A TRAFFIC ENGINEERING STUDY FOR FOREST CITY, IOWA

FEBRUARY, 1974

A

TRAFFIC ENGINEERING

STUDY

FOR

FOREST CITY, IOWA

FEBRUARY, 1974

I hereby certify that this study was prepared by me or under my direct supervision and that I am a duly registered engineer under the laws of the State of Iowa.

Robert F. Payer

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February, 1974

Mayor Roy Schram and the
Honorable Members of the City Council
Forest City, Iowa 50436

Gentlemen:

We are pleased to submit herewith the Forest City Traffic Study accomplished by our firm. It is hoped that this study will provide a sound basis for planning of future traffic and transportation projects for the city of Forest City.

This study is the result of approximately nine months of review and analysis of the city wide street network. It was accomplished in cooperation with the elected city officials, the director of public works, the city clerk and various other city employees. Acknowledgement is given to these people in helping to produce this study.

Respectfully submitted,

Robert F. Payer

Robert F. Payer
Project Engineer

RFP:pjh
Enclosure

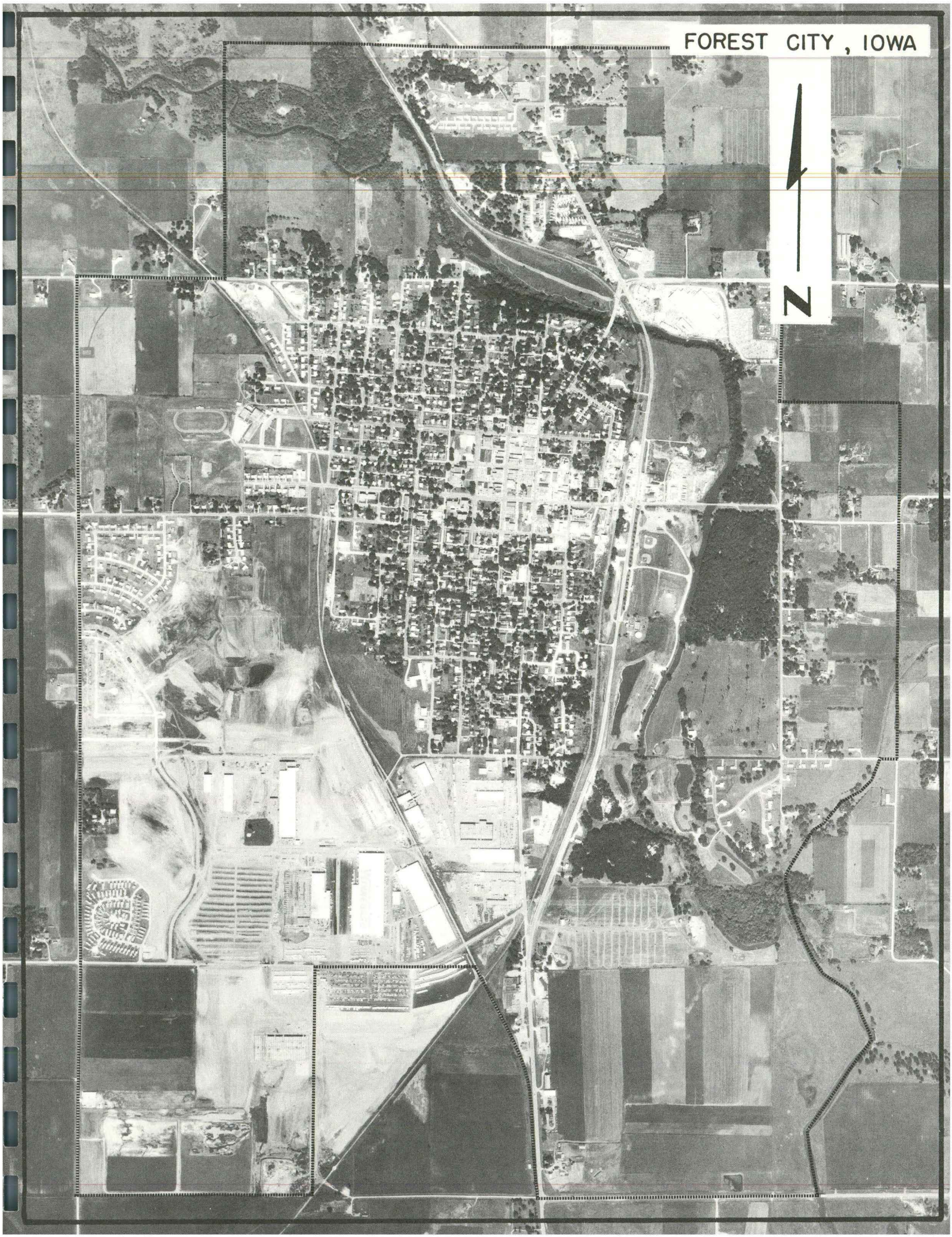
FOREST CITY OFFICIALS

FEBRUARY, 1974

Roy Schram, Mayor
Paul Oswald, Director of Public Works
David Nolton, Clerk

Councilmen
Jack Canady
Samuel Glime
Charles Langerud
Eugene Morris
Ivan Neilson
Calvin Peterson
Dr. Jack Soderling

This Study was prepared through a Grant provided by the United States Department of Transportation, Federal Highway Administration pursuant to the provisions of Section 402 of Title I of The Highway Safety Act of 1966. The Study was administered by the Iowa State Highway Commission under Safety Number 37-00-13CD-017.


FOREST CITY, IOWA
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INTRODUCTION

A. INTRODUCTION

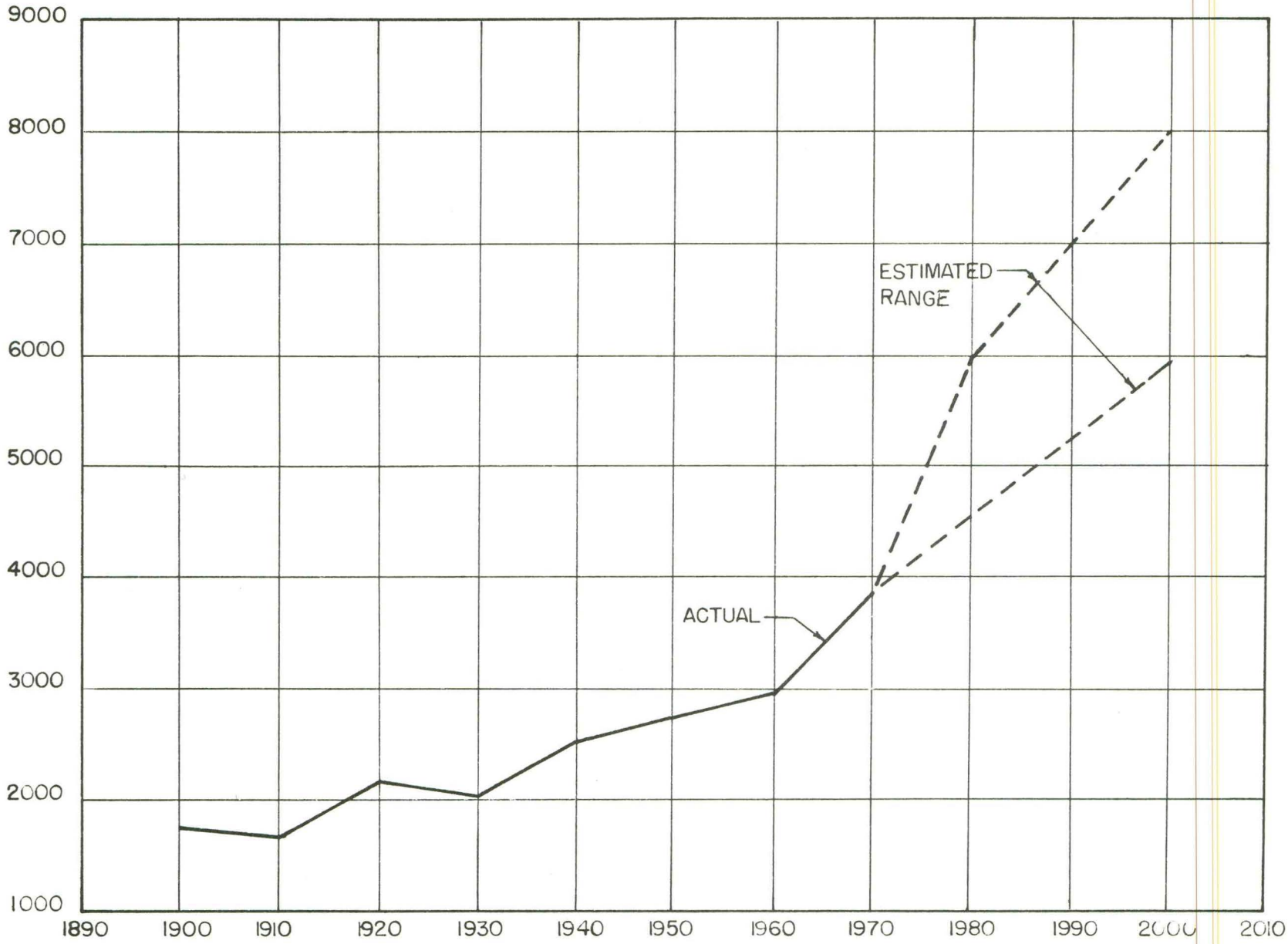
Forest City is located in north central Iowa with portions of the community in both Winnebago and Hancock counties. It lies about 120 miles south of Minneapolis and 120 miles north of Des Moines, being located approximately midway between the two. It is also about 25 miles northwest of Mason City, the nearest urban area of greater than 25,000 population.

Transportation systems serving the community include primary highways U.S. 69 to the north and south and Iowa 9 to the east. Two railroads, the Chicago Northwestern and the Chicago Rock Island and Pacific, have tracks through the city. An airport utilized by light private and commercial traffic is located to the southeast of the city.

Forest City is the home of Waldorf College, a two-year junior college with an average enrollment of 536 for the 1972-73 school year. Forest City is also the county seat of Winnebago County. The college facilities and the county courthouse are located adjacent to each other near the center of the community to the south and west of the Central Business District.

The population of Forest City has exhibited a growing trend over the last forty years after some fluctuation in the three decades from 1900 to 1930. (See Figure 1) The rapid increase in the past several years is attributable to the corresponding rapid expansion of the city's major industry, Winnebago Motor Homes. The estimated future populations are given as a range and depend somewhat on whether the industrial growth of the area can be sustained.

With the growth of the city, there has been a corresponding growth in the vehicular travel on the city's streets. The Central Business



POPULATION TRENDS — FOREST CITY, IOWA

SOURCE: WINNEBAGO COUNTY COMPREHENSIVE PLAN-1973[1]

FIGURE NO. 1

District (CBD) must now also provide more access and parking for the expanded city population. The corresponding increase in traffic has to some extent overloaded portions of the city's street system, with the resulting congestion, delays and accident problems.

B. PURPOSE OF THE STUDY

Recognizing the need to define and correct the deficiencies to be found within the city's street network, a traffic engineering study of the city, with emphasis on the arterial streets and the Central Business District, was conducted under a federal grant authorized by the Highway Safety Act of 1966.

This report presents the results and conclusions found during the above mentioned study. It will summarize the existing street system, deficient areas, recommended changes, estimated costs of improvements and include a schedule for implementation.

STUDY PARAMETERS

A. METHOD OF STUDY

The basic method employed in this study was to determine the traffic flow on the present street system, to inventory the characteristics of the existing streets and to summarize the occurrence of accidents by location, with the above then being compared and contrasted to determine deficient areas.

The determination of the traffic flow was accomplished by counting the movements made into and through thirty (30) intersections located throughout the city. Physical characteristics determined included street widths, surface types and existing traffic control devices. Parking in the Central Business District (CBD) was studied as to the extent it applies to traffic flow and accident causation. Accident files were searched back through 1969 in an effort to ascertain locations with (1) a high number of accidents and (2) a pattern of similar type accidents. In addition, the municipal code for Forest City was researched for authority to establish traffic controls, applicability or ordinances to existing traffic conditions and the possibility of changes that would enhance traffic flow on the city streets.

B. PHYSICAL CHARACTERISTICS AND CONTROL OF THE EXISTING STREET SYSTEM

The widths and surface types and the traffic control devices existing on the street system were inventoried. Their adequacy for the volumes arrived at from the manual counts and distribution of flow was then determined in the analysis portion of the study.

1. Roadway Width

Roadway widths for all streets within the urban limits were measured. Since the streets in the network range in size, they were divided into groups in increments of width to simplify the width-volume comparison and to enable presentation with more clarity. The roadway widths found during the spring of 1973 are shown on Plate 1.

2. Surface Types

The type of surface for all streets on the Forest City system were classified as to having a graveled surface, some form of bituminous treatment, or of Portland cement concrete construction. The details of the street's surface were gathered in conjunction with the roadway widths mentioned above. The type of surface found for each street is shown on Plate 2.

3. Traffic Control Devices

The existing traffic control devices were inventoried as to type and location. Traffic control devices are broken down into three basic categories depending on their function. These are functions to regulate, to

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GRAPHIC SCALE

RIVER
WINNEBAGO
CHICAGO NORTHWESTERN R R
U S 69 & IOWA 9
CHICAGO ROCK ISLAND & PACIFIC R R
WOODLAND DR
PLEASANT
SWEET GRASS LANE
ROAD B
HALVERSON ST
IOWA NO 9
OAKRIDGE DRIVE
HILLHAVEN DRIVE
CORPORATE LIMITS
COURT HOUSE
CENTRAL
PARK ST
U S NO 69
SPRING VALLEY ROAD
OAKRIDGE DRIVE
SUNLAND COURT
SUNLAND WAY
WESTGATE DRIVE
CRESTHAVEN COURT
WINNEBAGO
STONEBRIDGE DRIVE
WESTHAVEN COURT
WESTHAVEN DRIVE
INDIAN AVENUE
WINNEBAGO COUNTY
HANCOCK COUNTY
COUNTY GRAVEL ROAD
GREENFIELD ESTATE MOBILE HOME COURT
B 14
JOINT ASPHALT ROAD
CHICAGO NORTHWESTERN R R
CHICAGO ROCK ISLAND & PACIFIC R R
OAKMONT SOUTH
OAKMONT NORTH
FAIRVIEW DRIVE
DELWOOD DRIVE
RIVER
WINNEBAGO

LEGEND
25' or Less
26' to 35'
36' to 45'
46' or More

EXISTING STREET WIDTHS

FOREST CITY, IOWA

Plate No. 1

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GRAPHIC SCALE

RIVER
WINNEBAGO
CHICAGO NORTHWESTERN R R
CHICAGO ROCK ISLAND & PACIFIC R R
U S NO 69
IOWA NO 9
WOODLAND DR
PHEASANT
SWEET GRASS LANE
ROAD B
HALVERSON
CORPORATE LIMITS
OAKRIDGE DRIVE
HILLHAVEN DRIVE
COURT HOUSE
CENTER
MAIN
SPRING VALLEY ROAD
OAKRIDGE DRIVE
SUNLAND COURT
SUNLAND WAY
WESTGATE DRIVE
CRESTHAVEN COURT
WINNEBAGO
STONEBRIDGE DRIVE
WESTHAVEN COURT
WESTHAVEN DRIVE
INDIAN AVENUE
WINNEBAGO COUNTY
HANCOCK COUNTY
COUNTY JAIL
GREENFIELD ESTATE MOBILE HOME COURT
ASPHALT ROAD
OAKMONT SOUTH
OAKMONT NORTH
FAIRVIEW DRIVE
BELLWOOD DRIVE
RIVER
WINNEBAGO

LEGEND
BITUMINOUS
GRAVEL
CONCRETE

EXISTING STREET SURFACES

FOREST CITY, IOWA

Plate No. 2

warn or to guide. The Uniform Manual of Traffic Control Devices[2] states:

> "Traffic signs shall be placed only by the authority of a public body or official having jurisdiction, for the purpose of regulating, warning or guiding traffic."

The Manual[2] further states:

> "The basic requirements of a highway sign are that it be legible to those using it and that it be understood in time to permit a proper response. This means high visibility, lettering or symbols of adequate size, and a short legend for quick comprehension by a driver approaching a sign at high speed. Standardized colors and shapes are specified so that the several classes of traffic signs can be promptly recognized. Simplicity and uniformity in design, position, and application are important."

This study confined itself primarily to the adequacy of the existing regulatory signs; and, more specifically, to the YIELD and STOP sign conditions. There were 104 STOP locations and 71 YIELD locations found during the inventory. Many of the signs were nonconforming to the existing Manual[2], either in placement or in coloring; however, specific recommendations were confined to function in this study. An inventory of nonconforming signs was beyond the scope of this study.

The Manual[2] states that a STOP sign may be warranted at an intersection when one or more of these conditions are present:

> "1. Intersection of a less important road with a main road where application of the normal right-of-way is unduly hazardous.
> 2. Street entering a through highway or street.
> 3. Unsignalized intersection in a signalized area.
> 4. Other intersections where a combination of high speed, restricted view, and serious accident record indicates a need for control by the STOP sign."

There were eleven (11) four-way, or multi-way STOP intersections noted during the study. The locations are:

a. On Fourth, at Park and "L" Streets
b. On Clark, at "J" Street
c. On Sixth, at "G", "J", "K" and "L" Streets
d. On Seventh, at "J", "K" and "L" Streets
e. And the intersection of US 69 and Ia. 9.

The Manual[2] states that a multi-way STOP may be warranted by any of the following:

"1. Where traffic signals are warranted and urgently needed, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the signal installation.
2. An accident problem, as indicated by five or more repeated accidents of a type susceptible of correction by a multi-way stop installation in a 12-month period. Such accidents include right- and left-turn collisions as well as right-angle collisions.
3. Minimum traffic volumes:
   (a) The total vehicular volume entering the intersection from all approaches must average at least 500 vehicles per hour for any 8 hours of an average day, and
   (b) The combined vehicular and pedestrian volume from the minor street or highway must average at least 200 units per hour for the same 8 hours, with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the maximum hour, but
   (c) When the 85-percentile approach speed of the major street traffic exceeds 40 miles per hour, the minimum vehicular volume warrant is 70 percent of the above requirements."

YIELD signs are somewhat less severe, requiring a complete stop only when necessary to avoid interference with traffic on the street to which the subject vehicle is approaching. The Manual[2] gives the following warrants for YIELD signs:

"1. On a minor road at the entrance to an intersection where it is necessary to assign right-of-way to the major road, but where a stop is not necessary at all times, and where the safe approach speed on the minor road exceeds 10 miles per hour.
2. On the entrance ramp to an expressway where an acceleration lane is not provided.
3. Within an intersection with a divided highway, where a STOP sign is present at the entrance to the first roadway, and where the median width between the two roadways exceeds 30 feet.

4. Where there is a separate or channelized right-turn lane, without an adequate acceleration lane.
5. At any intersection where a special problem existing and where an engineering study indicates the problem to be susceptible to correction by use of the YIELD sign.

YIELD signs should not ordinarily be placed to control the major flow of traffic at an intersection. They should not be erected on the approaches of more than one of the intersecting streets or highways or used at any intersection where there are STOP signs on one or more approaches, except, under special circumstances, to provide minor movement control within complex intersections.

A YIELD sign should be erected in the same manner, at the point where the vehicle is to stop if necessary to yield the right-of-way. Where there is a marked crosswalk on the pavement, the sign should be erected approximately 4 feet in advance of the crosswalk line nearest to approaching traffic.

Where only one sign, STOP or YIELD, is used, it shall be on the right-hand side of the traffic lane to which it applies. At an intersection where a wide throat exists on the signed approach, observance of the sign may be improved by the erection of an additional sign on the left side of approach road, and by the use of a Stop line. Where two lanes of traffic are subject to the STOP sign, a second sign should be placed where it is visible to traffic in the inner lane. At certain channelized intersections, the additional sign may be effectively placed on a channelizing island. In no instance shall one STOP or YIELD sign be mounted above another on the same post.

Where two roads intersect at an acute angle, the STOP or YIELD sign should be positioned at an angle, or shielded, so that the message is out of view to traffic to which it does not apply."

The traffic control devices found during the study are shown on Plate 3.

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GRAPHIC SCALE 200 0 500 1000 1500

RIVER WINNEBAGO

CHICAGO NORTHWESTERN R R

CHICAGO ROCK ISLAND & PACIFIC R R

U S 69 & IOWA 9

WOODLAND DR

WOODLAND DR

PLEASANT

SWEET GRASS LANE

ROAD B

HALVERSON ST

HALVERSON ST

IOWA NO 9

OAKRIDGE DRIVE

HILLHAVEN DRIVE

CORPORATE LIMITS

U.S. NO 69

COURT HOUSE

CENTRAL

PARK ST

SPRING VALLEY ROAD

OAKRIDGE DRIVE

SUNLAND COURT

SUNLAND WAY

WESTGATE DRIVE

CRESTHAVEN COURT

WINNEBAGO

STONEBRIDGE DRIVE

WESTHAVEN COURT

WESTHAVEN DRIVE

INDIAN AVENUE

WINNEBAGO COUNTY
HANCOCK COUNTY

COUNTY GRAVEL ROAD

GREENFIELD ESTATE MOBILE HOME COURT

CONCRETE ASPHALT ROAD

OAKMONT SOUTH

OAKMONT NORTH

FAIRVIEW DRIVE

BELLWOOD DRIVE

RIVER WINNEBAGO

CHICAGO NORTHWESTERN R R

CHICAGO ROCK ISLAND & PACIFIC R R

LEGEND

STOP SIGN

YIELD SIGN

OTHER SIGNS

ONEWAY STREETS

TRAFFIC CONTROL DEVICE INVENTORY

FOREST CITY, IOWA

Plate No. 3

C. TRAFFIC COUNT AND FLOW DISTRIBUTION

For nearly all applications of traffic engineering, traffic demand is the essential factor. The design of any new facility or proposed reconstruction of an existing facility must be based on the existing and projected volumes of traffic that will use the facility.

Traffic volumes also furnish a basic scale upon which to compare the relative importance of a given street. In order to determine the traffic demand, or volumes, found on the street network in Forest City, manual counts of motor vehicles passing through thirty (30) intersections located throughout the city were accomplished. The thirty intersections counted are as follows:

1. Iowa #9 and U.S. #69
2. U.S. #69 and "J" Street
3. U.S. #69 and Fourth Street
4. West Entrance County Road from Crystal Lake and Spring Valley Road
5. "I" Street and Spring Valley Road
6. County Road Extension, "O" Street and Best Street
7. Clark Street and "J" Street
8. Fourth Street and "I" Street
9. "K" Street and Sixth Street
10. "B" Street and Fourth Street
11. "B" Street and Seventh Street
12. Park Street and Fourth Street
13. "J" Street and Central Street
14. "J" Street and Fourth Street
15. "L" Street and Fourth Street
16. "O" Street and Secor Avenue
17. "O" Street and Clark Street
18. U.S. #69 and Woodland Drive
19. U.S. #69 and Sunset Drive
20. "L" Street and Eighth Street
21. "G" Street and Eighth Street
22. "J" Street and Best Street
23. "J" Street and Golf Course Road
24. "N" Street and Ninth Street
25. "M" Street and Eleventh Street
26. "I" Street and Seventh Street
27. "O" Street and Seventh Street
28. "J" Street and West Street
29. "G" Street and Sixth Street
30. "C" Street and Clark Street

Condition diagrams were made for each of the locations counted. These sketches depict the intersection details, including signs, radii, widths and adjacent land use. These sketches are included in the Appendix - Figures C-1 to C-30.

The locations of the thirty intersections counted are shown on Plate 4. The counts were made on a two-intersection per day basis over a period from March 20, 1973, to Arpil 9, 1973. Each intersection was counted for twelve hours, from 6 a.m. to 6 p.m. in two six-hour shifts. Each vehicle entering the intersection was recorded as to the type of vehicle and the movement made. Counts were recorded by 15-minute intervals.

The twelve-hour counts were expanded to Annual Average Daily Traffic (ADT) figures using current Iowa State Highway Commission factors for cities of 5,000-9,999 population counted during the spring quarter. These figures represent the average number of vehicles making the indicated movement through an intersection for a twenty-four hour period. Schematic figures showing the Average Daily Traffic (ADT) broken down by specific movement for each intersection are included in the Appendix - Figures A-1 through A-30.

Once the ADT for each leg of the counted intersections was ascertained, the flow was distributed throughout the street system. Since the volume will vary from day to day and depends on input from side streets, a range of volumes for each street segment was used. The distribution of the average daily traffic flow on the street network is depicted on Plate 5.

In comparing the ADT on U.S. 69 found during this study to those counts of previous years available from the Iowa State Highway Commission, an approximate drop of 1500 to 2000 vehicles per day was found. This is not unreasonable and is due to the opening of Interstate 35 from Mason

City north. The Interstate traffic that once followed U.S. 69 now follows U.S. 18 to its junction with Interstate 35 near Clear Lake.

Capacity and demand are expressed in terms of vehicles per hour. Also, design criteria are usually based on a "design hour volume". The generally accepted design hour is the "30th Highest Hour". Characteristic curves of hourly volumes occurring during the hours of highest usage throughout a given year are shown in Figure 2. The knee of the curve occurs around the 20th to 30th Highest Hour for the various routes. It follows that the 30th Highest Hour volume has come to be used for design purposes; with the relatively few times per year the design "capacity" is exceeded being considered acceptable.

The four consecutive 15-minute intervals with the highest counts in conjunction with the calculated ADT for each intersection were used to estimate a 30th Highest Hour volume using a formula developed by the Iowa State Highway Commission. Schematic figures giving a breakdown by movement for the estimated 30th Highest Hour for each counted intersection in Forest City are included in the Appendix as Figures B-1 through B-30.

The four highest fifteen minute intervals for each count were usually in the 4:30 to 5:30 p.m. hour. This is due to release of the shift from the industries located in the city coinciding with the close of businesses in the CBD. The release of people with the corresponding generation of traffic is much more concentrated during this hour than in the morning hours when the movement to work is spread over a longer time frame. This characteristic is typical of traffic and has been found in numerous previous traffic studies.

The Directional Distribution and the Percentage of Trucks for each estimated 30th Highest Hour were also determined. Direction Distribution

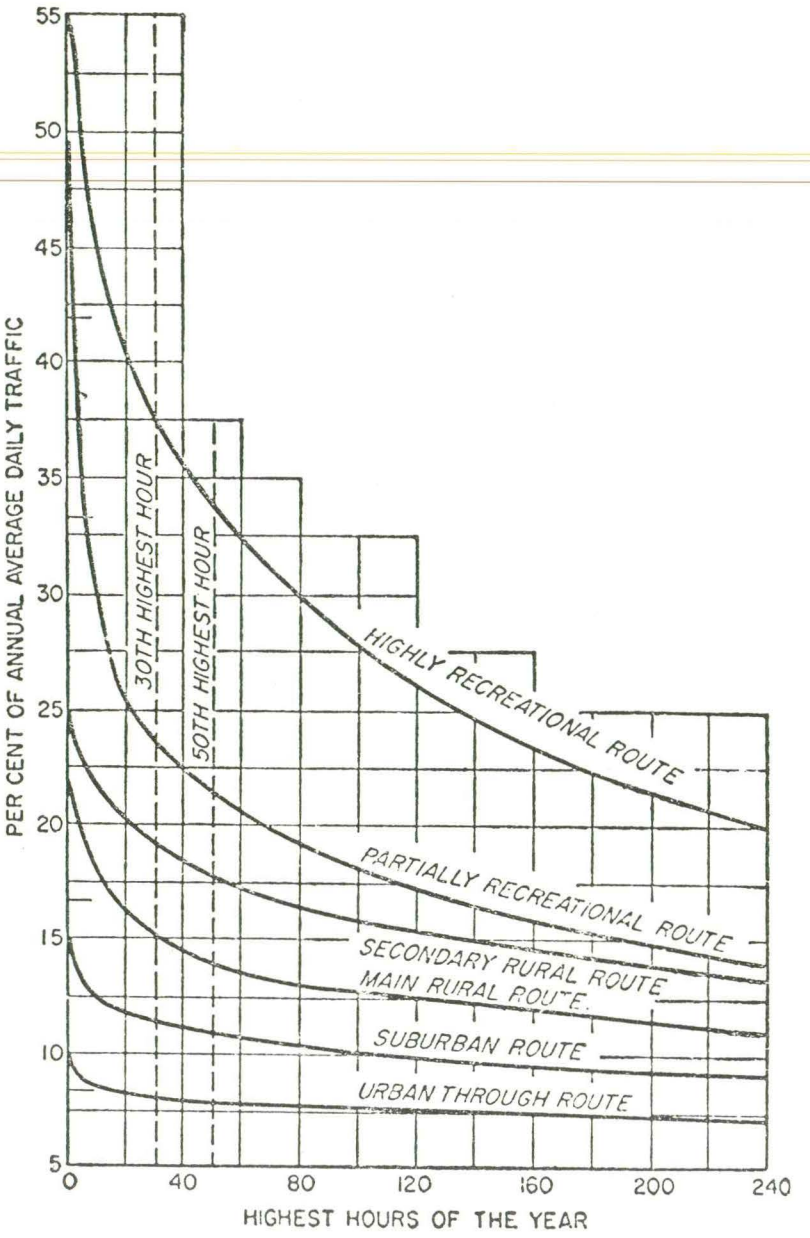

Figure 2 - Hourly Volumes as a percent of Average Daily Traffic (from "Traffic Engineering", T.M. Matson, W.S. Smith and F.W. Hurd, 1955[3])

is found by dividing the higher directional volume on a given intersection leg by the total volume. This statistic gives some idea as to the magnitude of the more heavily used lane(s) in relation to the facility as a whole. High percentages may indicate need for reversible lanes. Volumes in Forest City are not of the order that would require this type of improvement, however. Percentage of trucks gives the ratio of vehicles larger than a passenger car or pickup to the total volume for the given leg during the design hour. This statistic can indicate the design vehicle to be used for any proposed improvement.

D. ACCIDENT RECORD REVIEW

Traffic accidents are the result of a failure by the driver, the vehicle or the physical facility to function as intended in their role in traffic. Since one of the criteria of a good transportation network is the safe movement of people and goods, the reduction or elimination of accidents is a primary objective of traffic engineering.

One of the basic tools of a traffic engineer is the traffic accident data available. This may be in the form of individual reports, spot maps, location files or a computerized summary. From this data it is often possible to determine (1) locations where problems exist; and (2) a specific defect in the roadway facility that may be contributing to the type of accident occurring.

For this study, the accident reports from the city police files for the period from November 1968 to October, 1973 were researched. The present filing system leaves much to be desired. As best could be ascertained the present policy is for each officer to maintain a file of all accidents investigated by him. These are generally kept in chronological order. There is no city wide master file. It is highly likely that some reports for accidents occurring during the study period may have been lost or destroyed.

It should be noted also that the accident reports that were found in the existing police files were somewhat sketchy in many instances. It was also observed that many minor accidents may not have been reported. The importance of keeping accurate and up-to-date records cannot be overemphasized. Lack of adequate and accurate data may preclude developing the correct solution that would eliminate future minor accidents of the type not reported.

Each accident reported was noted as to location, the cause of the accident, the vehicles involved and whether property damage only, a personal in-

jury, or a fatality occurred. No fatal accidents had occurred during the period indicated. A spot map was prepared with the reported accidents shown as to location and whether they were property damage or personal injury.

After a review of the overall summary of accident reports and the spot map, it was decided to work with total numbers of accidents for a given location rather than to compute rates. There were relatively few locations with more than two accidents for the study period. The volumes on many of the streets would have to be estimated; and, in many instances, the lower volume streets would probably have distorted rates in comparison to the higher volume streets in the Central Business District (CBD). Also, it would be meaningless to attempt to ascertain any type of accident "pattern" from one or two accidents over the study period.

The nineteen locations with three or more reportable accidents in the study period are shown on Plate 6. Seventeen of the nineteen locations were at intersections. The two exceptions are the segment of U.S. 69 south of the U.S. 69-Iowa 9 intersection and the segment of U.S. 69 near the A and W driveway.

Collision diagrams were drawn on each of the above nineteen locations. These diagrams can be found in the Appendix - Figures D-1 to D-19.

