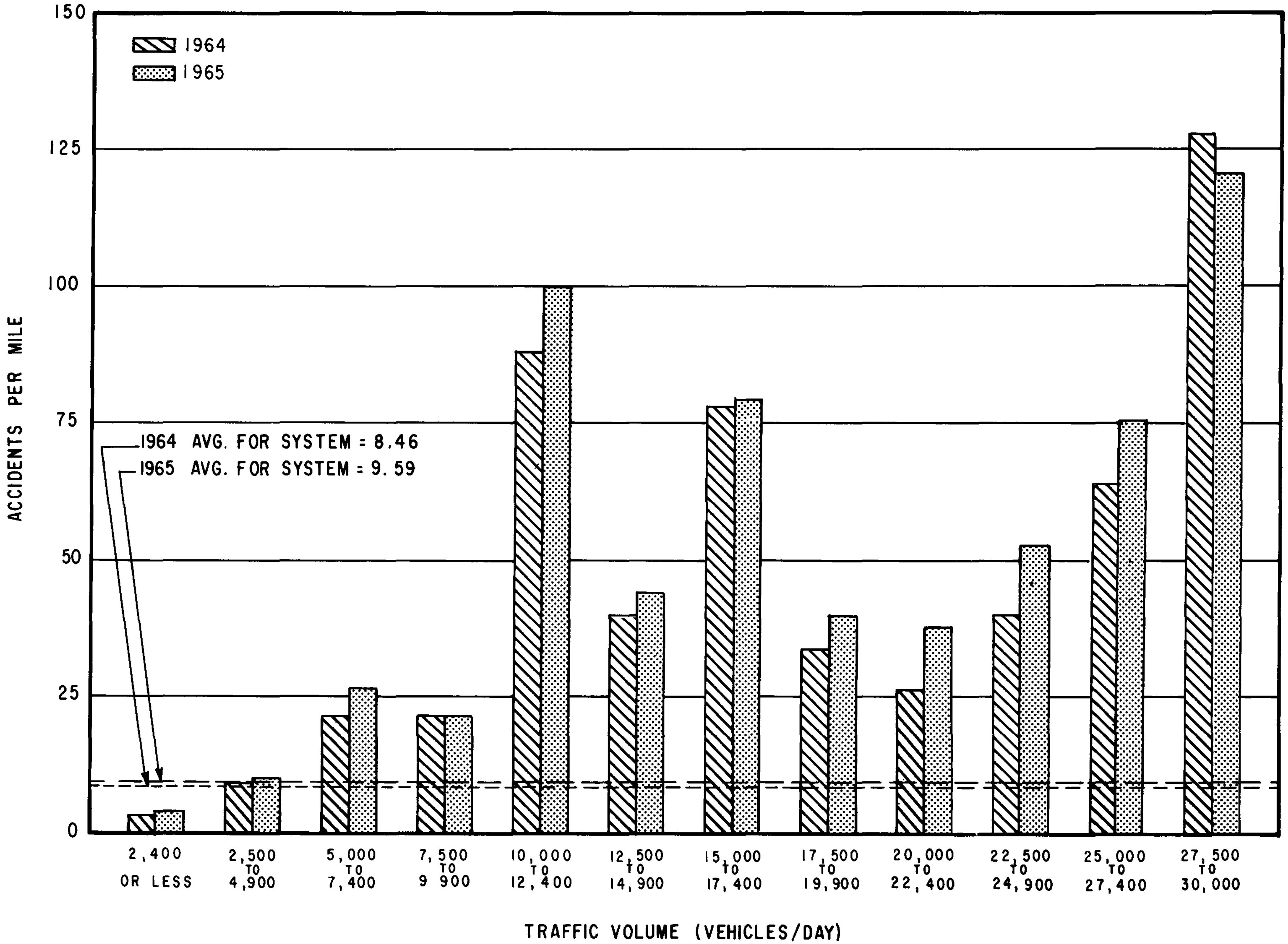
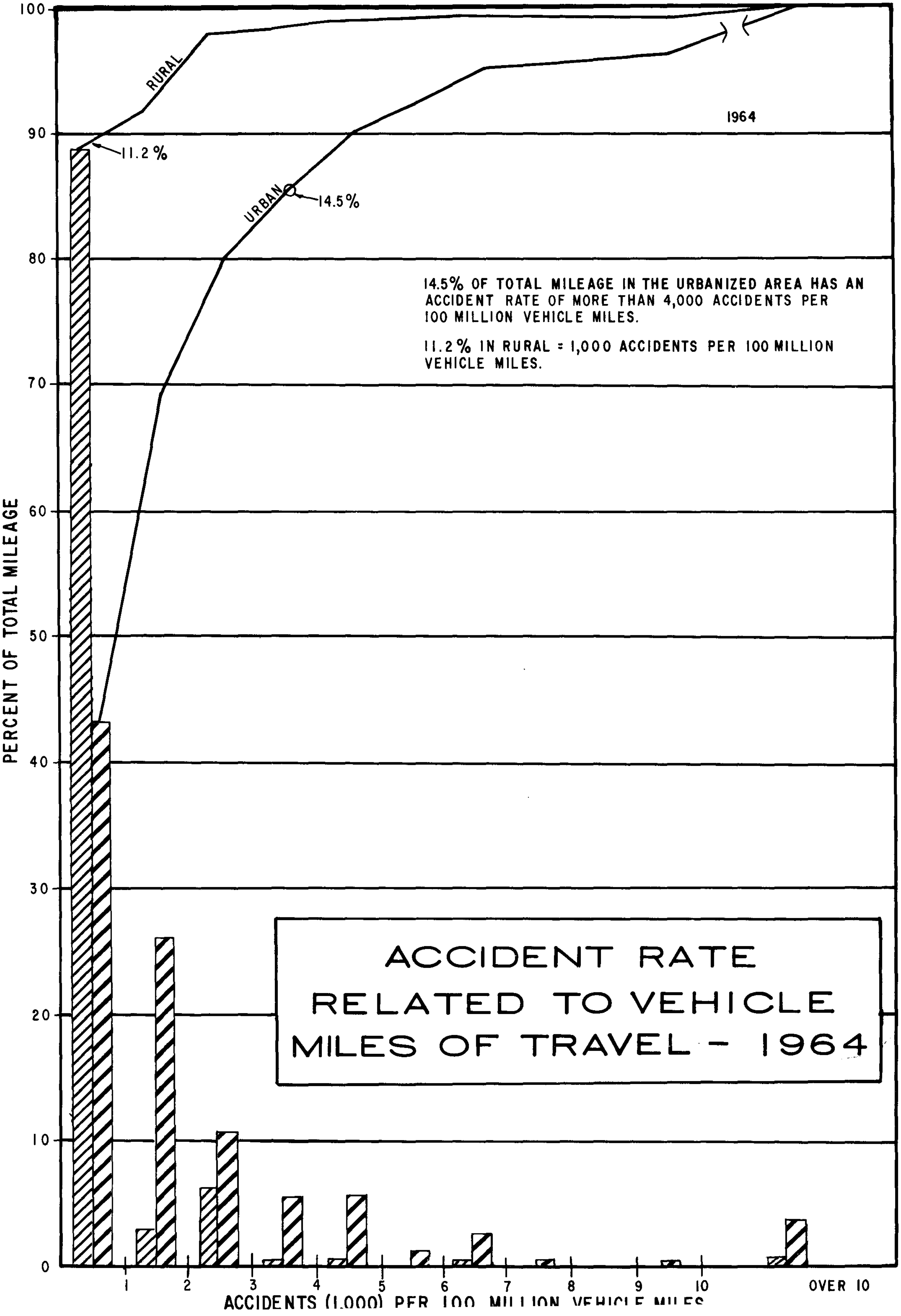
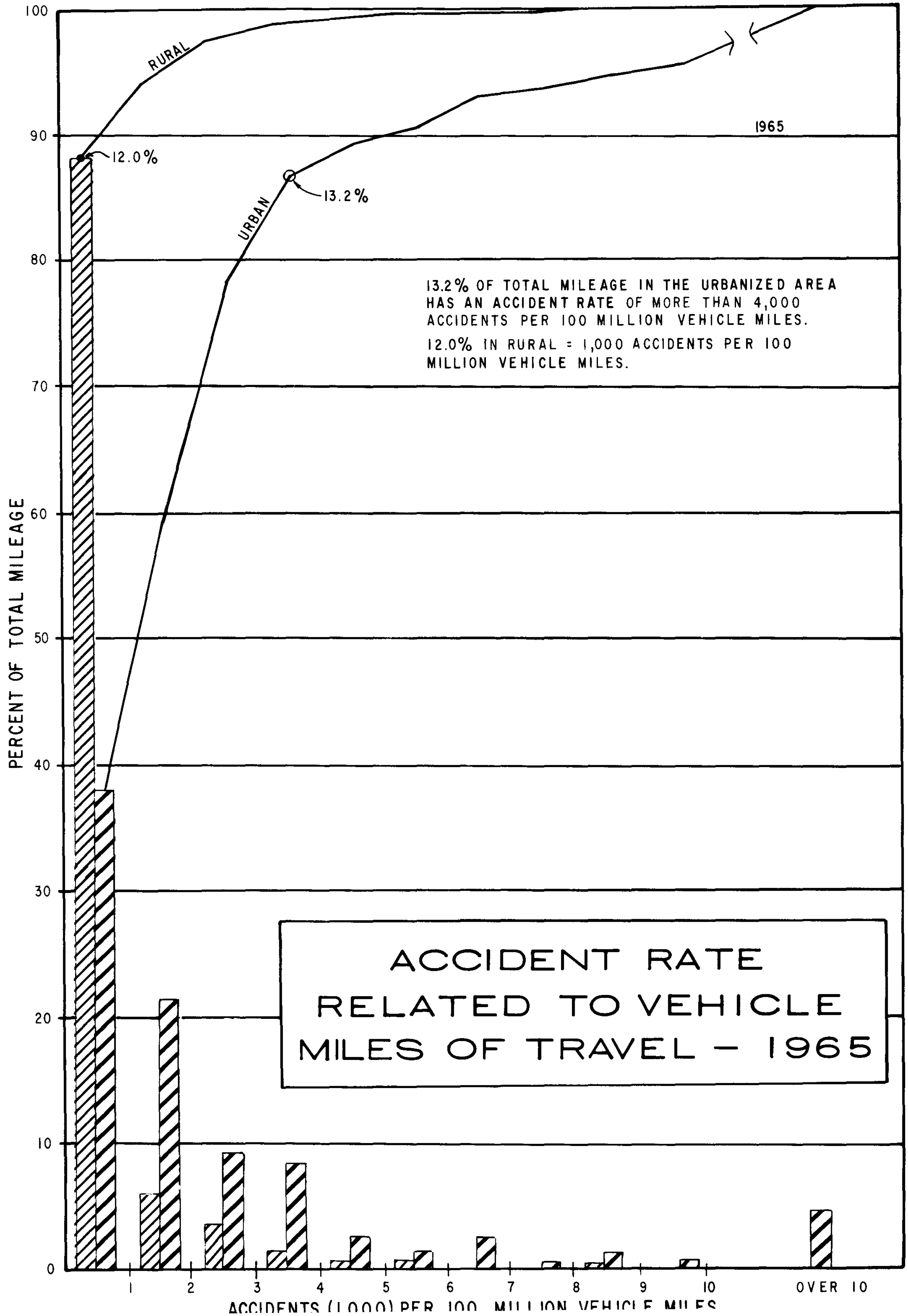


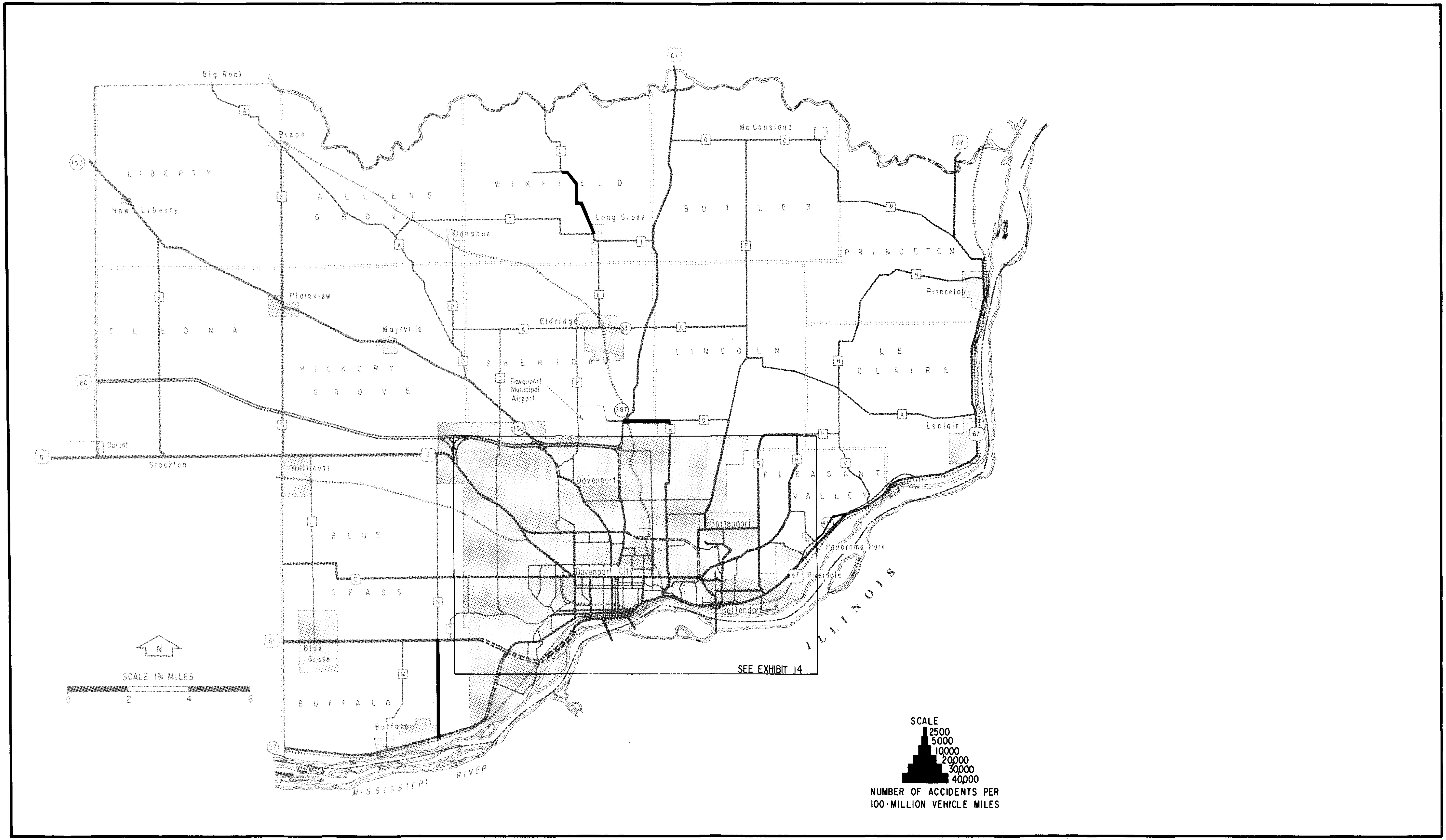
FIGURE 11

FIGURE 12



100
90
80
70
60
50
40
30
20
10
0
PERCENT OF TOTAL MILEAGE
RURAL
URBAN
1964
11.2 %
14.5%
14.5% OF TOTAL MILEAGE IN THE URBANIZED AREA HAS AN ACCIDENT RATE OF MORE THAN 4,000 ACCIDENTS PER 100 MILLION VEHICLE MILES.
11.2% IN RURAL = 1,000 ACCIDENTS PER 100 MILLION VEHICLE MILES.
ACCIDENT RATE RELATED TO VEHICLE MILES OF TRAVEL - 1964
1
2
3
4
5
6
7
8
9
10
OVER 10
ACCIDENTS (1,000) PER 100 MILLION VEHICLE MILES


RURAL
URBAN
12.0%
13.2%
1965
13.2% OF TOTAL MILEAGE IN THE URBANIZED AREA HAS AN ACCIDENT RATE OF MORE THAN 4,000 ACCIDENTS PER 100 MILLION VEHICLE MILES.
12.0% IN RURAL = 1,000 ACCIDENTS PER 100 MILLION VEHICLE MILES.
ACCIDENT RATE RELATED TO VEHICLE MILES OF TRAVEL - 1965
PERCENT OF TOTAL MILEAGE
0
10
20
30
40
50
60
70
80
90
100
1
2
3
4
5
6
7
8
9
10
OVER 10
ACCIDENTS (1,000) PER 100 MILLION VEHICLE MILES



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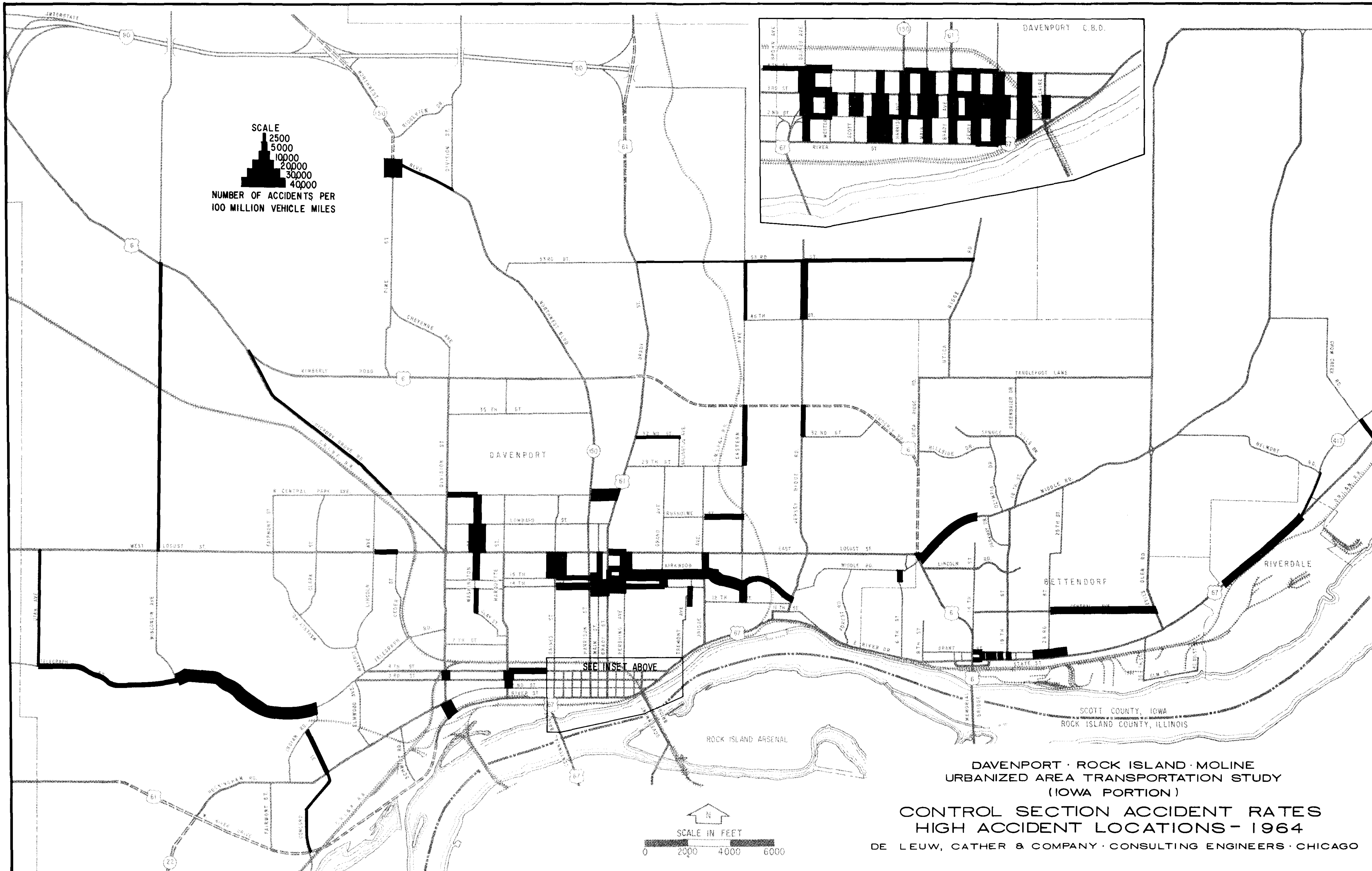
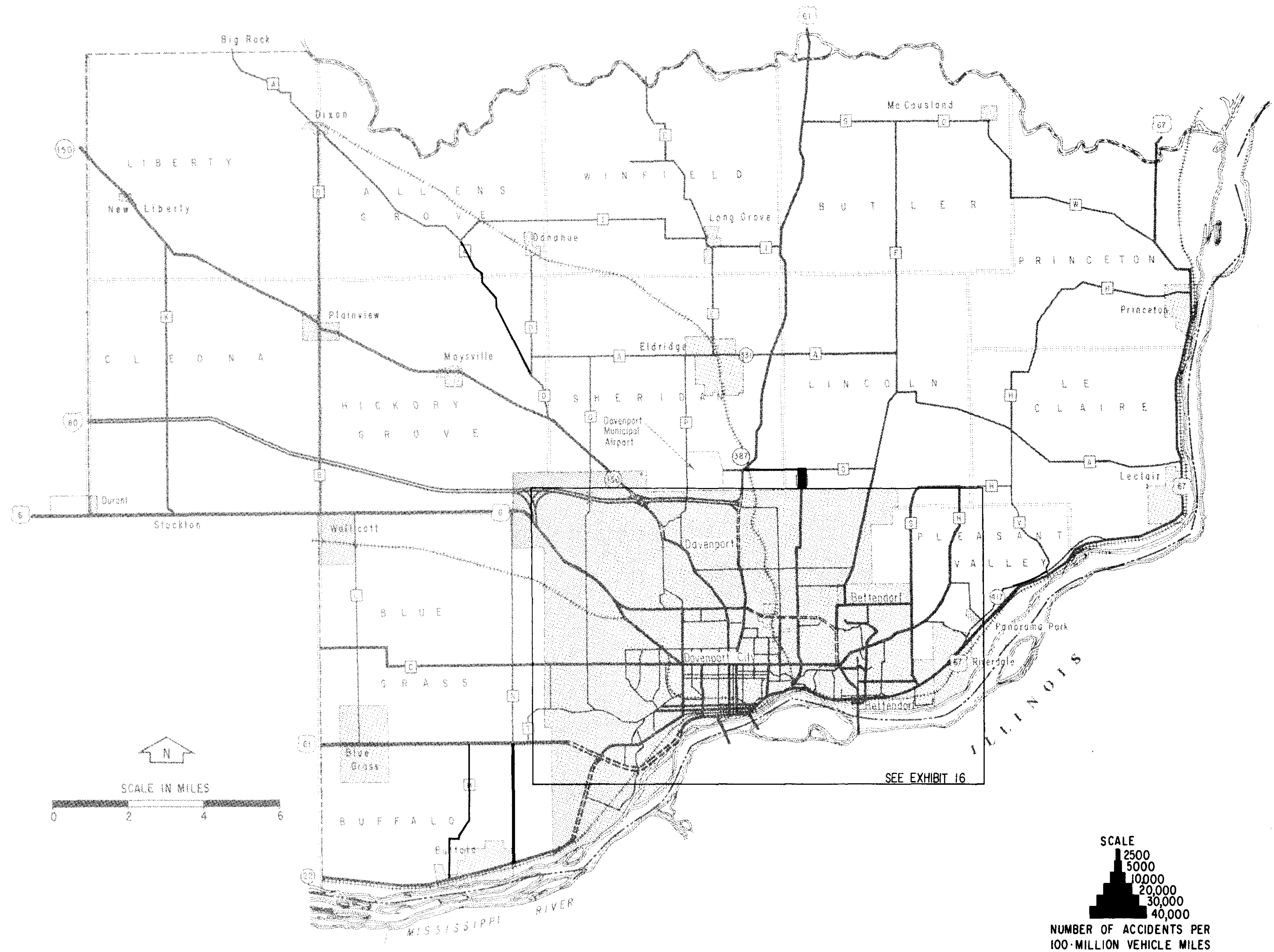
CONTROL SECTION ACCIDENT RATES
HIGH ACCIDENT LOCATIONS - 1964