A breakdown of the accidents at each location is as follows:

U.S. 69 and Ia. 9 - 19 reported accidents. The majority of these accidents involved two passenger cars and were caused by failure to yield right-of-way by vehicles entering or crossing U.S. 69 from Iowa 9 or Secor Avenue.

U.S. 69 and "J" Street - 15 reported accidents. The primary pattern at this location involved right angle collisions between vehicles entering or crossing U.S. 69 from "J" Street.

U.S. 69 and South 4th Street - 13 reported accidents. The types of vehicles involved in accidents at this intersection are evenly divided between two passenger

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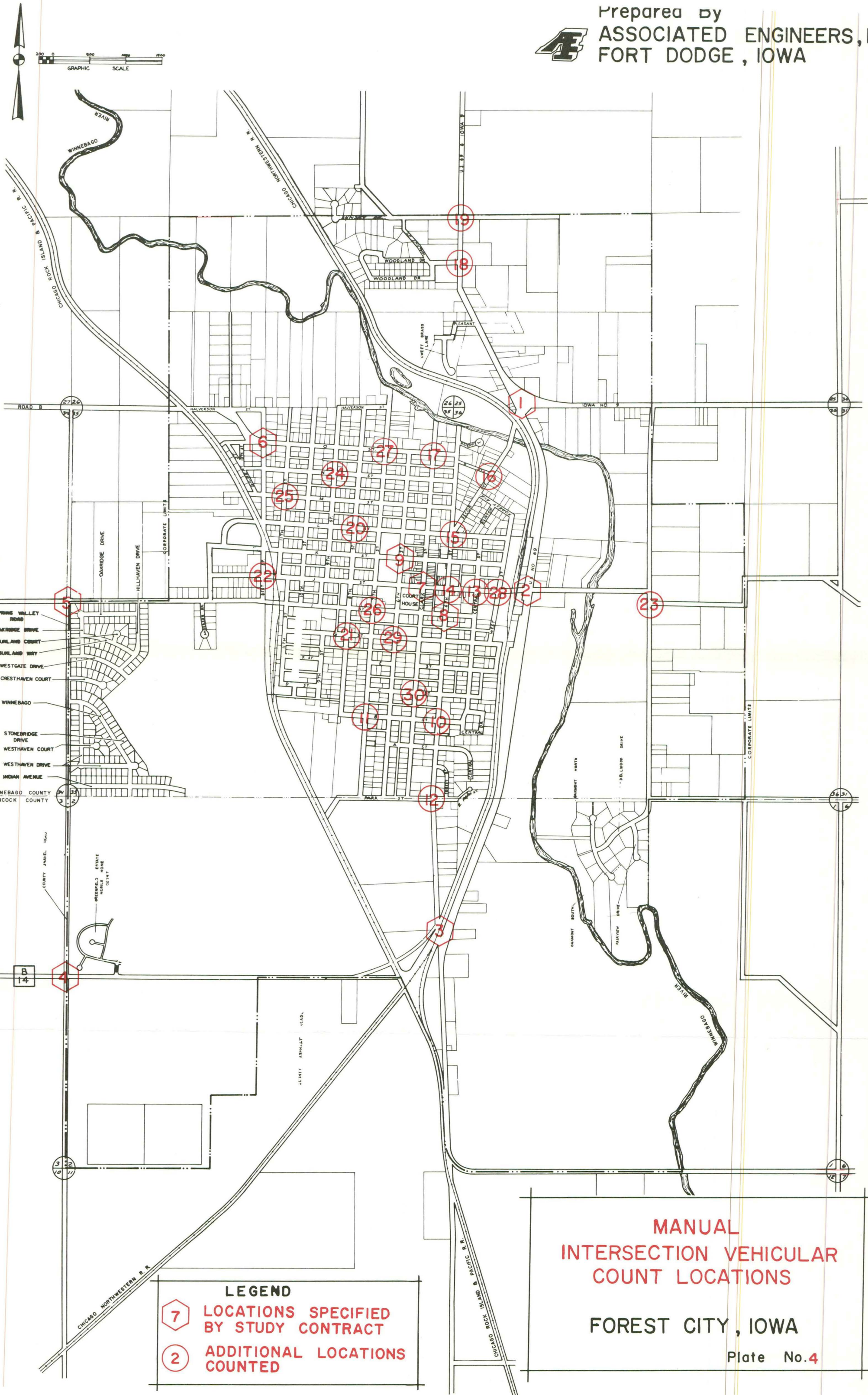

LEGEND

7 LOCATIONS SPECIFIED BY STUDY CONTRACT

2 ADDITIONAL LOCATIONS COUNTED

MANUAL INTERSECTION VEHICULAR COUNT LOCATIONS

FOREST CITY, IOWA

Plate No. 4

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GRAPHIC SCALE

ESTIMATED AVERAGE DAILY TRAFFIC FLOW ON CITY STREETS 1973

FOREST CITY, IOWA

Plate No. 5

LEGEND

- LESS THAN 500
- 501-1500
- 1501-3000
- 3001-5000
- 5000 AND MORE

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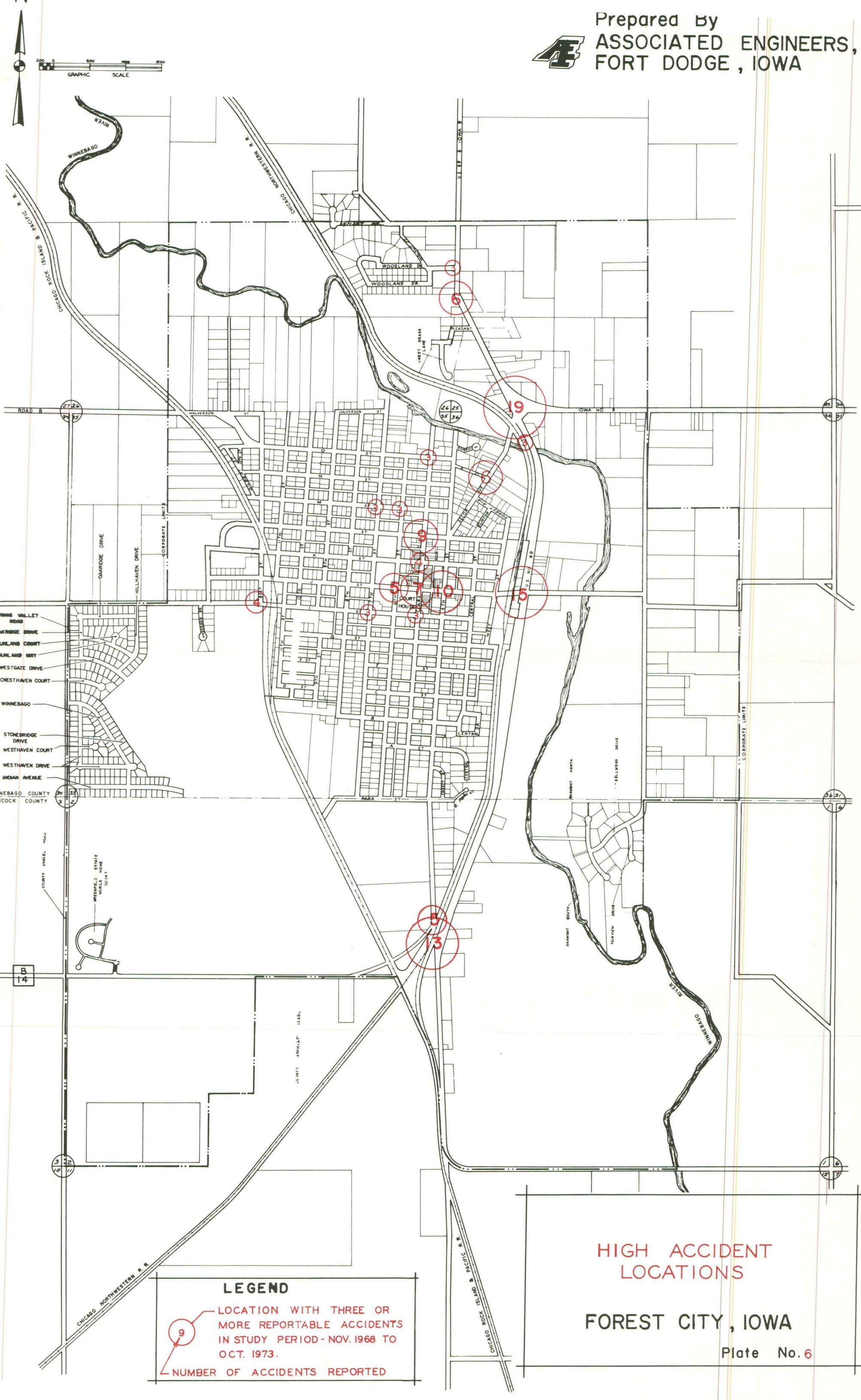


LEGEND

9 — LOCATION WITH THREE OR MORE REPORTABLE ACCIDENTS IN STUDY PERIOD - NOV. 1968 TO OCT. 1973.

NUMBER OF ACCIDENTS REPORTED

HIGH ACCIDENT LOCATIONS

FOREST CITY, IOWA

Plate No. 6

cars or a passenger car and truck. Causes of accidents are also distributed with rear end collisions (7 accidents) being most prevalent. These involved vehicles waiting to turn off of U.S. 69 primarily.

4th Street and "J" Street - 10 reported accidents. Five of the above accidents were of the right angle type and occurred before the change to a 4-way STOP condition. This change should serve to reduce this type of accident.

"O" Street and Secor Avenue - 6 reported accidents. The type and cause of accident vary at this location. It was noted in the field review of this location and during the manual count that there is very little sight distance to the north.

4th Street and County Road B-14 - 5 reported accidents. Three of the accidents involved turning vehicles. The acute angle of the intersection, particularly for the northbound to westbound left turn does not provide sufficient radius for large turning trucks.

"I" Street and Best Street - 4 reported accidents. The type of vehicles and type of accident vary, although two of the four were caused by a vehicle driving left of the center. "I" Street at this location was blocked during the majority of the study and all traffic followed Best Street to or from "J" Street. The left of center accidents were probably due to the vehicles making the left turn from "I" to Best cutting the intersection too short.

"O" Street and Clark Street - 3 reported accidents. All reported accidents involved two passenger cars and all occurred in 1973. Two of the three accidents were caused by vehicles running a stop sign under icy conditions.

"M" Street and 6th Street - 3 reported accidents. All reported accidents involved two passenger cars and all were caused by failure to yield right-of-way.

7th Street and "I" Street - 3 reported accidents. All accidents were of the right angle variety and involved a collision between a northbound car and a westbound car.

U.S. 69 and Walnut Drive - 3 reported accidents. All involved northbound vehicles turning left off of U.S. 69. Two were rear end collisions and the third was an improper turn.

"Clark Street and "L" Street - 9 reported accidents.

"Clark Street and "J" Street - 7 reported accidents.

U.S. 69 near A and W - 6 reported accidents.

6th Street and "J" Street - 5 reported accidents.

Clark Street and "K" Street - 4 reported accidents.

Clark Street and "I" Street - 3 reported accidents.

"M" Street and 7th Street - 3 reported accidents.

U.S. 69 near Winnebago River - 3 reported accidents.

For the latter eight locations, no discerible pattern was developed.

E. PARKING

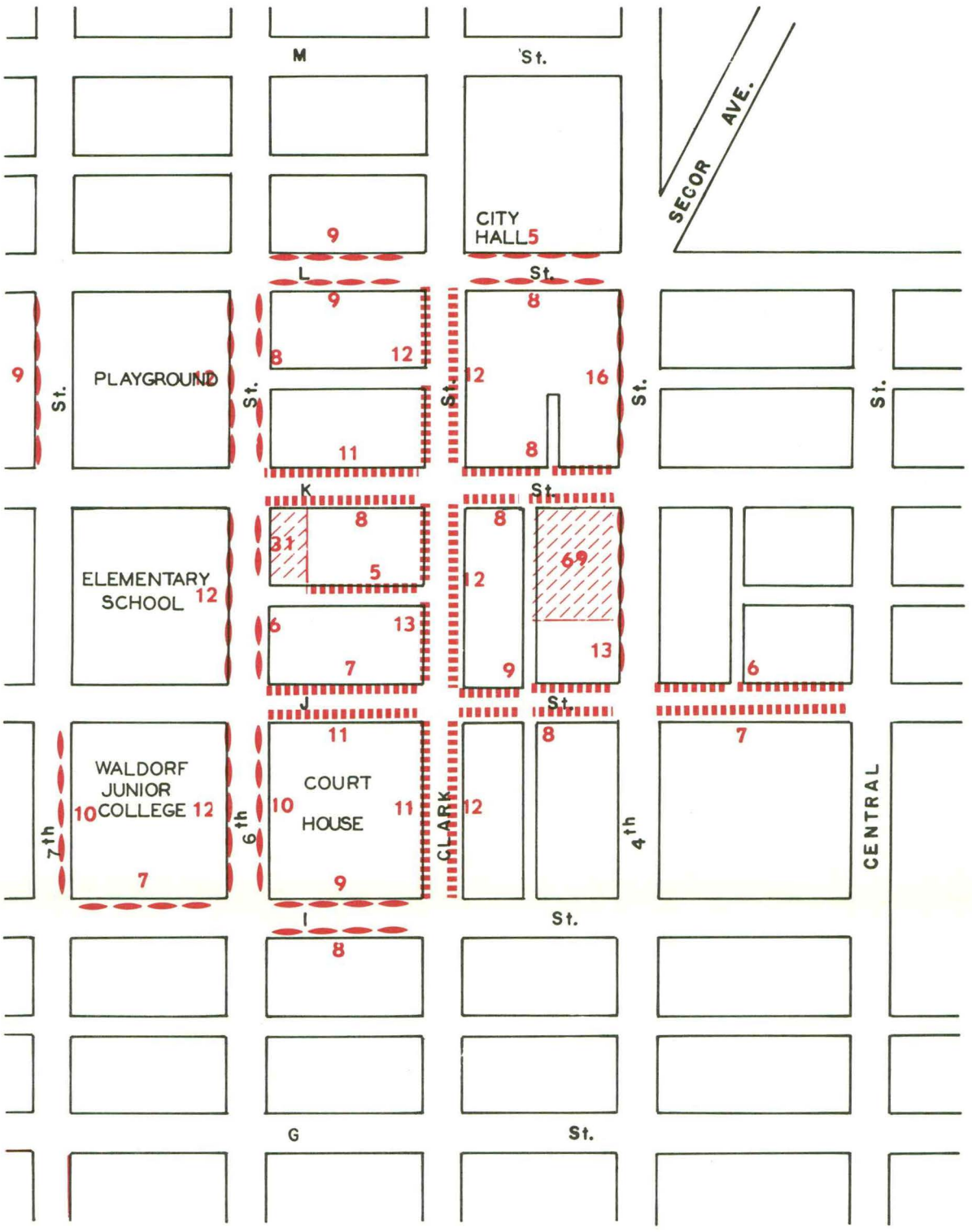
Parking in the Central Business District (CBD) was included as one of the study parameters in that it affects the traffic flow in the downtown area. The capacity of a given street is reduced by the presence of on-street parking. The interruption of flow for the required parking and unparking movement and the side friction inherent in having an object parked near the moving lane of traffic reduces the speed of the flow with a corresponding reduction in volume. The accident records were reviewed; and it was determined that only a small number of the on-street accidents in the CBD involved parking and unparking vehicles.

The actual parking covered in the study included the on-street spaces and the two lots in the downtown area. The study area was primarily a nine-square block area bounded by "I" Street on the south, "L" Street on the north, Fourth Street on the east and Seventh Street on the west. Parking on both sides of "J" Street from Fourth to Central was included because of the presence of meters along this block.

Parking spaces in the area were counted as to number and the presence or absence of meters. The totals and type of parking varies somewhat from that depicted in the "Report on the City Planning Program-1966" by Harland, Bartholomew and Associates.[4] The major differences are the new parking lot at the corner of Sixth and "K" and the fact that many of the spaces indicated as diagonal parking are actually parallel parking. Most on-street parking in the core area is presently parallel parking with the notable exception being the north side of "K" for about a half block from Clark to Sixth. The inventoried available parking spaces for this study are shown on Plate 7.

CENTRAL BUSINESS DISTRICT

FOREST CITY, IOWA



LEGEND

- METERED PARKING
- FREE PARKING
- PARKING LOT
- 6 NUMBER OF SPACES

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Fort Dodge, Iowa

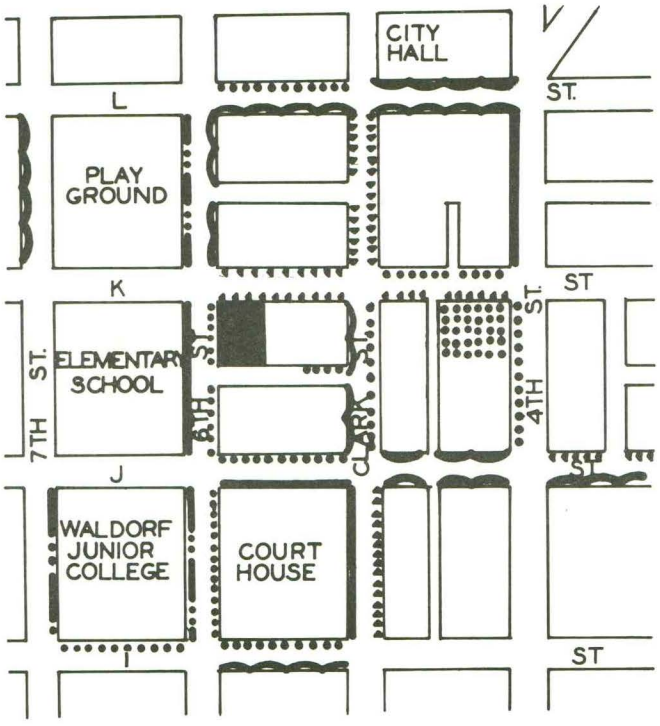
EXISTING PARKING FACILITIES
ON STREETS AND IN LOTS

FOREST CITY, IOWA

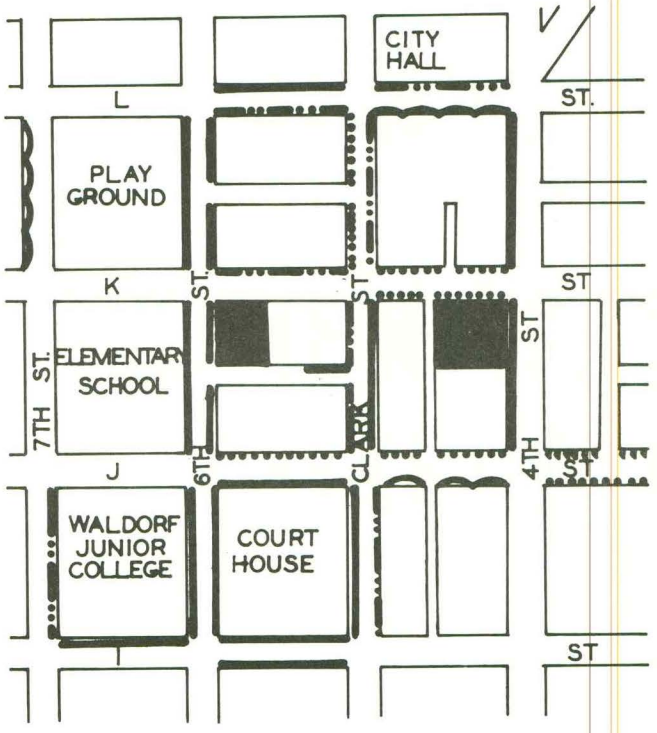
Plate No. 7

CENTRAL BUSINESS DISTRICT PARKING

ON THE STREET & IN LOTS



TYPICAL AM
OFF PEAK



TYPICAL PM
PEAK HOUR

LEGEND

- 0-20%
- 21-40%
- 41-60%
- 61-80%
- 81-100%

VARIATION IN UTILIZATION OF AVAILABLE PARKING FOREST CITY, IOWA

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Fort Dodge, Iowa

Figure No. 3

The occupancy rate for the inventoried spaces was measured for an offpeak morning period and an afternoon peak hour on March 20, 1973. Percentage of available space utilized was calculated for the on-street parking and in the two lots. The schematic breakdown by increments is shown on Figure 3. A turnover survey was not conducted because of the relatively low frequency of parking-unparking accidents, however, this Figure gives some idea of where the greatest demand versus lack of availability presently is found.

The overall occupancy in the morning was about 47 percent. In the afternoon it was calculated at 80 percent with most of the core area spaces full and the rates being less nearer the fringes. In contrasting the morning and afternoon summaries, it can be seen that the areas in the western portion of the CBD and around the Courthouse and Waldorf College are critical, being full most of the day. This may be in part due to all-day "parkers" from the educational institution or the Courthouse staff using some or all of the available spaces.

There was also considerable parking noted along the east side of Fourth Street from "I" to "L". This was not included in the counted spaces because it appears to be mostly "off-street" and utilized by the customers of the commercial establishments upon whose property this parking takes place. Also, most of this parking is "head-in" or at a right angle to the street. Unparking from this position requires much more street space and restricts sight distance. This type of parking is also prevalent along the west side of Fourth Street from "J" to the entrance to the parking lot and to some extent along the west side of Fourth from "K" to "L".

In the core area the majority of the curb space available is used for

parking. These spaces extend to within 10 feet or less of the intersections in some cases. The relative closeness of this parking severely restricts sight distance for vehicles entering and traversing the downtown intersections. These locations include the intersections of Clark and "I", Clark and "J", Clark and "K" and Sixth and "J" as noted on the condition diagrams in the appendix.

Similar parking at other intersections has been removed or restricted to "Official Use Only". However, it was noted during the field review of the available parking that in many instances these restrictions were not enforced and the spaces were still being utilized.

F. TRAFFIC LAWS AND ORDINANCES

The regulation of highway traffic involves control of the driver, the vehicle and the facility upon which the traffic flows. The vehicle is controlled by registration, licensing and inspection requirements. The driver is regulated by licensing and insurance coverage. The facility is governed by minimum design standards. Even with the above mentioned controls, there is still a requirement to have regulations to govern traffic flow to enable the driver of one vehicle to have some reasonable expectation of the intent of other drivers. For legality and effectiveness, all highway traffic regulations are dependent upon the laws of states and local governments, especially the traffic ordinances of cities and towns.

With the above in mind, the appropriate portions of the Forest City code were reviewed to determine their applicability. Much of the original code was found to have been superceded. The bulk of the authority for enforcement is found in Ordinance No. 178. This ordinance gives many definitions, sets the speed limits for the various streets, covers numerous other offenses and sets forth the penalties in Section 18. Parking is covered by Ordinances No. 167, No. 171, No. 199, No. 216 and No. 233. Ordinance No. 199 gives the authority to eliminate parking near intersections.

Ordinance No. 180 outlines the controlled access primary extensions. Ordinance No. 229 prohibits parking within 35 feet of the centerline of U.S. 69 for 300 feet on either side of the "J" street intersection. This prohibition is being abused, along with the access control intended.

The only authority in relation to traffic control and traffic control devices not previously mentioned include Ordinances No. 112 and No. 112A which deal with STOP control on Clark and 4th Streets and the prohibition

of U-turns. Nothing pertaining to the remaining YIELD and STOP placements; particularly the multi-way STOPS or the one-way streets could be found. Locations of all YIELD and STOP conditions and one-way streets are given on Plate 3.

Ordinance No. 204 governs the size, type and locations of streets in future subdivisions.

G. CLASSIFICATIONS OF SYSTEM

The 63rd General Assembly enacted House File 394[5] which requires the functional classification of all streets and roads in the state of Iowa. Functional Classification as defined by the Bill is:

> "The grouping of roads and streets into systems according to the character of service they will be expected to provide, and the assignment of jurisdiction over each class to the governmental unit having primary interest in each type of service."

The roads and streets within the state were divided into three major groups based on the governmental entity having jurisdiction. These are the Primary Road System controlled by the Iowa State Highway Commission, the Secondary Road System controlled by the 99 counties, and the Municipal Street System controlled by the individual cities and towns.

Each of the above three systems are further subdivided as follows:

Primary Road System

a. Freeway-Expressway System

The Freeway-Expressway System will include:

i. The National System of Interstate and Defense highways in Iowa.

ii. All roads connecting and serving the major urban and regional areas of the state with high volume, long distance traffic movements, and generally connecting with like roads of adjacent states.

The Freeway-Expressway System will be limited to three thousand miles.

b. The Arterial System

The Arterial System will include those roads which connect the Freeway-Expressway System with the Arterial Connector System, or which serve long-distance movements of traffic, or which serve as collectors of long-distance traffic from other systems to the Freeway-Expressway System. The Arterial System will be limited to three thousand five hundred miles.

c. The Arterial Connector System

The Arterial Connector System will consist of those roads providing service for short-distance intrastate and interstate traffic, or providing connections between highways classified as Arterial or Freeway-Expressway.

Secondary Road System

a. The Trunk System

The Trunk System will include the intracounty and intercounty roads which serve principal traffic generating areas and connect such areas to other trunk roads and roads on the Arterial or Freeway-Expressway System. The Trunk System will be limited to fifteen thousand miles.

This system will include, but not be limited to, the major Federal Aid Secondary roads of the state.

b. The Trunk Collector System

The Trunk Collector System will include the roads providing service for short-distance intracounty and intercounty traffic, or providing connections between roads classified as Trunk and Area Service. The Trunk Collector System will be limited to twenty thousand miles.

The Trunk System and the Trunk Collector System will constitute the Farm-to-Market road system for the state.

c. The Area Service System

The Area Service System shall consist of all other rural roads not otherwise classified.

Municipal Street System

a. The Municipal Arterial System

The Municipal Arterial System will consist of those streets within municipalities, not included in other classifications, which connect principal traffic generating areas or connect such areas with other systems. This sytem is limited to fifteen percent of the entire street mileage under the jurisdiction of the municipality, except in those municipalities with under 2,000 population, in which case the limitation may be exceeded.

b. The Municipal Collector System

The Municipal Collector System will consist of those streets within municipalities that collect traffic from the Municipal Service System and connect to other systems. The Municipal Col-

lector System will be limited to twenty percent of the entire street mileage under the jurisdiction of the municipality, except in those municipalities under 2,000 population in which case the limitation may be exceeded.

c. The Municipal Service System

The Municipal Service System will consist of those streets within municipalities providing access to property.

The Existing Functional Classification for the streets in Forest City are shown on Plate 8. Extensions of the Primary Road System are indicated as Arterial Extensions. Extensions of the Secondary Road System are indicated either as Trunk Extensions or Trunk Collector Extensions. The Municipal System is indicated as being either an Arterial, a Collector or on the Local Service System. The existing classification was submitted to the Iowa Highway Commission on November 19, 1970, for the portion involved in Hancock County, and on December 31, 1970, for the portion in Winnebago County.

Prepared By
ASSOCIATED ENGINEERS, Inc
FORT DODGE, IOWA

GRAPHIC SCALE

EXISTING FUNCTIONAL CLASSIFICATION OF STREETS

FOREST CITY, IOWA

Plate No. 8

LEGEND

- ARTERIAL EXTENSION
- TRUNK EXTENSION
- TRUNK COLLECTOR EXTENSION
- MUNICIPAL ARTERIAL SYSTEM
- MUNICIPAL COLLECTOR SYSTEM
- MUNICIPAL SERVICE SYSTEM

ANALYSIS -
RECOMENDATIONS

A. PROCEDURE FOR ANALYSIS

The analysis and recommendations portion of this study has been broken down by the individual parameters for which the field data was gathered. It is recognized that there is a great deal of interrelation among the various factors: the traffic, the physical facilities, the traffic control devices, the accident data, the parking, etc., so that for each individual area an improvement warranted in one area may in fact be beneficial to others. In many instances more than one element may be changed to improve or correct the situation. An example would be recommended reconstruction of an intersection in addition to changes in existing signing.

The procedure followed in this portion of the study was to look at each individual area for specific improvements, keeping in mind the interrelation mentioned above. Once each specific area was analyzed, the recommended changes or improvements were summarized and compared to insure continuity and correctness.

After all recommendations were finalized, cost estimates where appropriate were made. Priorities for the various recommended improvements were assigned. Availability of funding was investigated. From the above a proposed implementation schedule was developed.

Low cost improvements, such as sign addition or deletion, and the proposed changes in city ordinances and the Functional Classification System were recommended for immediate action. Major reconstruction projects were spread out over a period of years. Proposed future developments were added for consideration in further planning.

B. RECOMMENDATIONS - TRAFFIC FLOW

Prior to any decision as to applicable traffic engineering or highway engineering improvements, the traffic demand must be known or at least estimated. Once this "demand" is identified it can be compared to the available "capacity" inherent in the physical facility. This comparison of "demand" to "capacity" has been related, along with several other factors, in the 1965 Highway Capacity Manual[6] to derive various Levels of Service provided by the facility. The other factors include speed or travel time, traffic interruptions and delay, freedom to maneuver, safety, comfort and convenience, and economy.

The percentage of trucks and buses also is usually of significance because of their size and restricted speed and acceleration characteristics. However, for Forest City, there were very few trucks or buses on any streets with the exception of the primary extensions and the major arterials.

Capacity is defined in the Traffic Engineering Handbook[7] as "the maximum number of vehicles that can pass over a given section of roadway in one direction (or in both directions for a two- or three-lane highway) during a given time period under prevailing roadway and traffic conditions. It is the maximum rate of flow that has a reasonable expectation of occurring." The generally accepted criteria for various capacities as given in the 1965 Highway Capacity Manual[6] are as follows:

Type of Facility	Capacity
Multi-lane roadways	2,000 passenger cars/hour, each lane, average
Two-lane, two-way roadways	2,000 passenger cars/hour, total both directions
Three-lane, two-way roadways	4,000 passenger cars/hour, total both directions

Demand, then, can be expressed in terms of a volume/capacity ratio. This volume/capacity ratio is used in conjunction with speed or travel time as being the major factors in determining the six Levels of Service assigned. Figure 4 gives a schematic representation of the general concept as related to uninterrupted flow and Figure 5 depicts the relationship for various flows on urban and suburban arterial streets. Table 1 gives the approximate levels of service for downtown streets.

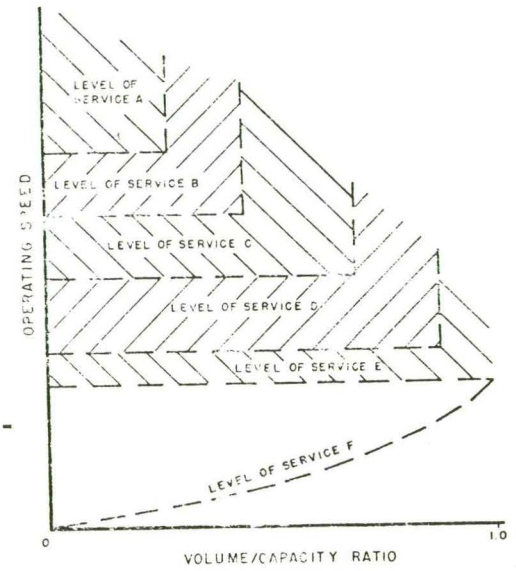


Figure 4 - Relationship of levels of service to operating speed and volume/capacity ratio for uninterrupted flow (from "Highway Capacity Manual--1965[6])

The Traffic Engineering Handbook[7] gives the following definitions of the various levels of service for uninterrupted flow. With some modifications the concepts behind each can be applied to suburban and urban streets.

Level of Service A - a condition of free flow, accompanied by low volumes and high speeds. Traffic density will be low, with uninterrupted flow speeds controlled by driver desires, speed limits, and physical roadway conditions.

Level of Service B - in the zone of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation. Reductions in speed are not unreasonable, with a low probability of traffic flow being restricted. The lower limit (lowest speed, highest volume) of this level of service has been associated with service volumes used in the design of rural highways.

Level of Service C - still in the zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass. A relative satisfactory operating speed is still obtained, with service volumes perhaps suitable for urban design practice.

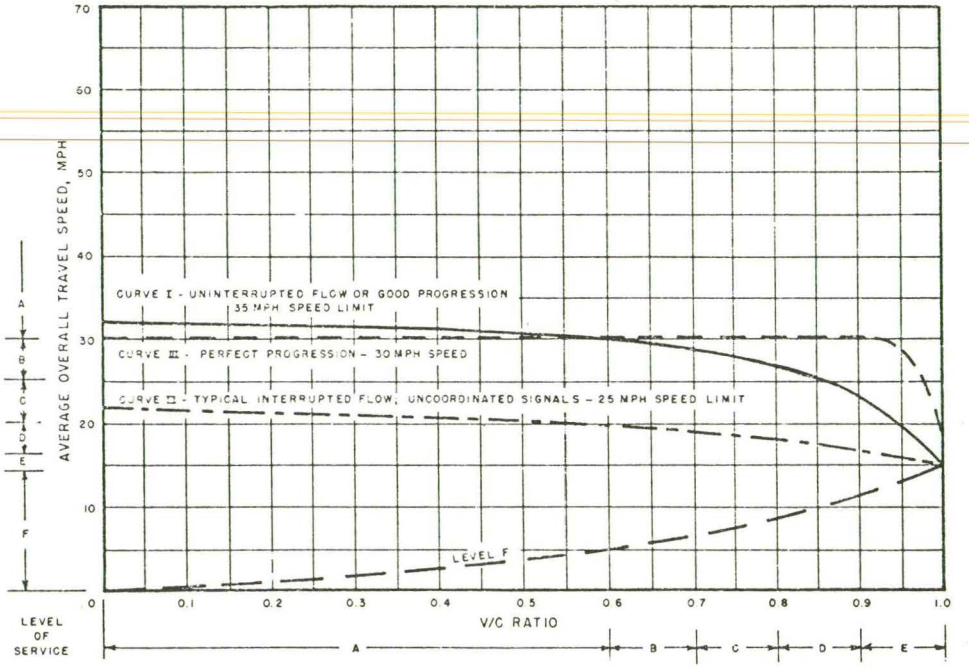


FIGURE 5 - Relationship of levels of service to travel speed and volume/capacity ratio on urban and suburban arterial streets (from "Highway Capacity Manual - 1965"[6])

LEVEL OF SERVICE	TRAFFIC FLOW CONDITIONS (APPROXIMATIONS, NOT RIGID CRITERIA)	
	DESCRIPTION	AVERAGE OVERALL SPEED (MPH)
A	Free flow (relatively; some stops will occur)	≥25
B	Stable flow (delays not unreasonable)	≥20
C	Stable flow (delays significant but acceptable)	≥15
D	Approaching unstable flow (delays tolerable)	≥10
E	Unstable flow (congestion not due to back-ups ahead)	Below 10 but moving
F	Forced flow (jammed)	Stop-and-go

TABLE 1 - Levels of Service for downtown streets (from "Highway Capacity Manual - 1965"[6])

Level of Service D - approaches unstable flow, with tolerable operating speeds being maintained, though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low. These conditions can be tolerated, however, for short periods of time.

Level of Service E - cannot be described by speed alone, but represents operations at even lower operating speeds typically, but not always, in the neighborhood of 30 mph, with volumes at or near the capacity of the highway. Flow is unstable, and there may be stoppages of momentary duration.

Level of Service F - describes a forced flow operation at low speeds, where volumes are below capacity. In the extreme, both speed and volume can drop to zero. These conditions usually result from queues of vehicles backing up from a restriction downstream. The section under study will be serving as a storage area during parts of all of the peak hour. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion.

In reviewing the traffic flows on the city streets, it can be seen that there are generally less than 5,000 vehicles per day on all but the heavily traveled downtown streets (Clark and "J") and on the primary extension (U.S. 69). The highest leg found in the 30th Highest Hour calculations is in the 700 vehicles per hour range and most are less than 600 vehicles per hour.

In applying the Level of Service criteria to the overall street network, it is obvious there are none that attain Levels A or B as speed restrictions are imposed on all streets. Conversely, it is unlikely that the lowest Level - F - is ever reached. Most streets have a Level of Service of C. As this is the best than can be attained in an urban area, future improvements would serve the minor factors, such as convenience and safety, and would also tend to reinforce the Level of Service C rating.

The arterials, particularly the 4th Street and Secor Avenue corridor, operate at Level of Service C during the majority of the time. However, the volumes during peak hours, combined with the restrictive width on

4th Street and on Secor, probably drop the Level to D.

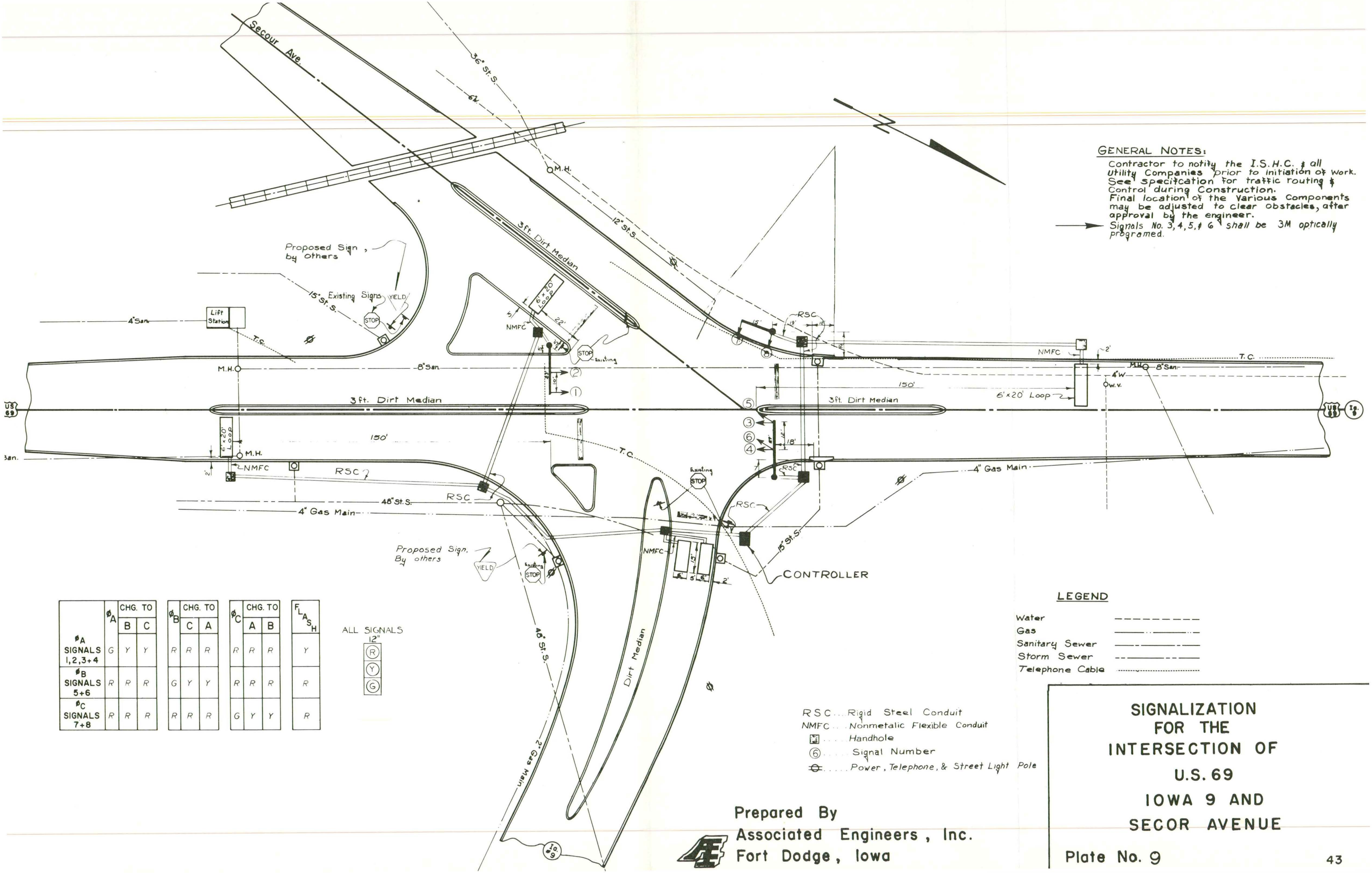
In the downtown area, the profusion of multi-way STOP conditions restrict the Level of Service to C or less. Since the only criteria for the CBD is travel time or speed, the stops required at every block on "J" severely restrict movement. These stops should not be confused with the "stop and go" referred to for Level of Service E. However, speeds would probably be below 10 miles per hour, indicating a Level of D or E. Parking and unparking, particularly of the right angle variety found on 4th Street, and the restrictive sight distance caused by parking vehicles in close proximity to the downtown intersections also tend to add to delay and restrict movement.

Expected growth in the volume of traffic will tend to magnify the problems now present unless corrective action is taken. Widening of the arterial streets proposed in Section III-D should provide sufficient capacity to retain Level of Service C in all but the most severe conditions. Removal of the extraneous signs and improperly positioned parking discussed in Sections III-E and III-F respectively should insure that the Level of Service be D or greater in the CBD.

C. RECOMMENDATIONS - ACCIDENT ANALYSIS

The nineteen locations with the highest number of accidents were reviewed on an individual basis. Where traffic counts were available they were used in determining possible improvements. Several of the lower volume intersections with relatively few accidents were felt to warrant no specific changes. The analysis of the accident history by individual location is as follows:

a. Traffic signals were installed during the study period at the intersections of U.S. 69 and Iowa 9 and U.S. 69 and "J" Street. Plates 9 and 10 give the schematic layouts of the improvements as constructed. The geometrics at the U.S. 69 - Iowa 9 intersection, the heavy skew of Secor Avenue and the bridges over the Winnebago River all tend to limit sight distance. Likewise sight distance for vehicles on the "J" Street leg (west) of the U.S. 69-"J" Street intersection is limited, and almost nonexistent when another vehicle pulls even in an adjacent lane. Volumes of traffic in 1969-1971 were sufficient to warrant signals; and, although the through traffic has decreased on U.S. 69 because of the opening of Interstate 35, they would appear from the 1973 counts to still be sufficient assuming the 70% factor for Warrant 1 given in the Traffic Engineering Handbook[7]. No further recommendations on these intersections shall be made because the installation of the above signals should be sufficient to correct the deficiencies at the intersections. For the area north of "J" Street on U.S. 69, more strict enforcement of the parking prohibition given in Ordinance No. 229 and the limitation of access to the commercial establishments on both sides of U.S. 69 would greatly improve the safety in this area.



GENERAL NOTES:

Contractor to notify the I.S.H.C. & all Utility Companies prior to initiation of work.
See specifcation for traffic routing & Control during Construction.
Final location of the various Components may be adjusted to clear obstacles, after approval by the engineer.
Signals No. 3, 4, 5, & 6 shall be 3M optically programed.

	φA	CHG. TO B	CHG. TO C	φB	CHG. TO C	CHG. TO A	φC	CHG. TO A	CHG. TO B	FLASH
φA SIGNALS 1,2,3+4	G	Y	Y	R	R	R	R	R	R	Y
φB SIGNALS 5+6	R	R	R	G	Y	Y	R	R	R	R
φC SIGNALS 7+8	R	R	R	R	R	R	G	Y	Y	R

ALL SIGNALS 12"
(R) (Y) (G)

LEGEND

- Water
- Gas
- Sanitary Sewer
- Storm Sewer
- Telephone Cable

RSC ... Rigid Steel Conduit
NMFC ... Nonmetalic Flexible Conduit
▣ ... Handhole
⑥ ... Signal Number
⊖ ... Power, Telephone, & Street Light Pole

Prepared By
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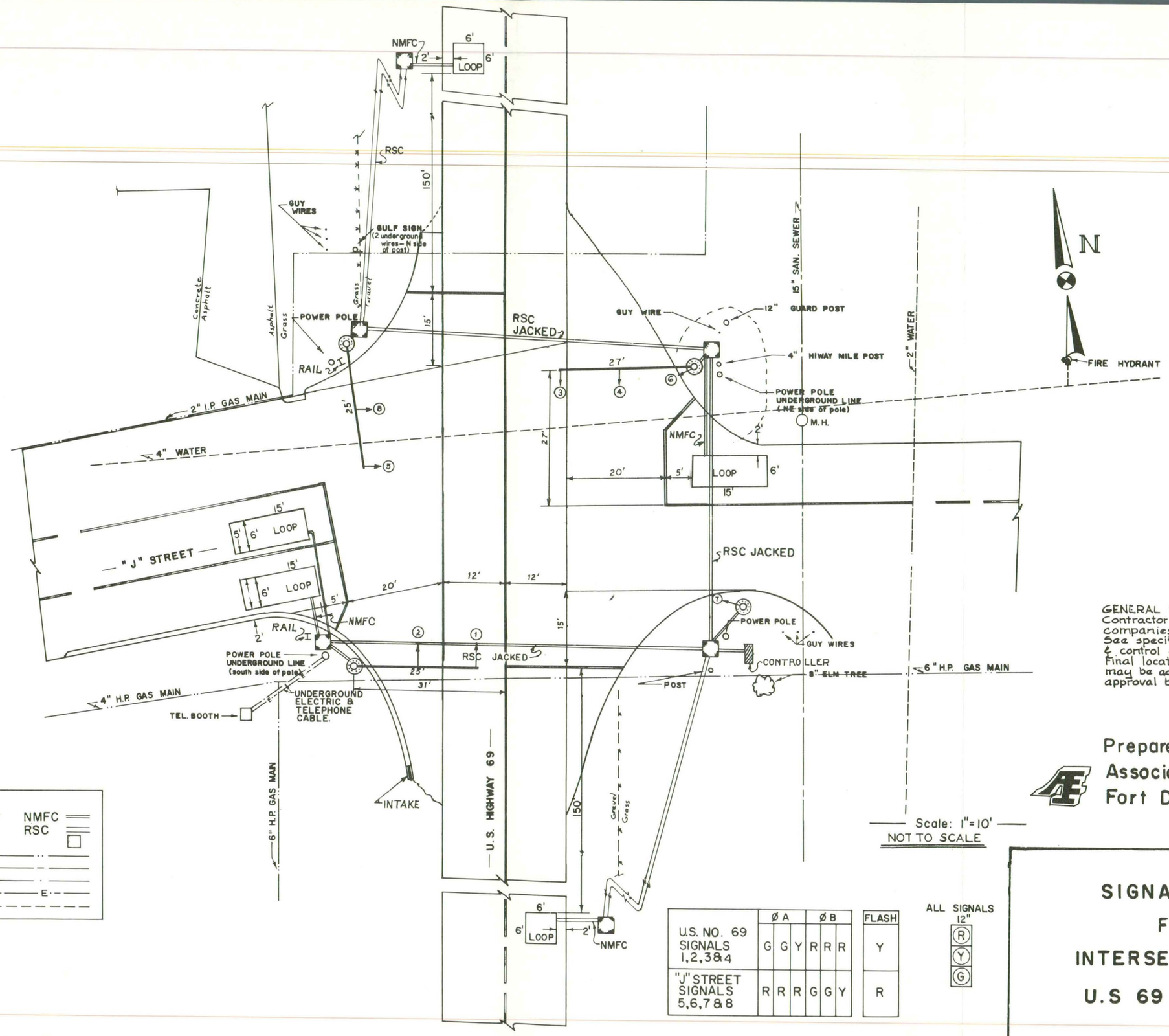
SIGNALIZATION FOR THE INTERSECTION OF U.S. 69 IOWA 9 AND SECOR AVENUE

Plate No. 9



GENERAL NOTES:
Contractor to notify the ISHC & all utility companies prior to initiation of work.
See specification for traffic routing & control during construction.
Final location of the various components may be adjusted to clear obstacles, after approval by the engineer.

LEGEND

NONMETALIC FLEXIBLE CONDUIT	NMFC
RIGID STEEL CONDUIT	RSC
HANDHOLE	
GAS	
SANITARY SEWER	
TELEPHONE CABLE	
ELECTRIC CABLE	E E
WATER	

	ØA			ØB			FLASH
U.S. NO. 69 SIGNALS 1,2,3&4	G	G	Y	R	R	R	Y
"J" STREET SIGNALS 5,6,7&8	R	R	R	G	G	Y	R

ALL SIGNALS 12"
R
Y
G

Scale: 1"=10'
NOT TO SCALE

Prepared By
Associated Engineers, Inc.
Fort Dodge, Iowa

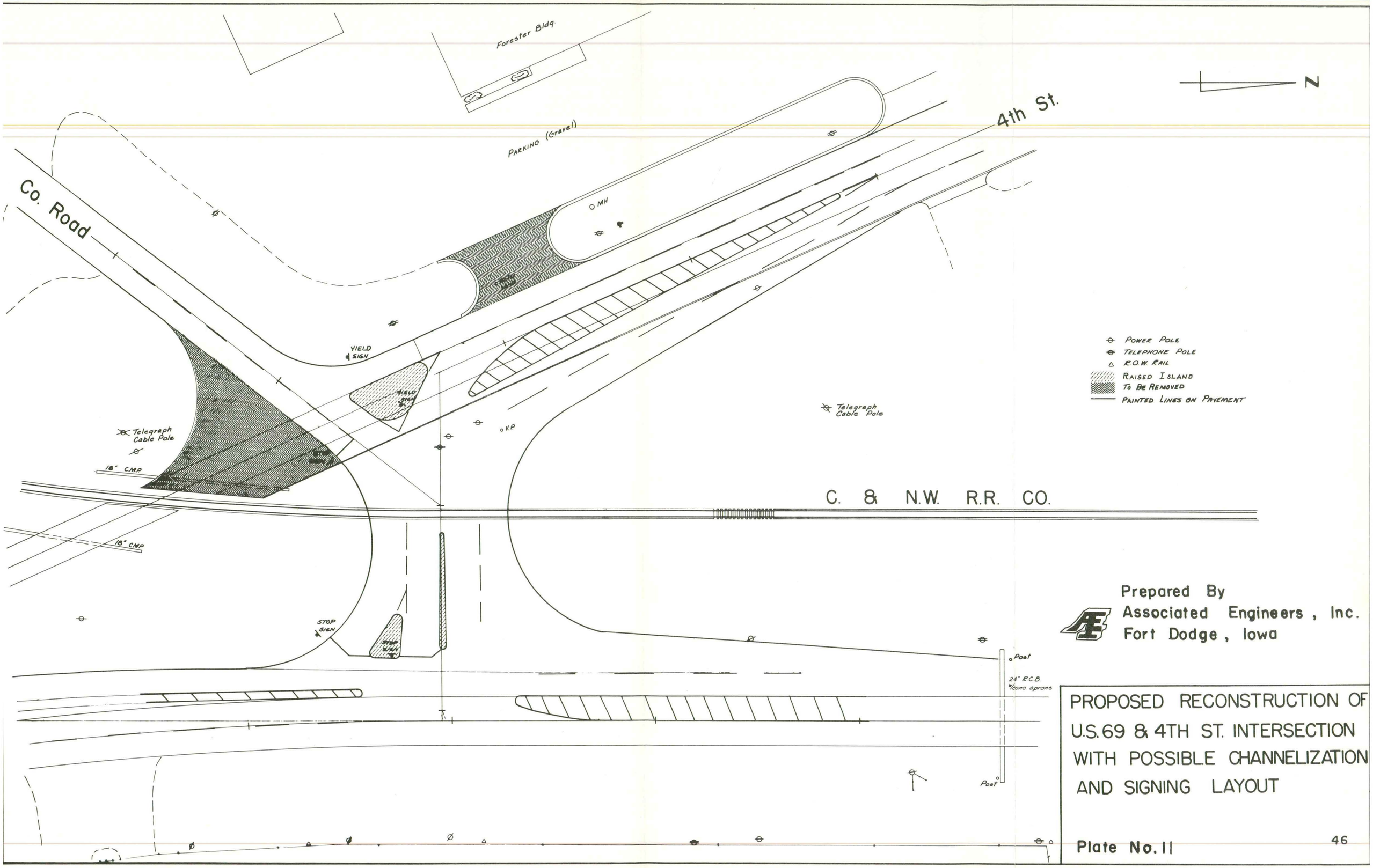
SIGNALIZATION FOR THE INTERSECTION OF U.S 69 AND "J" STREET

Plate No. 10

b. There has been a proposed reconstruction of the intersection of U.S. 69 and South 4th Street in the design stages for the past several years. The problem at the above intersection is primarily the heavy skew on which South 4th Street intersects U.S. 69. The intersection has "spread out" over the years and it is now possible for traffic to line up several abreast in attempting to enter U.S. 69. Those going north have to make about a 160° turn. Those going to the south have very poor sight distance to the rear. This becomes especially bad during the evening peak hour when the adjacent industries let out a high volume of traffic in a relatively short time frame.

Just to the south of the intersection an additional problem exists with traffic making turning movements to enter or exit from the Winnebago Outlet Sales Store on the east side of U.S. 69 and the Sale Barn on the west side of the highway. There are also many vehicles parked on the shoulder of the road when the Sale Barn is having a sale. Further complicating the intersection are a railroad track and the intersection of a county road with South 4th Street approximately 500 feet to the north.

Several concepts have been put forth in the past to include a "T" intersection of South 4th Street with U.S. 69 with the county road stubbing into South 4th Street. A variation of this was to have the county road making a "T" intersection with U.S. 69 and South 4th stubbing into the county road. The latest concept and the one presently being used for design is a reconstruction with all intersections being combined. The outline of the proposed reconstruction with a possible signing and channelization layout is given on Plate 11. An alternative



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Associated Engineers, Inc.
Fort Dodge, Iowa

PROPOSED RECONSTRUCTION OF U.S.69 & 4TH ST. INTERSECTION WITH POSSIBLE CHANNELIZATION AND SIGNING LAYOUT

Plate No. 11

proposal which involved separating the two intersections and moving the location north was discussed but was eventually rejected because of poor geometrics and the grade problems. The proposed reconstruction is presently awaiting railroad approval of the change in crossing location. The railroad affected has some reservations about the proposed improvement in that the storage available between the railroad and the highway will be limited. However, there is only one train a day usage of the tracks and it would seem that the high volume of traffic and the documented accident history would indicate the need for the proposed reconstruction. The 30th Highest Hour volume for this intersection (see Figure B-3) indicate a higher volume by a factor of 2 to 2.5 for vehicles entering from the South 4th Street leg as opposed to the through traffic on U.S. 69. This thirtieth highest hour is based on the end of shift peak hour for the adjacent industries, consequently the percentage of trucks is low because few trucks would be making deliveries at this late hour.

c. The intersection of 4th Street and "J" Street presently has a two way STOP condition with traffic on 4th Street stopping for "J" Street. This is the opposite of the conditions put forth in Ordinance No. 112. No authority superceding the above ordinance was found. Both streets are included in the cities functional classification as Arterials although "J" Street is an extension of a county trunk. The volumes for ADT (Figure A-14) and the 30th Highest Hour (Figure B-14) are relatively equal. It is recommended that the present two way STOP be retained. Contributing factors to the accidents may be poor sign placement and the right angle parking and unparking from commercial establishments along 4th Street (see Section II-E).

d. The intersection of Clark Street and "J" Street was changed to a multi-way (4 way) STOP during the course of the study. This intersection is probably the heart of the city's transportation system. It has the highest downtown area traffic count volumes and is at a strategic location in the business district. There is a steep grade on the east leg and this was formerly a YIELD condition. There is somewhat of a problem here in the winter with vehicles attempting to regain traction after stopping on an icy surface. This was partially the justification for the YIELD. The multi-way STOP is more in conformance with the Uniform Manual of Traffic Control Devices[2]. The intersection, along with others in the downtown area, have restricted sight distances due to the close proximity of curb parking to the intersection. At this location the first spaces on each side on the north leg and the first space on the north side of the east and west legs should have parking prohibited. The city has this authority under Ordinance No. 199. The possibility of using a one-way pair to eliminate the grade problem on "J" Street was also considered. See the section on Traffic Control Devices III-E for further details.

e. The intersection of "J" and 6th is a multi-way (4 way) STOP under the present conditions. The traffic on 6th is insufficient for a multi-way stop under the warrants given in Section II-B-3. This multi-way STOP is typical of the six placed on 6th Street and 7th Street from "J" to "L" around the school and playground. This area will be discussed further in Section III. The first parking spaces on each side of the south leg should be eliminated. The space on the east side is presently restricted but there is a lack of yellow paint on the curb

and the signing is poorly placed so that the space is still utilized. It is proposed that this intersection become a two-way STOP and the above mentioned two parking spaces be prohibited.

f. As mentioned in Section II-D, the heavy turning movements at the intersection of "I" and Best were probably a contributing factor in the two left of center accidents. There is no delineation of lanes because of the relatively poor quality of surface. Although the "I" Street railroad crossing has been opened during the period of this study the projected traffic patterns will continue to follow those of the past. White striping to separate the traffic movements should be added. Also if the "I" Street railroad crossing is to remain in operation, a YIELD sign should be added for the westbound traffic on "I". It is anticipated that this westbound movement will be small in comparison to the left turning east to north movement for "I" to Best Streets.

g. There is a limestone wall about 3' to 4' in height located in the northwest quadrant of the intersection of "O" and Secor. (See Figure C-16) For traffic stopping on "O" Street, there is very little sight distance to the north. A review of the ADT for this intersection (see Figure A-16) indicates that over 90% of the eastbound traffic on "O" makes the east to north left turn across the path of oncoming traffic from the north. The street widths are also very narrow considering that each is classified as a Municipal Arterial. The intersection can best be improved by widening both intersecting streets as is discussed in Section III-D and by providing more sight distance to the north in conjunction with the above reconstruction. It would appear that the additional space required for the widening of "O" can best come from the

south side of the street, and additional "daylighting" can be obtained by reconstructing the limestone wall 10' to 15' to the west.

h. The fact that there have been accidents caused by failure to stop at the intersection of Clark and "O" is not surprising considering the sign placement, the lack of sight distance and the limited width for the intersecting streets. In addition to the limited width on "O" there is a fairly high bank in the southwest quadrant of the intersection (see Figure C-17).

The ADT and 30th Highest Hour Volumes (see Figures A-17 and B-17) both have the highest figures on the west leg, which also has the narrowest width and a STOP condition for eastbound traffic. In fact, of the four highest volume movements for the ADT (1. right turn, "O" to Clark - 639, 2. westbound straight on "O" - 607, 3. eastbound straight on "O" - 524, 4. left turn, Clark to "O" - 520) three of the four have to stop (1, 3 and 4 above). Since all northbound traffic must stop, the present condition means that the heaviest movement is stopping in favor of the left turn from "O" westbound to Clark southbound which is only about one sixth as large. In addition to some extensive reconstruction discussed in Section III-D(a); the STOP on "O" should be removed, the STOP on the south leg of Clark should be retained, and a STOP should be added to the north leg of Clark. This arrangement will mean that only one of the four heaviest movements given above will have to stop as opposed to the present three of four.

i. The fact that all three of the accidents at "M" and 6th Streets were of the "failure to yield" type indicates some type of control might be required. A field review of the intersection ascertained that trees

line both sides of 6th, somewhat restricting sight distance. Since 6th Street is considered a Municipal Collector under both the Existing and Proposed Functional Classifications (see Plates 8 and 12) and "M" is on the Municipal Service System; and, with the restricted sight distance, YIELD signs on the east and west legs of "M" Street are recommended.

The remaining intersections with more than three accidents in the study period had no specific accident pattern. After a review of the signing and geometrics of the intersections in question no specific changes or improvements were developed.

D. RECOMMENDATIONS - PHYSICAL FACILITIES

In determining priorities for improvements of physical facilities, the existing surface widths and types as shown on Plates 1 and 2 were compared to the Proposed Functional Classification (Plate 12), the existing traffic flow (Plate 5), and the accident analysis. Criteria assumed for streets were as follows:

A 44 foot hard surfaced street with curb and gutter for all arterial streets with an ADT of 5000 existing or projected; and,

A 36 foot hard surfaced road with curb and gutter for all other arterials or collectors,

The 44 foot width given is that proposed in the Harland, Bartholemew Study[4] and is sufficient for 4 eleven foot lanes with no parking. The 36 foot width is that put forth in the city zoning ordinances for the new street construction.

The following deficient locations are recommended for improvement:

a. Widen "O" Street from 6th to Clark. Widen Clark from "O" to "M". Reconstruct the intersection of "O" and Clark. The above mentioned streets are on the Trunk Extension under the Proposed Classification. Volumes on the "O" Street segment are in the 2200 vehicles per day (VPD) range and are slightly under 1500 vpd on the Clark segment. Width of the pavement on both legs is less than 25 feet. The deficiencies of the "O" - Clark intersection are given in Section III-C, Accident Analysis.

b. Widen 4th Street from "A" to "J" Street. This section is classified as a Municipal Arterial and carries volumes slightly under 5000 vpd, particularly near the downtown area. It should be widened to 44 feet. In conjunction with the above widening; parking, if permitted, should be restricted to the parallel type, especially south of "J".

c. Widen 4th Street from "J" to "L" and Secor Avenue from "L" to U.S. 69. This section is similar to the above. The basic considerations are the same, the break at "J" being for economical considerations and a desire to be able to divert flow to other city streets. Widening of the structure over the Winnebago River will be required.

d. The U.S. 69 extension should be widened to a four-lane facility from South 4th Street to the Iowa 9 intersection. This is a primary extension and also carries the largest volume of traffic. Widening through the "J" Street intersection would provide additional capacity at the intersection and addition of curbs would better control access to the north of the intersection. Reconstruction of the South 4th Street intersection, as discussed in Section III-C (b), could be accomplished in conjunction with this widening if it will have been delayed that long.

e. Widen "O" Street from Clark to Secor. Remove "kink" in alinement at the 4th Street intersection. Reconstruct the intersection with Secor. "O" Street is classified as a Municipal Arterial. Traffic volumes are in the 1000-1500 vehicles per day range, although the street width from 4th to Secor is only 22 feet.

f. Widen Clark from Park to "G" Street. This street is classified as a Municipal Collector. Volumes are in the 1500 to 3000 vehicles per day range and the existing street width is less than 25 feet.

g. Widen "L" Street from Clark to 8th. This segment is classified partly as an Arterial and partly as a Collector. Volumes range from 1000 to 3000 vehicles per day. The street widths are less than 25 feet.

It should be noted at this point that Items a. through g. given above are similar either in total or in part to the recommendations for street

sections given by the 1966 Forest City Planning Report by Harland, Bartholomew and Associates[4]. This would tend to reinforce the fact that these areas are deficient and require some reworking.

There are also two proposed streets which, if built, would act as Municipal Collectors. The first would be an extension of 11th Street from its intersection with "J" to the south, paralleling the tracks along the east side, to a connection with Park Street. The area south of "D" Street is presently undeveloped. The existing 11th Street shown on the various plates is presently gravel surfaced and on railroad property. The construction of this extension would provide somewhat of a "beltway" around the existing residential areas that would serve as a corridor from the industrial sites to the south to the residential areas to the northwest without passing through the CBD on 4th Street or Clark Street. It would serve the same function as the extension of Best Street put forth in the 1966 Planning Report[4] which is no longer feasible. It should be noted that both routes parallel the railroad; and, should the railway be abandoned in the near future or prior to construction of the above facility, the railroad right-of-way would be an ideal location for the above route.

The second proposed route would be an extension of Indian Avenue to cross the railroad, crossing the above described 11th Street extension and connecting to "B" Street near 7th Street. This would provide an additional access to the residential development along Spring Valley Road, provide another crossing of the railroad and open the area east of the railroad between "I" and the proposed street to further development.

E. RECOMMENDATIONS - TRAFFIC CONTROL DEVICES

The inventory of the existing traffic control devices was reviewed in respect to the applicability to the volumes controlled. A determination of whether the individual sign conforms to the specifications pertaining to coloring, positioning, etc. put forth by the Uniform Manual of Traffic Control Devices[2] was felt to be beyond the scope of this study. In order to comply with the new Manual, however, the entire system should be inventoried as to color, location, etc., so that the existing signs that do not conform can be replaced or relocated.

The possibility of using an east-west one-way pair of streets in the downtown area was discussed extensively during the study. "I" Street is presently one-way westbound from 6th to 10th. A north-south one-way pair now exists on 7th from "G" to "J" and 8th from "J" to "G".

The east-west system envisioned would have begun at Central and extended to 6th. "J" Street would be eastbound only from 6th to Central; Central would be southbound from "J" to "I"; "I" would be westbound from Central to 6th, and 6th would be northbound from "I" to "J".