See Exhibit 13 for remainder of study area



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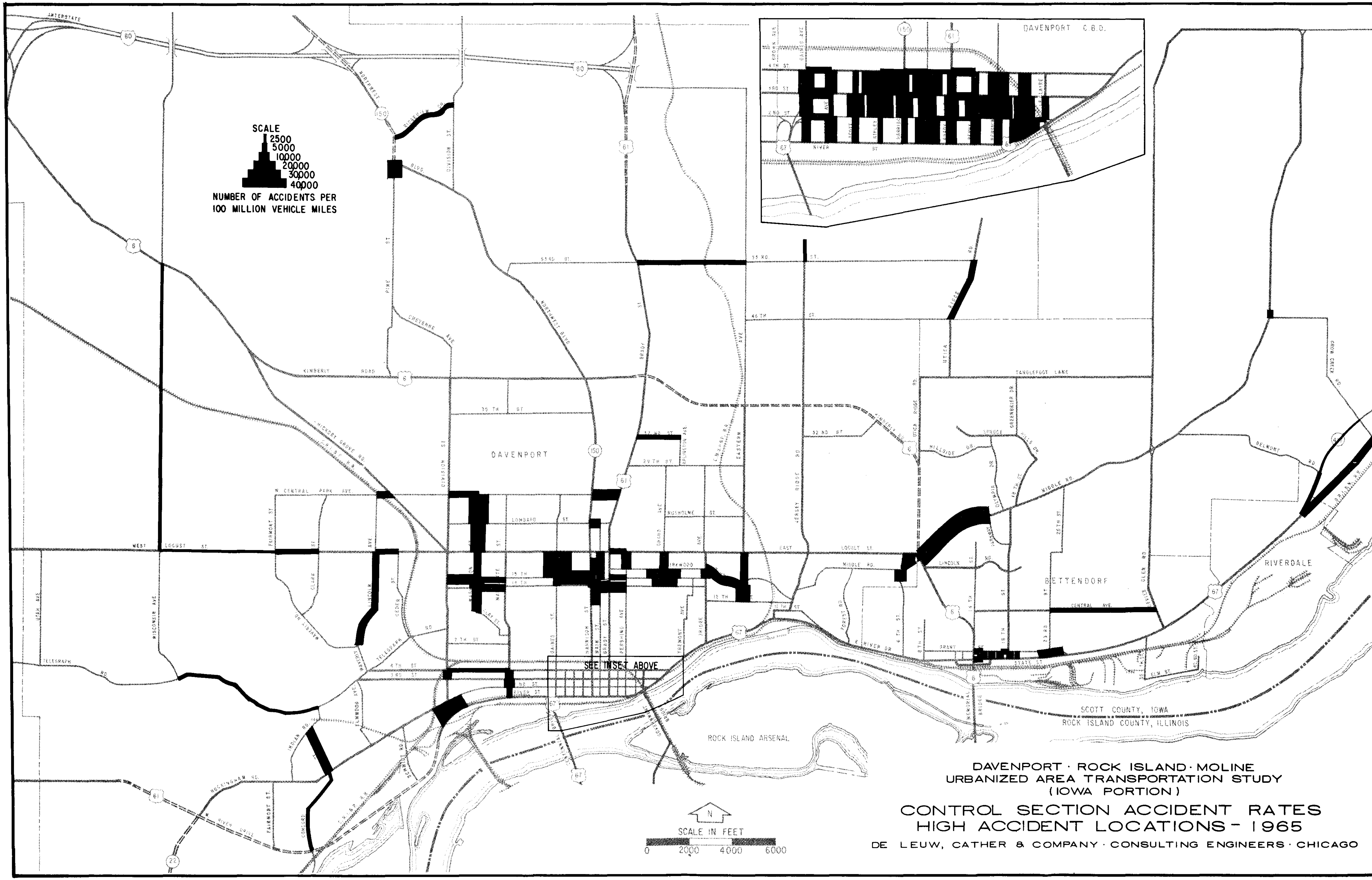
CONTROL SECTION ACCIDENT RATES
HIGH ACCIDENT LOCATIONS - 1965

EXHIBIT 16



DAVENPORT · ROCK ISLAND · MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)

CONTROL SECTION ACCIDENT RATES
HIGH ACCIDENT LOCATIONS - 1965

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

See Exhibit 15 for remainder of study area.

TABLE 25

SUMMARY OF ACCIDENT RATES
ACCIDENTS PER MILE OF ROADWAY
1964-1965

Severity of Accidents	Freeway	Expressway	Major	Collector	All Principal Streets and Highways	Local Streets and Highways
	Functional Classification					
	1964					
Property Damage	0.34	10.33	9.87	3.85	6.30	1.04
Personal Injury	-	4.36	3.42	1.17	2.12	0.53
Fatality	-	0.31	0.06	0.01	0.04	0.01
All Accidents	0.34	15.00	13.35	5.03	8.46	1.58
	1965					
Property Damage	0.40	10.41	11.76	4.58	7.43	1.21
Personal Injury	0.46	4.04	3.38	1.19	2.12	0.65
Fatality	-	0.08	0.07	0.03	0.04	0.00
All Accidents	0.86	14.53	15.14	5.80	9.59	1.86

Accident Costs

The National Safety Council annually publishes approximations of the calculable costs of motor vehicle accidents, classified by accident severity. The following values were approximated for calendar years 1964 and 1965:

Severity	1964	1965
Death	$34,400	$35,000
Non-fatal injury	1,800	1,900
Property damage accidents	310	320

These values were estimated for each person killed or injured, rather than for each fatal or personal injury accident. Accordingly, study area rates were adjusted to reflect the estimated number of persons involved in each fatal or personal injury accident. The following adjustment factors were developed on the basis of data furnished by the Iowa State Highway Commission:

	1964	1965
Persons killed per fatal accident	1.10	1.27
Persons injured non-fatally per fatal accident	1.00	2.00
Persons injured per personal injury accident	1.33	1.32

Table 26 shows the estimated cost of accidents per mile of road for each functional classification of the street and highway system.

While these estimates permit comparisons between various functional classifications of streets and highways, they include duplicate data for accidents at intersections of principal thoroughfares. Therefore, total accident costs for the study area were estimated by applying adjusted rates and National Safety Council values to total accidents as estimated in Table 17, page 61. On this basis, the total cost of accidents in the study area was approximately $3,540,000 in 1964 and $3,870,000 in 1965.

TABLE 26

ESTIMATED COST OF ACCIDENTS
PER MILE OF ROADWAY

Severity of Accidents	Functional Classification					
	Freeway	Expressway	Major	Collector	All Principal Streets and Highways	Local Streets and Highways
	1964					
Property Damage	$105	$3,202	$3,060	$1,194	$1,953	$322
Personal Injury	-	10,436	8,187	2,800	5,075	1,269
Fatality	-	12,288	2,378	396	1,585	396
All Accidents	$105	$25,926	$13,625	$4,390	$8,613	$1,987
	1965					
Property Damage	$128	$3,331	$3,763	$1,466	$2,303	$387
Personal Injury	1,154	10,132	8,477	2,985	5,317	1,630
Fatality	-	3,800	3,378	1,448	1,930	48
All Accidents	$1,282	$17,263	$15,618	$5,899	$9,550	$2,065

CAPACITY ANALYSIS

The capacity of a street or highway is a measure of its ability to accommodate traffic. Capacity is defined as "the maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or a roadway in one direction (or in both directions for a two-lane or a three-lane highway) during a given time period under prevailing roadway and traffic conditions."(1) The term "capacity" is synonymous with the term "possible capacity" as defined in the Highway Capacity Manual.

Capacity is a function of both the physical features of the highway and the operational characteristics of traffic using the highway. Because urban and rural traffic characteristics differ, capacity analyses for urban and rural areas were based on separate factors. In addition, the following discussion pertains only to major and collector streets and highways with interrupted flows, and not to freeways and expressways with free flow design characteristics.

Location

Various locational factors were applied in capacity analyses. A general distinction was made between urban and rural areas. Urban areas were further classified as central business districts, fringe areas, outlying business districts, or residential areas. See Exhibits 17 and 18. Criteria used in defining these areas are summarized below.(2)

1. Central Business District--that portion of a municipality in which intense business activity is the dominant land use. Such a district is characterized by large pedestrian traffic volumes, commercial vehicle loading of goods and people, a heavy demand for parking space, and high parking turnover.

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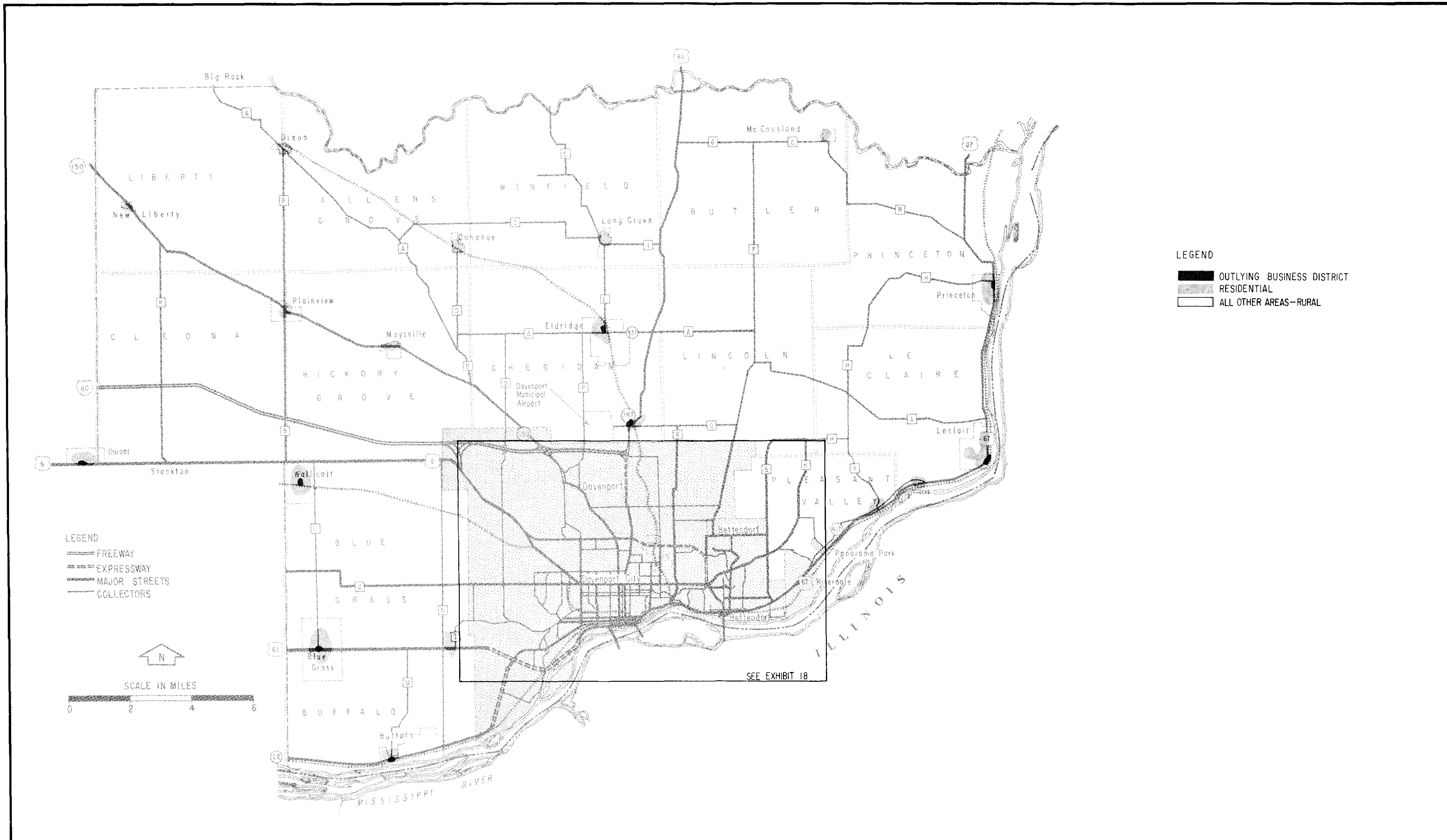
(1)-Highway Capacity Manual, 1965, Highway Research Board Special Report 87, page 5.

(2)-Highway Capacity Manual, 1965, Highway Research Board Special Report 87, page 19.



DAVENPORT · ROCK ISLAND · MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)
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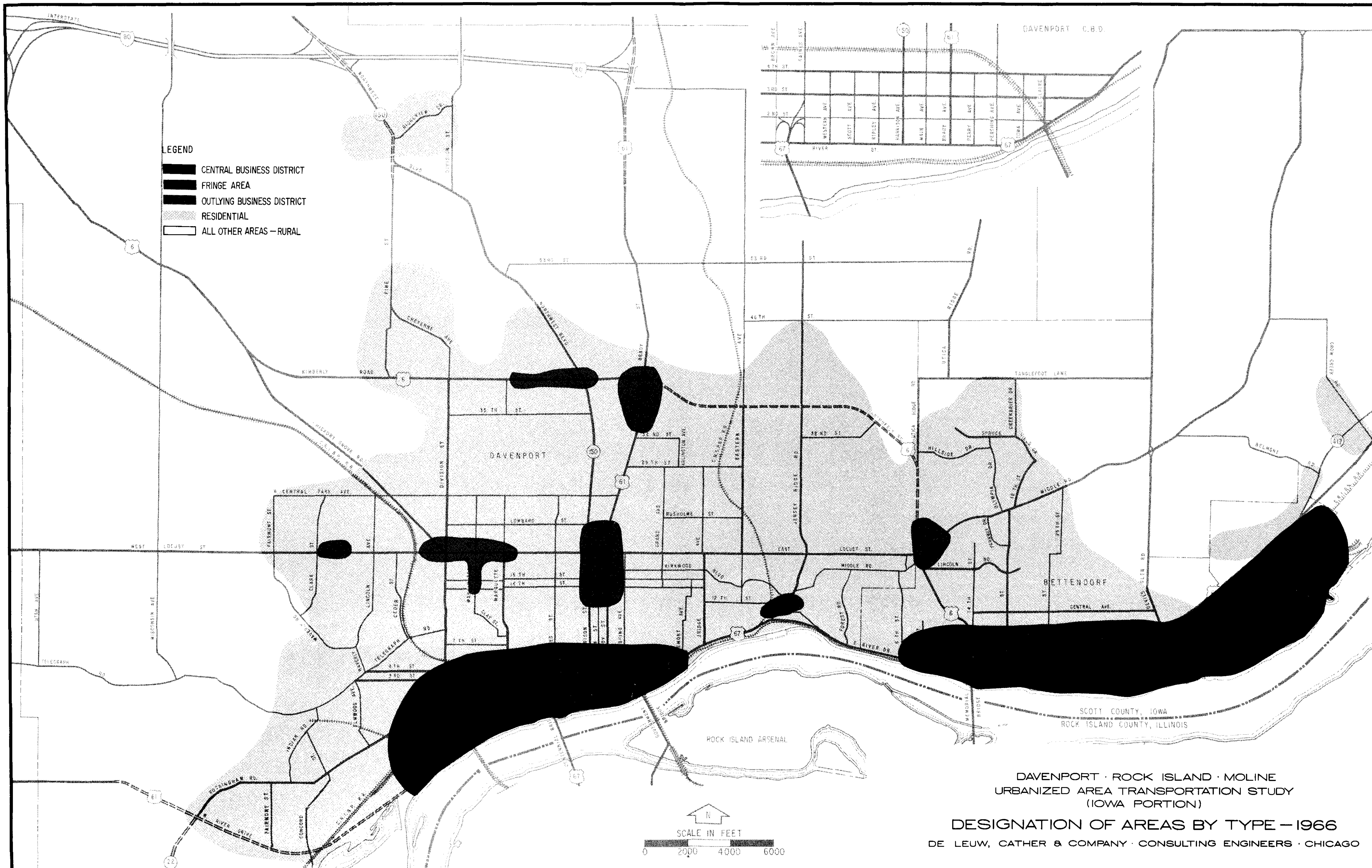
DESIGNATION OF AREAS
BY TYPE — 1966



See Exhibit 17 for remainder of study area

2. Fringe Area--that portion of a municipality immediately outside the central business district in which there is a wide range of business, generally including small businesses, light industry, warehousing, automobile service activities, and intermediate strip development, as well as some concentrated residential areas. Most traffic in such an area has neither origin nor destination within the area. Such an area is characterized by moderate pedestrian traffic and lower parking turnover than is found in the central business district, but may include large parking areas serving the central business district.

3. Outlying Business District--that portion of a municipality or an area within the influence of a municipality, but normally some distance from the central business district and its fringe area, in which the principal land use is business activity. Such a district generates its own local traffic circulation pattern which is superimposed on through movements to and from the central business district; it has relatively high parking demand and turnover, and moderate pedestrian traffic. Compact and self-contained shopping centers free of through streets are not included in this definition.

4. Residential Area--that portion of a municipality, or an area within the influence of a municipality, in which the dominant land use is residential, but in which there may be limited business. Such an area is characterized by few pedestrians and low parking turnover.

A locational factor reflecting size of urban areas in the study area was also applied. Previous research has shown that intersection approaches within large metropolitan areas have higher capacities than those with similar geometrics in comparable areas in smaller cities.

<u>Urban Capacities</u>

In general, maximum traffic volume on a specific section of roadway is limited either by an intersection approach or by a pavement constriction between intersections. In urban capacity analyses, factors classifying type of traffic and levels of service were defined as follows:

Level of Service. A load factor (LF) was assumed as a measure of level of service. Load factor is an indication of the utilization of the entire approach roadway during one hour of peak traffic flow and may be defined as follows:

$$\text{Load Factor} = \frac{\text{Total number of green phases that are fully utilized during the peak hour}}{\text{Total number of green phases for that approach during the same period}}$$

A green phase on an approach may be considered to be fully utilized when there are vehicles ready to enter the intersection in all lanes when the signal turns green and they continue to enter in all lanes during the entire phase with no unused time or exceedingly long spacings between vehicles at any time due to lack of traffic. A load factor of 0.20, representative of a desirable level of service, was selected for use in the Davenport-Rock Island-Moline Urbanized Area. The capacity at the given level of service is denoted the "Service Volume."

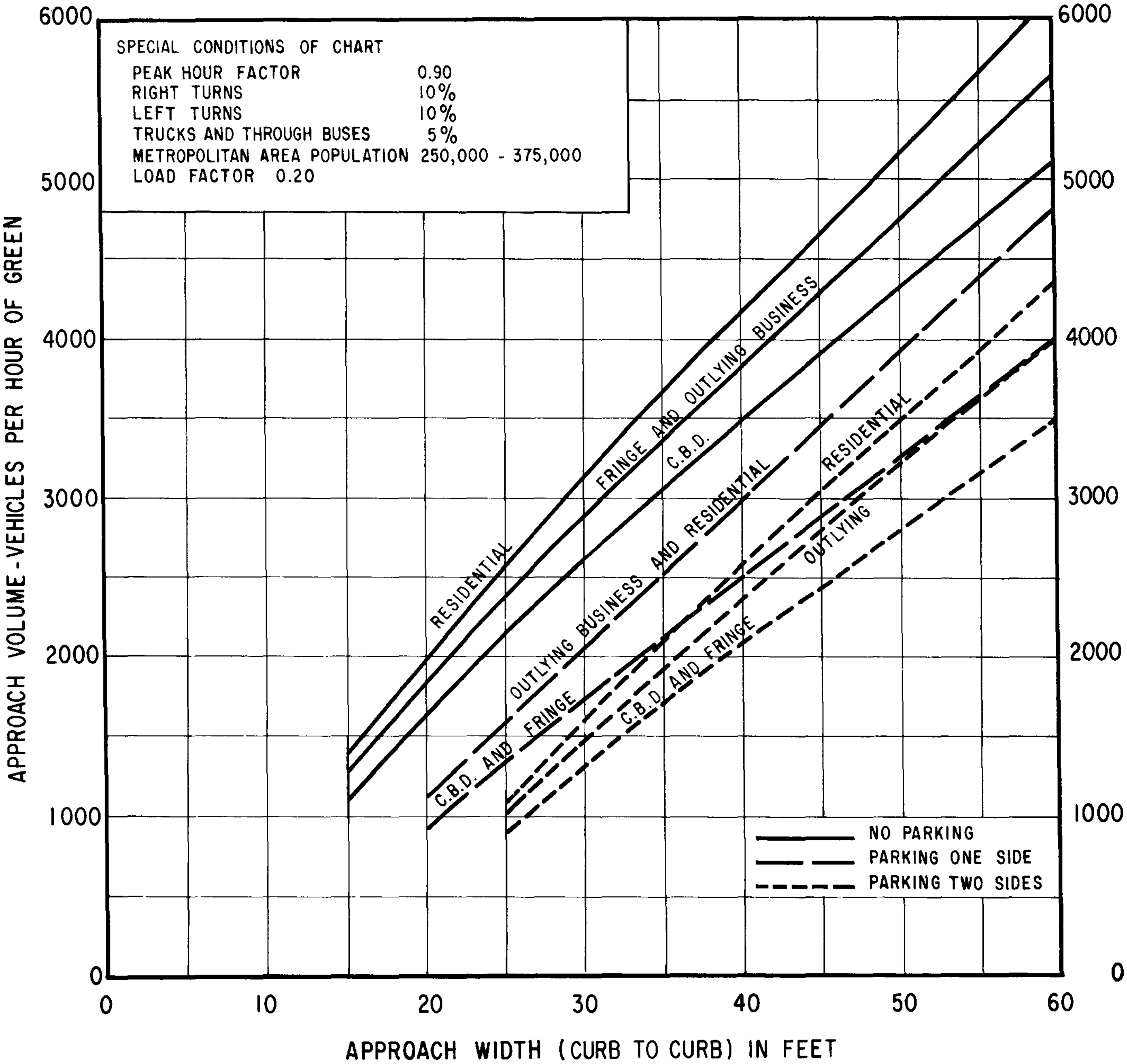
Physical and Operational Conditions. Street width, parking conditions, and type of operation (one-way or two-way) were evaluated for all links in the system, as part of the physical inventory of streets and highways. For purposes of analysis, ten percent right and left turn volumes were assumed.

Analysis of available data indicated that commercial vehicles accounted for approximately 4.0 percent of total traffic in central business districts, 2.0 percent of total traffic in fringe areas, and 3.0 percent of total traffic in outlying business districts and residential areas. Panel, pickup and other light four-wheel trucks were classified with passenger cars, since their size and performance are similar. All other trucks, as well as intercity and express buses, were defined as commercial vehicles.

The family of curves reflecting locational factors, levels of service, and physical and operational conditions are shown in Figures 14 and 15. Service volumes are indicated in vehicles per hour of green.

INTERSECTION APPROACH SERVICE VOLUME BY TYPE OF AREA

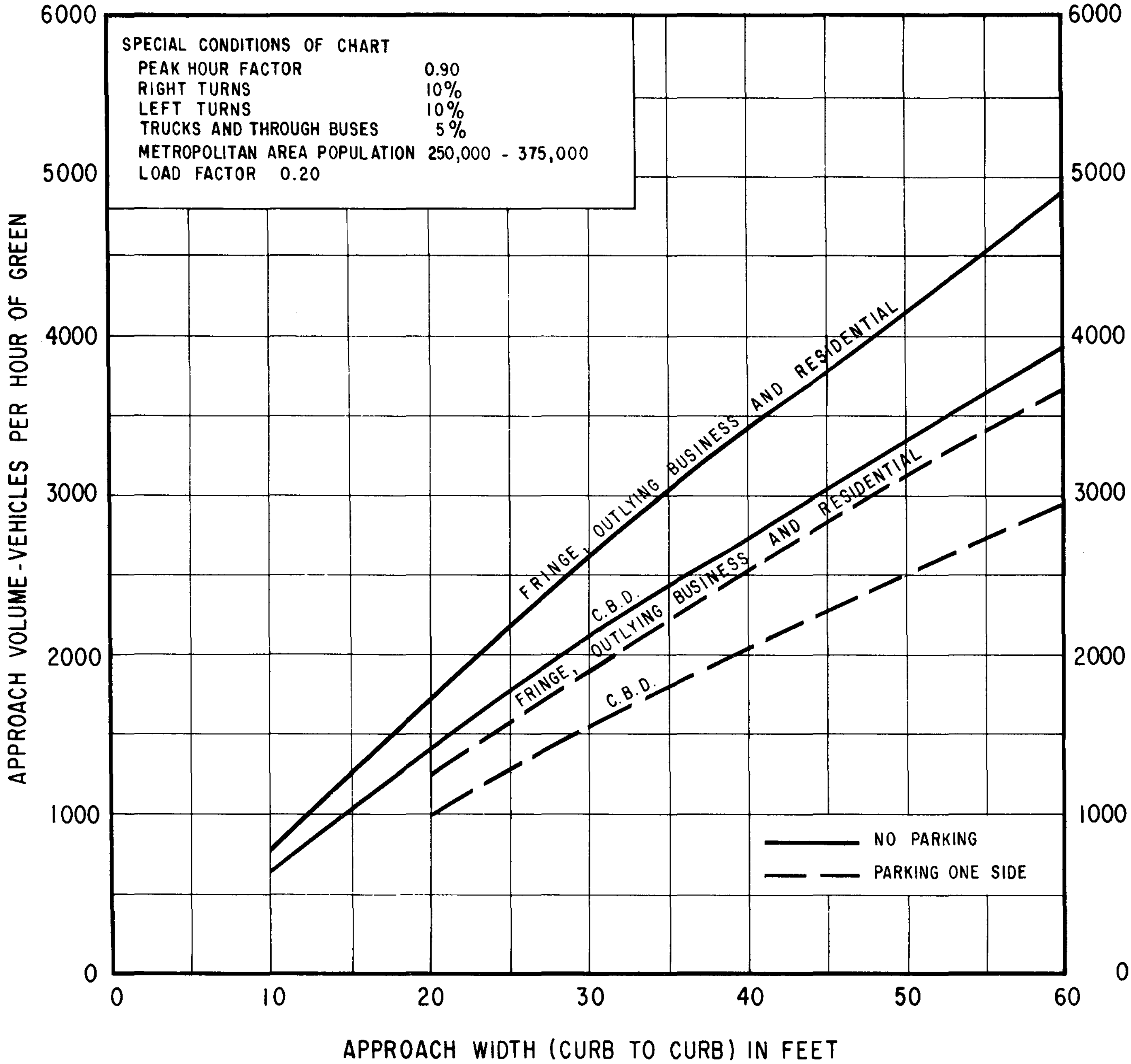
ONE-WAY STREETS



SOURCE: HIGHWAY CAPACITY MANUAL – 1965, HIGHWAY RESEARCH BOARD SPECIAL REPORT 87, NATIONAL ACADEMY OF SCIENCES, NATIONAL RESEARCH COUNCIL, PUBLICATION 1328, WASHINGTON, D.C. FIGURES 6.5, 6.6 AND 6.7.

INTERSECTION APPROACH SERVICE VOLUME BY TYPE OF AREA

TWO-WAY STREETS



SOURCE: HIGHWAY CAPACITY MANUAL – 1965, HIGHWAY RESEARCH BOARD SPECIAL REPORT 87, NATIONAL ACADEMY OF SCIENCES, NATIONAL RESEARCH COUNCIL, PUBLICATION 1328, WASHINGTON D.C. FIGURES 6.8 AND 6.9

The peak hour factor (PHF) reflects variations in peak hour traffic flow. The peak hour factor is defined as the ratio between the number of vehicles on the approach during the peak hour to four times the number of vehicles in the highest 15 consecutive minutes.[1] It is possible for the peak hour factor to vary from 0.25 to 1.00. Intersection turning movement surveys, described in an earlier section of this report (Volume Studies), were used to estimate applicable peak hour factors for the study area. Table 27 summarizes peak hour factors by area as estimated from traffic counts at intersections. A peak hour factor of 0.90 was selected as being representative of conditions throughout the study area. It was applied to capacity curves to estimate peak hour approach capacities.

Current and future traffic volumes are usually expressed in terms of daily traffic. To allow direct comparisons with these volumes, it was necessary to convert peak hour service volumes to average weekday traffic (AWT) service volumes. (The origin-destination study did not include surveys of travel on Saturday and Sunday.) The service volumes were converted through use of observed relationships of the peak hour directional split and the ratio between peak hour traffic and average weekday traffic from the volume study. These relationships are summarized in Table 27.

Average weekday service volume was calculated by dividing the peak hour approach service volume from Figures 14 and 15 by the appropriate peak hour directional split and the percent of the peak hour to average weekday traffic. These calculations are expressed in the following formula:

$$\begin{array}{l}\text{Urban}\\ \text{Daily}\\ \text{Service}\\ \text{Volume}\\ \text{Per Hour}\\ \text{of Green}\end{array} = \begin{array}{l}\text{Approach}\\ \text{Volume}\\ \text{From}\\ \text{Figures}\\ \text{14 and 15}\end{array} \times \begin{array}{l}\text{Truck}\\ \text{Factor}\end{array} \times \begin{array}{l}\text{Peak}\\ \text{Hour}\\ \text{Adjustment}\end{array} \times \frac{1}{\begin{array}{l}\text{Percent of}\\ \text{Peak Hour}\\ \text{Traffic in}\\ \text{Heavier}\\ \text{Direction}\end{array}} \times \frac{1}{\begin{array}{l}\text{Percent}\\ \text{of AWT}\end{array}}$$

The resulting average daily service volumes for urban streets are listed in Exhibits D-1, D-2, D-3 and D-4 in the Appendix.

(1)-Highway Capacity Manual, 1965, Highway Research Board Special Report 87, page 117.

TABLE 27

PEAK HOUR TRAFFIC CHARACTERISTICS
IN THE STUDY AREA

Location	Directional Split	Percent of AWT	Peak Hour Factor
Central Business District	65% - 35%	9.5%	0.90
Fringe Area	70% - 30%	9.0%	0.87
Outlying Business District	60% - 40%	9.5%	0.92
Residential Area	60% - 40%	9.5%	0.90

AWT = Average Weekday Traffic

Freeway (full access control) service volumes and expressway (partial access control) service volumes were calculated by multiplying appropriate values from Table 28 by the number of lanes.

Rural Capacities

Rural service volumes were calculated by adjusting rural capacities under ideal conditions to representative conditions of the study area. For two-lane, two-way highways an ideal capacity of 2,000 passenger vehicles per hour total for both lanes was used. For multilane highways, a value of 2,000 passenger vehicles per hour per lane was used. Adjustments were made for lane width, commercial vehicles, directional split and level of service. Factors used to adjust for lane width are given in Table 29.

Two separate factors have been developed to account for commercial vehicles. Commercial vehicles accounted for approximately two percent of total traffic on two-lane highways and three percent on multilane facilities. For two-lane highways, one commercial vehicle was assumed to be equivalent to 2.5 passenger vehicles. For multilane highways one commercial vehicle was assumed to be equivalent to 2.0 passenger vehicles. The formula used to determine the factors was:

$$\text{Factor} = \frac{100}{100 - T + PT}$$

Where:

T = percent commercial vehicles

P = passenger car equivalents

Application of this formula resulted in a truck adjustment factor of 0.98 for both two-lane and multilane rural highways.

Directional split was derived from the volume studies and applied to rural capacities. The studies showed that approximately 60 percent of peak hour traffic in rural areas was in the heavier direction of traffic flow. No adjustment was made for percent grade on rural highways, since average grades throughout the study area are less than seven percent. In addition, no further adjustment was made for the percent of commercial traffic inasmuch as the passenger car equivalents described above made allowance for fairly steep gradients over short distances.

TABLE 28

ACCESS-CONTROLLED FACILITY CHARACTERISTICS

Location	Vehicles Per Day Per Lane Freeways	Vehicles Per Day Per Lane Expressways
Urban Areas	12,600	10,500
Rural Areas	8,000	6,400

Source: Instruction Manual for Operational Characteristics Inventory and Capacity Analysis -- 1966, Illinois Division of Highways.

TABLE 29

EFFECT OF LANE WIDTH ON CAPACITY

RURAL STREETS AND HIGHWAYS

Lane Width (Feet)	Capacity Expressed as a Percentage of Capacity of Ideal 12-Foot Lane	
	Two-Lane Streets and Highways Percent	Multi-Lane Streets and Highways Percent
12	100	100
11	88	97
10	81	91
9	76	81

Each of the above factors was applied to the ideal capacities to determine peak hour rural capacities as a function of pavement width.

It was determined that peak hour traffic amounted to 8.0 percent of total 24-hour volumes. A factor of 0.50 was selected as being representative of a desirable level of service. Dividing the peak hour capacities by the percent peak hour and multiplying by the level of service factor resulted in the average weekday service volumes shown in Exhibit D-5 in the Appendix. Rural service volume is calculated by the following formula:

$$\text{Rural Daily Service Volume} = \text{Ideal Capacity Per Lane} \times \text{Lane Width Factor} \times \text{Truck Factor} \times \frac{1}{\text{Percent of Peak Hour Traffic in Heavier Direction}} \times \frac{1}{\text{Percent of AWT}} \times \text{Level of Service Factor}$$

Sufficiency Analysis

Full capacity of a street or highway is seldom realized, due to various factors which act as retardants to free vehicular movement. The most important factor limiting the capacity of any facility in urban areas is the at-grade intersection. Since it would be impractical to make a detailed capacity analysis of each intersection, a program was developed which computed in general the existing sufficiency of each segment of the principal street and highway system based on limitations imposed by intersections.

For purposes of analysis, the principal street and highway system was described in terms of "nodes" and "links." In general, a node identified the intersection of two functionally classified roadways. A link was defined as a segment of street or highway between two nodes. Other nodes were added and new links established when the following conditions existed between intersections:

a. Any change in type of operation (i.e., from one-way to two-way).
b. Variation of more than two feet in total surfaced width.
c. Change in parking conditions.
d. Change in type of area.

This system of node numbering was used for urban streets. In areas which were distinctly rural in nature, nodes were assigned at intersections of functionally classified streets and at points where the surfaced width changed by more than two feet.

Based on type of area, type of operation, parking conditions, and street width, the service volume per hour of green signal phase time was estimated for each link of the system. Except for access-controlled facilities, actual approach width, measured in feet, was used rather than the number of traffic lanes. Estimates were based on service volume tables described earlier.

It was assumed that all intersections were signalized with ten percent of total green time reserved for the amber phase of the signal cycle. The remaining 90 percent of green time was split between intersection legs on the basis of the demand volume/service volume (D/S) ratios of opposing traffic movements. The ratios were computed for each leg of the intersection under free-flow conditions. Green time was proportioned to each direction of travel as follows:

$$\%G_{+} = 0.90 \; \frac{D/S +}{D/S_{+} + D/S_{-}}$$

Where:

$\%G_{+}$ = Percent green time in one direction (+).

D/S_{+} =Highest ratio of demand volume to service volume under free-flow conditions in the + direction.

D/S_{-} =Highest ratio of demand volume to service volume under free-flow conditions in the opposing direction (-).

In this manner, an optimum percentage of green time was calculated for each leg of an intersection. When there was no cross traffic movement at a node, the optimum percentage of green time for each link was selected as 65 percent in business and intermediate areas and 70 percent in outlying and rural areas.

An optimum percent green time was thus computed for each pair of nodes defining each link in the system. The lower of the two percentages was used as the controlling percentage for that link. Service volume of each link, both with and without parking, was computed by applying this percentage to the service volume per hour of green phase time previously estimated for the link. A listing of all intersection nodes, their controlling links and calculated optimum percent green times may be found in Exhibit E-3 in the Appendix.

The estimated average weekday traffic volume on a link was divided by its service volume to approximate sufficiency or deficiency. A value greater than 100 percent indicated a deficiency. Analyses suggested that in Bettendorf, the areas of greatest deficiency were on 14th Street and Kimberly Road, as well as on State Street and East River Drive near the 8th Street intersection. In Davenport, there were apparent deficiencies on East River Drive from 3rd Street to Bridge Avenue and from Mound Street to Forest Road; on Kimberly Road from Division Street to Eastern Avenue; and on Harrison and Brady Streets near Kimberly Road. See Exhibit 19.

Table 30 indicates mileage of the street and highway system operating above and below service volume conditions; system mileage is classified by type of facility for each jurisdiction. Figure 16 classifies total system mileage by percentage of service volume classes.

Vehicle miles, a measure of system usage, were calculated by multiplying the segment length by its average weekday traffic volume. Figure 17 is a chart of percentages of total vehicle miles by percentage of service volume classes.

Exhibit F-3 in the Appendix lists all inventoried links as well as their service volumes and vehicle miles of travel.