Among the advantages of the above system would be the diversion of traffic to the Courthouse or Waldorf College around the fringe of the CBD and the elimination of the grade problem at the intersection of "J" and Clark. Disadvantages include the reconstruction that would be required along Central and "I", and the circuitous route that traffic from the east destined for the northern part of the CBD would have to take. It was felt that the advantages gained were out-weighted by the disadvantages at this time.

The possibility of installation of traffic signals at the intersections of Clark and "J" and 4th and "J" was considered during the study. Since

present and projected 8 hour volumes were not sufficient to meet the requirements put forth in the Manual[2] and the accident experience is not great at these locations, they were not recommended. Should the volumes increase much more rapidly than expected, or the 4-way STOP at Clark and "J" fail to function or an accident history develop, the installation of signals at these locations should be reconsidered.

The following changes in the present signing system are proposed or noted:

a. The signalization of the intersections of U.S. 69 and Iowa 9 and U.S. 69 and "J" Street are covered in Section III-C(a) and depicted on Plates 9 and 10.

b. The proposed reconstruction of the U.S. 69 South - 4th Street intersection with a possible signing layout is covered in Section III-C(b) and depicted on Plate 11.

c. There are presently ten (10) four-way STOP conditions within the city. These are given in Section II-B-3. It is doubtful that any of the intersections could meet the warrants put forth in the Manual[2]. Six of the ten are in the vicinity of the elementary school and playground with their function being to provide safe crossing for school children. Since the children are crossing at specific periods of the day and since the speeds are relatively low in this downtown area, it is recommended that the intersections at 6th and 7th on "J" and "L" Streets would be served better by a safety patrol during the pedestrian peak hours. This would eliminate the necessity for stops at each intersection for the remaining 90 percent of the time on "J" and "L". "K" is closed entirely between 6th and 7th for fairly long periods of the day during the school periods as a safety precaution. It carries little through traffic and

the retention of the multi-way STOP would not have as great an effect on downtown traffic circulation.

The multi-way STOP at 4th and "K" should be changed to a two-way STOP with elimination of the signs on 4th Street. The present positioning of the signs on 4th Street is poor. In addition, the STOP on 4th is not warranted. The volumes carried by 4th Street as opposed to those on "K", and the fact that 4th Street is classified an Arterial where "K" is only a local street, dictate that 4th Street receive priority.

The intersection of 4th and Park was changed from a four-way to a two-way stop condition in December, 1973. This intersection has been changed from four-way to two-way and back again on several occasions in the past. This procedure is inconsistent with the function of the STOP conditions. If a four-way STOP is desired because of the heavy pedestrian traffic on Park to the pool in conjunction with the poor sight distance due to the hedge in the northeast quadrant, this STOP condition should be permanent. If a two-way STOP is desired because of the icing during winter months and the larger volumes on 4th Street, the hedge should be removed to enhance sight distance. Changing from one condition to the other detracts from the effectiveness and authority of both of the conditions.

For the remaining two multi-way STOP conditions, no changes are proposed. Clark and "J" is the intersection of two Arterial streets with equal volumes. The STOP condition on "J" will be the only one except for the signals at U.S. 69. The STOP on Clark will be the only one except for the one for northbound traffic at "O" Street. At the

intersection of 6th and "G", lack of accidents or other overt problems indicate the intersection is functioning adequately under the existing conditions.

d. The change of the STOP condition from the west leg to the north leg at the intersection of "O" and Clark is discussed in Section III-C(h).

e. The addition of YIELD signs at 6th and "M" is discussed in Section III-C(i).

f. The addition of a YIELD condition on the east leg of the "I" and Best intersection is discussed in Section III-C(f), as is the need for delineation of lanes.

g. The YIELD condition for northbound traffic at 4th, "L" and Secor Avenue should be moved to the west leg facing eastbound traffic on "L". Secor, 4th and "L" are all classified as Arterials. In reviewing the ADT and 30th Highest Hour volumes (Figures A-15 and B-15), it can be seen that the west and south legs are comparable. For the ADT, the 2nd and 4th highest volume movements, the left turn from "L" onto Secor versus the through movement from Secor southbound onto 4th are in conflict with neither controlled. For the 30th Highest Hour, the heaviest movement is the northbound from 4th to Secor. This is approximately 50 percent greater than the left turn from "L" on to Secor yet must yield.

Changing the YIELD on 4th along with the removal of the multi-way STOP covered in Item c. above would mean that this heavily traveled Arterial would have STOP conditions only at the U.S. 69 junctions, north and south, and at "J" and Park Streets.

Also, the STOP condition on the north leg (4th Street) at the Secor "L" intersection should be changed to a YIELD to conform with the Manual[2].

h. There are several intersections with a STOP condition on one leg and YIELD condition on the opposite leg. To conform to the Manual[2] and to be consistent, these situations should be changed. Included are the "K" intersections on Clark. For the former two, the STOP signs should be replaced by YIELD signs. For the latter two, the YIELD signs should be replaced by STOP signs.

i. The YIELD sign facing eastbound traffic on "O" Street at 4th should be removed when the reconstruction discussed in Section III-D(e) is accomplished.

j. The STOP condition for eastbound traffic on "I" at 10th Street is positioned incorrectly and should be relocated.

F. RECOMMENDATIONS - PARKING

Three major problem areas concerning parking in the downtown area were found during the study. They are the closeness of curb parking to intersections, the head-in or right angle parking on narrow streets, and the lack of available spaces in the southern portion of the CBD.

The problems caused by the proximity of curb parking were discussed in the Section II-E and Section III-B. Nine spaces should have parking removed. The proper signing should be erected and the curb should be painted yellow. In addition, those spaces which already have restrictied or prohibited parking should be checked for proper signing and the required yellow paint. The authority to remove parking spaces is given in Ordinance No. 199.

The only diagonal parking in the downtown area is along the north side of "K" between Clark and 6th and along 4th Street, although much of that along 4th is "head-in". The diagonal parking along "K", in addition to considerable truck loading and unloading, severely restricts the already limited street width. The city should, by passing a new City Ordinance, eliminate all head-in or diagonal parking within the CBD and replace it with parallel parking. With the widening of 4th Street discussed in Section III-D (b and c), provision should be made for parallel parking on at least one side of the street.

The elimination of spaces caused by the prohibition or change in type of parking will further tax the existing facilities, which are already overloaded at times. To compensate for this, two locations for parking lots are proposed. The first would be in the east half of the block bounded by "J", 4th, "I" and Clark. The 1966 Planning Report[4] proposed a lot in the southeast corner of the above block. This area is still open. However,

a more ideal location would be in the northeast corner of the above block. The northeast corner is presently being used for new and used car storage. If this parcel could not be obtained outright, perhaps the south half could and then be traded for the north. In any event, the northern portion would be better as it would provide better access to the downtown area, the hotel and commercial establishments on the west side of 4th north of "J", and to the relatively large grocery store on the east side of 4th. The above commercial establishments would lose some "out-front" parking with the conversion from head-in to parallel parking.

The second proposed lot would be in the location presently occupied by the Catholic church south of the Courthouse. A new Catholic church at another location is proposed which would leave the above area vacant. A parking lot in this area should relieve the congestion around the Courthouse square and provide parking for people desiring access to the Courthouse and Waldorf Junior College.

G. RECOMMENDATIONS - CITY ORDINANCES

In reviewing the city code pertaining to traffic, it became obvious that many of the traffic controls used in the city have no authority and that several out-of-date ordinances that conflict with existing conditions have never been superceded. Nothing could be found concerning the majority of YIELD and STOP conditions located throughout the city. There was no ordinance establishing the one-way conditions on "I", 7th and 8th Streets. The speed limits on city streets are covered in Ordinance No. 178. However, the speed zones given in Section 7 of Ordinance No. 180 concerning primary extensions do not cover those existing on U.S. 69 south of the Winnebago River bridge.

Three new ordinances are proposed, although the first two may be combined. The first would be concerned with the establishment of STOP and YIELD conditions. Once the desired conditions throughout the city are concurred upon, including proposed changes from this study, each location should be specifically covered in an ordinance to insure that the actual conditions desired do exist and that authority for enforcement is available. If it is determined that the existing one-way streets are to be retained, their establishment should be covered by this ordinance also.

The second proposed ordinance would cover defining speed limits on U.S. 69. The existing speed limits not found defined are 55 miles per hour from south of the 4th Street intersection to the county line, 45 miles per hour from the county line to south of "J" Street, and 35 miles per hour from "J" Street to the Winnebago River bridge. Although the adequacy of these speed limits was not specifically checked in this study, it is felt they are appropriate. Should the council concur in this, the actual speed limits should be defined by ordinance.

The third proposed ordinance would prohibit diagonal and head-in parking in the downtown area. This may be done in stages depending on the provision of replacement parking and/or adequate parallel parking in the same location.

H. RECOMMENDATIONS - FUNCTIONAL CLASSIFICATION

After a review of the traffic flow derived in this study (see Section II-C and Plate 5) and the definitions of the various systems, the following changes of the classifications are proposed:

The present Trunk Extension coming in from the northwest following 11th to "J", and "J" Street to U.S. 69 should instead follow "O" Street to Clark and then south on Clark to J". 11th Street would then become a Municipal Collector.

The traffic flow following the proposed Trunk Extension is in the 1500-2200 vehicles per day range, compared to the 1000 vehicles per day found on the present 11th Street route. The proposed route for this Trunk Extension will connect to the downtown area of Forest City.

The procedure and authority for making any proposed changes to the functional classification is given in Section 4 and 5 of House File 394 (Functional Highway Classification Bill). This bill is also set forth in the Iowa Roads and Streets Functional Classification Manual[5]. The proposed functional classification is given on Plate 12.

IMPLEMENTATION

Prepared By
ASSOCIATED ENGINEERS, Inc
FORT DODGE, IOWA

GRAPHIC SCALE

PROPOSED FUNCTIONAL CLASSIFICATION OF STREETS

FOREST CITY, IOWA

Plate No. 12

LEGEND

- ARTERIAL EXTENSION
- TRUNK EXTENSION
- TRUNK COLLECTOR EXTENSION
- MUNICIPAL ARTERIAL SYSTEM
- MUNICIPAL COLLECTOR SYSTEM
- MUNICIPAL SERVICE SYSTEM

A. IMPLEMENTATION

To better present an implementation schedule, the proposed changes were divided into two types--Minor Traffic Engineering and Major Construction. The Traffic Engineering items involve little or no cost and can be implemented upon concurrence of the City Council. The items involving construction run into considerable capital outlay. Estimates of cost for each were made and they were then grouped into three stages as follows:

	Time Frame For Construction
Stage I - High Priority	1973-1978
Stage II - Intermediate Priority	1978-1985
Stage III - Low Priority	1985-1995

Four tables have been prepared to depict the recommendations.

Table 2 gives the proposed Traffic Engineering Improvements. Each item or group of similar items is given a number and is listed by location with a description of the proposed additions, deletions, or other changes and time frame for implementation. Council passage of the ordinances required to authorize the proposed change should be accomplished prior to their implementation.

Tables 3, 4 and 5 give the Stage I, II and III construction oriented recommendations, respectively. Each item is assigned a number and described as to location, type of improvement and estimated cost.

The locations of the recommended improvements, to include both the Minor Traffic Engineering and Major Construction items, are depicted on Plates 13 and 14.

TABLE 2
TRAFFIC ENGINEERING IMPROVEMENTS

NUMBER	LOCATION(S)	DESCRIPTION	IMPLEMENTATION
1.	"J" and 6th "J" and 7th "L" and 6th "L" and 7th 4th and "K"	Change 4-way STOP to 2-way STOP by removing STOP conditions on "J", "L" and 4th Streets	Immediately following approval of ordinance
2.	"O" and Clark	Change STOP from west leg to north leg	Immediately following approval of ordinance
3.	"L", 4th and Secor	Change YIELD from south leg to west leg, change STOP to YIELD on north leg	Immediately following approval of ordinance
4.	Various in CBD	Remove Parking from curb spaces close to intersections	Immediately following approval of ordinance
5.	North side of "K" and along 4th Street	Prohibit diagonal and head in parking	Immediately following approval of ordinance
6.	"I" and Best	Add YIELD on east leg, delineate lanes	Immediately following approval of ordinance
7.	6th and "M"	Add YIELD signs on the east and west legs	Immediately following approval of ordinance
8.	Clark and "I" Clark and "K"	Replace YIELD on east leg with STOP	Immediately following approval of ordinance
9.	11th and "K" 11th and "L"	Replace STOP on west leg with a YIELD	Immediately following approval of ordinance
10.	"I" and 10th	Relocate STOP for eastbound traffic on "I" from east side of intersection to west side	Immediately following approval of ordinance
11.	"O" and 4th	Remove YIELD on west leg	To be done in conjunction with reconstruction. See Number 20

TABLE 3

STAGE I CONSTRUCTION
(1973-1978)

NUMBER	LOCATION	TYPE OF IMPROVEMENT	COST
12.	U.S. 69 - Iowa 9	Install traffic signals	$25,860 *‡
13.	U.S. 69 - "J" Street	Install traffic signals	$14,750 *‡
14.	U.S. 69 - 4th Street	Relocation and reconstruction of intersection with channelization.	$53,755 **‡
15.	"O" from 6th to Clark Clark from "O" to "M"	Widen, reconstruct intersection daylight southwest quadrant	$58,250
16.	4th from "A" to "J"	Widen to four lanes	$98,150
17.	4th from "J" to "L"and Secor from "L" to U.S.69	Widen to four lanes to include bridge widening	$153,125
18.	West side of 4th from "I" to "J"	Construct new parking lot	$31,850

*Contract has been let
**Includes $15,000 for railway grade crossing and signal
‡Iowa Highway Commission participation in funding is or may be available

TABLE 4

STAGE II CONSTRUCTION
(1978-1985)

NUMBER	LOCATION	TYPE OF IMPROVEMENT	COST	
19.	U.S. 69 from 4th Street to Iowa 9	Widen to four lanes to include bridge widening	$601,250	‡
20.	"O" from Clark to Secor	Widen, remove "kink" at 4th Street intersection	$ 48,325	
21.	11th Street Extension Park to "J"	New Construction	$205,375	
22.	Extension of Indian Avenue to the above extension	New Construction	$116,125	
23.	SE Quadrant of 6th and "I"	Construct new parking lot	$ 22,550	
24.	U.S. 69 and 4th Street	Signalization	$ 20,000	*‡

* To be determined at a later date based on volumes and accident experience
‡Iowa Highway Commission participation in funding may be available

TABLE 5

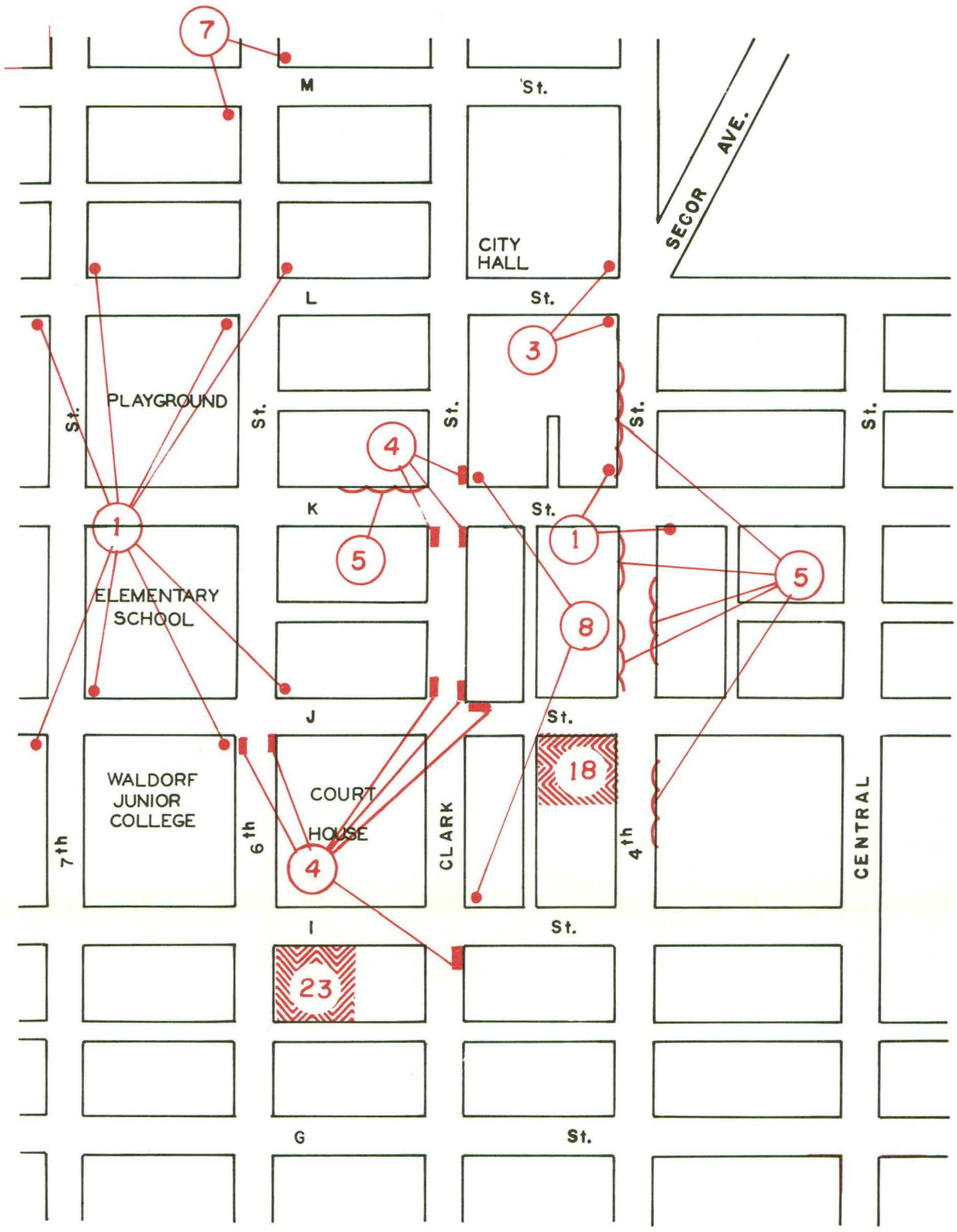
STAGE III CONSTRUCTION
(1985-1995)

NUMBER	LOCATION	TYPE OF IMPROVEMENT	COST
25.	Clark from Park to "G"	Widen	$69,950
26.	"L" from 6th to 8th	Widen	$27,750
27.	"I" from 6th to Best	Widen	$64,525
28.	Clark and "J"	Signalization	$17,500 *
	4th and "J"	Signalization	$17,500 *

* To be determined at a later date based on volumes and accident experience.

CENTRAL BUSINESS DISTRICT

FOREST CITY, IOWA



LEGEND

(6) - PROJECT NO. FROM TABLES 2 THROUGH 5.

Prepared By
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LOCATION OF PROPOSED IMPROVEMENTS IN THE DOWNTOWN AREA

FOREST CITY, IOWA

Plate No. 13

Prepared By
ASSOCIATED ENGINEERS, Inc.
FORT DODGE, IOWA

GRAPHIC SCALE

LOCATION OF PROPOSED IMPROVEMENTS

FOREST CITY, IOWA

Plate No. 14

LEGEND

(3) -PROJECT NO. FROM TABLES 2 THROUGH 5.

Prepared By
ASSOCIATED ENGINEERS, Inc.
FORT DODGE, IOWA

GRAPHIC SCALE

LOCATION OF PROPOSED IMPROVEMENTS

FOREST CITY, IOWA

Plate No. 14

LEGEND

(3) -PROJECT NO. FROM TABLES 2 THROUGH 5.

B. SOURCES OF FUNDS

Recognizing that many proposed improvements may involve extensive and costly reconstruction, a provision of the contract for this Study stipulates that available state and federal sources of funds for financing recommended changes should be reviewed and listed.

State funds were used for the signals that were installed at the U.S. 69 - Iowa 9 and the U.S. 69 - "J" Street intersection. The percentage of the total costs funded by state money on these projects was determined by the ratio of the traffic through the city to the total volumes using the intersections. Should volumes and/or accident experience dictate future signalization of the U.S. 69 - 4th Street reconstruction, the same formula may be applied.

For the above mentioned reconstruction, there is presently a commitment by the Iowa State Highway Commission for a specific amount to be used for the project. The committed funds are for the reconstruction only. If signalization is warranted in the future, it would be judged on its own merits as a separate project under the Highway Commission's cooperative program.

The only other area where state funds might be available would be the proposed widening of U.S. 69. This project has been proposed before and is reviewed on an annual basis. The funding of this projection varies from 100 percent state funds to some type of state-municipal cooperative effort under the Iowa State Highway Commission's "2601" policy. Partial financing by the city would tend to expedite any project of this type.

The Federal Domestic Assistance Catalog was reviewed for programs applicable to the proposed improvements. Two possible methods of assistance were found. The first is under the Federal Highway Administration and is actually

the same program under which the Iowa State Highway Commission distributes federal monies. The second program is administered by the National Highway Traffic Safety Administration.

APPENDIX

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4. A Report on the Forest City, Iowa City Planning Program; Harland, Bartholomew and Associates; Urban Planning Grant Project No. Iowa p-29; 1966.

5. "Iowa Roads and Streets Functional Classification Manual", prepared by the Iowa State Highway Commission, in accordance with House File 394 and House File 1103.

6. Highway Capacity Manual; Special Report 87; Highway Research Board; 1965.

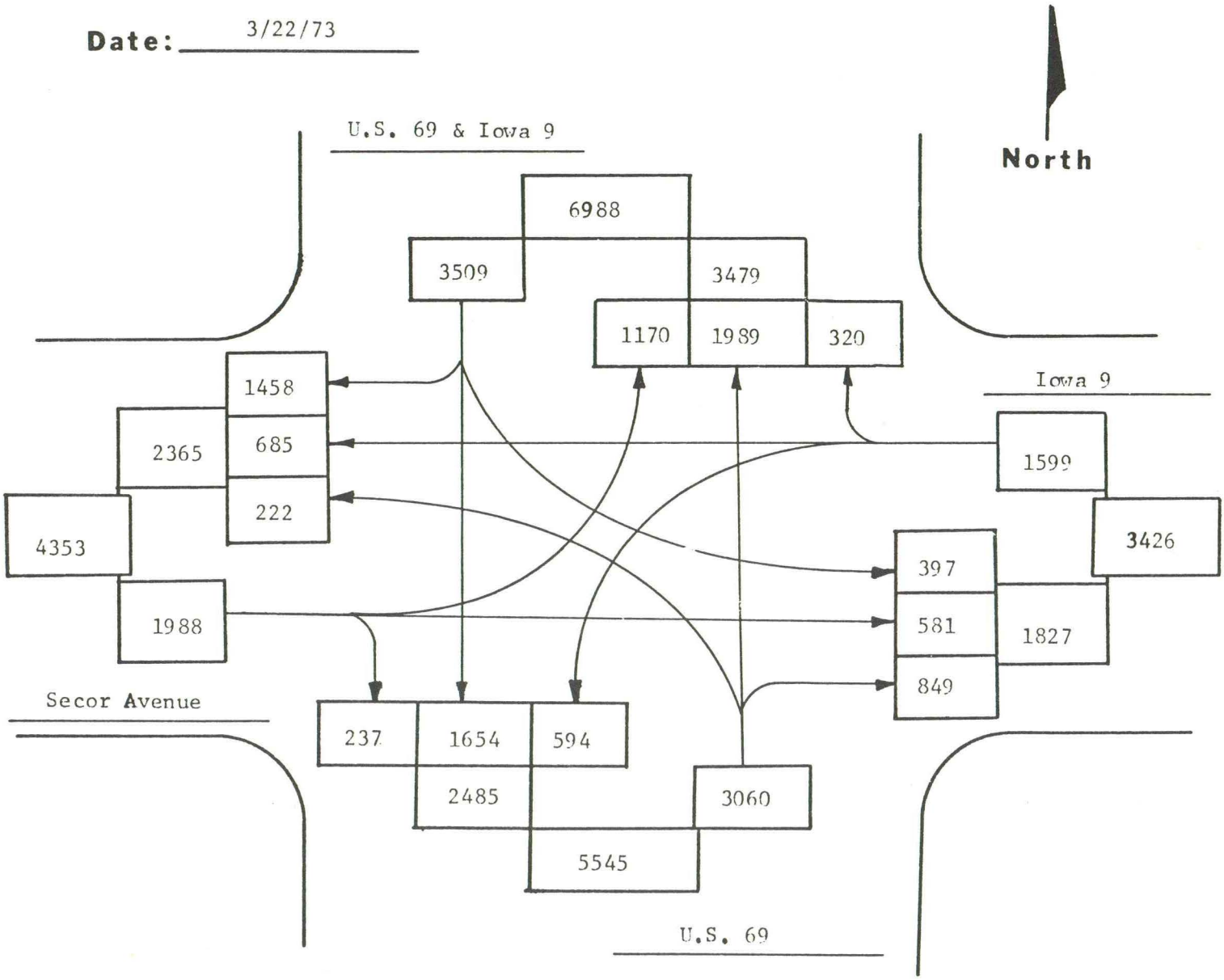
7. Traffic Engineering Handbook; Institute of Traffic Engineers; Third Edition, 1965.

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection U.S. 69 and Iowa 9 **City:** Forest City, Iowa

Date: 3/22/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 1
(SEE PLATE NO.4)

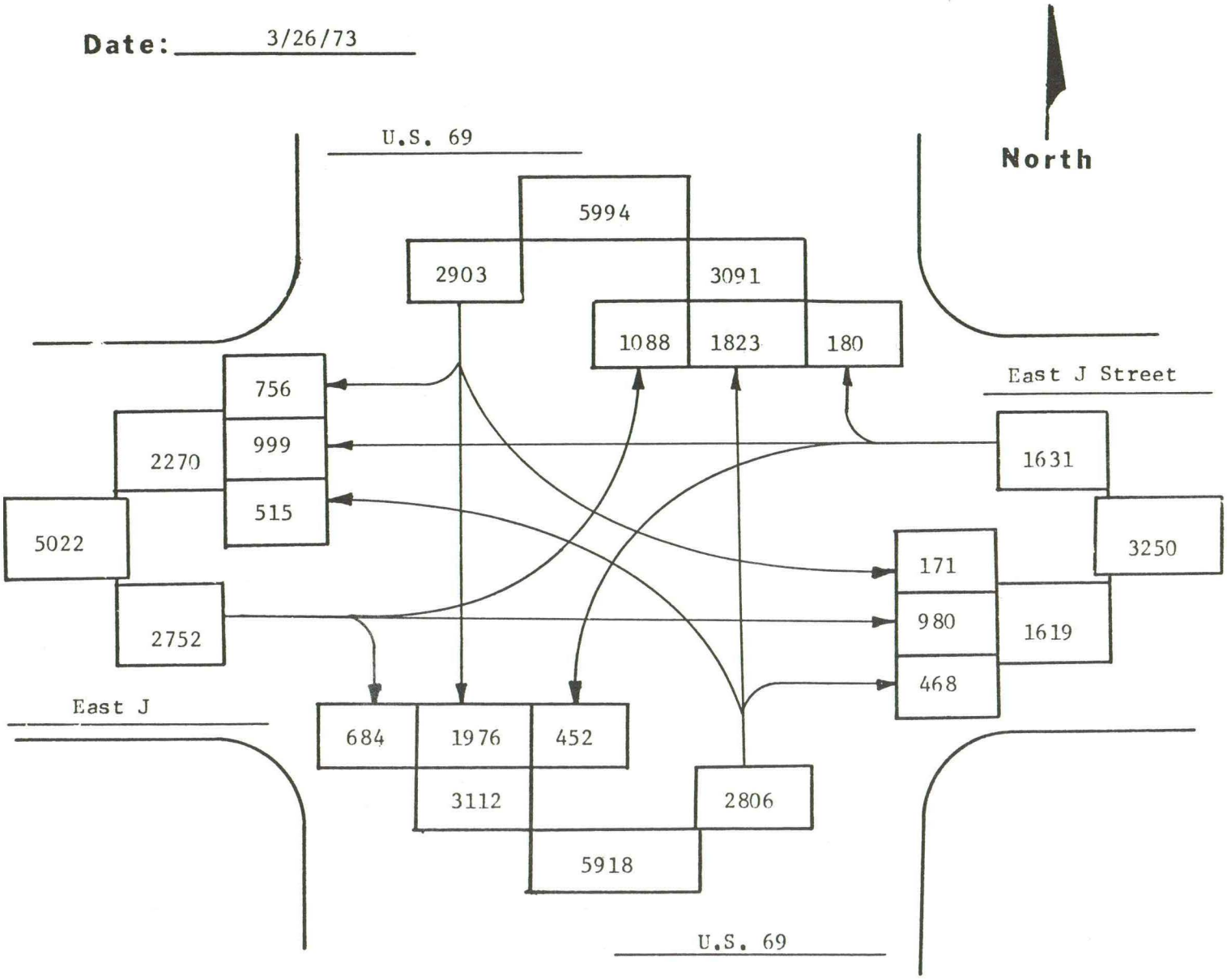
Figure A-1

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection U.S. 69 and "J" St. **City:** Forest City, Iowa

Date: 3/26/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 2

Figure A-2

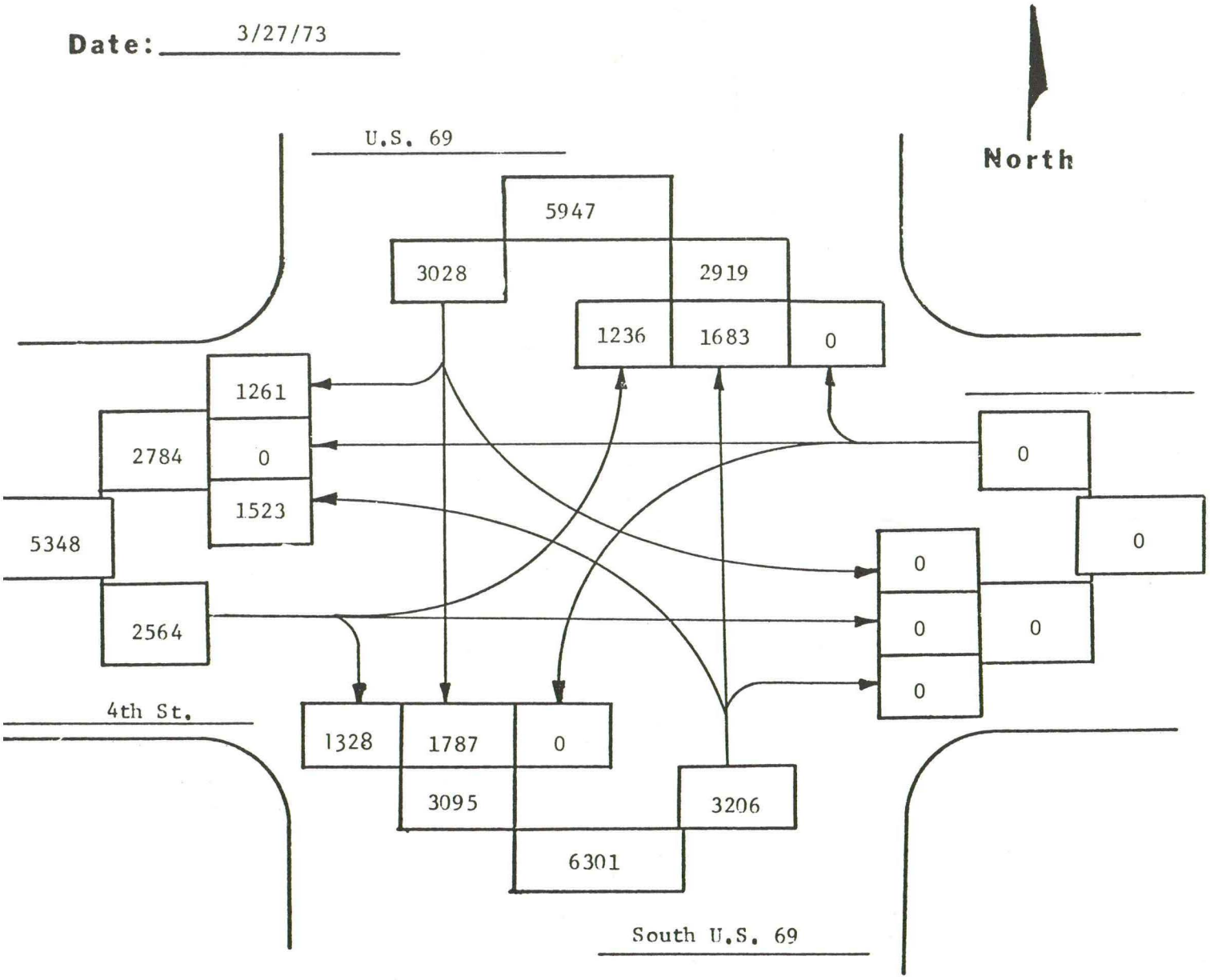
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection U.S. 69 and 4th St. **City:** Forest City, Iowa