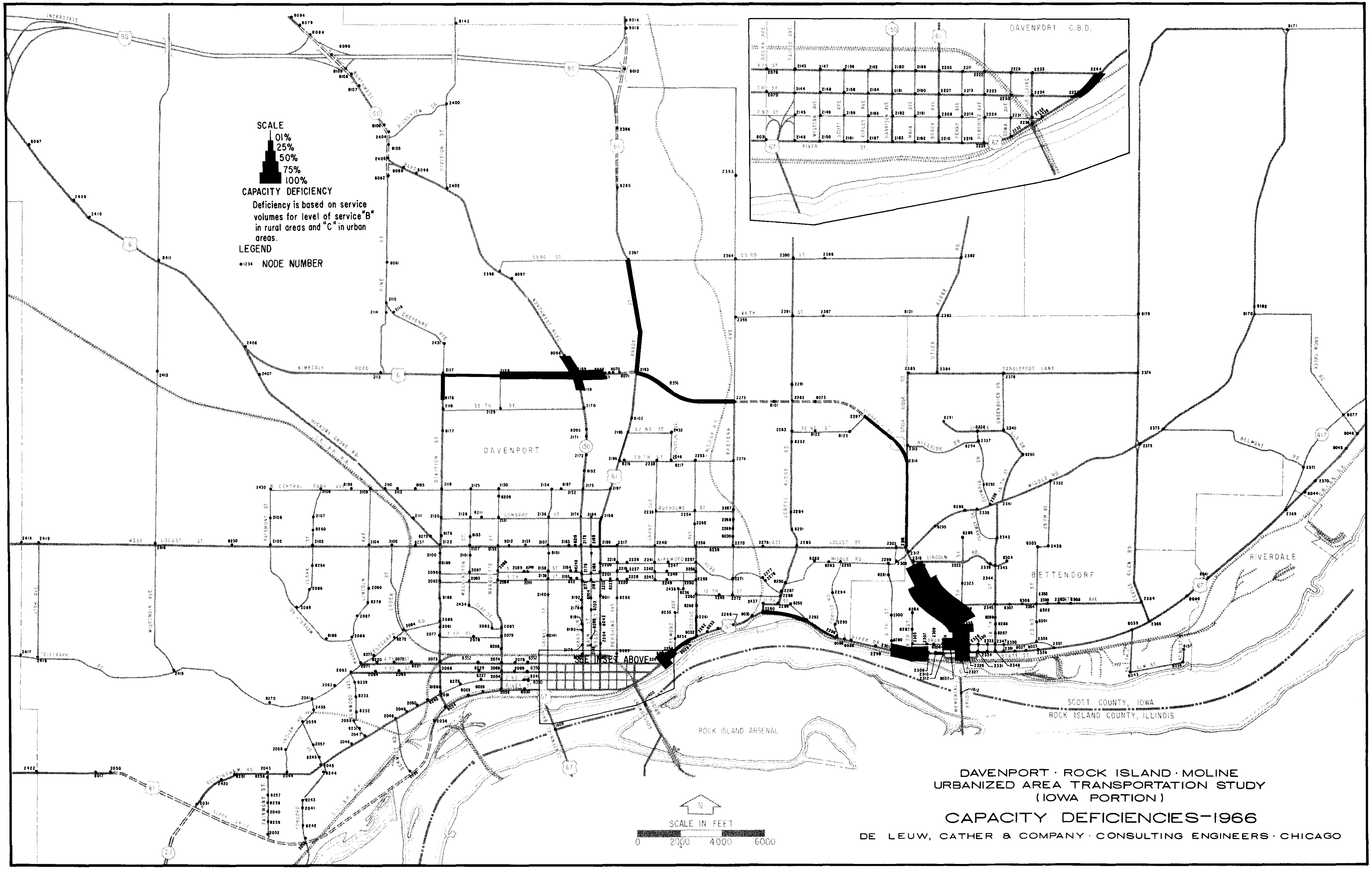

DAVENPORT C.B.D.
SCALE
01%
25%
50%
75%
100%
CAPACITY DEFICIENCY
Deficiency is based on service volumes for level of service "B" in rural areas and "C" in urban areas.
LEGEND
•1234 NODE NUMBER
DAVENPORT
BETTENDORF
RIVERDALE
ROCK ISLAND ARSENAL
SCOTT COUNTY, IOWA
ROCK ISLAND COUNTY, ILLINOIS
SEE INSET ABOVE
SCALE IN FEET
0 2000 4000 6000
DAVENPORT · ROCK ISLAND · MOLINE
URBANIZED AREA TRANSPORTATION STUDY
(IOWA PORTION)
CAPACITY DEFICIENCIES-1966
DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

TABLE 30

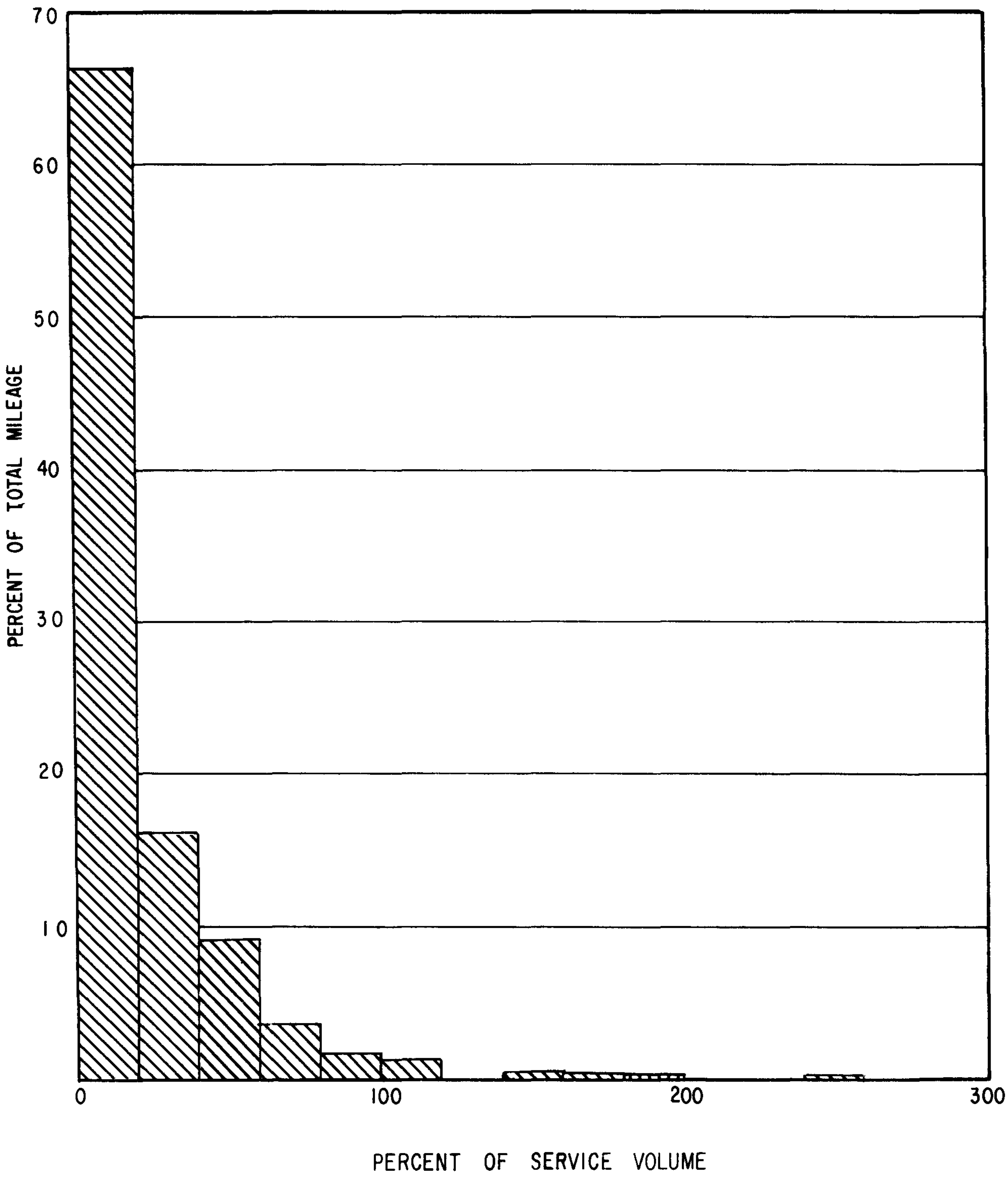
SUMMARY OF MILEAGE ABOVE AND BELOW 100% SERVICE VOLUME CONDITIONS

1966

Jurisdiction	Freeways and Expressways			Arterial Streets and Highways			Collector Streets and Highways			Totals		
	Miles	$\frac{d}{s} < 1$	$\frac{d}{s} > 1$	Miles	$\frac{d}{s} < 1$	$\frac{d}{s} > 1$	Miles	$\frac{d}{s} < 1$	$\frac{d}{s} > 1$	Miles	$\frac{d}{s} < 1$	$\frac{d}{s} > 1$
Davenport	18.29	16.12	2.17	55.37	50.18	5.19	63.44	63.44	-	137.10	129.74	7.36
Bettendorf	0.17	0.17	-	17.59	15.68	1.91	7.99	7.83	0.16	25.75	23.68	2.07
Remainder Scott County	11.92	11.92	-	85.98	85.98	-	141.02	141.02	-	238.92	238.92	-
Total	30.38	28.21	2.17	158.94	151.84	7.10	212.45	212.29	0.16	401.77	392.34	9.43

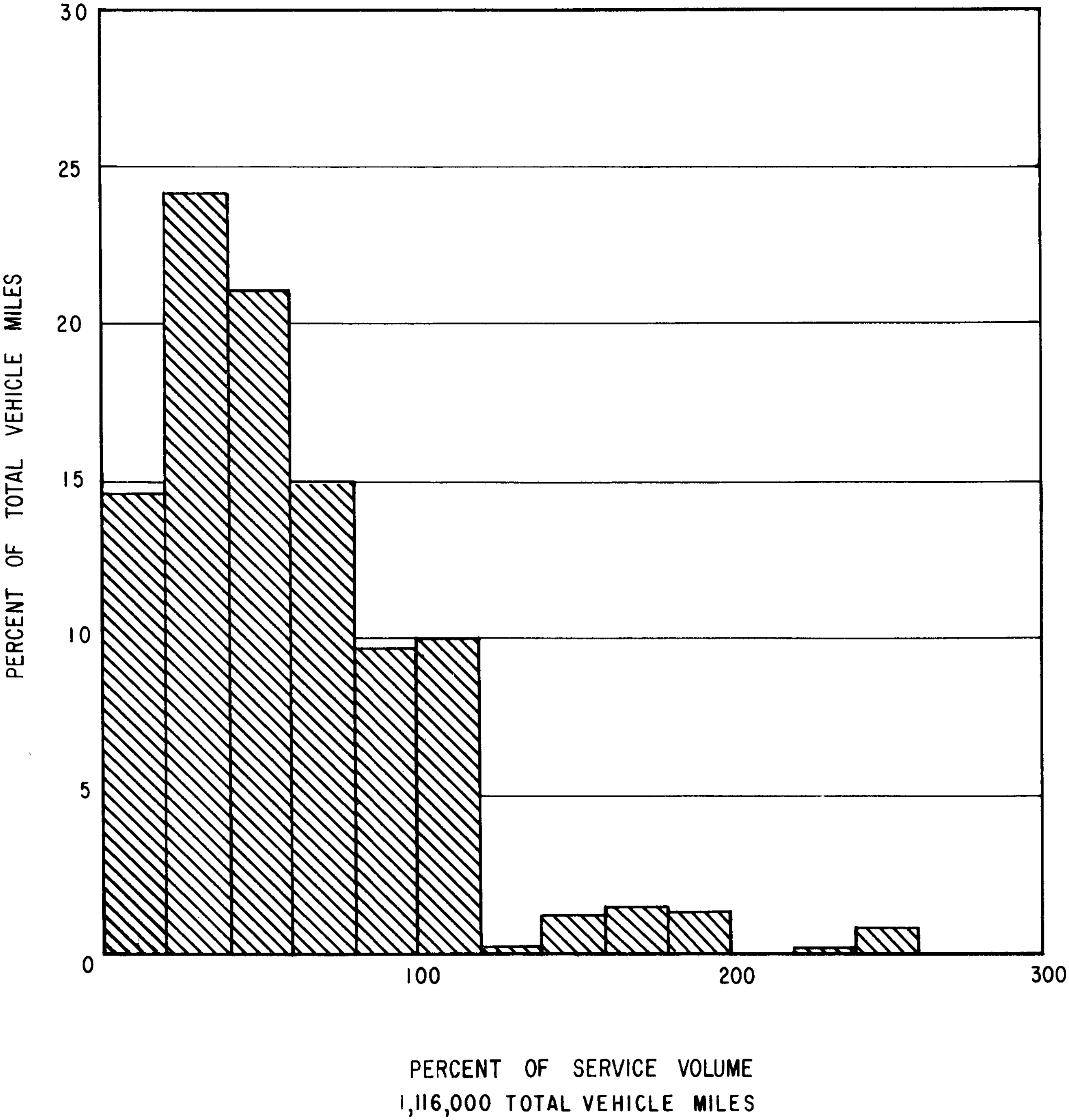
d=Average weekday demand volume.
s=Service volume without parking.

FIGURE 16



PERCENT OF TOTAL SYSTEM MILEAGE BY PERCENT OF SERVICE VOLUME CLASSES

FIGURE 17



PERCENT OF TOTAL VEHICLE MILES
BY PERCENT OF SERVICE VOLUME CLASSES

APPENDICES

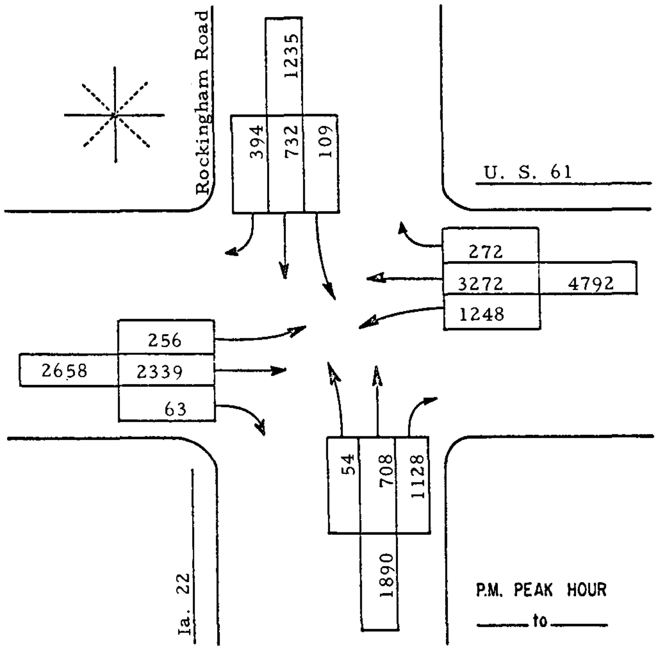
EXHIBIT A-1

Intersection Volume Counts

INTERSECTION VOLUME COUNT

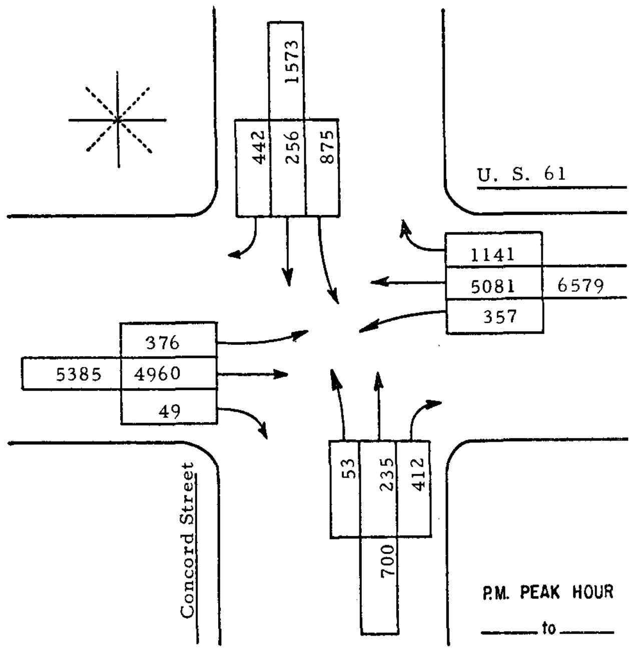
101

INTERSECTION U. S. 61, Ia. 22 AND Rockingham Road
DATE 1966 AADT DAY
WEATHER CITY Davenport



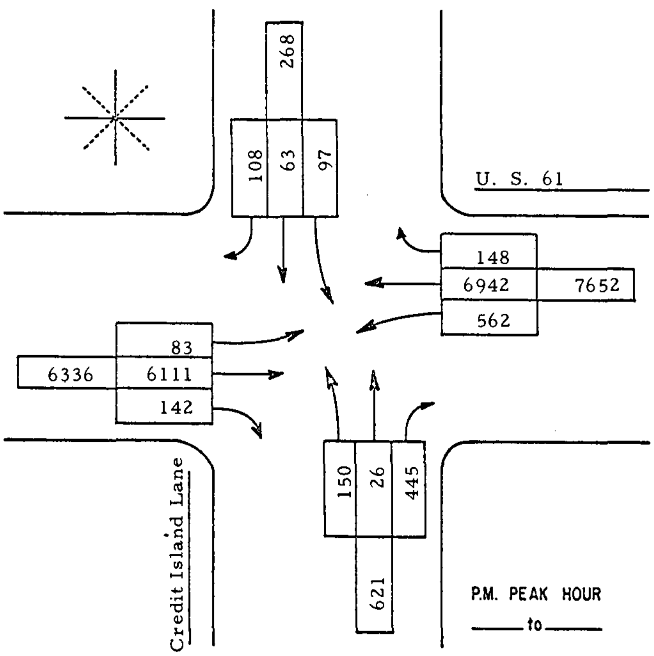
102

INTERSECTION U. S. 61 AND Concord Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



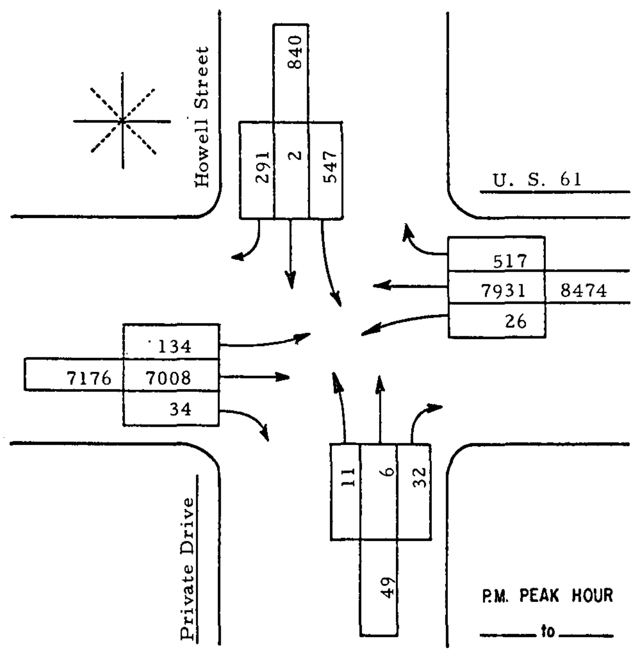
103

INTERSECTION U. S. 61 AND Credit Island Lane
DATE 1966 AADT DAY
WEATHER CITY Davenport



104

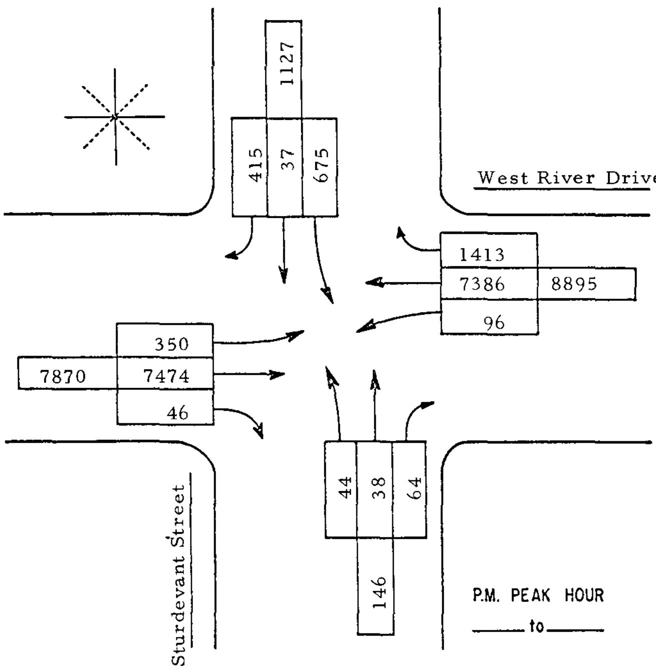
INTERSECTION U. S. 61 AND Howell Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

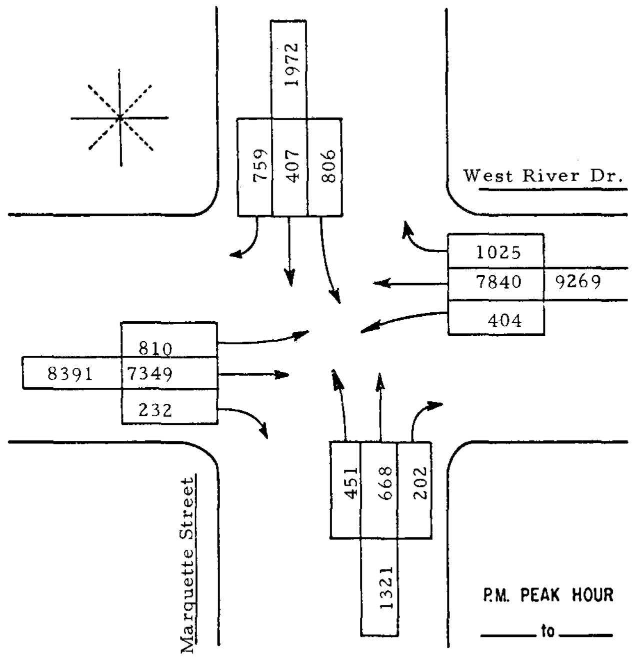
105

INTERSECTION West River Drive (US 61) AND Sturdevant Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



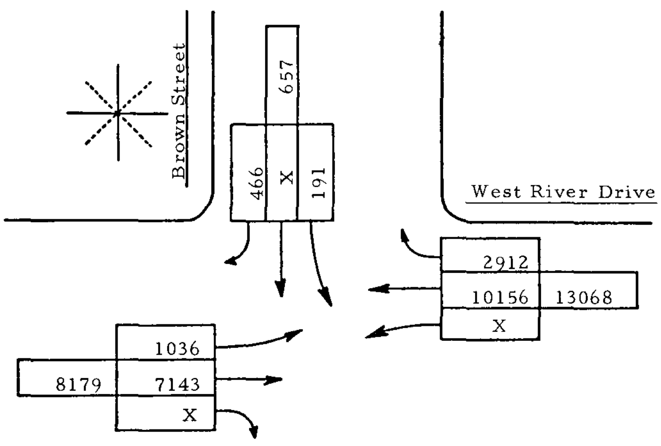
106

INTERSECTION West River Dr. (US 61) AND Marquette Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



107

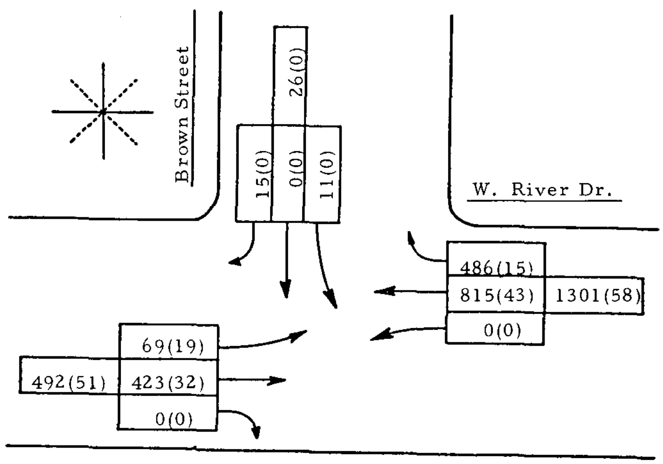
INTERSECTION W. River Dr. (U. S. 61) AND Brown Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



P.M. PEAK HOUR
to

7-C

INTERSECTION W. River Dr. (U. S. 61) AND Brown Street
DATE November 8, 1966 DAY Tuesday
WEATHER CITY Davenport

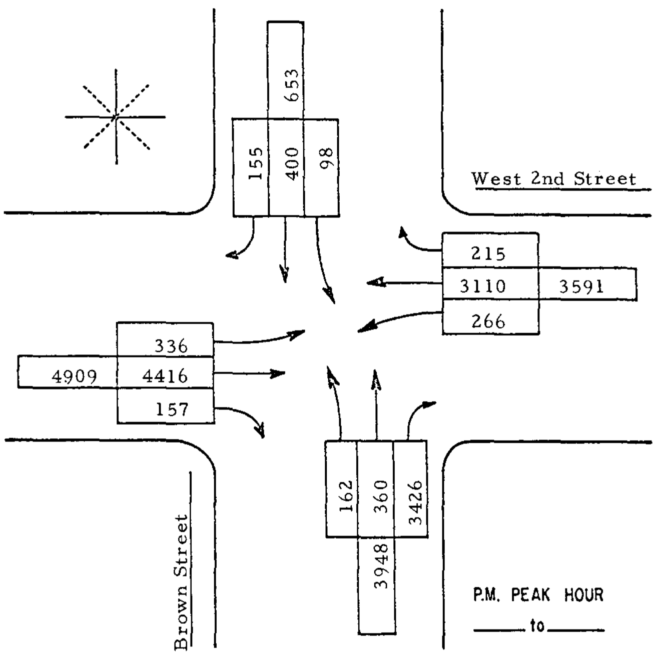


P.M. PEAK HOUR
4:30 to 5:30
PHF 0.94

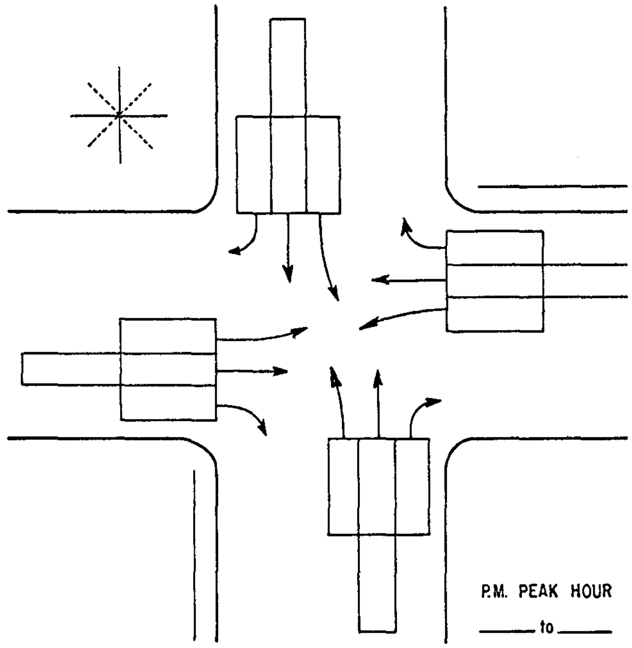
INTERSECTION VOLUME COUNT

108

INTERSECTION Brown Street AND West 2nd Street
DATE 1966 AADT DAY
WEATHER CITY Davenport

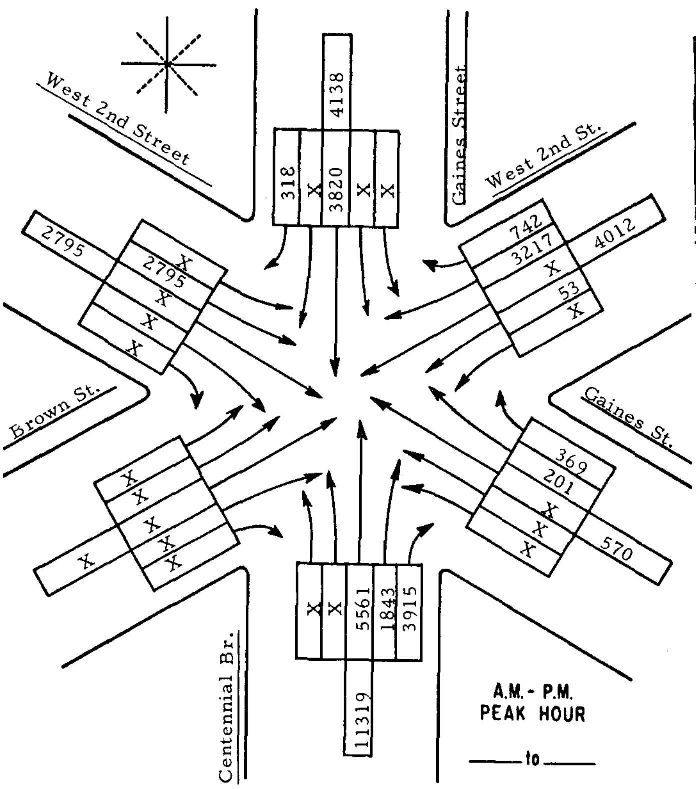


INTERSECTION AND
DATE DAY
WEATHER CITY



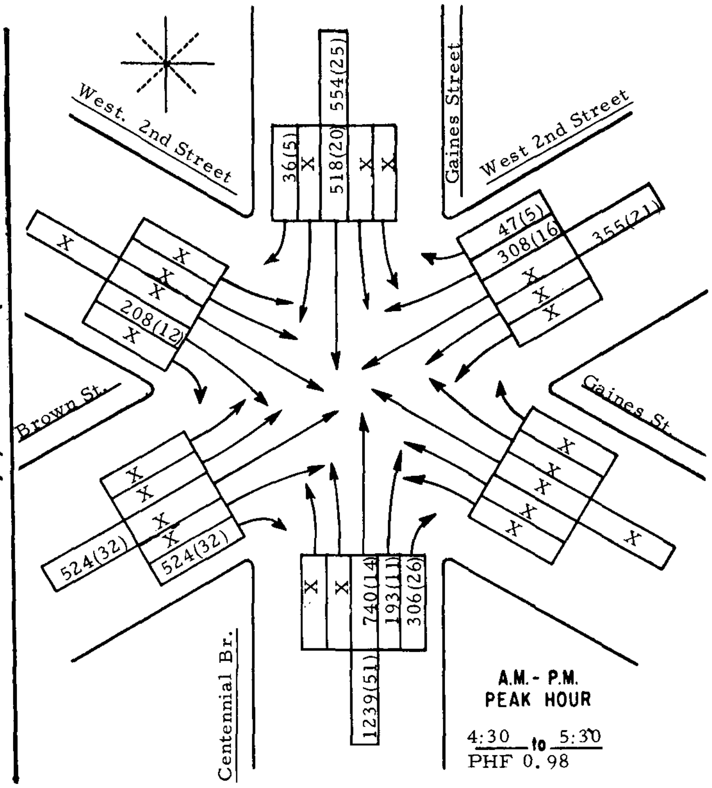
109

INTERSECTION W. 2nd St. Gaines St. AND Centennial Bridge (U. S. 67)
DATE 1966 AADT DAY
WEATHER CITY Davenport



9-C

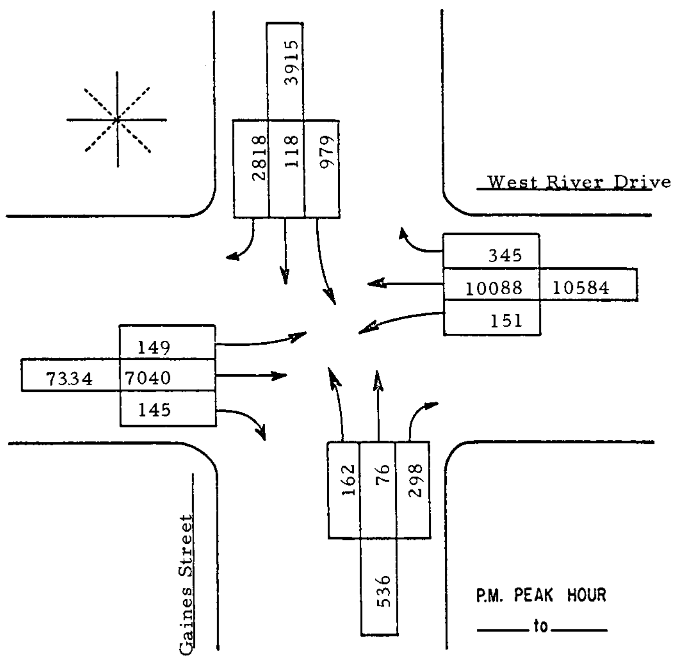
INTERSECTION W. 2nd St., Gaines St. AND Centennial Bridge
DATE November 8, 1966 DAY Tuesday
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

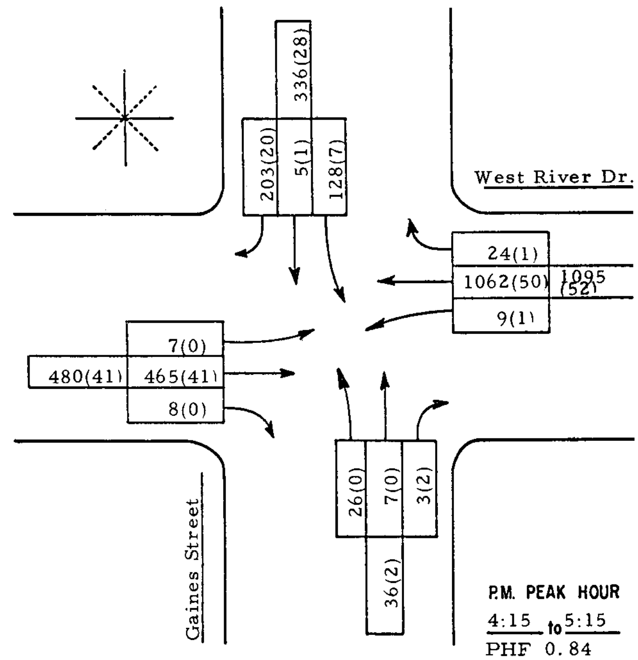
110

INTERSECTION West River Drive-- (U. S. 61, U. S. 67) AND Gaines Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



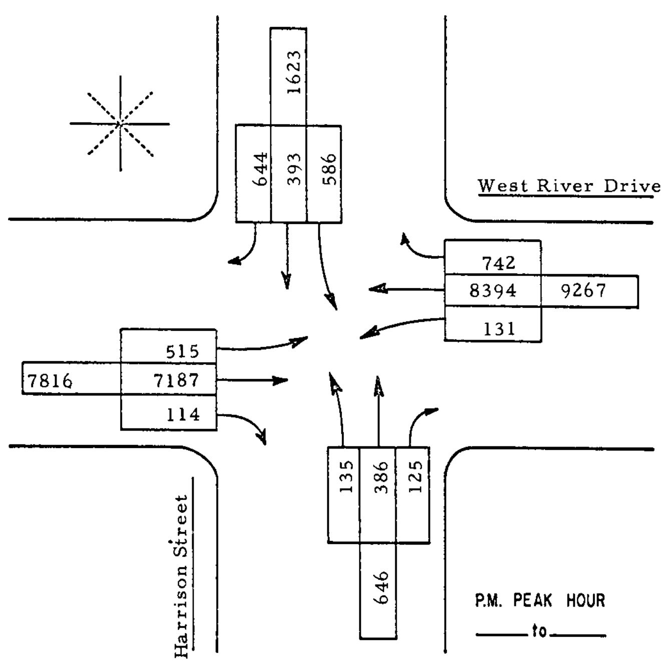
10-C

INTERSECTION West River Drive-- (U. S. 61, U. S. 67) AND Gaines Street
DATE November 8, 1966 DAY Tuesday
WEATHER CITY Davenport



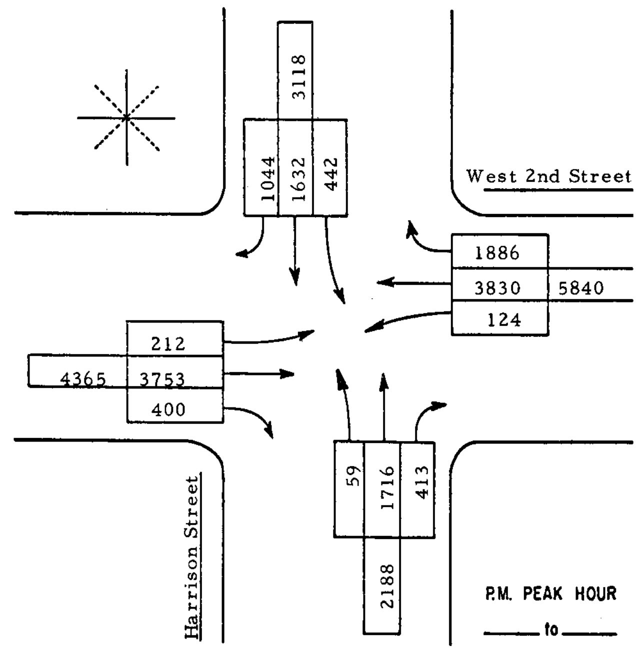
111

INTERSECTION West River Drive (U. S. 61, U. S. 67) AND Harrison Street (Ia. 150)
DATE 1966 AADT DAY
WEATHER CITY Davenport



112

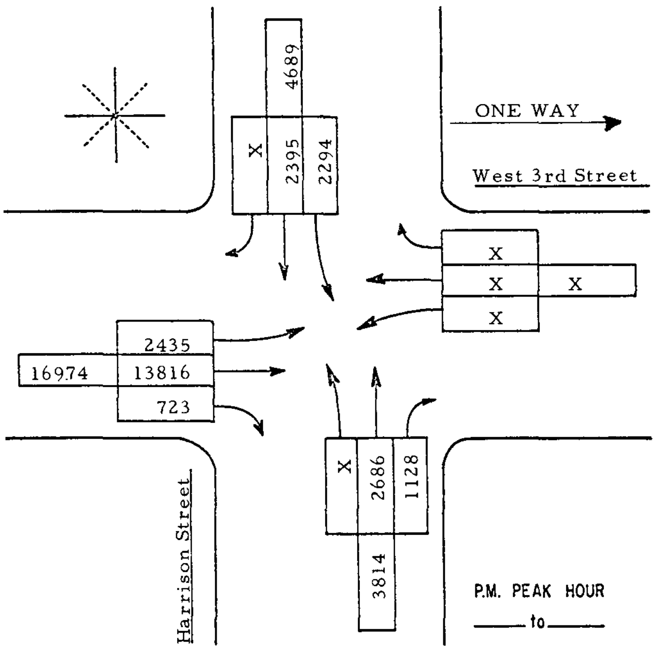
INTERSECTION West 2nd Street AND Harrison St. (Ia. 150)
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

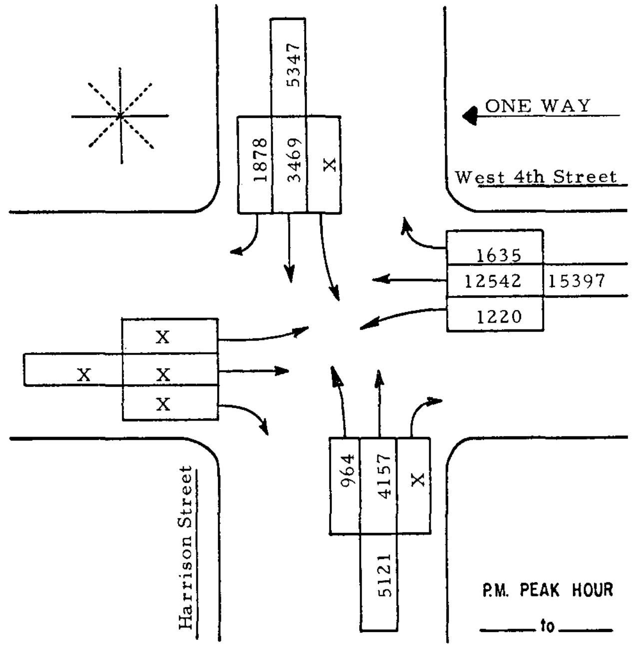
113

INTERSECTION West 3rd Street AND Harrison Street (Ia. 150)
DATE 1966 AADT DAY
WEATHER CITY Davenport



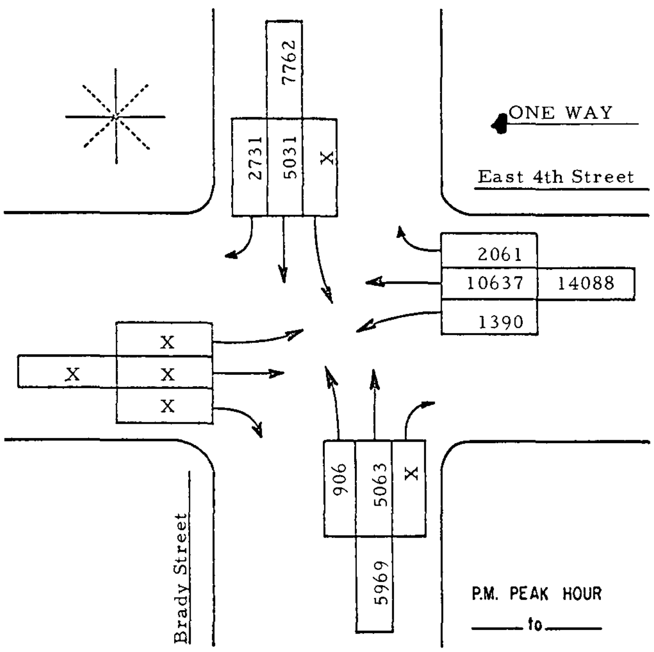
114

INTERSECTION West 4th Street AND Harrison St. (Ia. 150)
DATE 1966 AADT DAY
WEATHER CITY Davenport



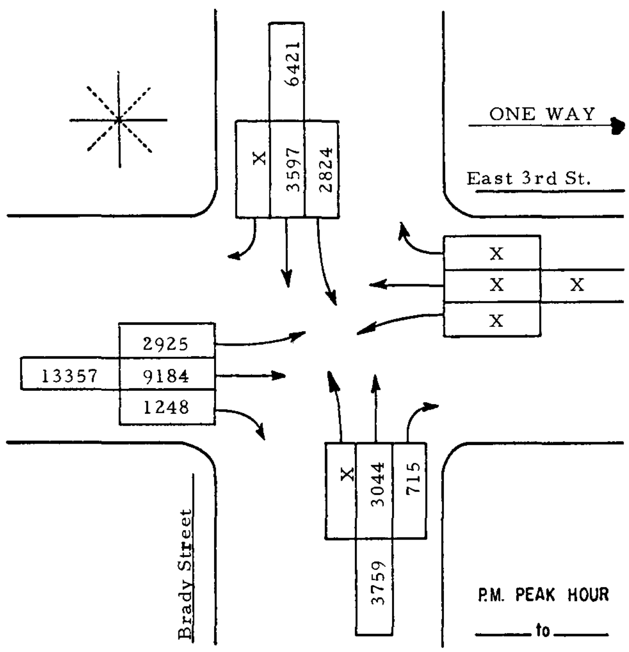
115

INTERSECTION East 4th Street AND Brady Street (U. S. 61)
DATE 1966 AADT DAY
WEATHER CITY Davenport



116

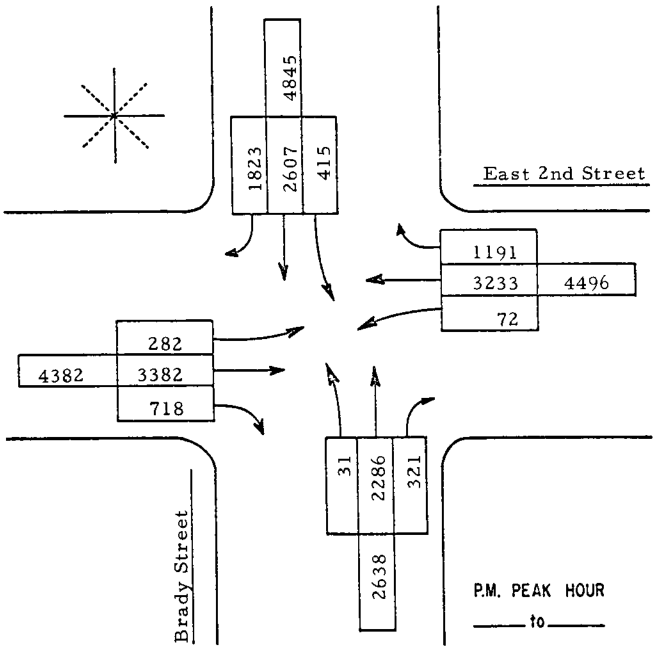
INTERSECTION East 3rd Street AND Brady St. (U. S. 61)
DATE 1966 AADT DAY
WEATHER CITY Davenport