Date: 3/27/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 3

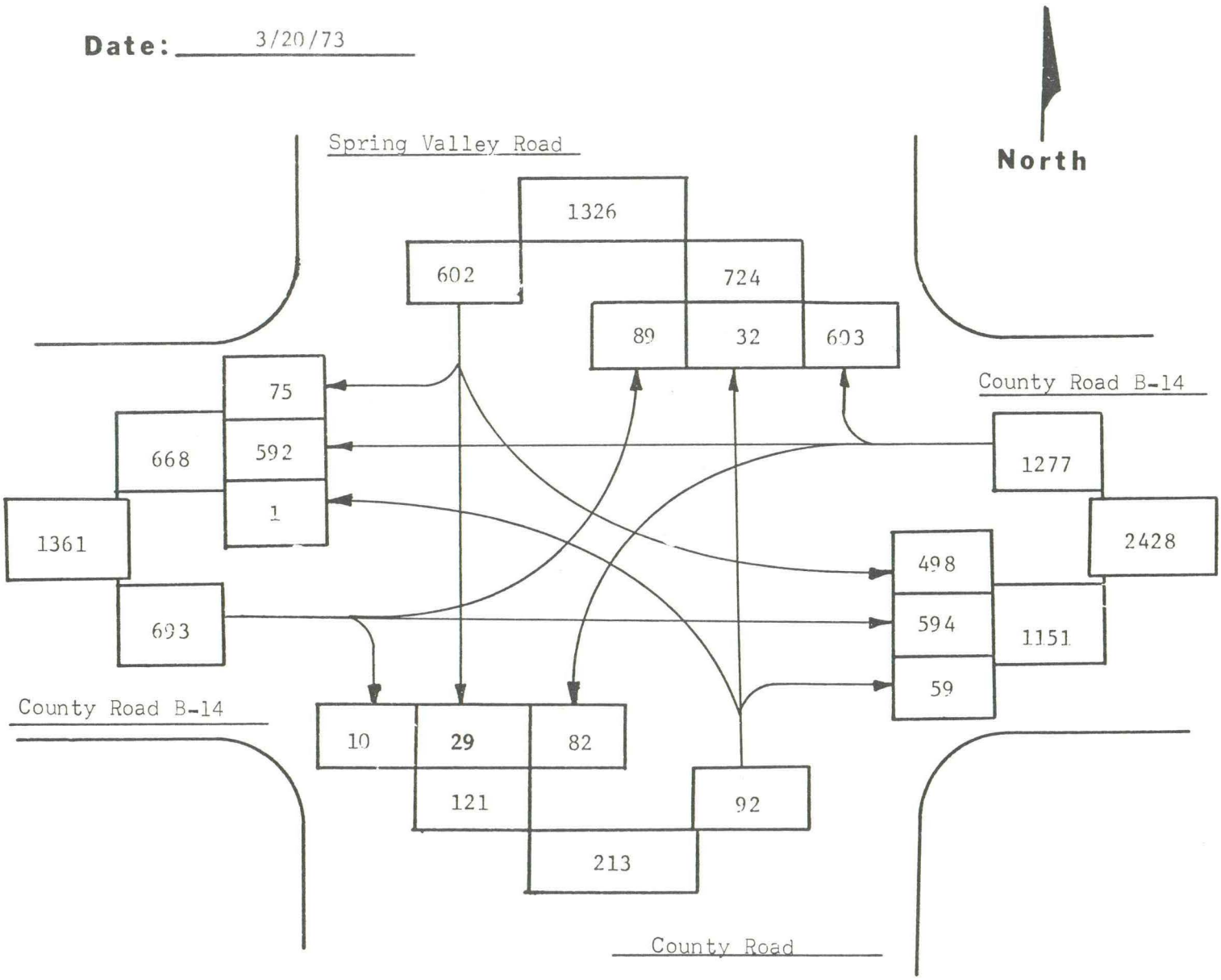
Figure A-3 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: West Entrance County Road from Crystal Lake **City:** Forest City, Iowa

Date: 3/20/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 4

(SEE PLATE NO.4)

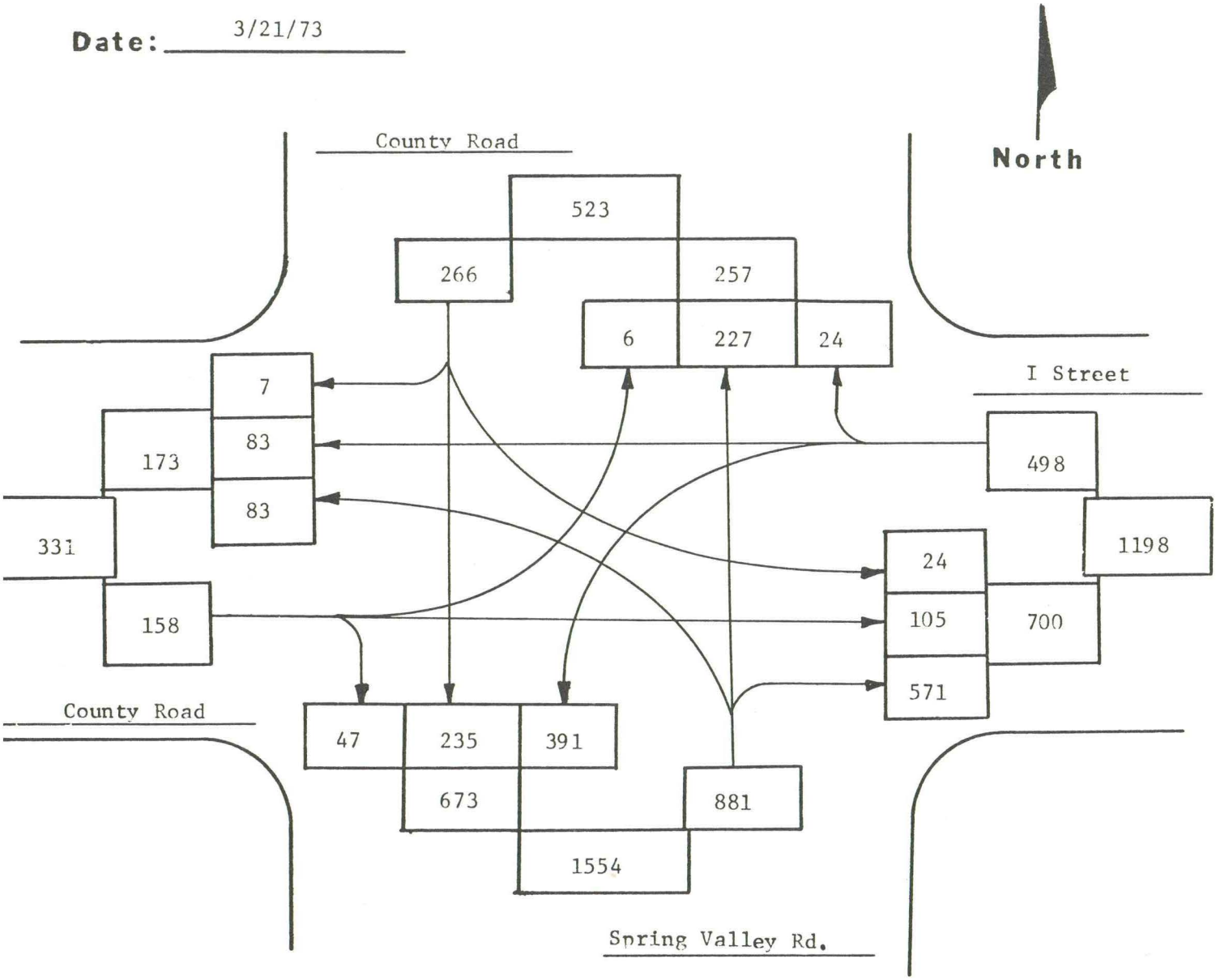
Figure A-4

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "I" and Spring Valley Road **City:** Forest City, Iowa

Date: 3/21/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 5

(SEE PLATE NO.4)

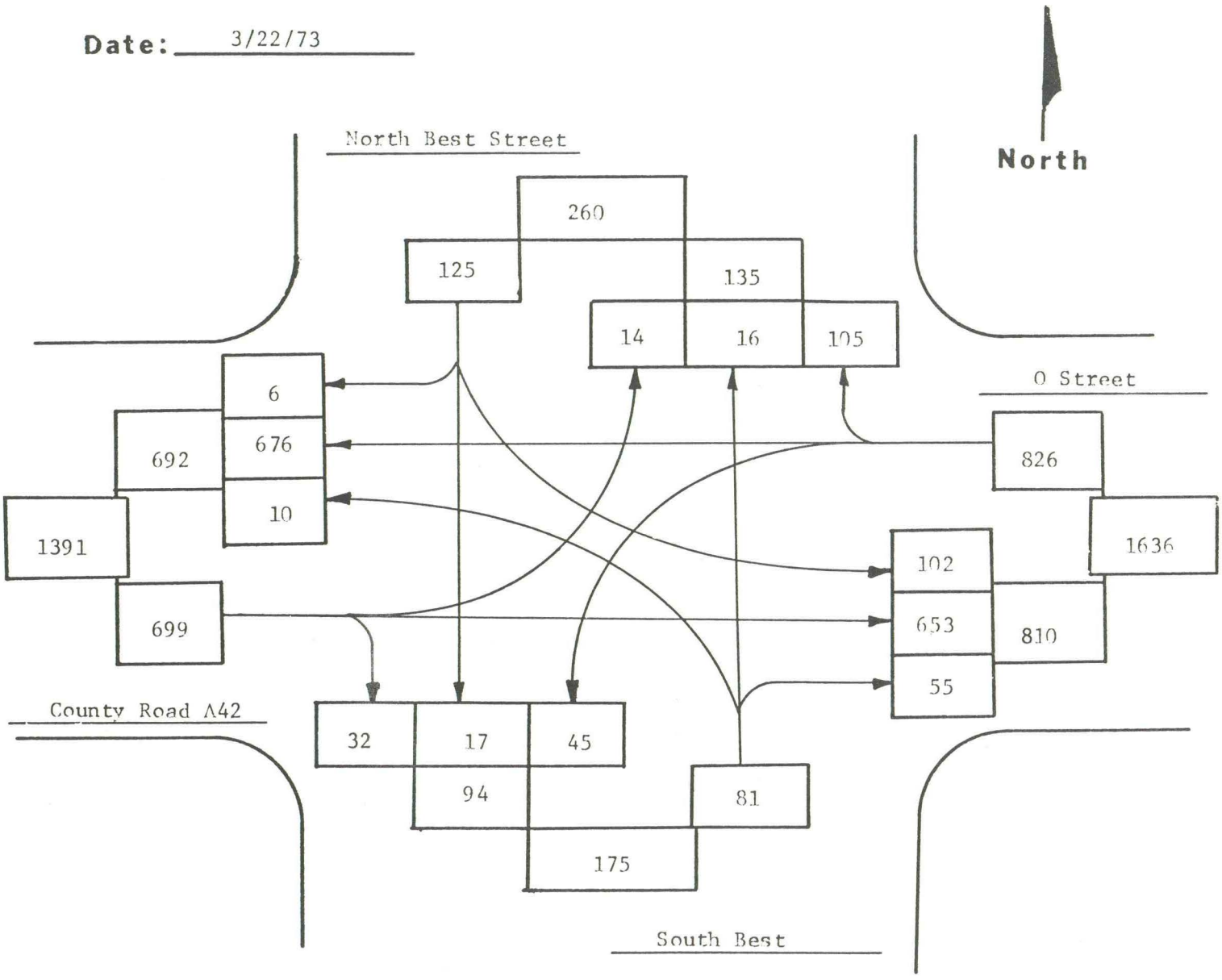
Figure A-5

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "O", County Road A42 & Best St **City:** Forest City, Iowa

Date: 3/22/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 6

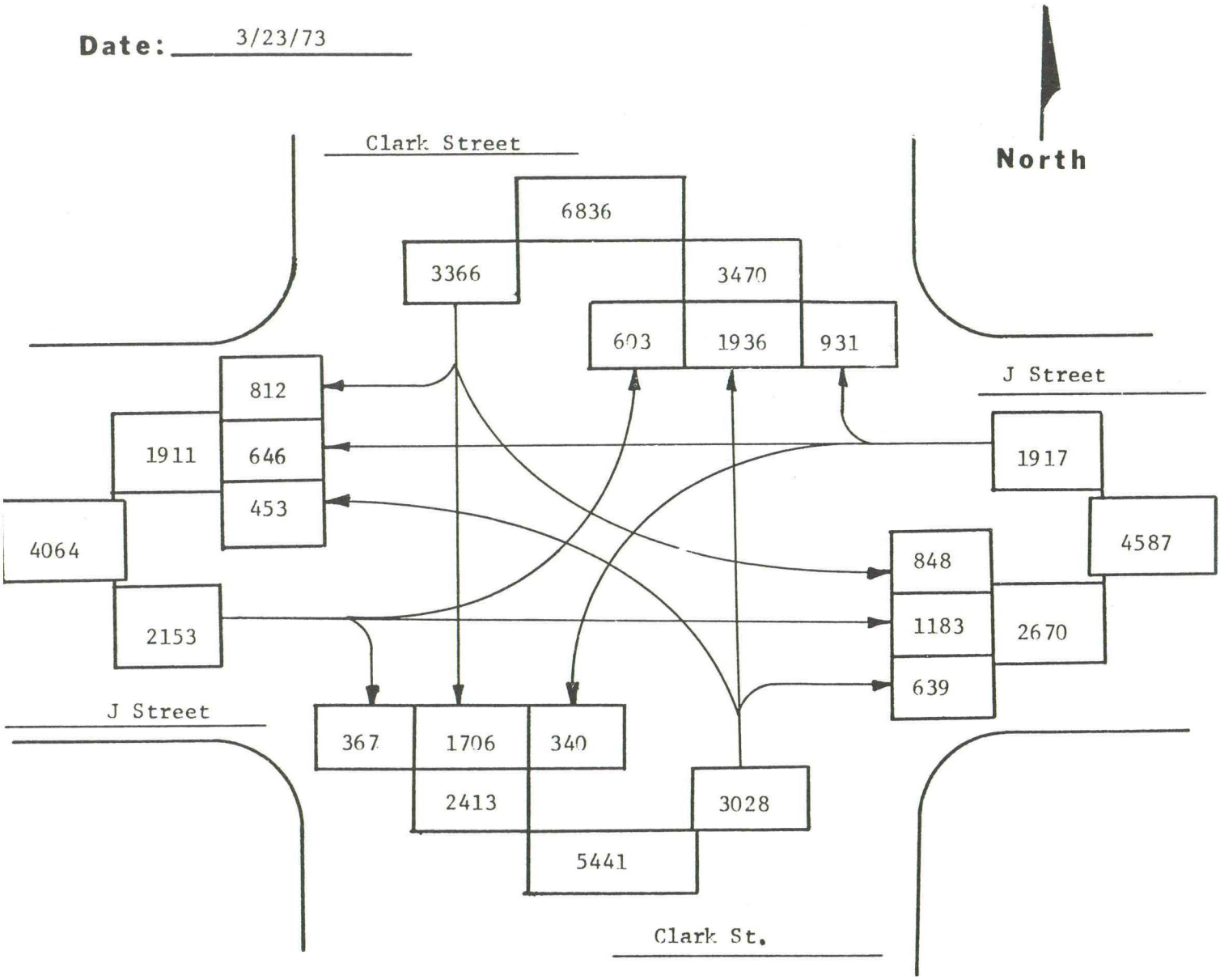
Figure A-6 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection Clark and "J" Street **City:** Forest City, Iowa

Date: 3/23/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 7

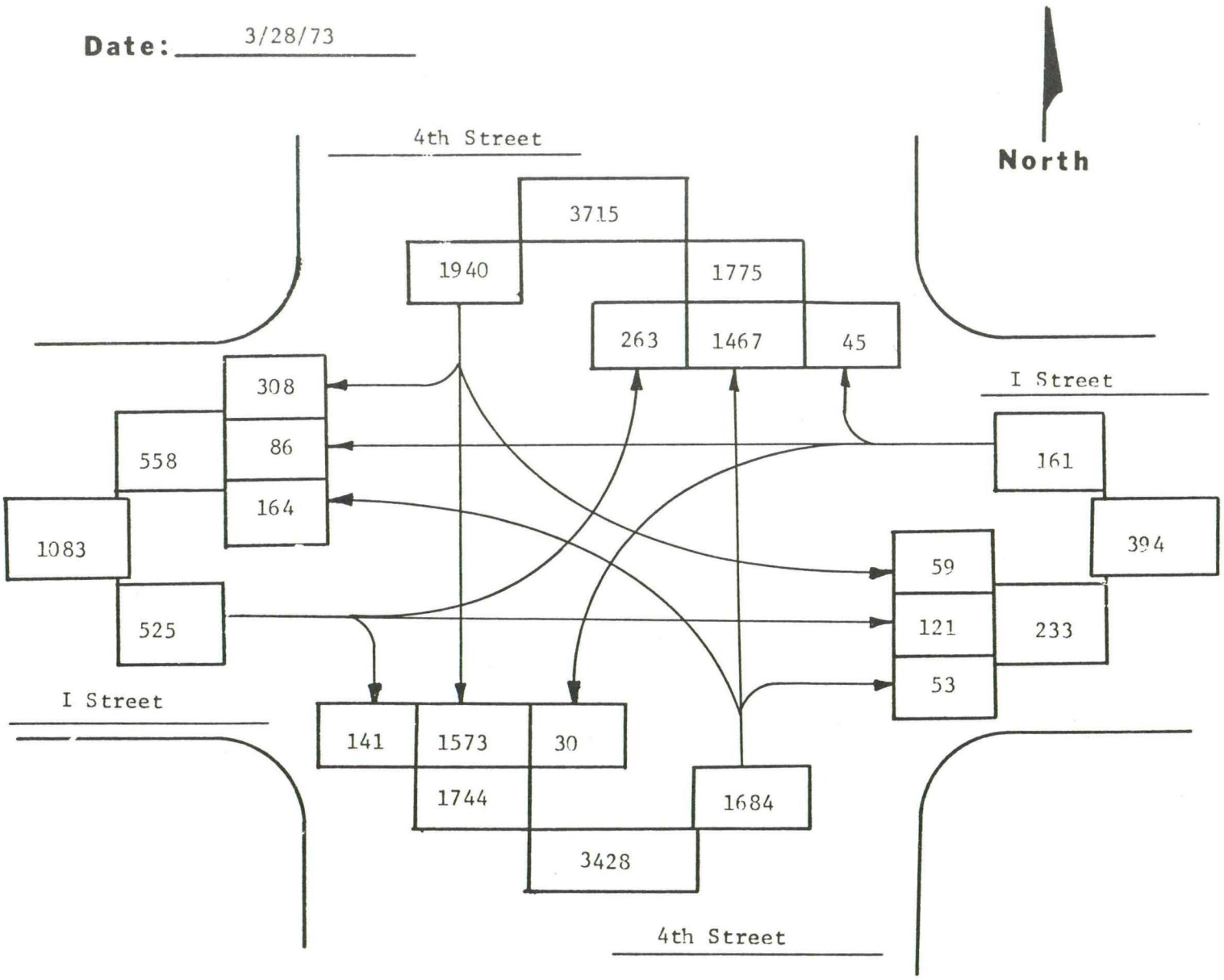
Figure A-7 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection South 4th and East "I" **City:** Forest City, Iowa

Date: 3/28/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 8

(SEE PLATE NO.4)

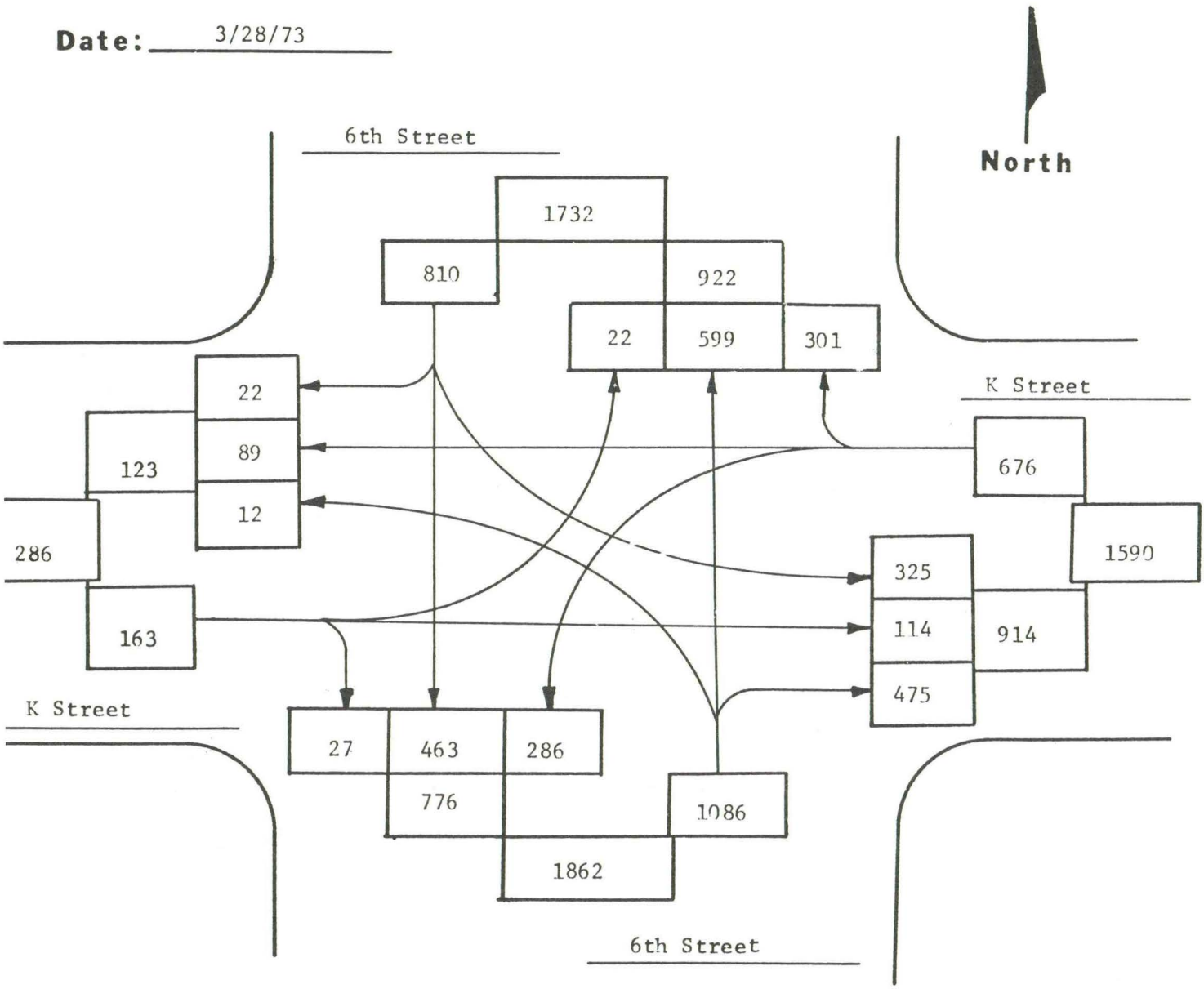
Figure A-8

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "K" and 6th Streets **City:** Forest City, Iowa

Date: 3/28/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 9

(SEE PLATE NO.4)

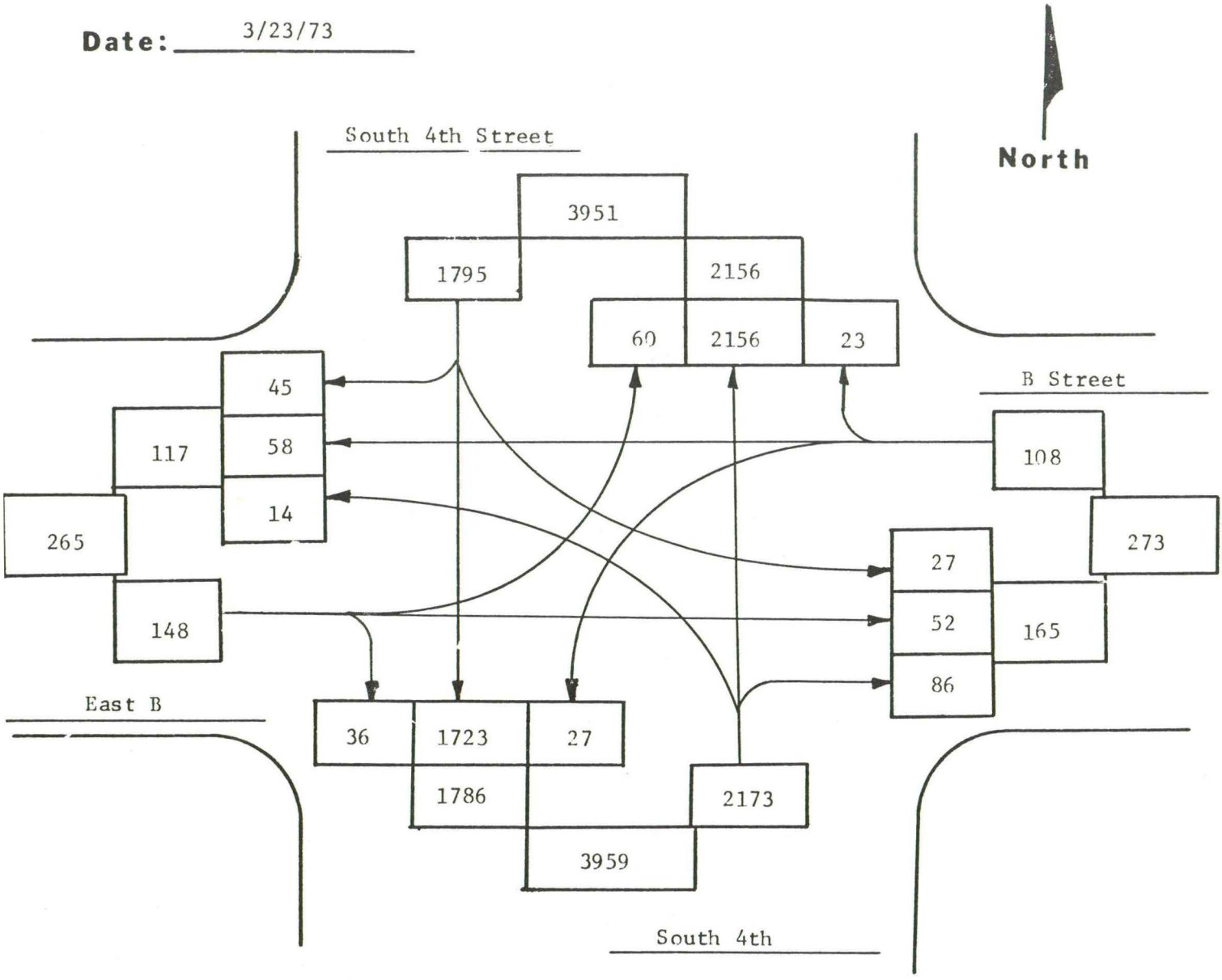
Figure A-9

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection 4th and "B" Street **City:** Forest City, Iowa

Date: 3/23/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 10

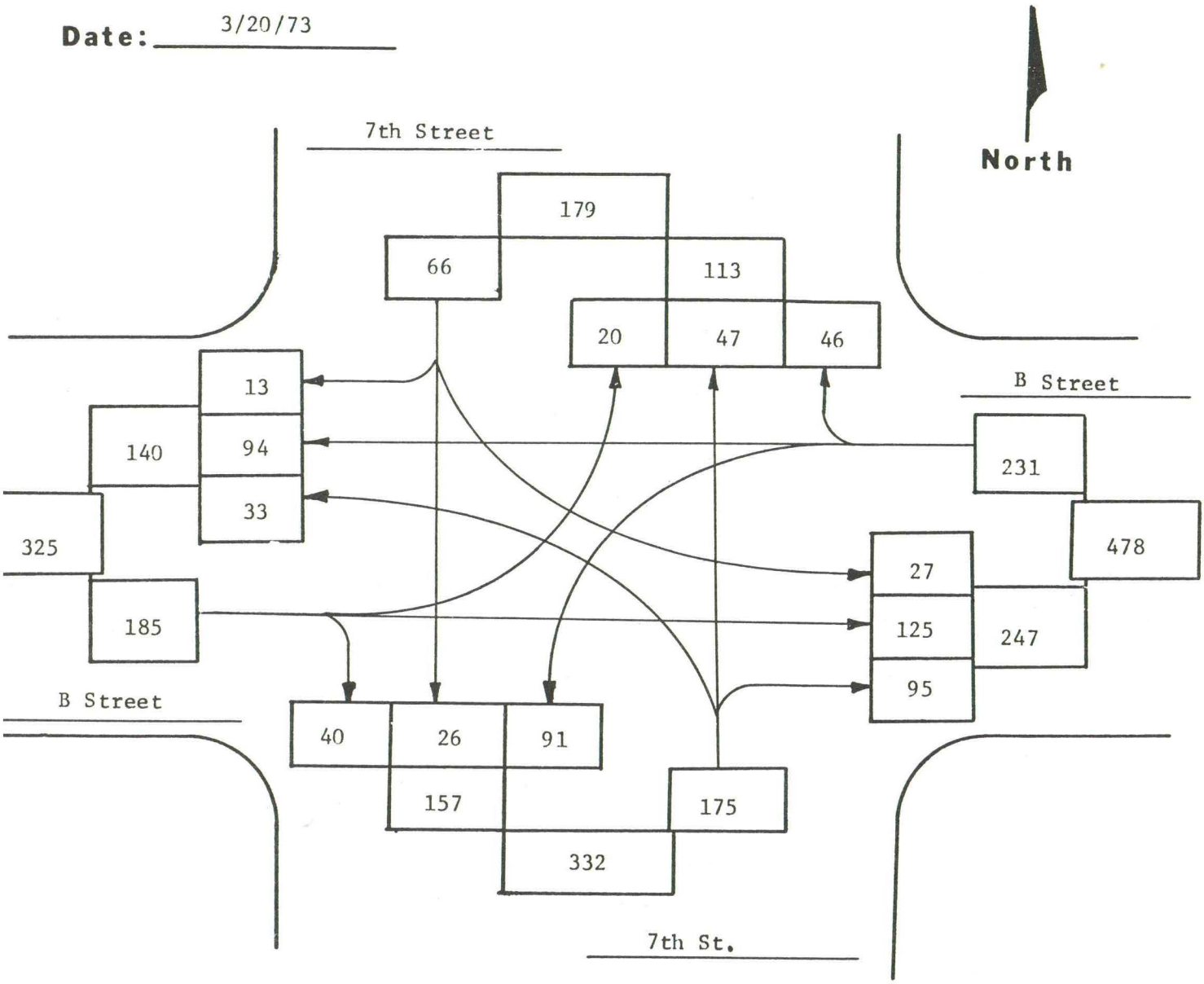
Figure A-10 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "B" and 7th St. **City:** Forest City, Iowa

Date: 3/20/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 11 (SEE PLATE NO.4)