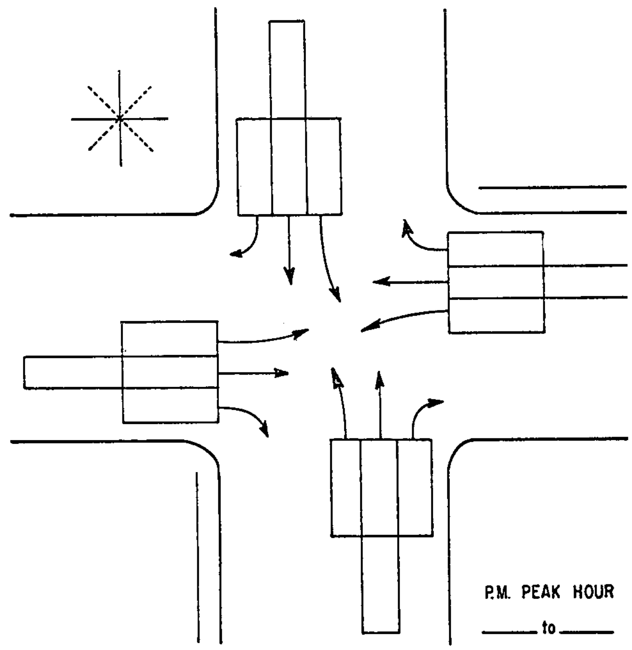
INTERSECTION VOLUME COUNT

117

INTERSECTION East 2nd Street AND Brady Street (U. S. 61)
DATE 1966 AADT DAY
WEATHER CITY Davenport

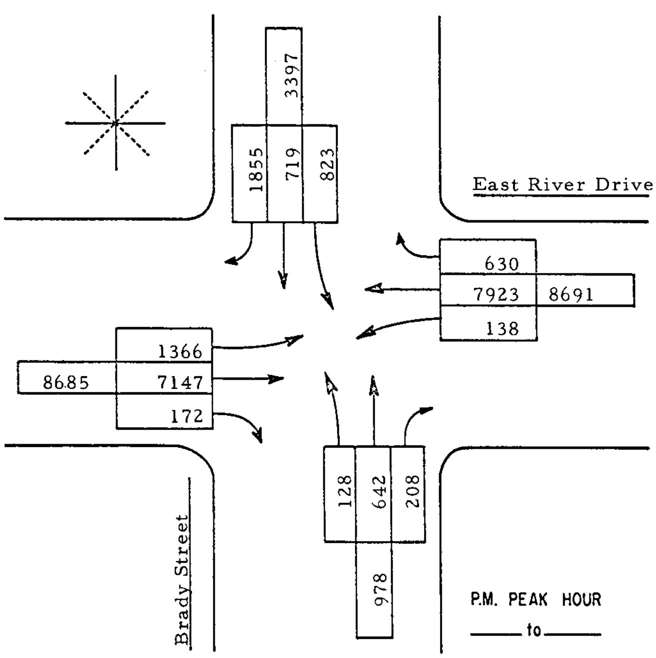


INTERSECTION AND
DATE DAY
WEATHER CITY



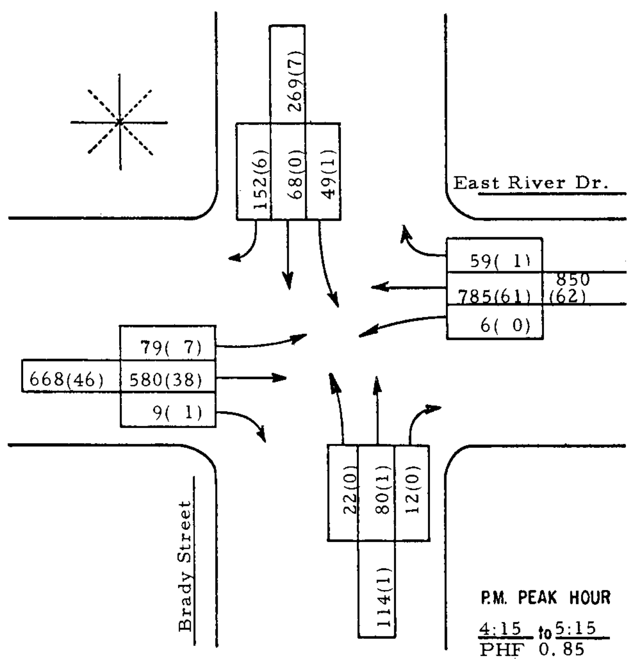
118

INTERSECTION East River Drive (U. S. 61, U. S. 67) AND Brady Street (U. S. 61)
DATE 1966 AADT DAY
WEATHER CITY Davenport



18-C

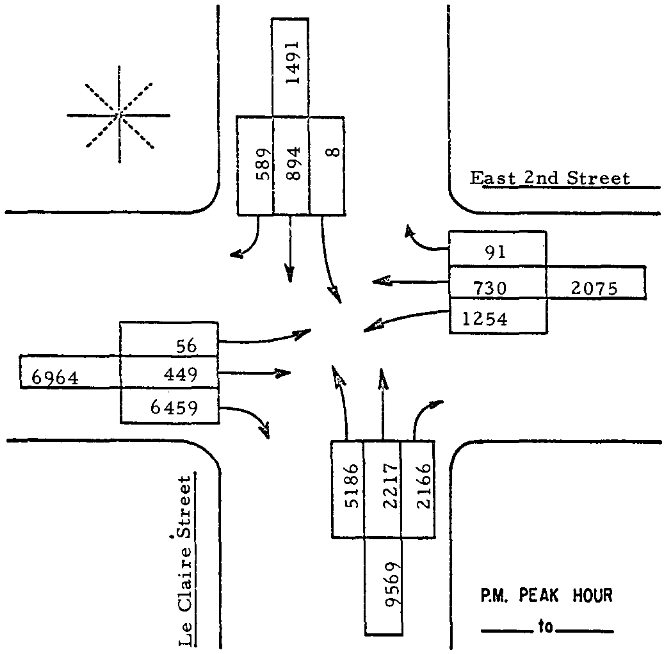
INTERSECTION East River Drive (U. S. 61, U. S. 67) AND Brady St. (U.S. 61)
DATE November 7, 1966 DAY Monday
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

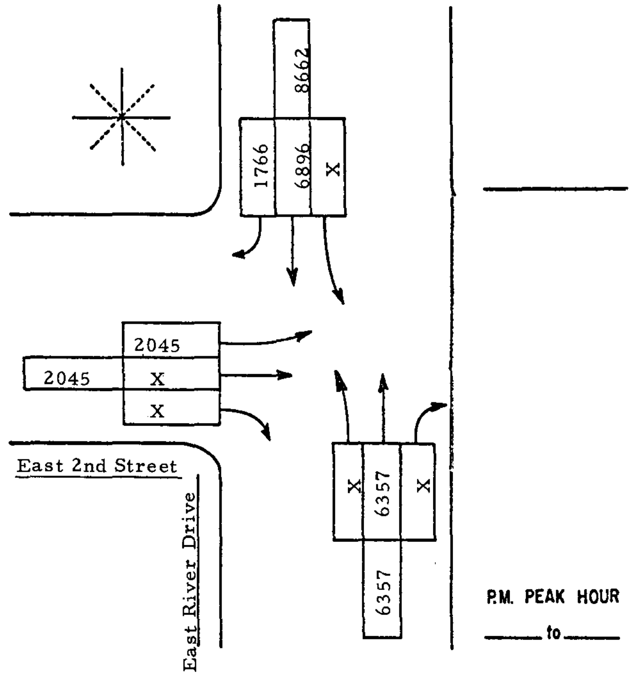
119

INTERSECTION East 2nd Street AND LeClaire Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



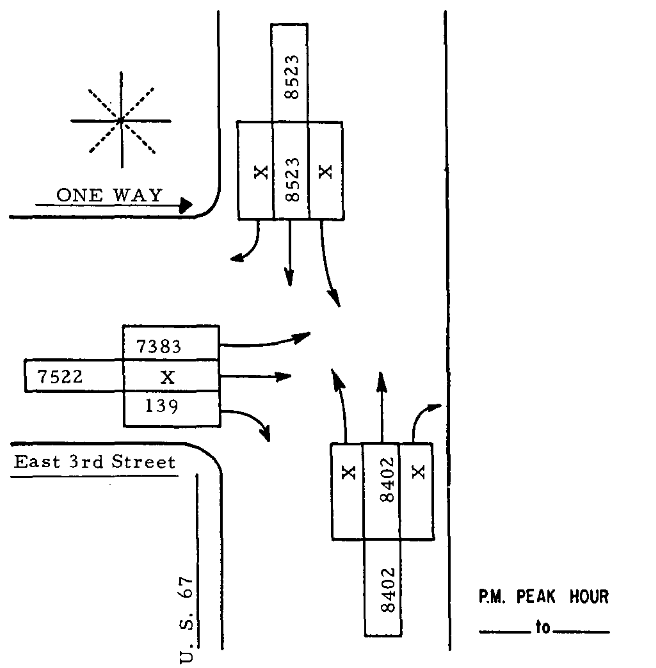
120

INTERSECTION East 2nd Street AND East River Drive (U. S. 67)
DATE 1966 AADT DAY
WEATHER CITY Davenport



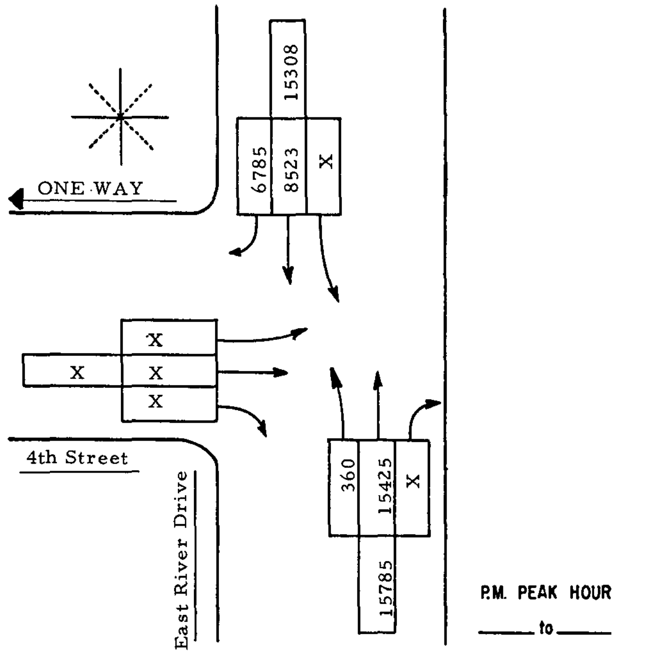
121

INTERSECTION East 3rd Street AND East River Drive (U. S. 67)
DATE 1966 AADT DAY
WEATHER CITY Davenport



122

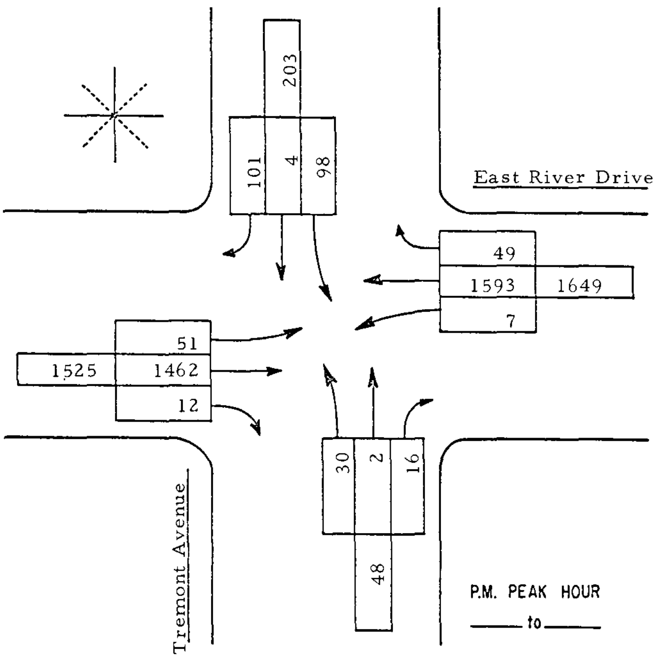
INTERSECTION East 4th Street AND East River Drive (U. S. 67)
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

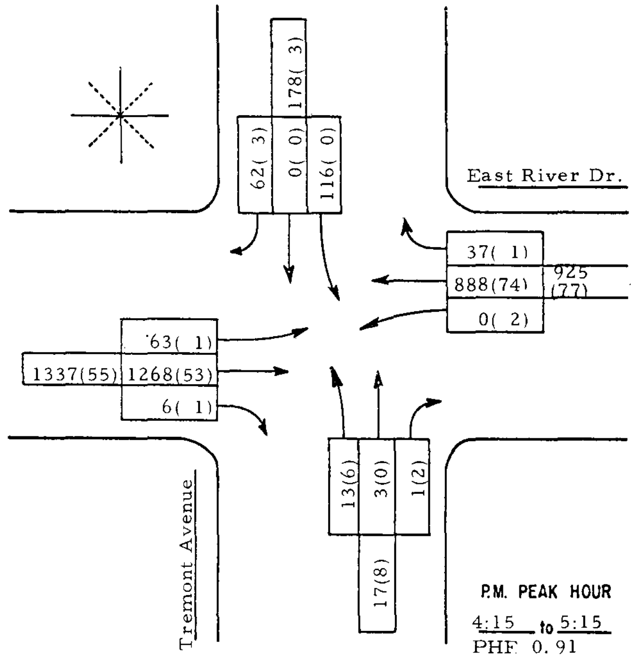
123

INTERSECTION E. River Dr. (U.S.67) AND Tremont Avenue
DATE 1966 AADT DAY
WEATHER CITY Davenport



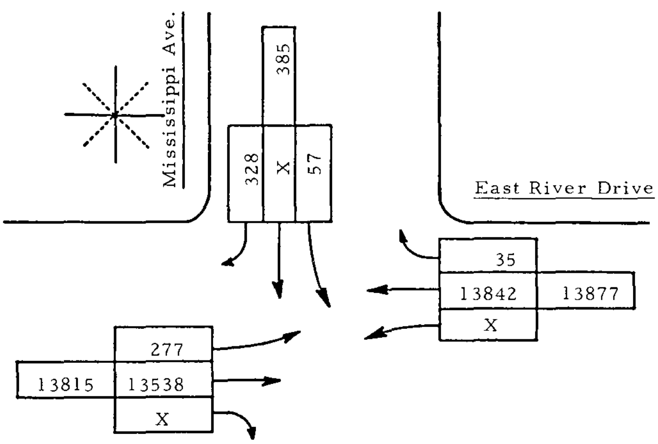
23-C

INTERSECTION E. River Dr. (U.S.67) AND Tremont Avenue
DATE November 1, 1966 DAY Tuesday
WEATHER CITY Davenport



124

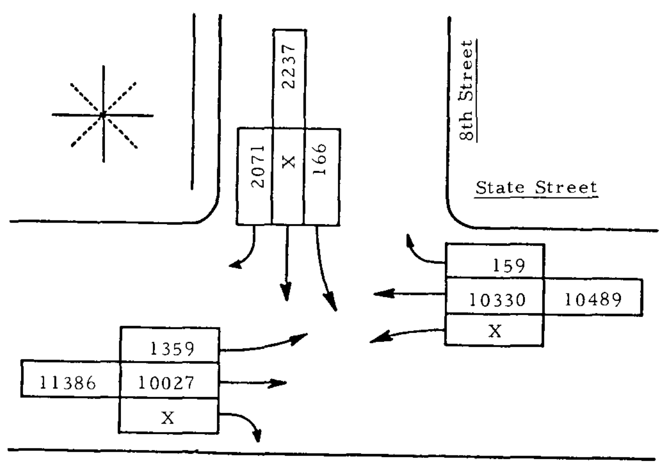
INTERSECTION East River Drive (U.S. 67) AND Mississippi Avenue
DATE 1966 AADT DAY
WEATHER CITY Davenport



P.M. PEAK HOUR
to

125

INTERSECTION State Street (U.S. 67) AND 8th Street
DATE 1966 AADT DAY "
WEATHER CITY Bettendorf

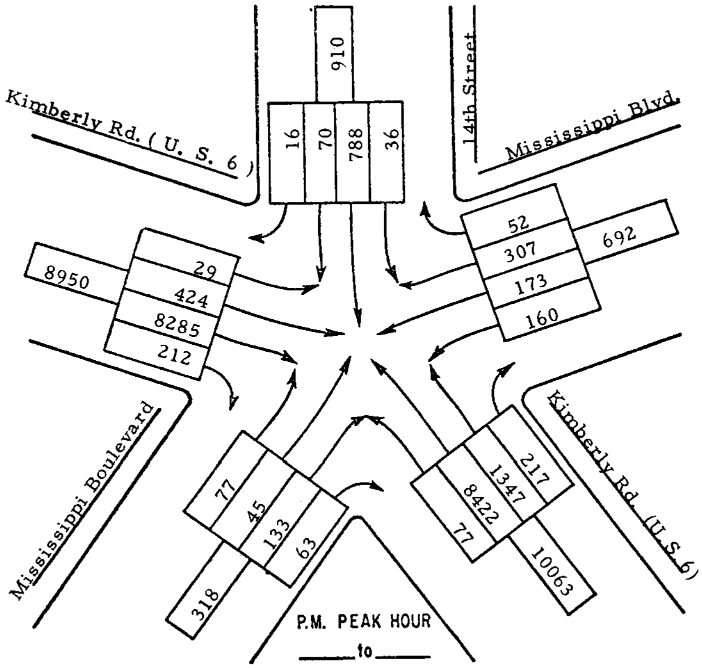


P.M. PEAK HOUR
to

INTERSECTION VOLUME COUNT

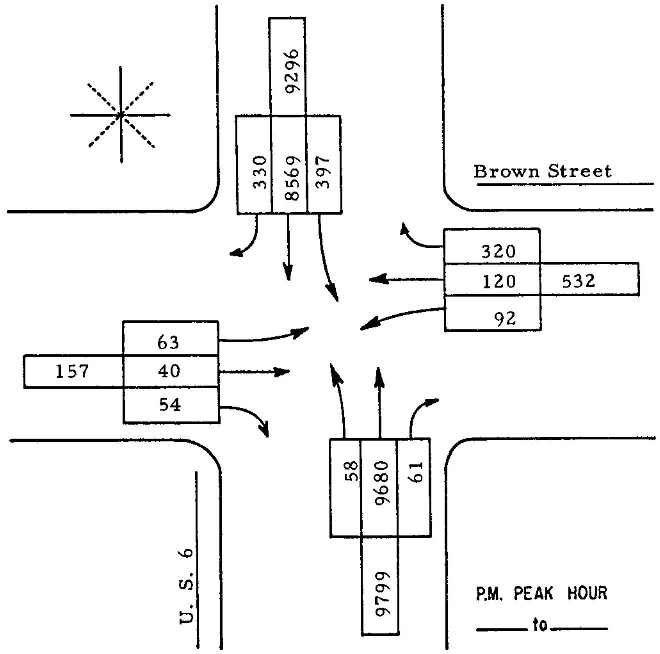
126

INTERSECTION: Mississippi Boulevard / 14th Street AND Kimberly Road (U.S. 6)
DATE: 1966 AADT DAY:
WEATHER: CITY: Bettendorf



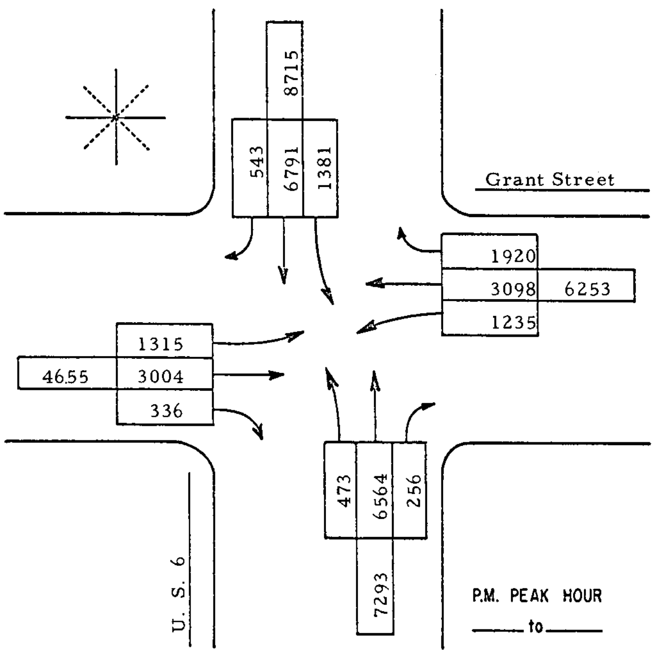
127

INTERSECTION: Brown Street AND 14th Street (U. S. 6)
DATE: 1966 AADT DAY:
WEATHER: CITY: Bettendorf

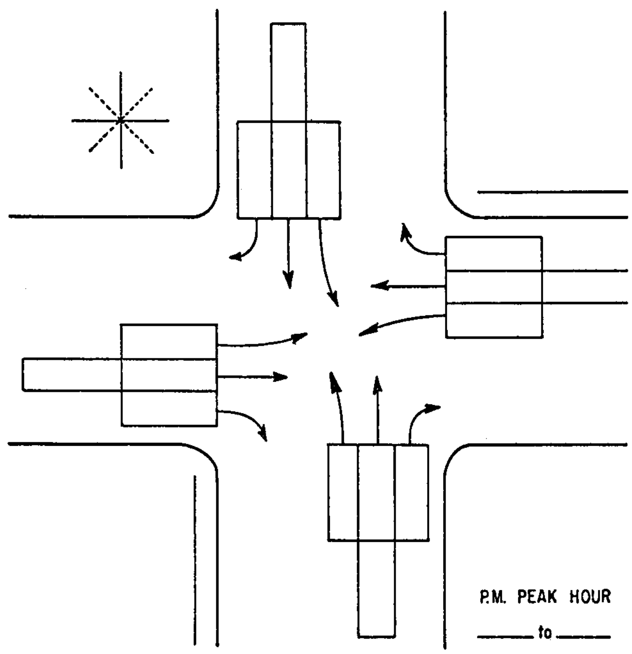


128

INTERSECTION: Grant Street AND 14th Street (U. S. 6)
DATE: 1966 AADT DAY:
WEATHER: CITY: Bettendorf



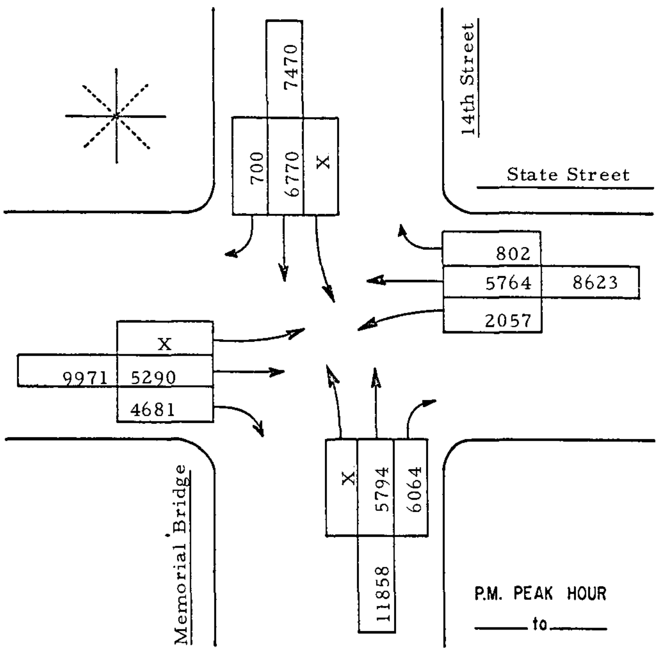
INTERSECTION: AND
DATE: DAY:
WEATHER: CITY:



INTERSECTION VOLUME COUNT

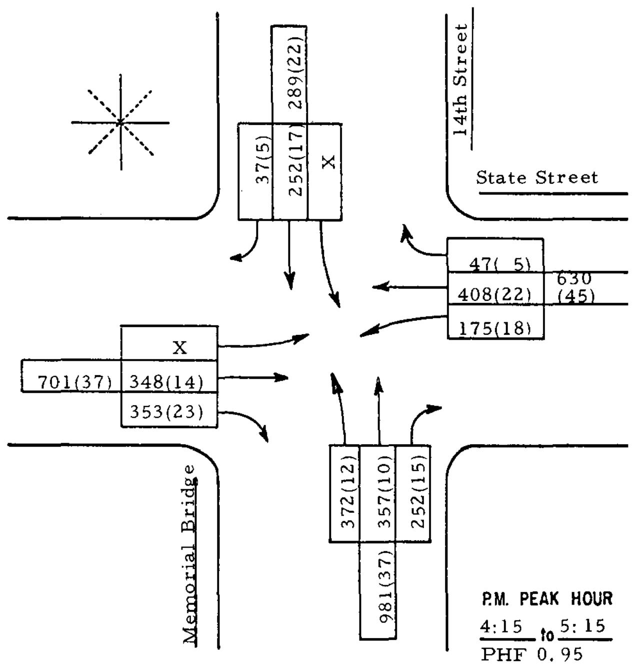
129

INTERSECTION State Street(U. S. 67) AND 14th Street (U. S. 6)
DATE 1966 AADT DAY
WEATHER CITY Bettendorf



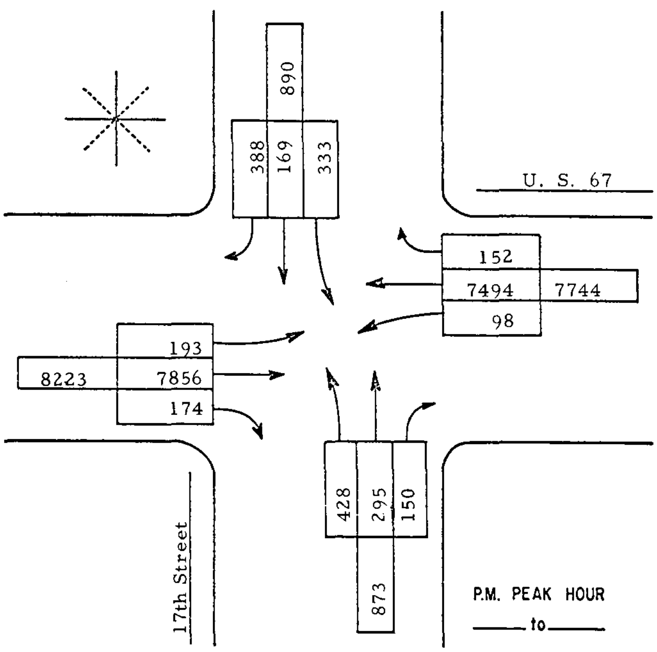
29-C

INTERSECTION State Street(U. S. 67) AND 14th Street(U. S. 6)
DATE November 9, 1966 DAY Wednesday
WEATHER CITY Bettendorf



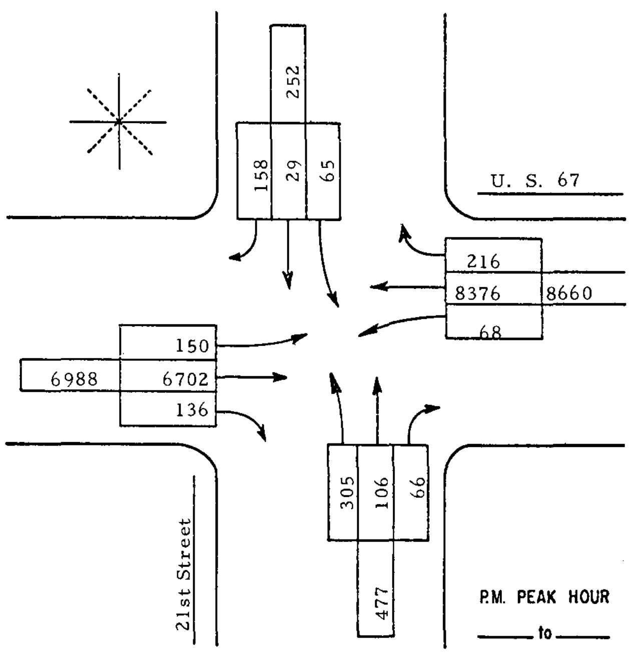
130

INTERSECTION State Street(U. S. 67) AND 17th Street
DATE 1966 AADT DAY
WEATHER CITY Bettendorf



131

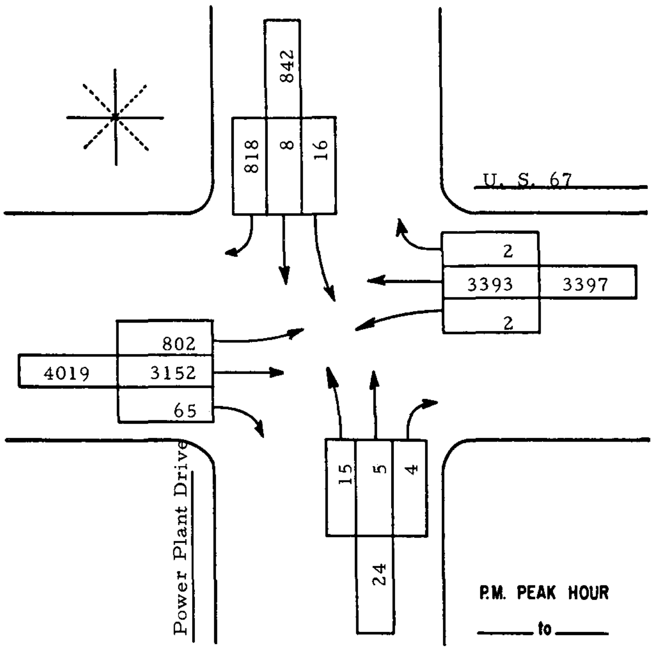
INTERSECTION State Street(U. S. 67) AND 21st Street
DATE 1966 AADT DAY
WEATHER CITY Bettendorf



INTERSECTION VOLUME COUNT

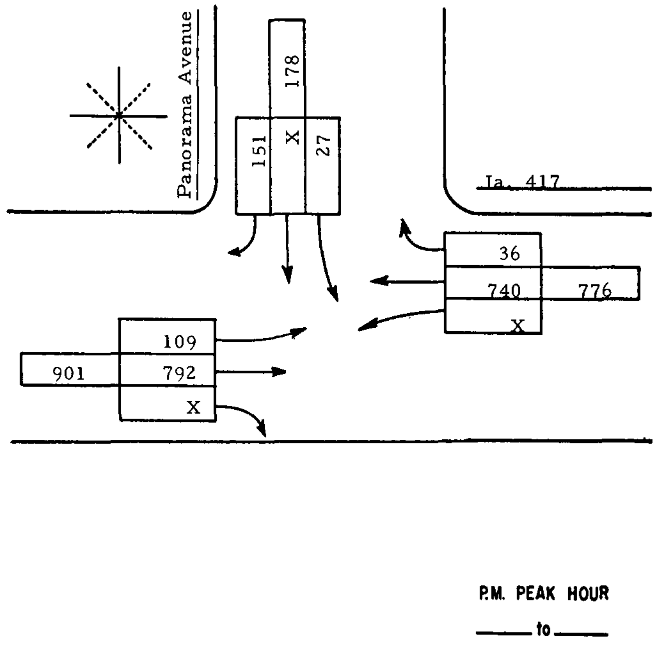
136

INTERSECTION U. S. 67 AND Ia. 417
DATE 1966 AADT DAY
WEATHER CITY Riverdale



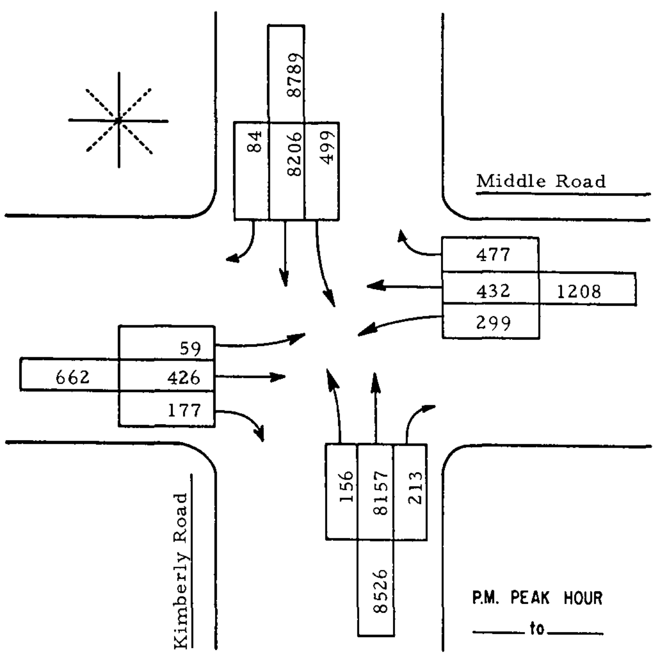
137

INTERSECTION Ia. 417 AND Panorama Avenue
DATE 1966 AADT DAY
WEATHER CITY Panorama Park



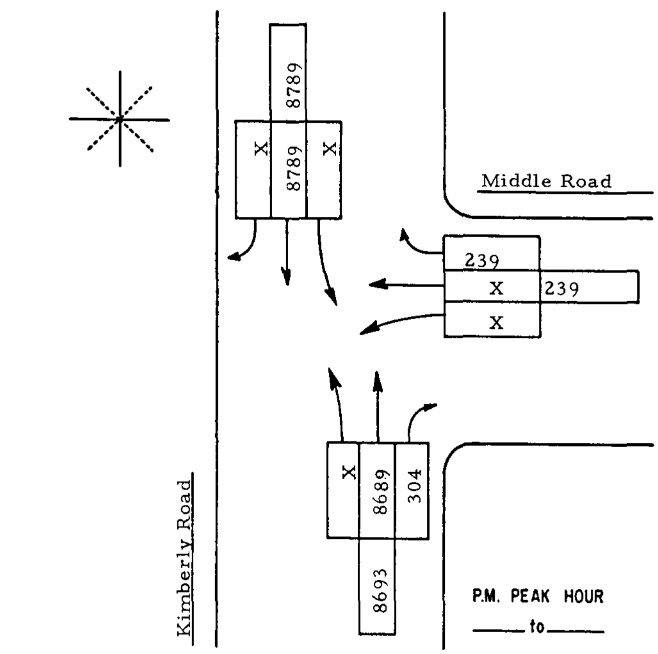
138

INTERSECTION Kimberly Road (U. S. 6) AND Lincoln Road
DATE 1966 AADT DAY
WEATHER CITY Bettendorf



139

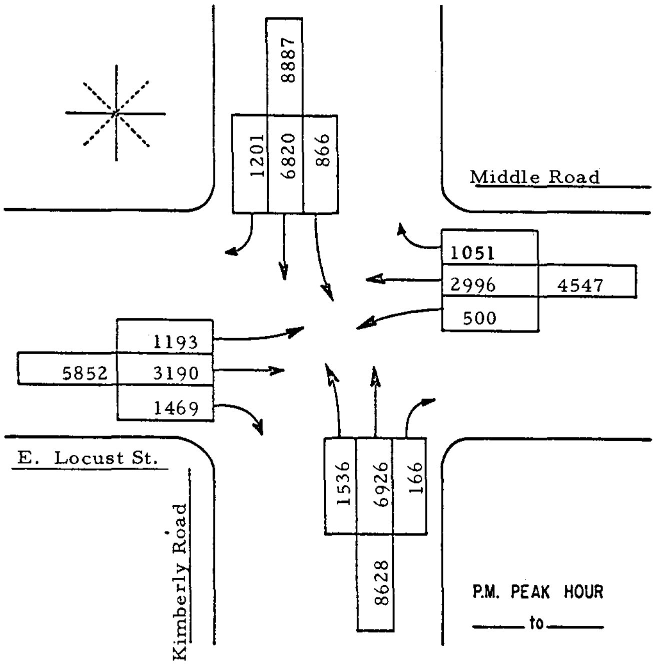
INTERSECTION Kimberly Road (U. S. 6) AND Middle Road
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

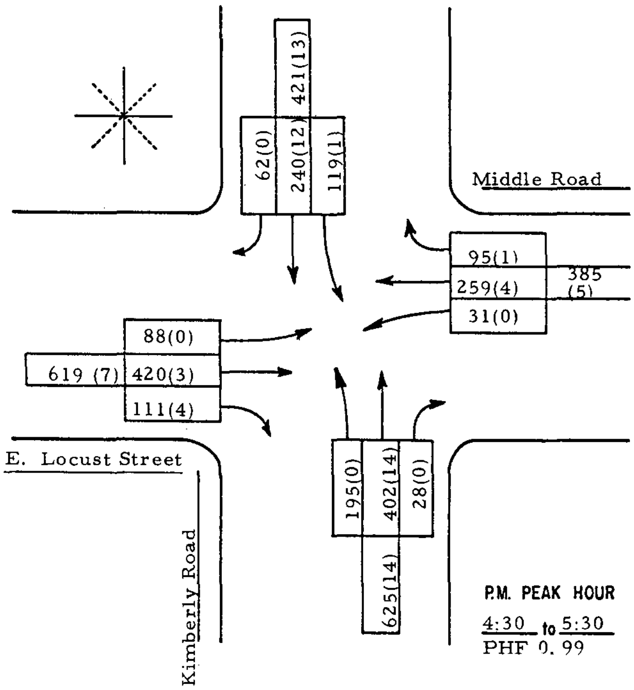
140

INTERSECTION East Locust Street, Middle Road AND Kimberly Road (U. S. 6)
DATE 1966 AADT DAY
WEATHER CITY Davenport



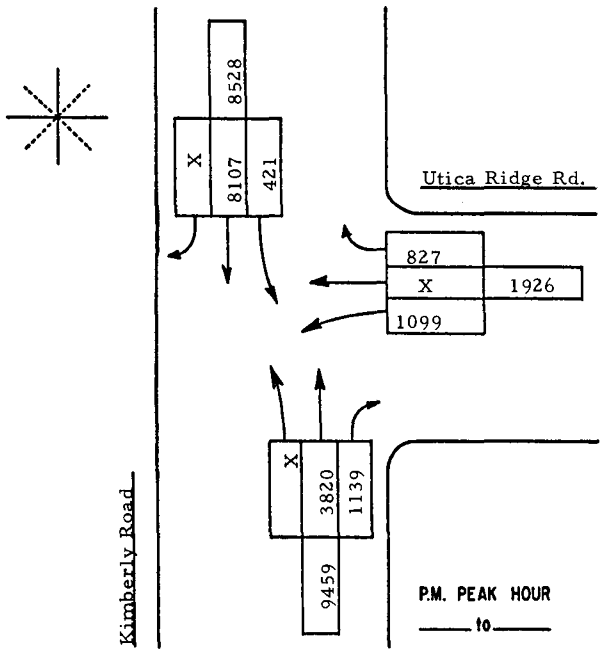
40-C

INTERSECTION East Locust Street, Middle Road . AND Kimberly Road (U. S. 6)
DATE November 7, 1966 DAY Monday
WEATHER CITY Davenport



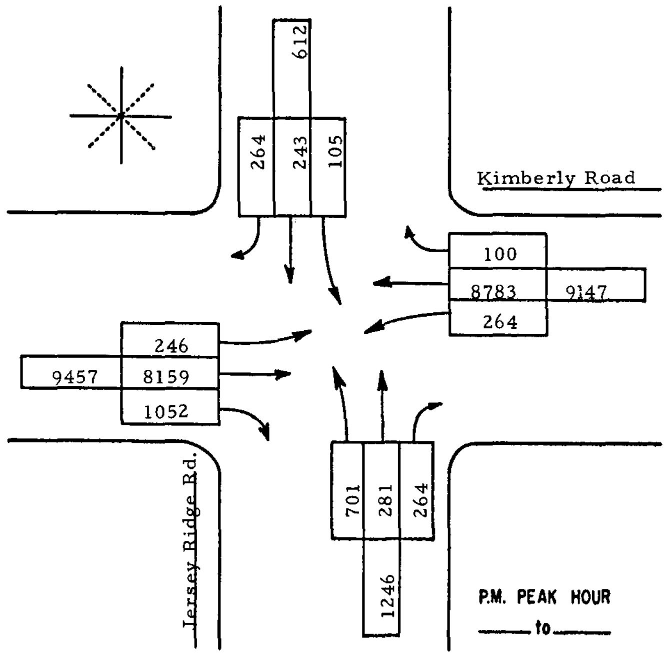
141

INTERSECTION Kimberly Rd. (U.S. 6) AND Utica Ridge Road
DATE 1966 AADT DAY
WEATHER CITY Davenport



142

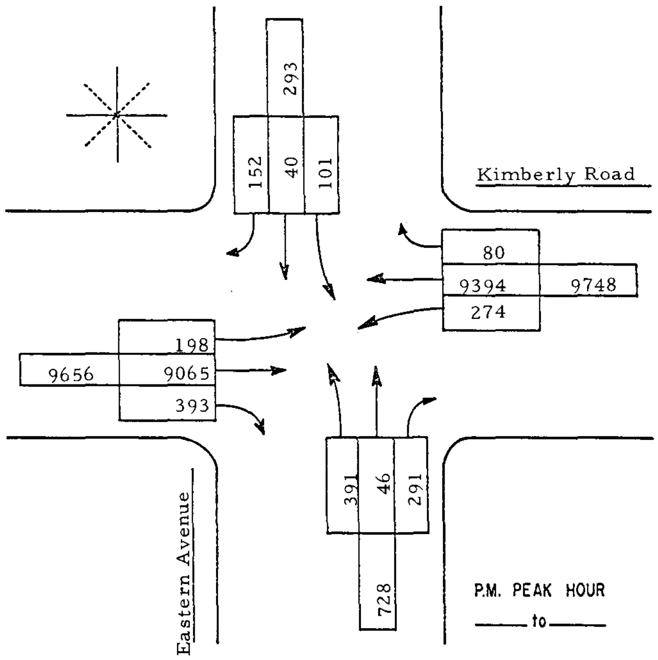
INTERSECTION Kimberly Rd. (U. S. 6) AND Jersey Ridge Road
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