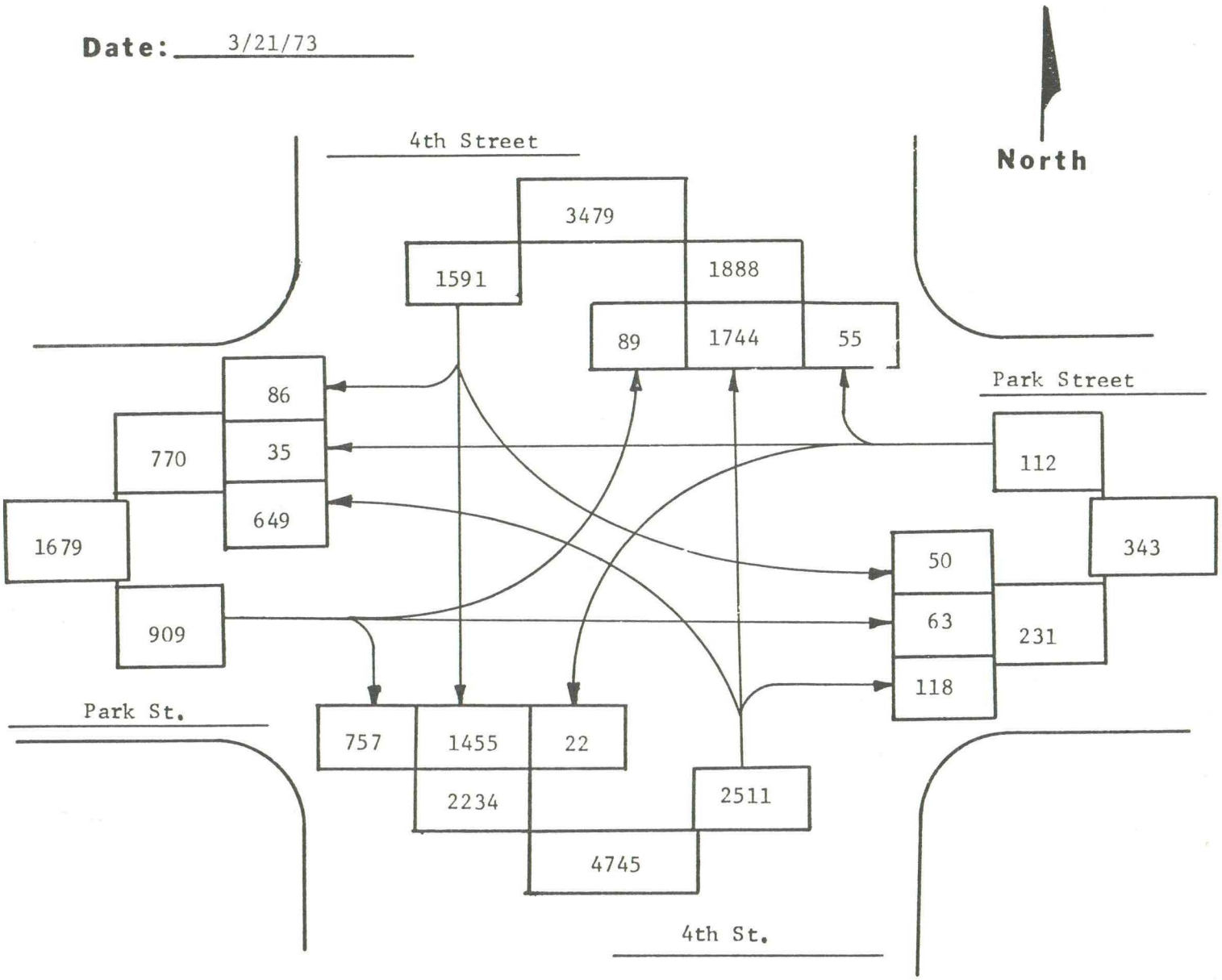
Figure A-11

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection 4th and Park **City:** Forest City, Iowa

Date: 3/21/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 12

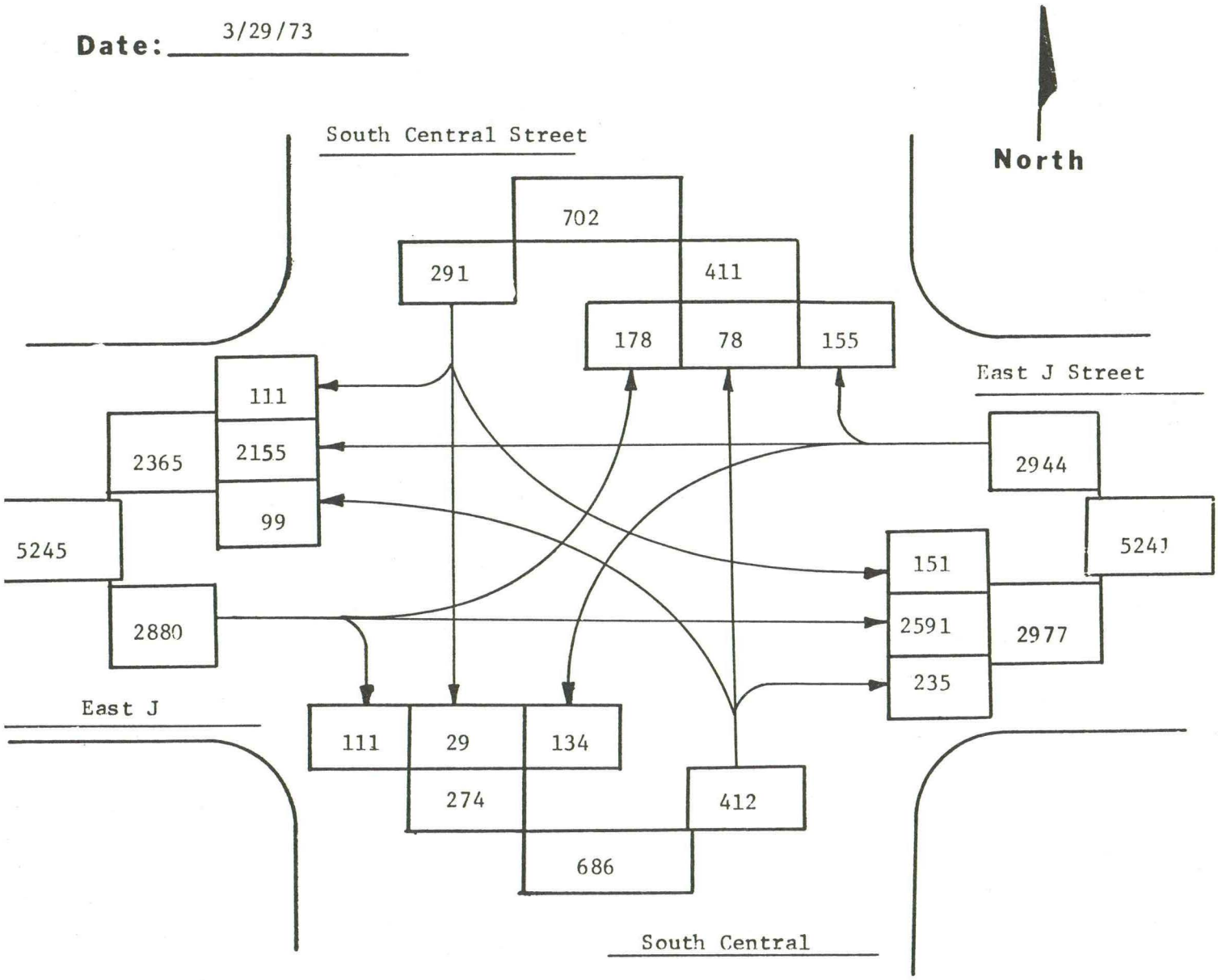
Figure A-12 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection East "J" and Central St. **City:** Forest City, Iowa

Date: 3/29/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 13

(SEE PLATE NO.4)

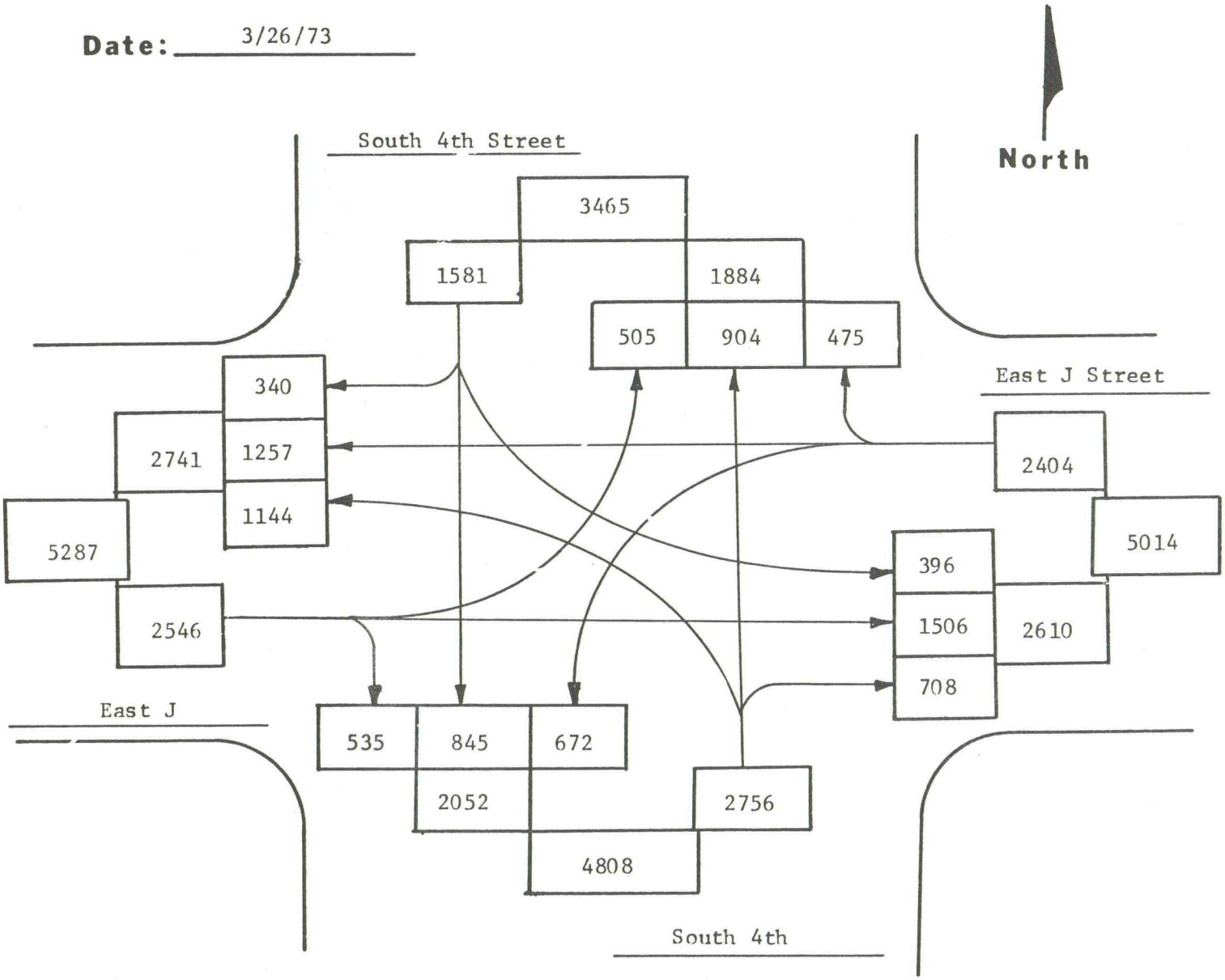
Figure A-13

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection East "J" and 4th St. **City:** Forest City, Iowa

Date: 3/26/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 14

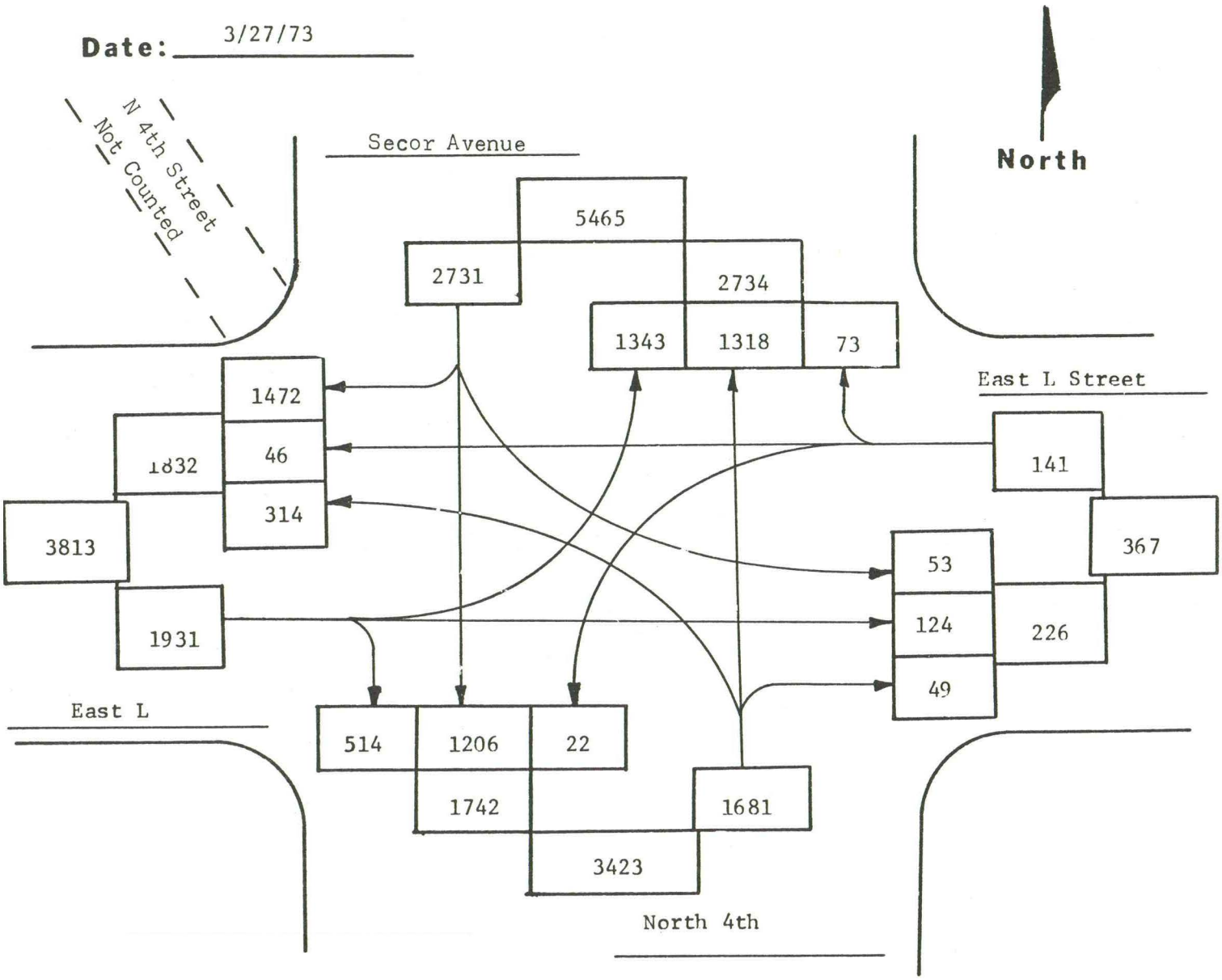
Figure A-14 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "L", 4th and Secor Ave. **City:** Forest City, Iowa

Date: 3/27/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 15

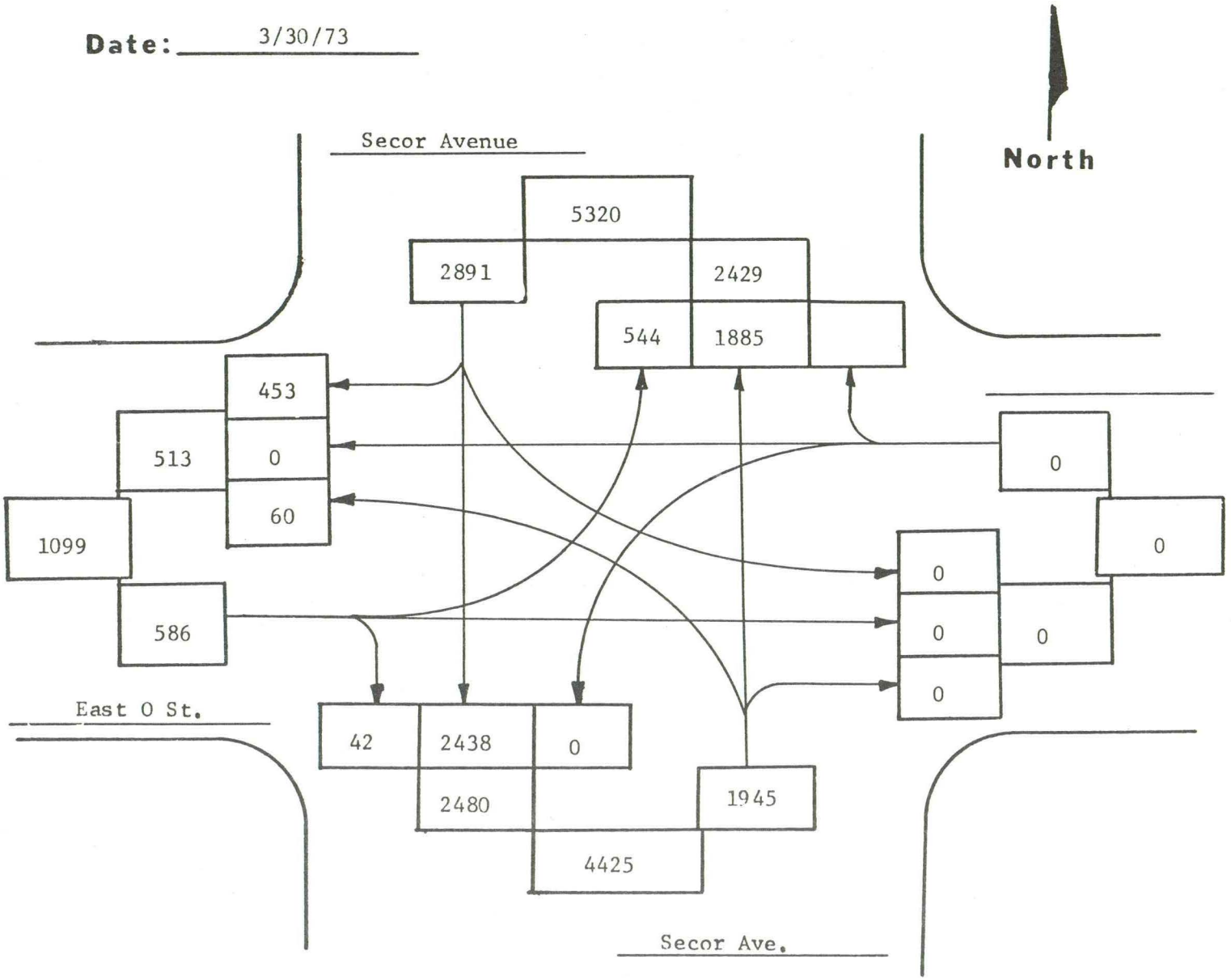
Figure A-15 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "0" and Secor Ave. **City:** Forest City, Iowa

Date: 3/30/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 16

Figure A-16

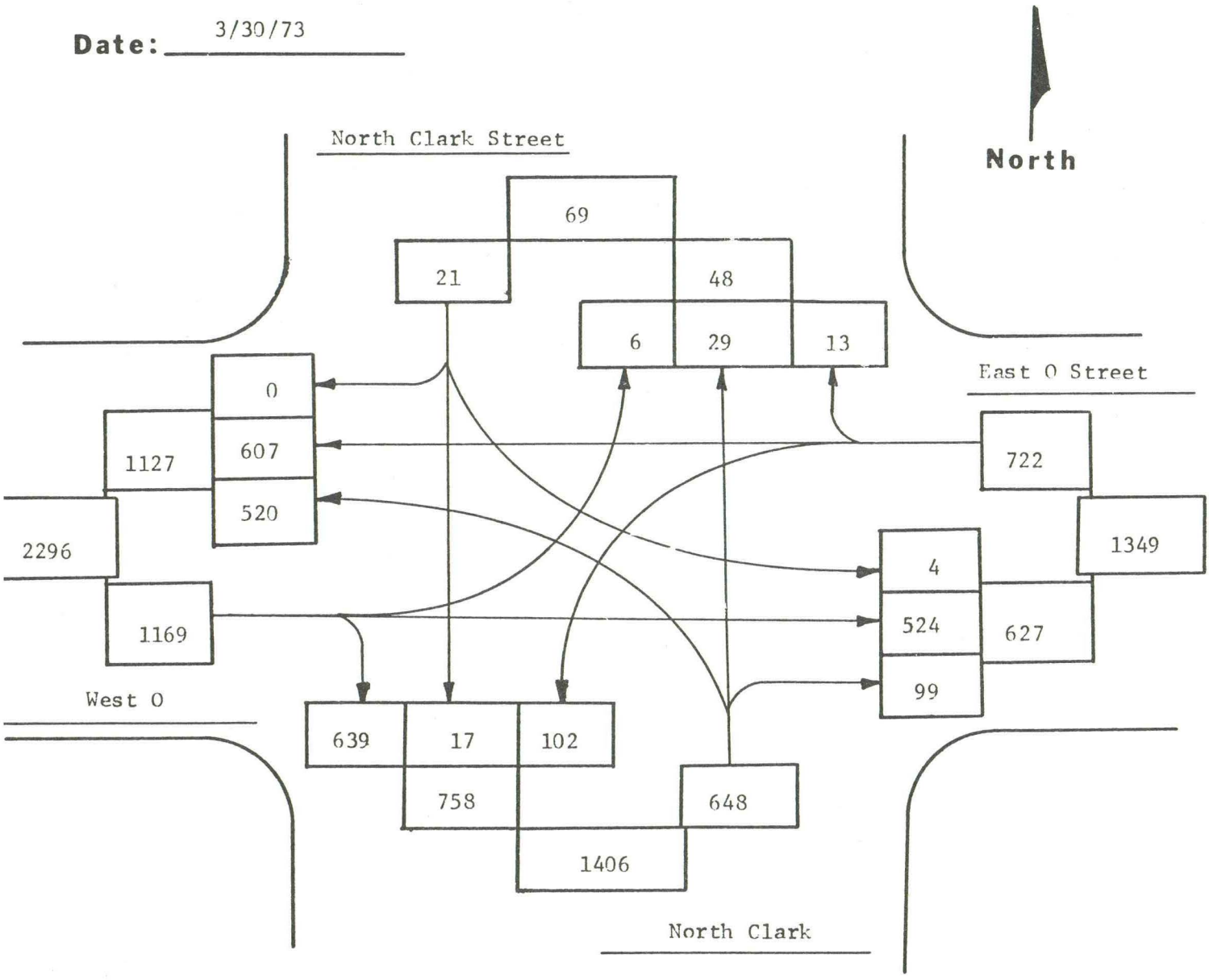
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: North Clark and "O" Street **City:** Forest City, Iowa

Date: 3/30/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 17
(SEE PLATE NO.4)

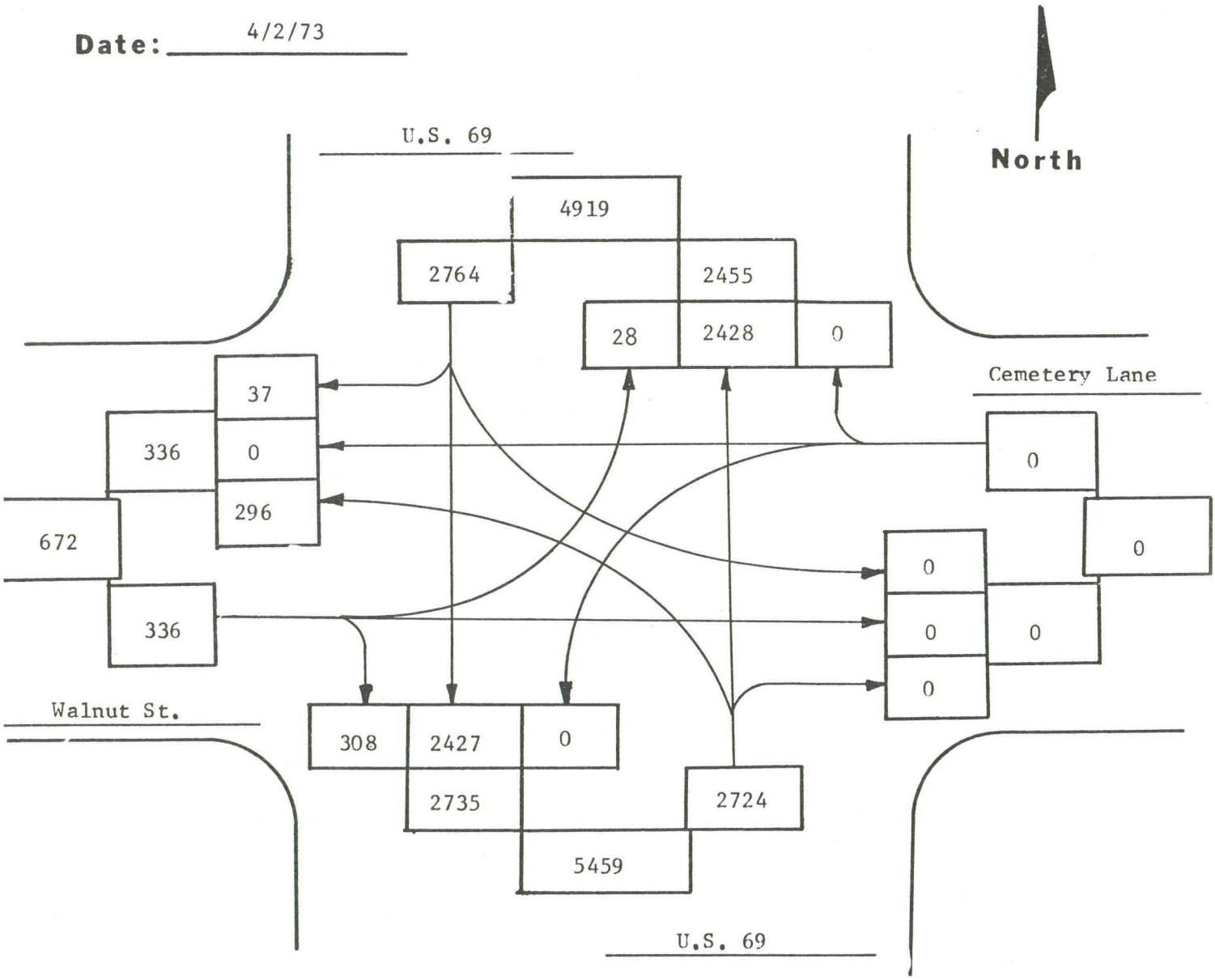
Figure A-17

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection U.S. 69 and Woodland Dr. **City:** Forest City, Iowa

Date: 4/2/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 18

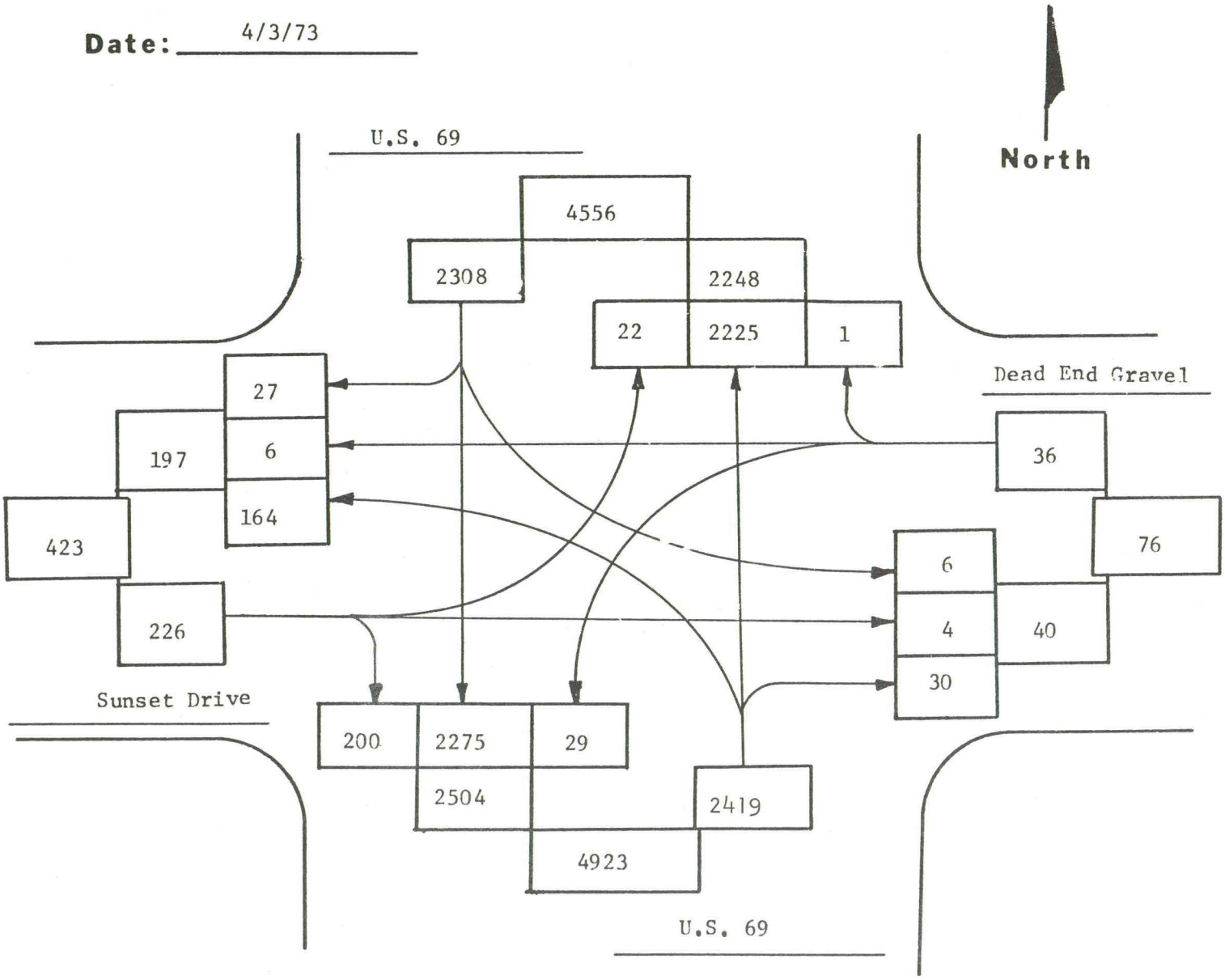
Figure A-18 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection U.S. 69 and Sunset Drive **City:** Forest City, Iowa

Date: 4/3/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 19

(SEE PLATE NO.4)