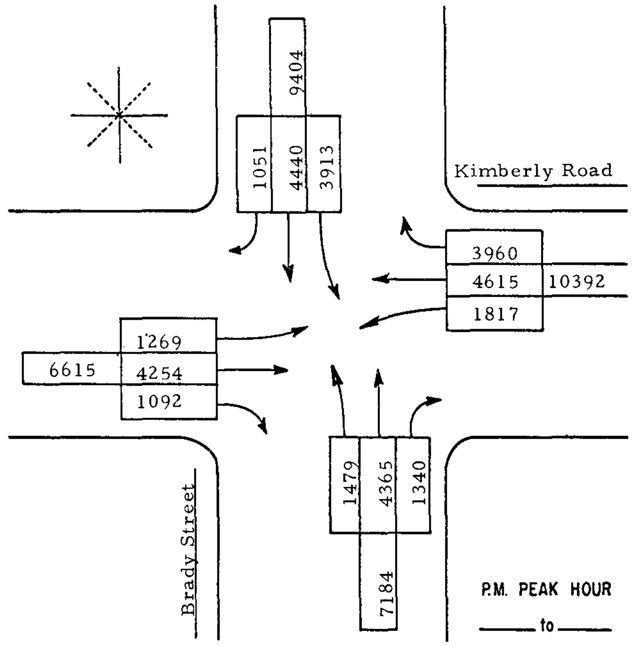
143

INTERSECTION Kimberly Road (U.S. 6) AND Eastern Avenue
DATE 1966 AADT DAY
WEATHER CITY Davenport



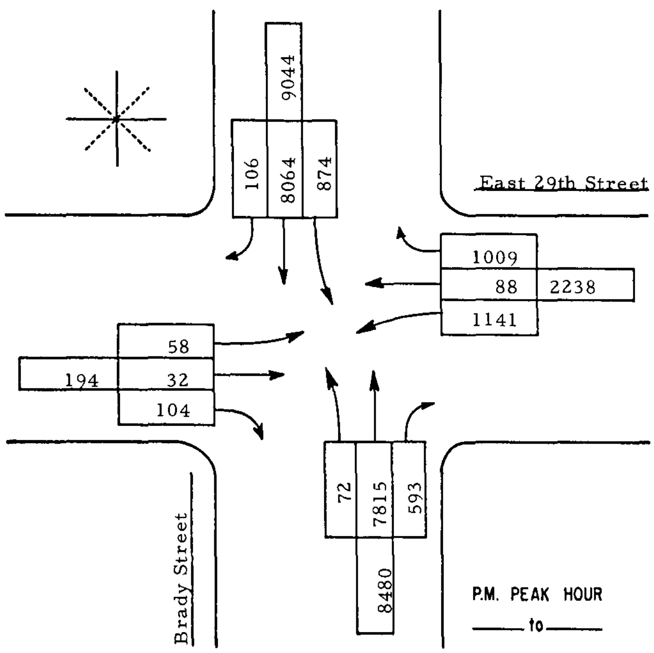
144

INTERSECTION Kimberly Rd. (U.S. 6) AND Brady St. (U.S. 61)
DATE 1966 AADT DAY
WEATHER CITY Davenport



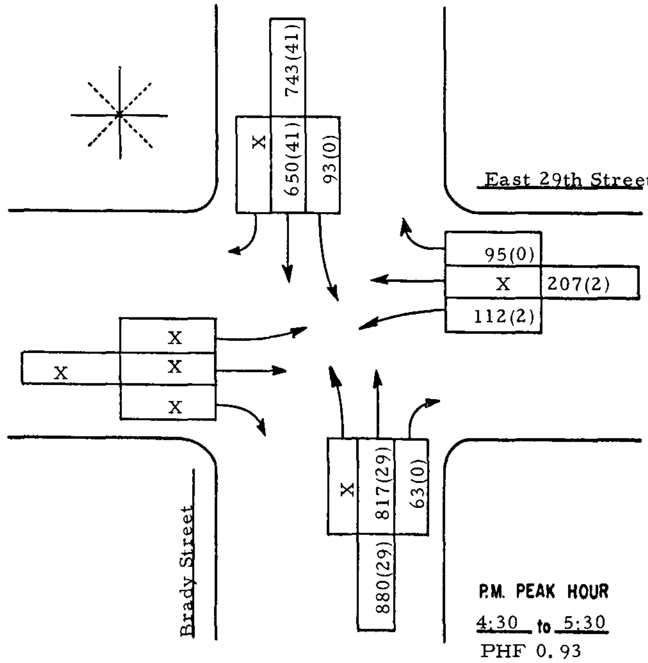
145

INTERSECTION Brady St. (U. S. 61) AND East 29th Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



45-C

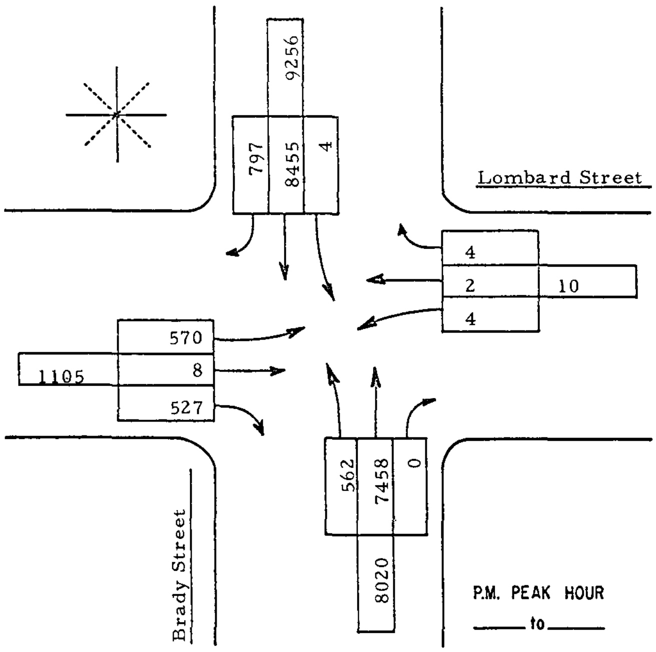
INTERSECTION Brady St. (U. S. 61) AND East 29th Street
DATE October 25, 1966 DAY Tuesday
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

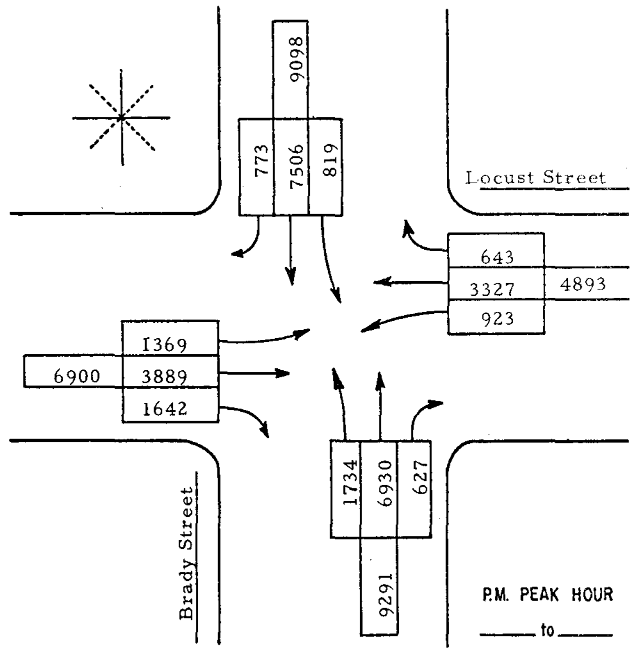
146

INTERSECTION Brady Street (U.S. 61) AND Lombard Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



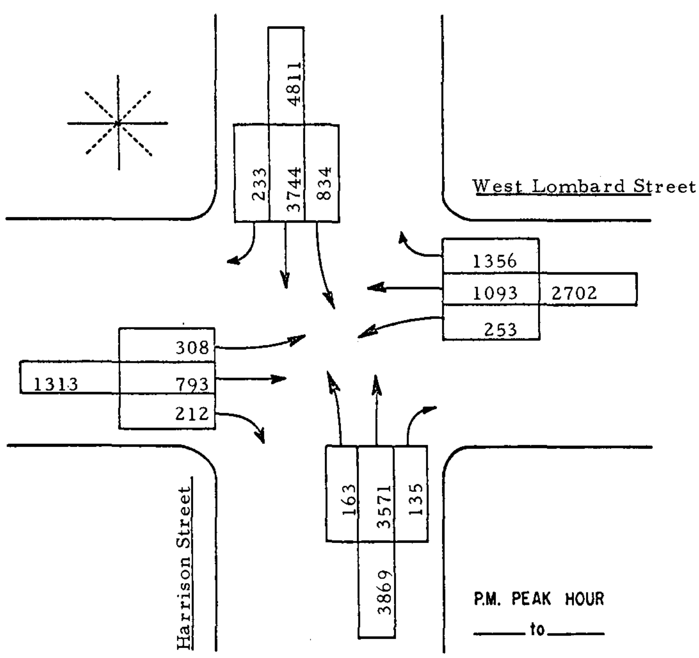
147

INTERSECTION Brady Street(U. S. 61) AND Locust Street
DATE 1966 AADT DAY
WEATHER CITY Davenport

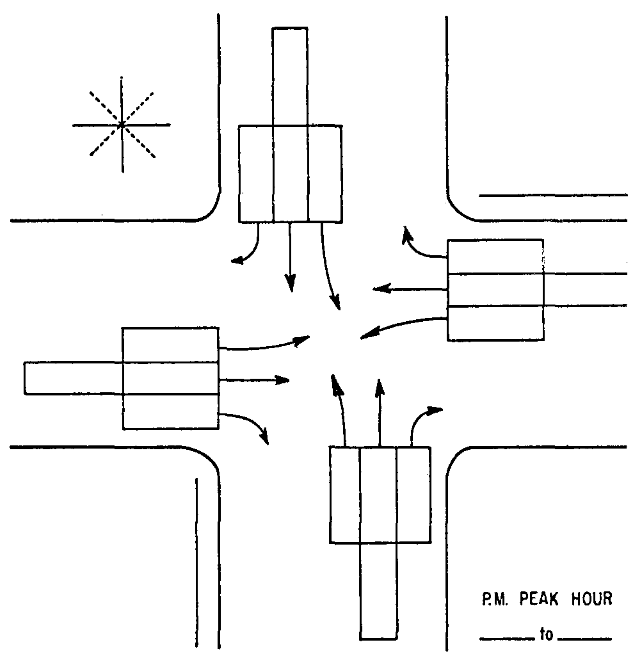


148

INTERSECTION Harrison St. (Ia. 150) AND West Lombard Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



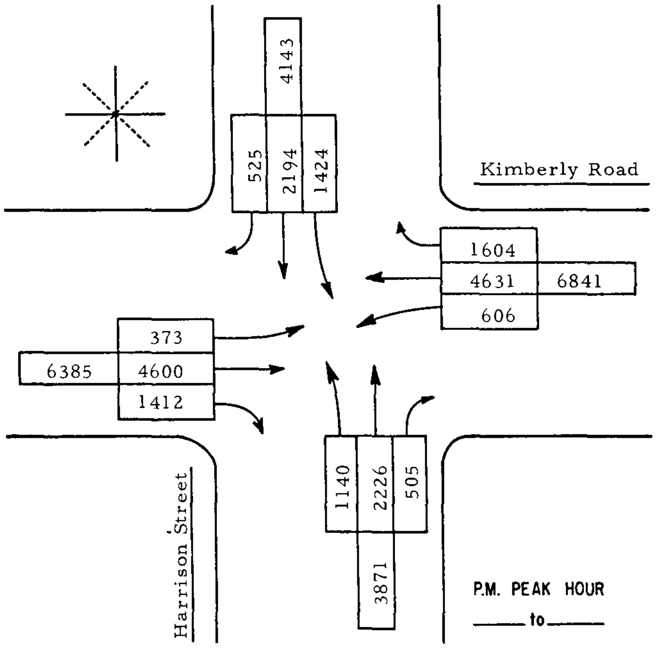
INTERSECTION AND
DATE DAY
WEATHER CITY



INTERSECTION VOLUME COUNT

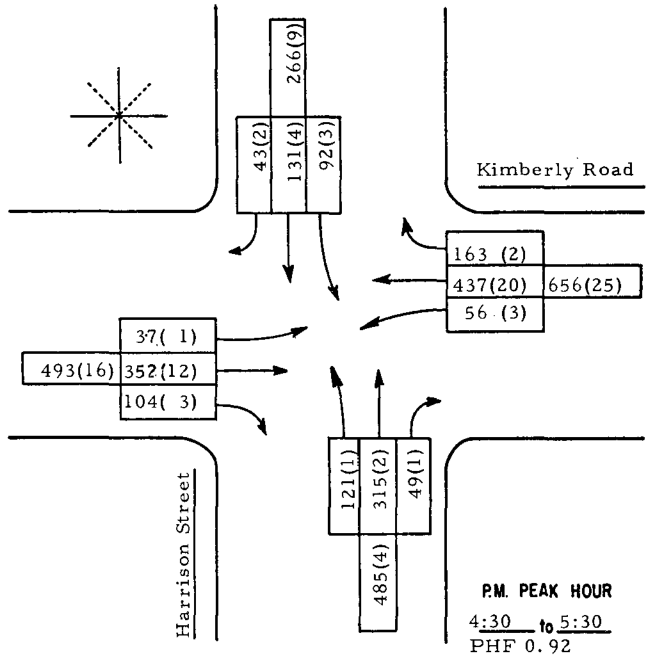
149

INTERSECTION Harrison St. (Ia. 150) AND Kimberly Road (U.S. 6)
DATE 1966 AADT DAY
WEATHER CITY Davenport



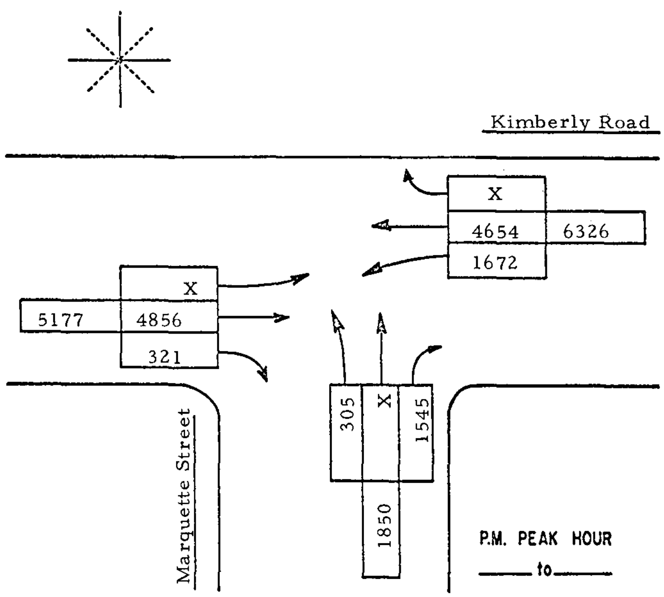
49-C

INTERSECTION Harrison St. (Ia. 150) AND Kimberly Road (U.S. 6)
DATE DAY
WEATHER CITY Davenport



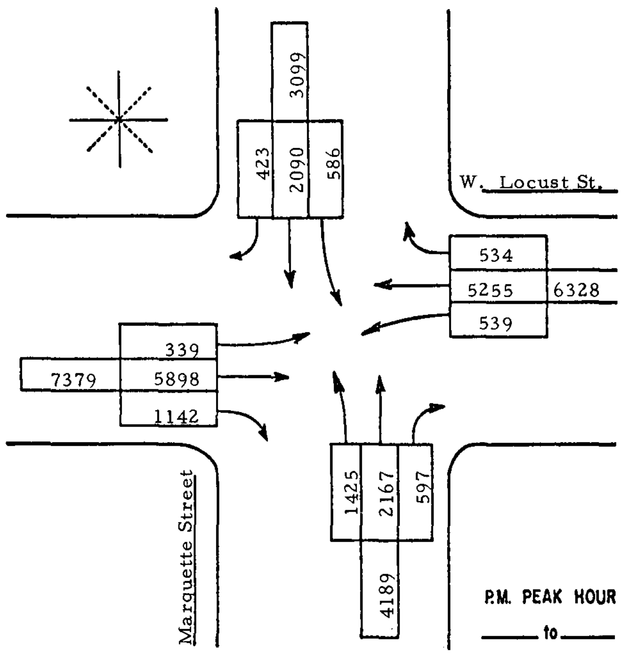
150

INTERSECTION Kimberly Rd. (U. S. 6) AND Marquette Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



151

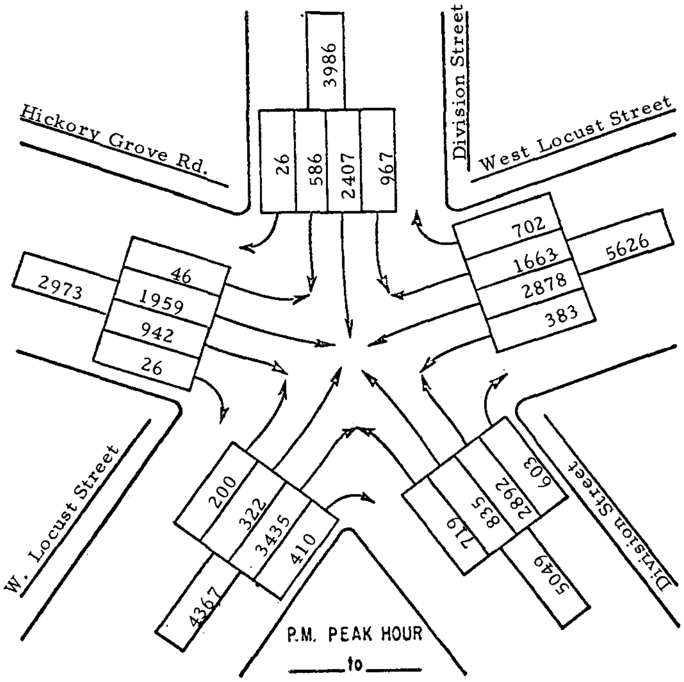
INTERSECTION West Locust Street AND Marquette Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION VOLUME COUNT

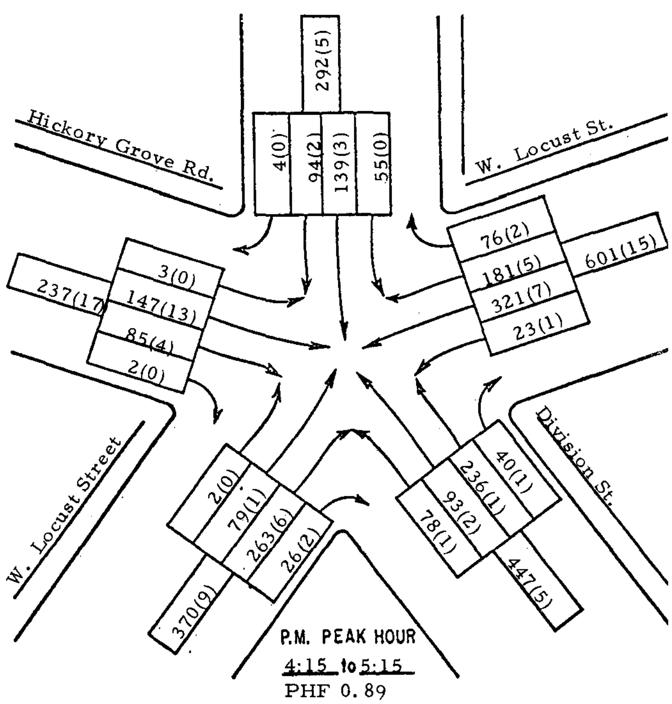
152

INTERSECTION West Locust Street, Division Street AND Hickory Grove Road
DATE 1966 AADT DAY
WEATHER CITY Davenport



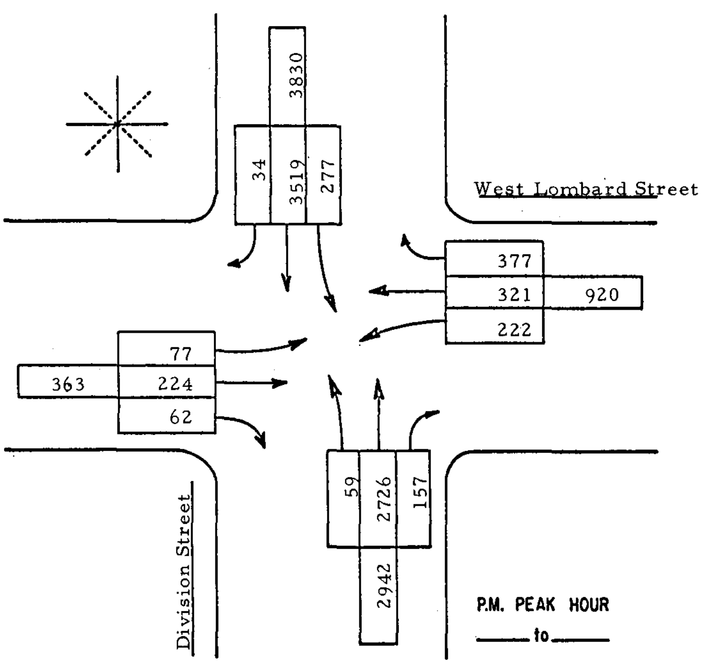
52-C

INTERSECTION West Locust Street, Division Street AND Hickory Grove Road
DATE November 2, 1966 DAY Wednesday
WEATHER CITY Davenport



153

INTERSECTION Division Street AND West Lombard Street
DATE 1966 AADT DAY
WEATHER CITY Davenport



INTERSECTION AND
DATE DAY
WEATHER CITY