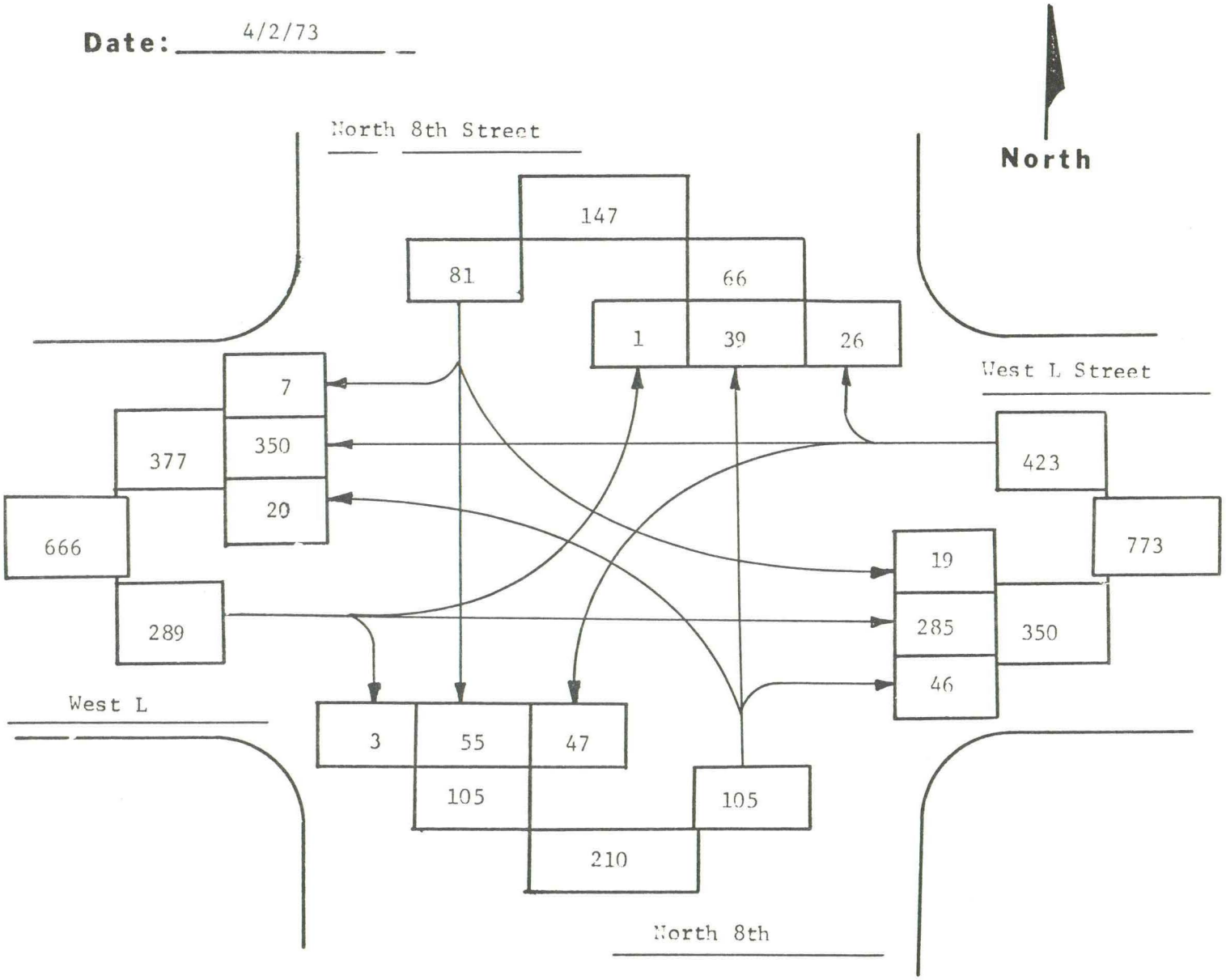
Figure A-19

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection North 8th and West "L" **City:** Forest City, Iowa

Date: 4/2/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 20

Figure A-20

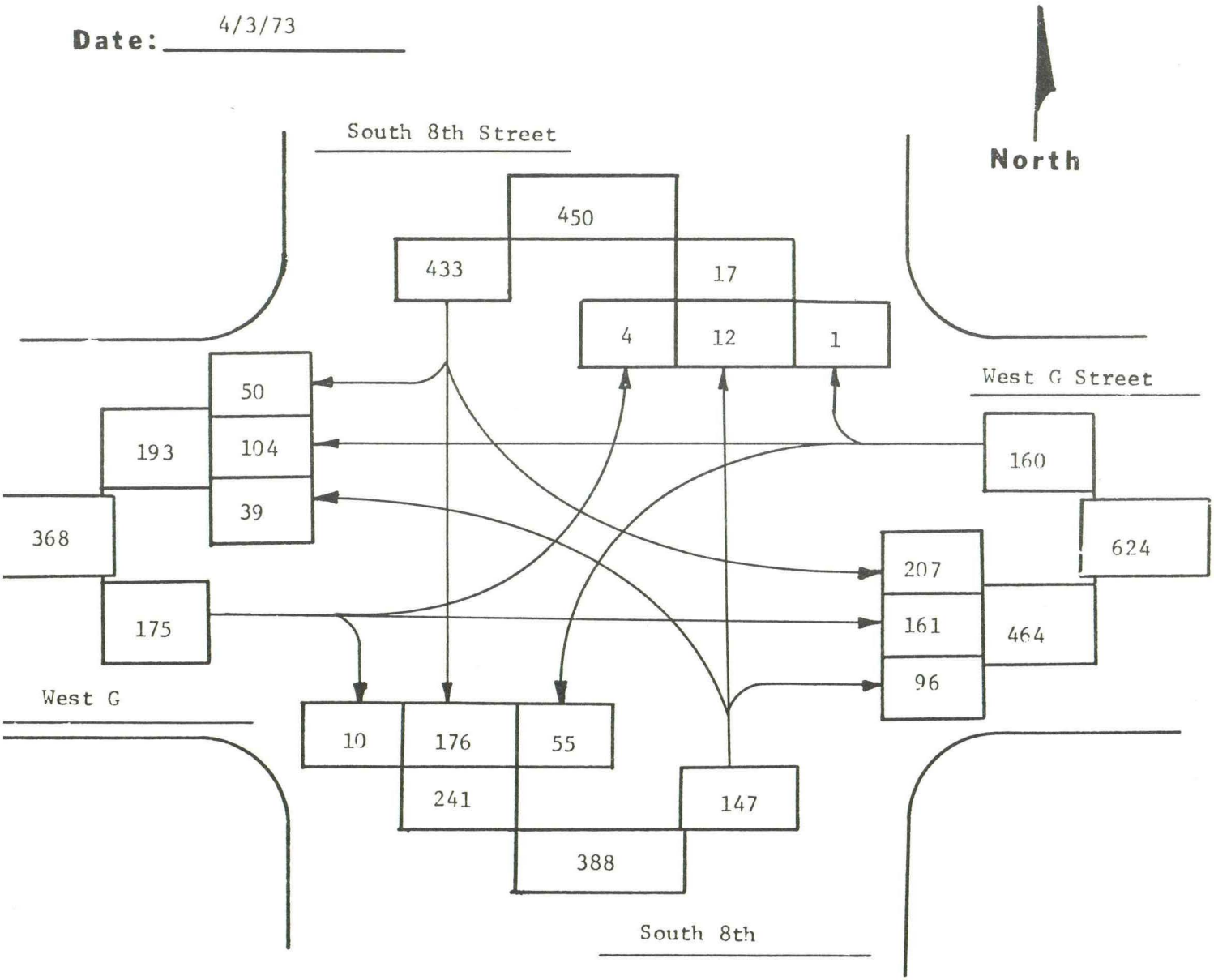
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection West "G" and South 8th **City:** Forest City, Iowa

Date: 4/3/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 21

(SEE PLATE NO.4)

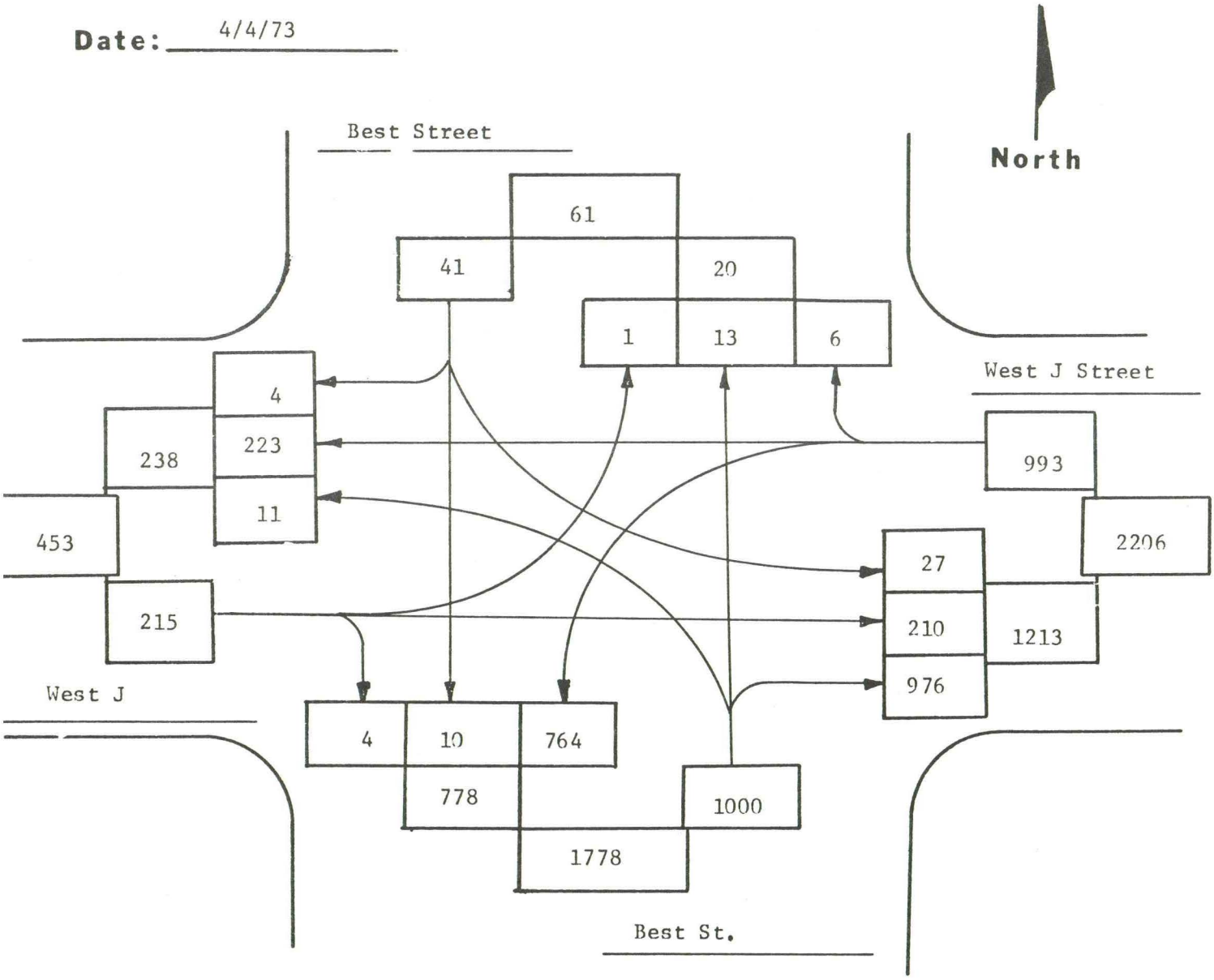
Figure A-21

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection West "J" and Best Street **City:** Forest City, Iowa

Date: 4/4/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 22
(SEE PLATE NO.4)

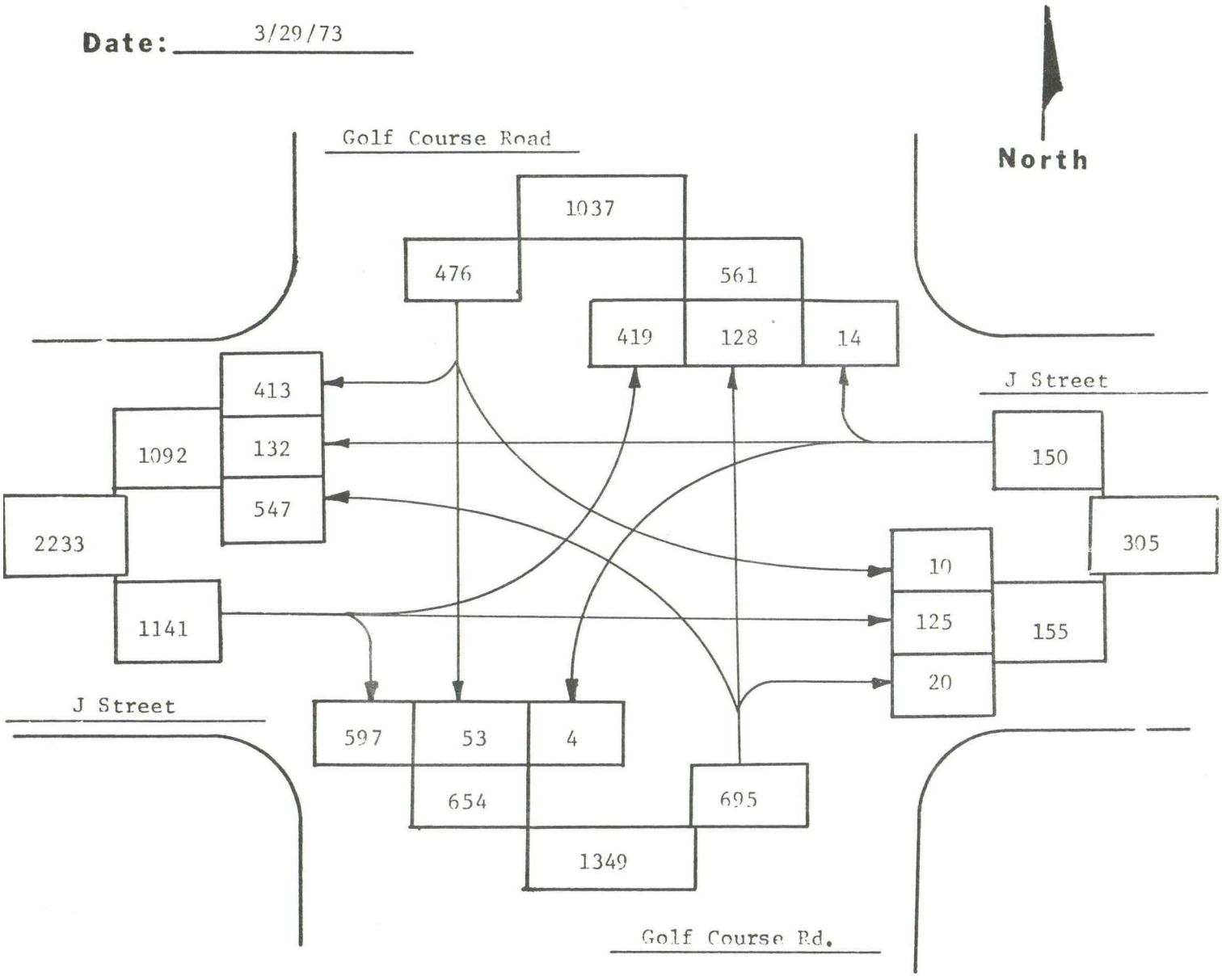
Figure A-22

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "J" St. and Golf Course Rd. **City:** Forest City, Iowa

Date: 3/29/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 23

Figure A-23

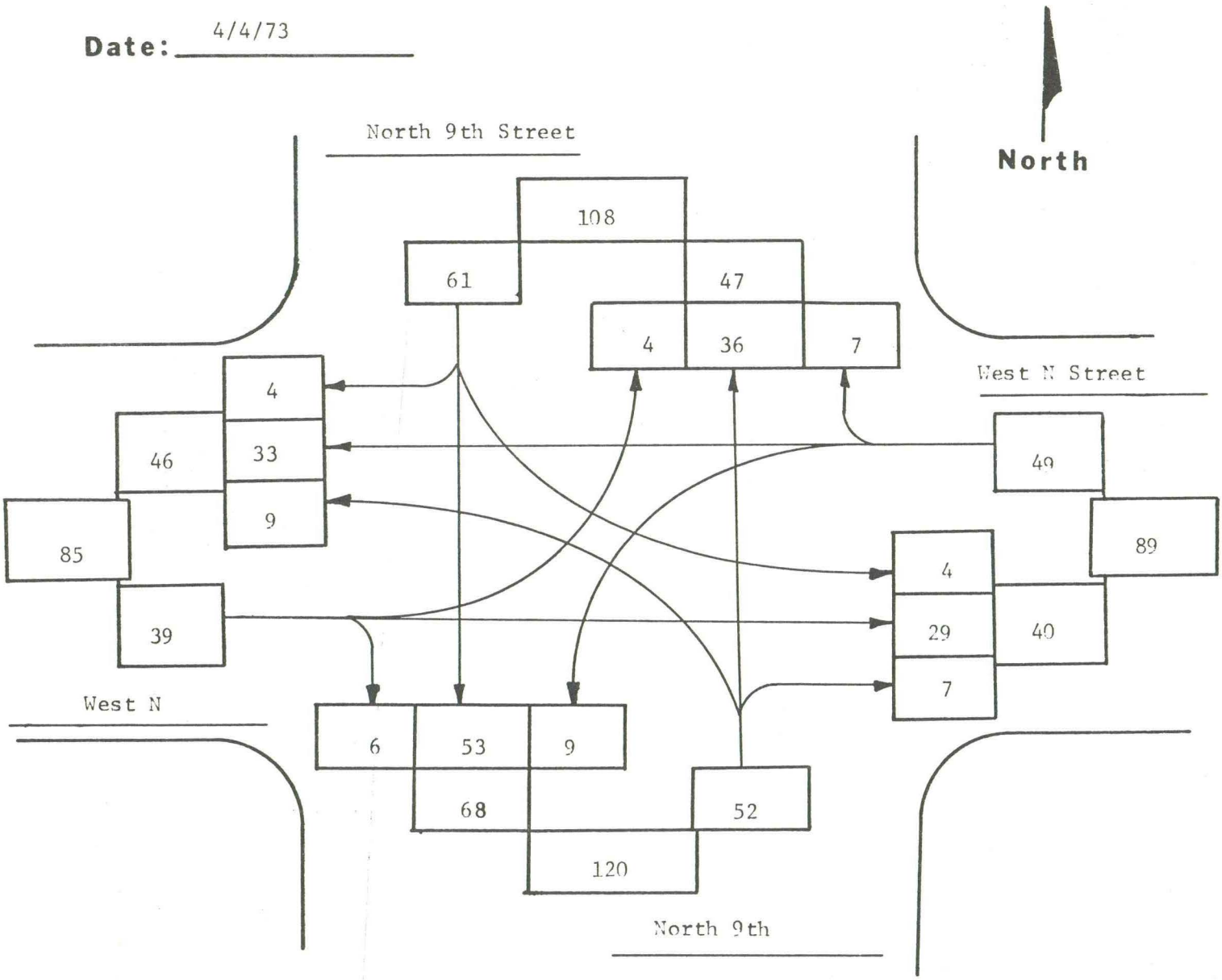
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection West "N" and North 9th **City:** Forest City, Iowa

Date: 4/4/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 24

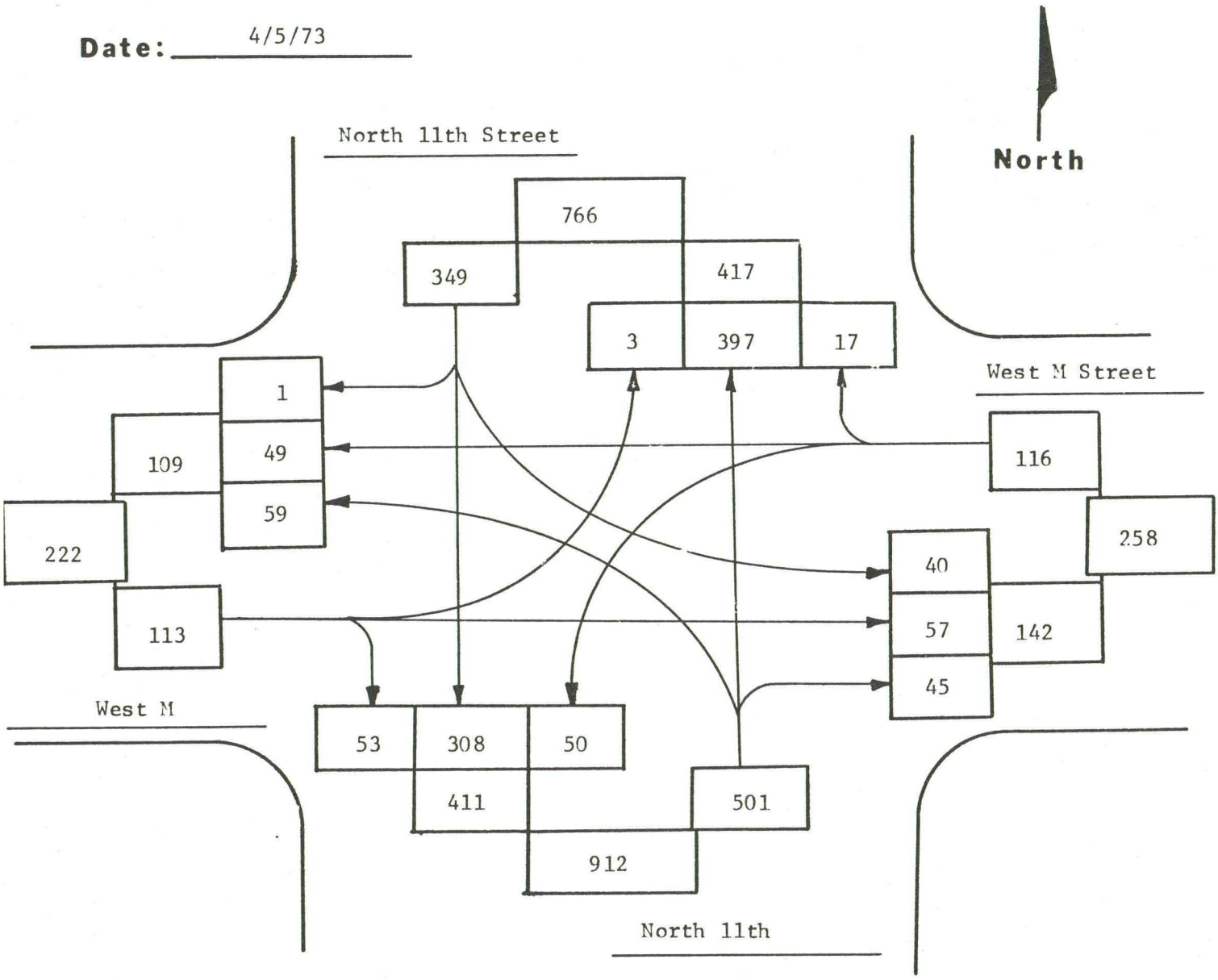
Figure A-24 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "M" St. and 11th St. **City:** Forest City, Iowa

Date: 4/5/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 25

(SEE PLATE NO.4)

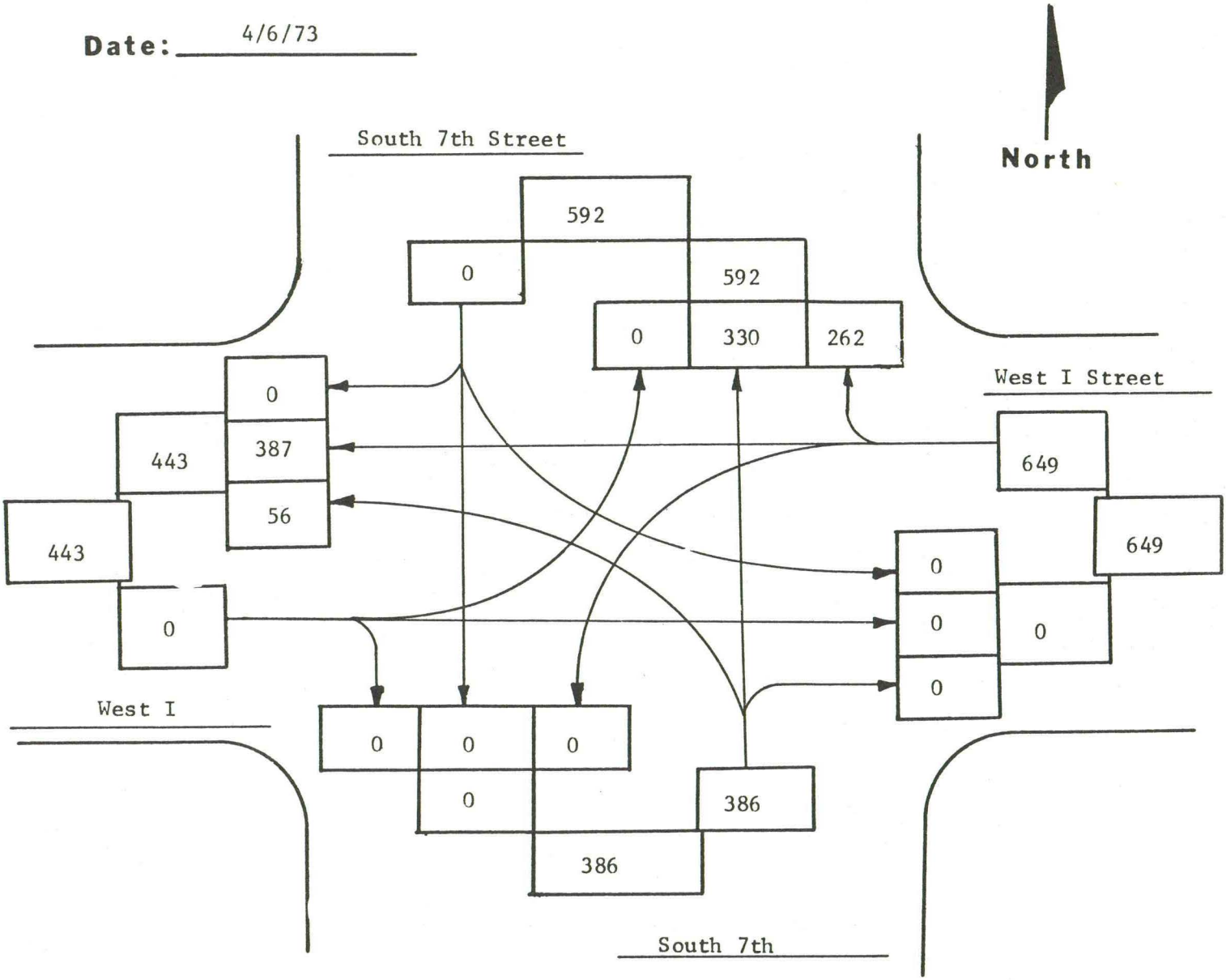
Figure A-25

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection West "I" and South 7th **City:** Forest City, Iowa

Date: 4/6/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 26

(SEE PLATE NO.4)

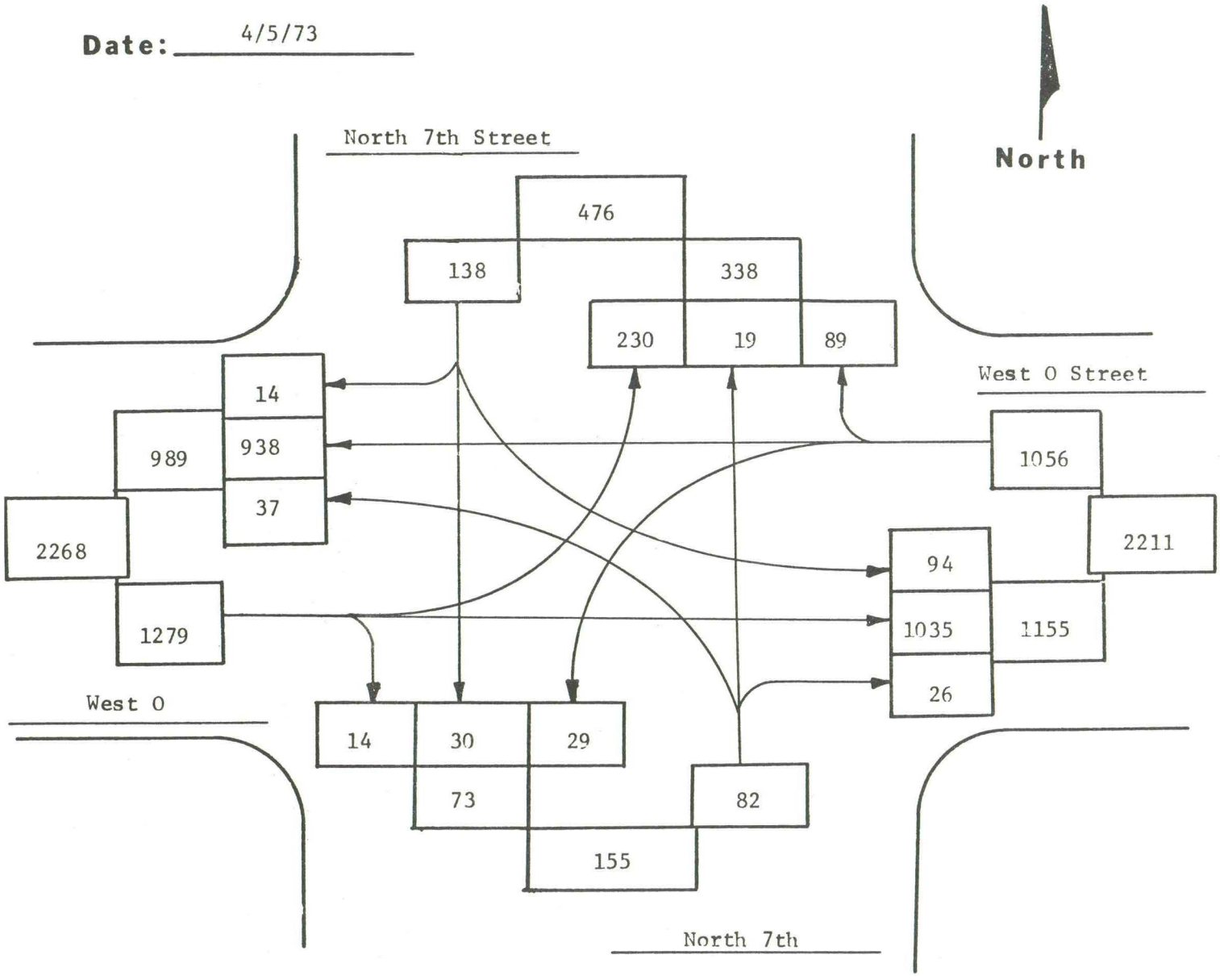
Figure A-26

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection West "O" and North 7th **City:** Forest City, Iowa

Date: 4/5/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 27

Figure A-27

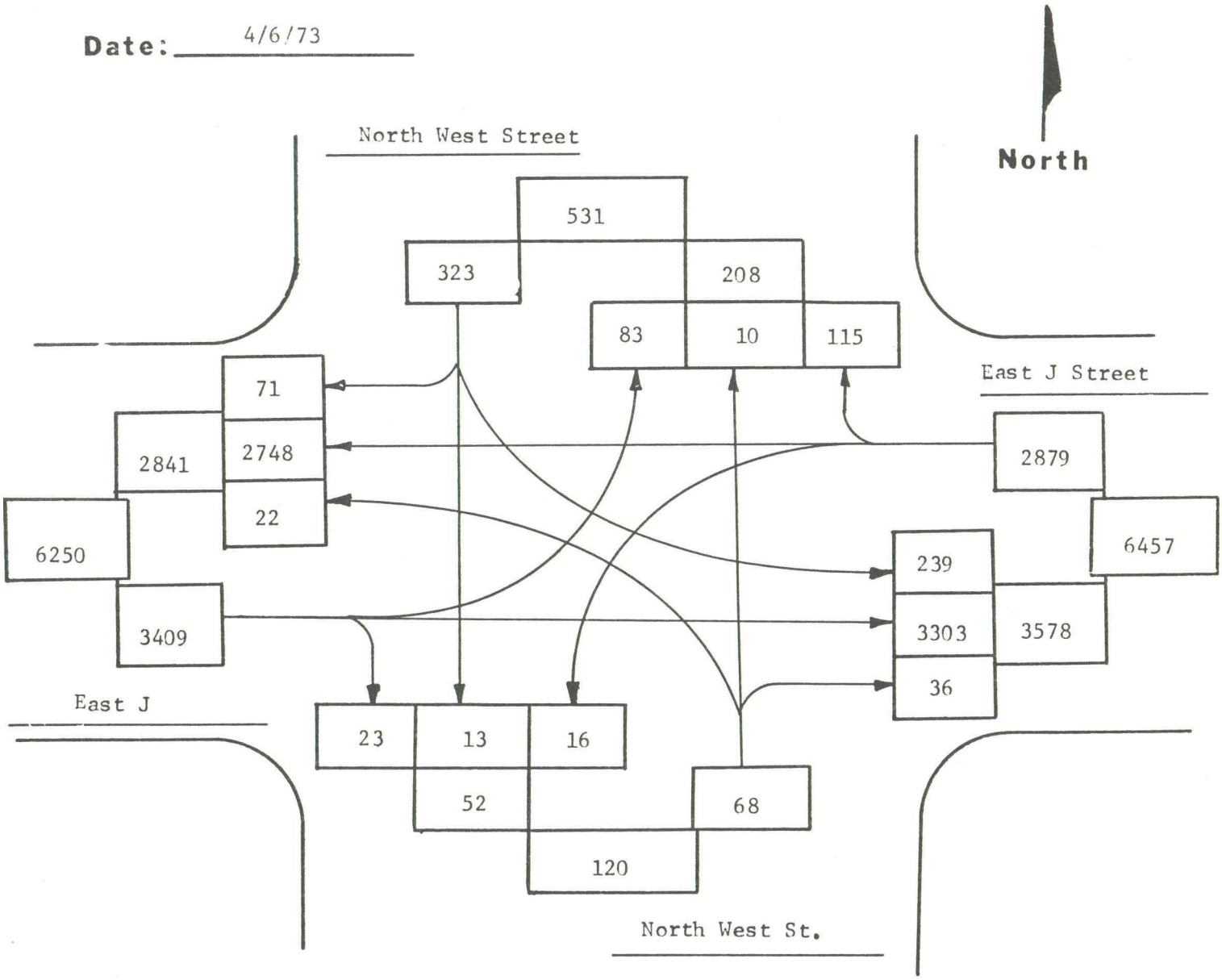
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "J" and West St. **City:** Forest City, Iowa

Date: 4/6/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 28

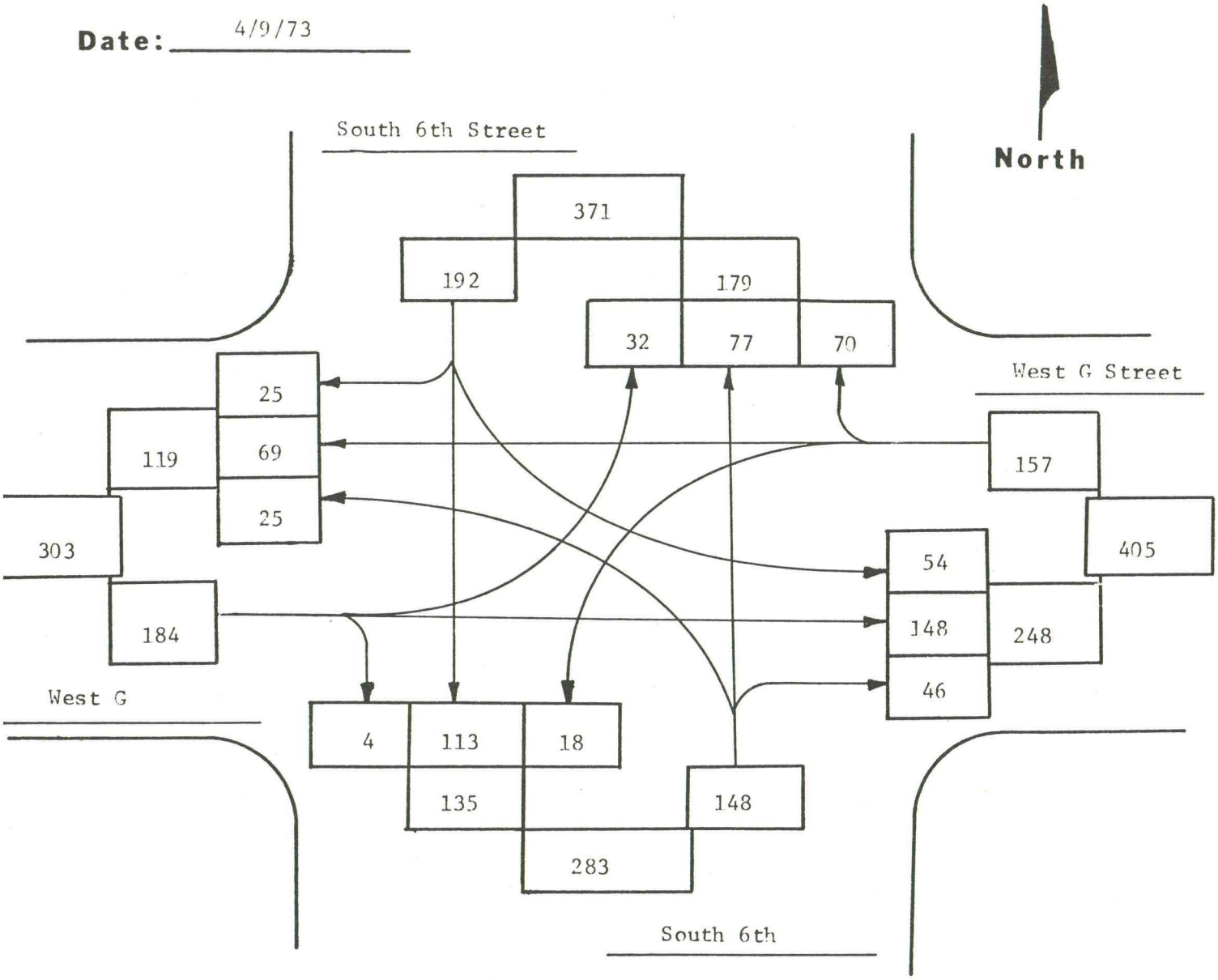
Figure A-28 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection West "G" and South 6th **City:** Forest City, Iowa

Date: 4/9/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 29

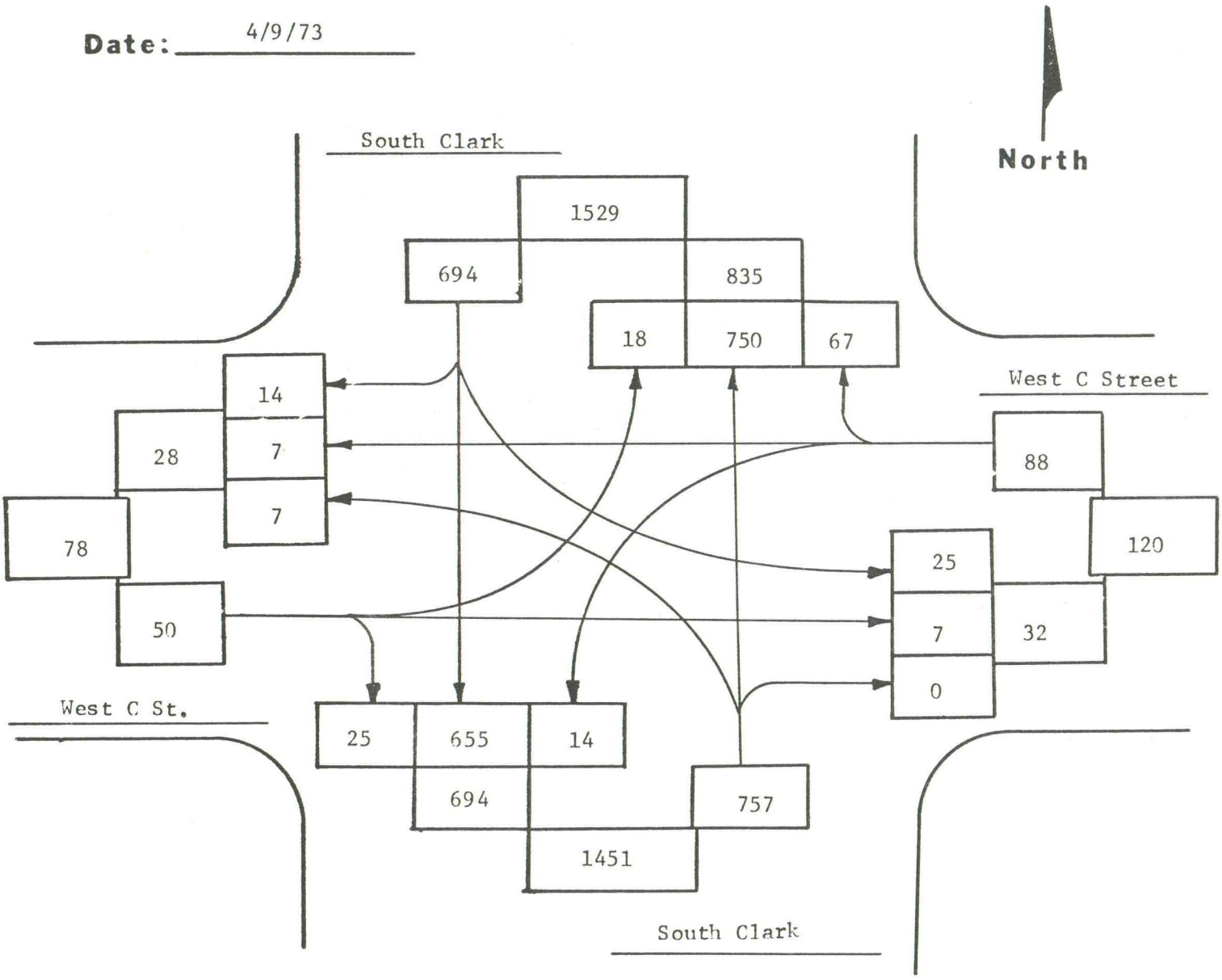
Figure A-29 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

AVG. DAILY TRAFFIC

Location: Intersection "C" and South Clark Sts. **City:** Forest City, Iowa

Date: 4/9/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 30

Figure A-30

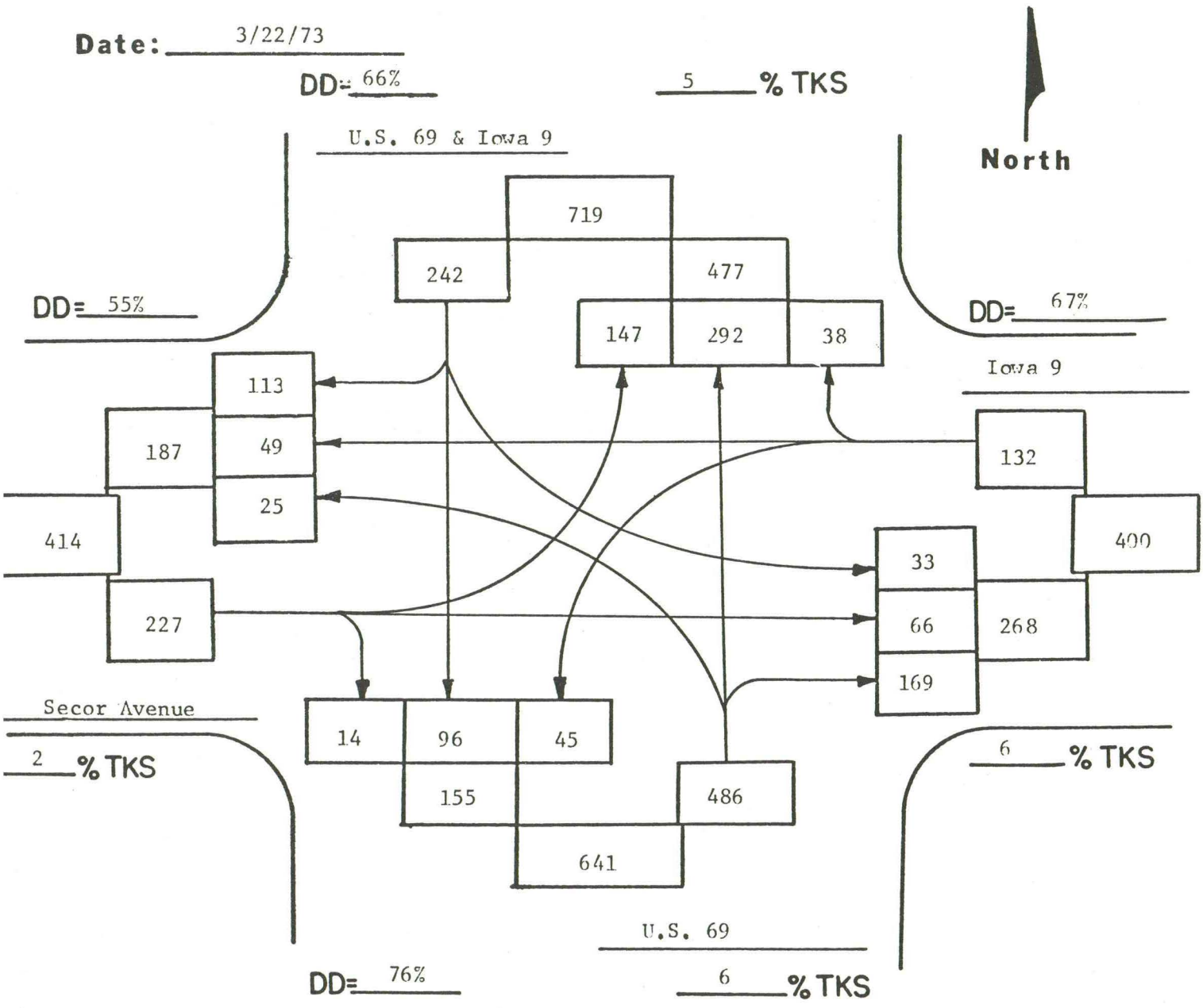
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection U.S. 69 and Iowa 9 **City:** Forest City, Iowa

Date: 3/22/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 1

(SEE PLATE NO.4)

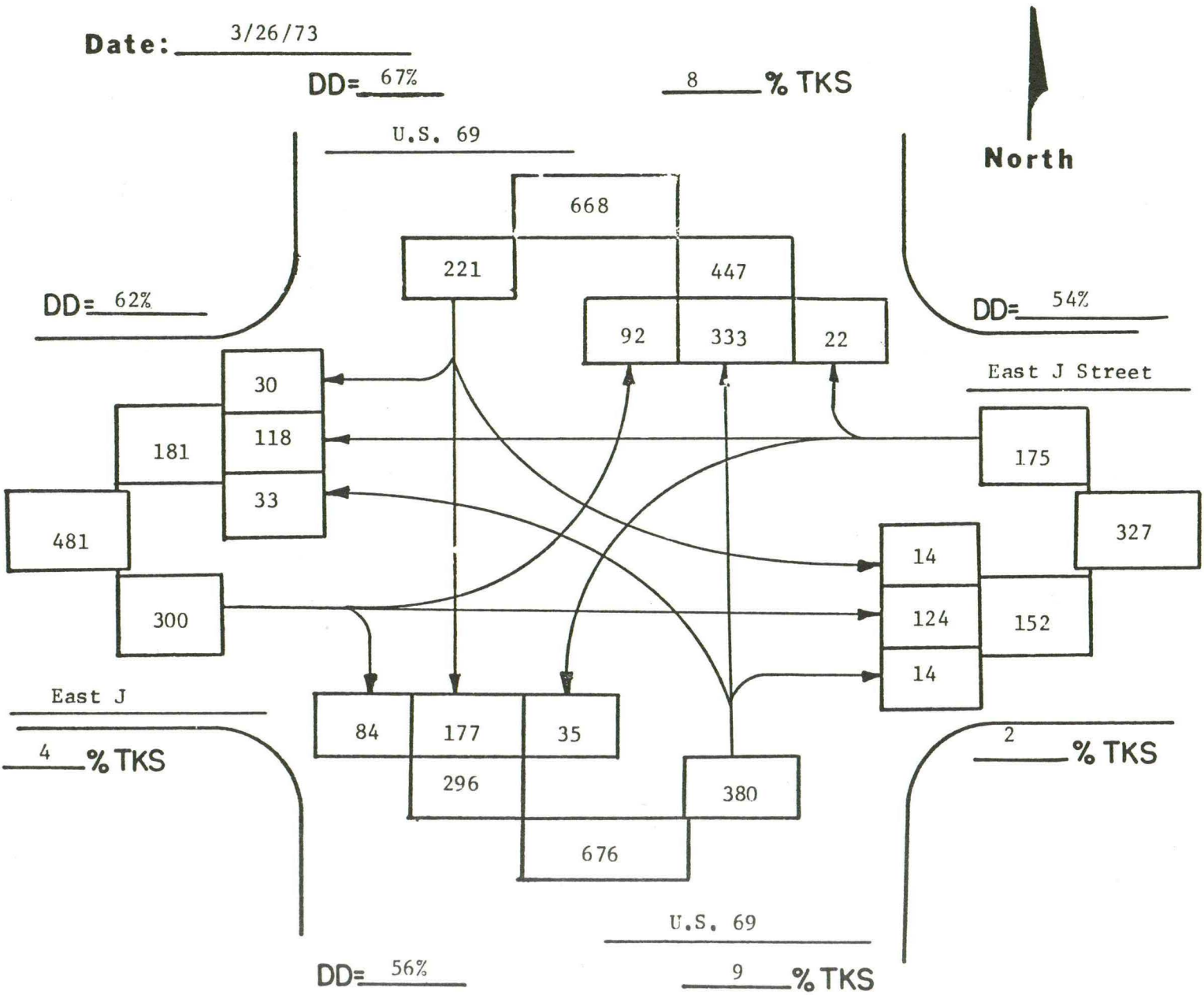
Figure B - 1

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection U.S. 69 and "J" St. **City:** Forest City, Iowa

Date: 3/26/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 2

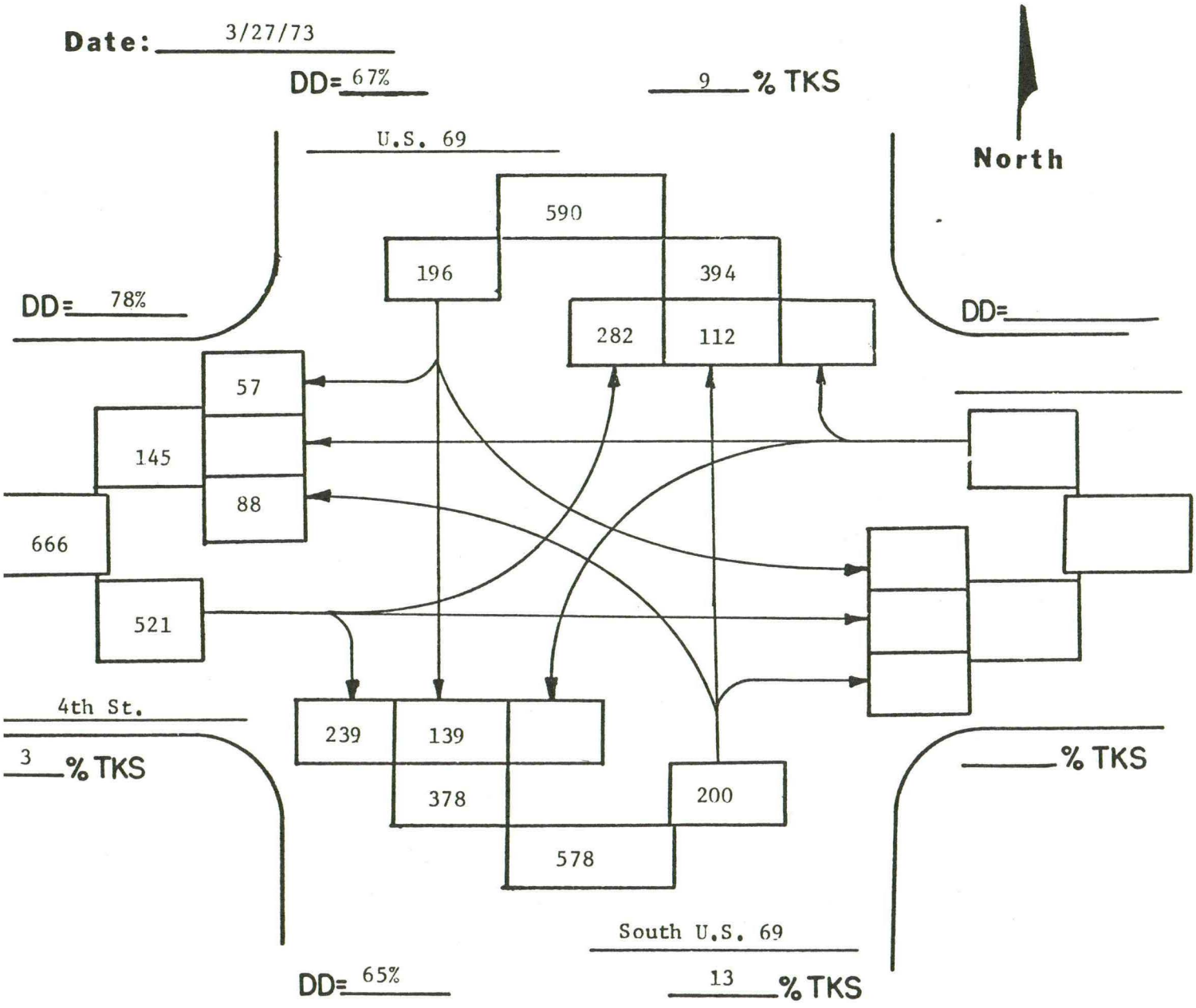
Figure B- 2 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection U.S. 69 and 4th St. **City:** Forest City, Iowa

Date: 3/27/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 3

(SEE PLATE NO.4)

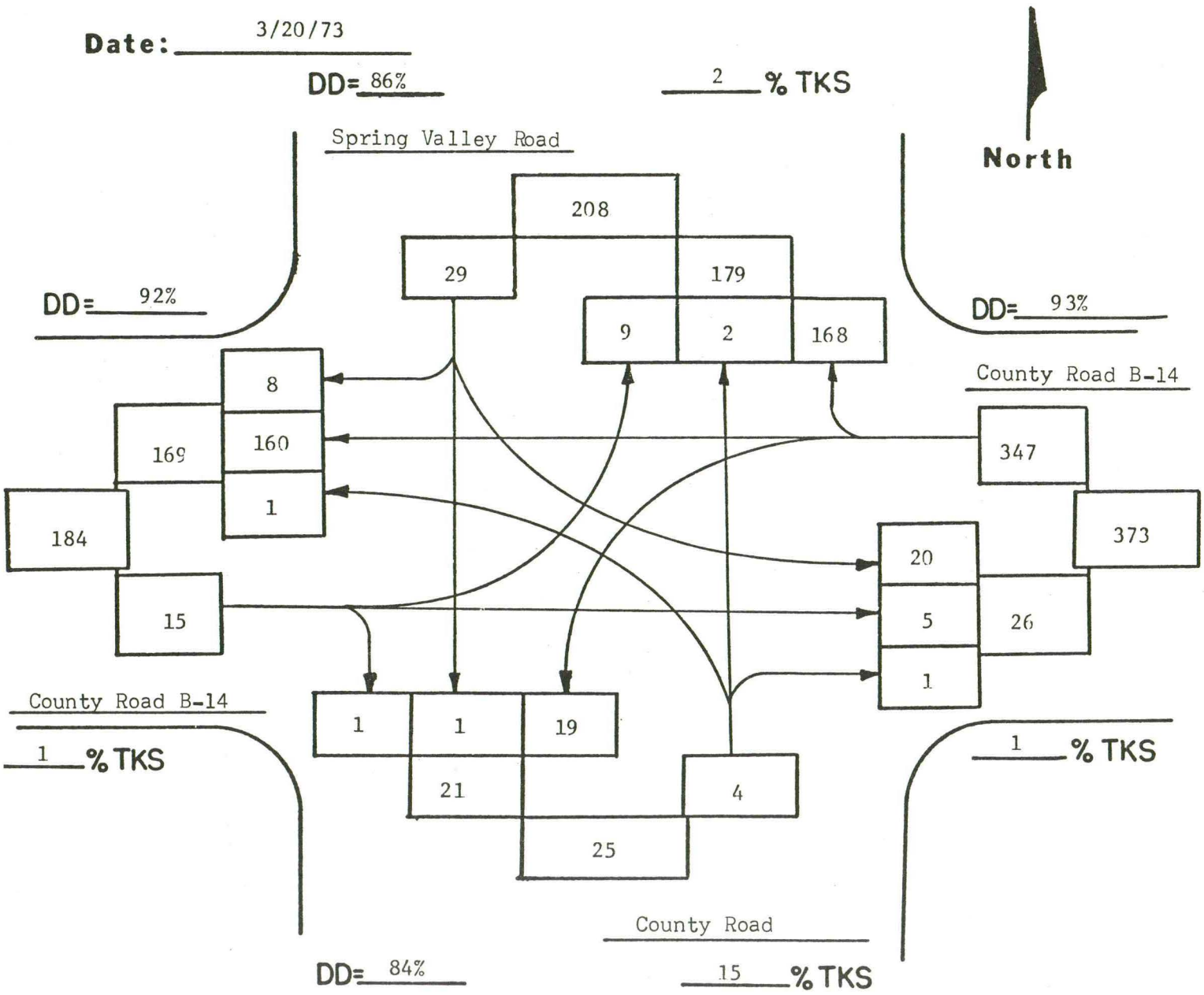
Figure B-3

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: West Entrance County Road from Crystal Lake **City:** Forest City, Iowa

Date: 3/20/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 4

(SEE PLATE NO.4)

Figure B- 4

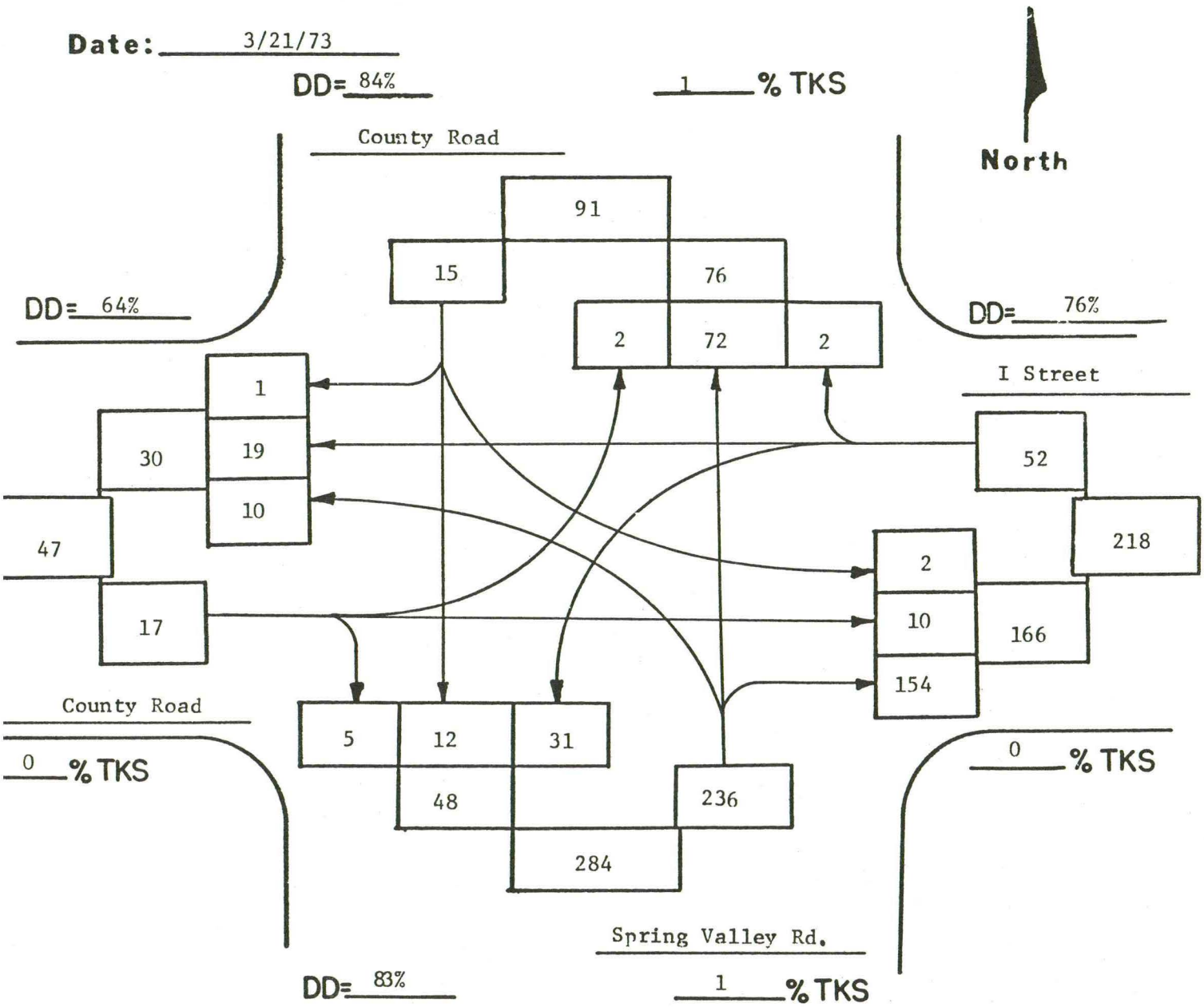
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "I" and Spring Valley Road **City:** Forest City, Iowa

Date: 3/21/73

DD= 84% 1 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 5

Figure B- 5 (SEE PLATE NO.4)

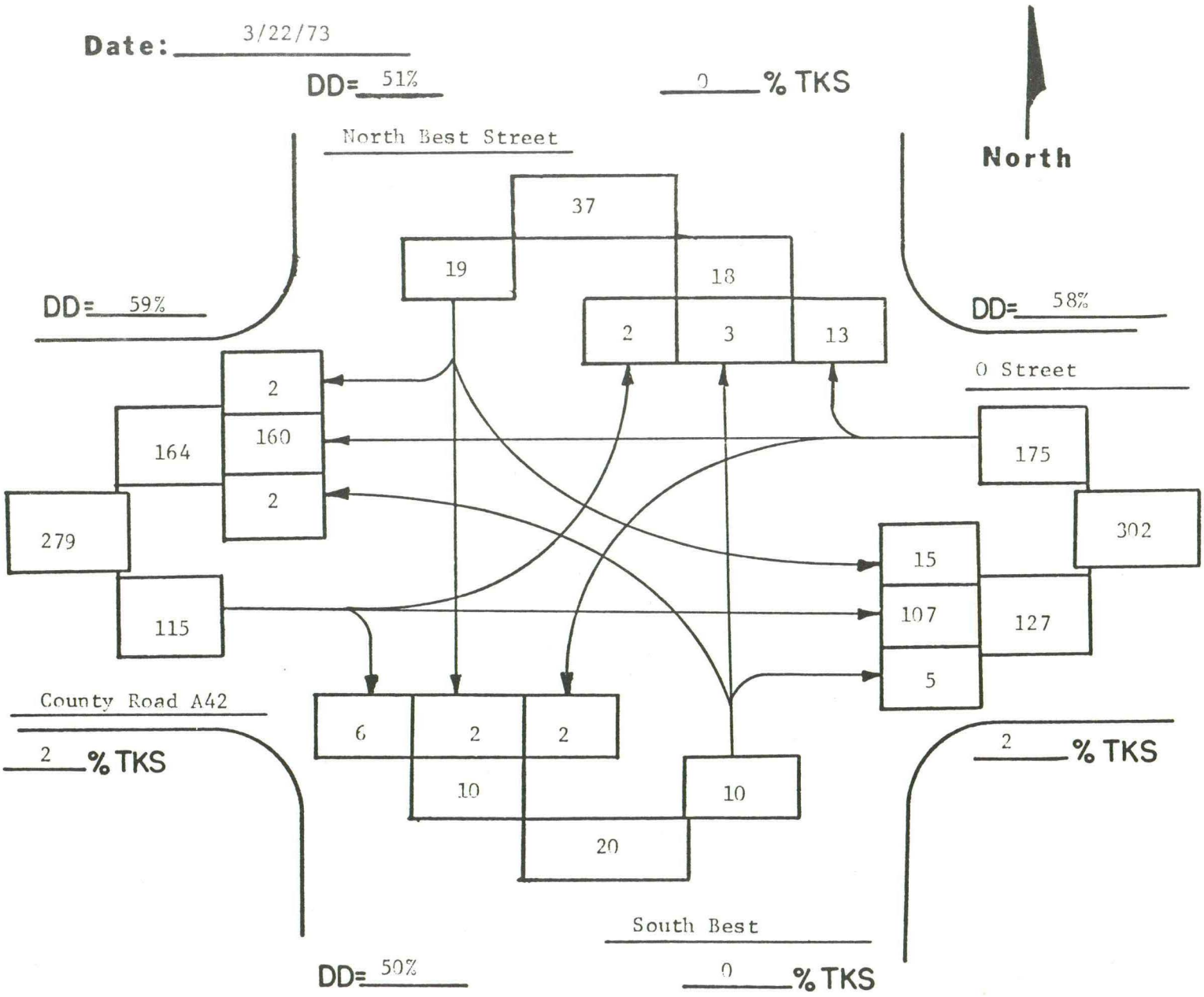
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "O", County Road A42 & Best St. **City:** Forest City, Iowa

Date: 3/22/73

DD= 51% 0 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 6

(SEE PLATE NO.4)

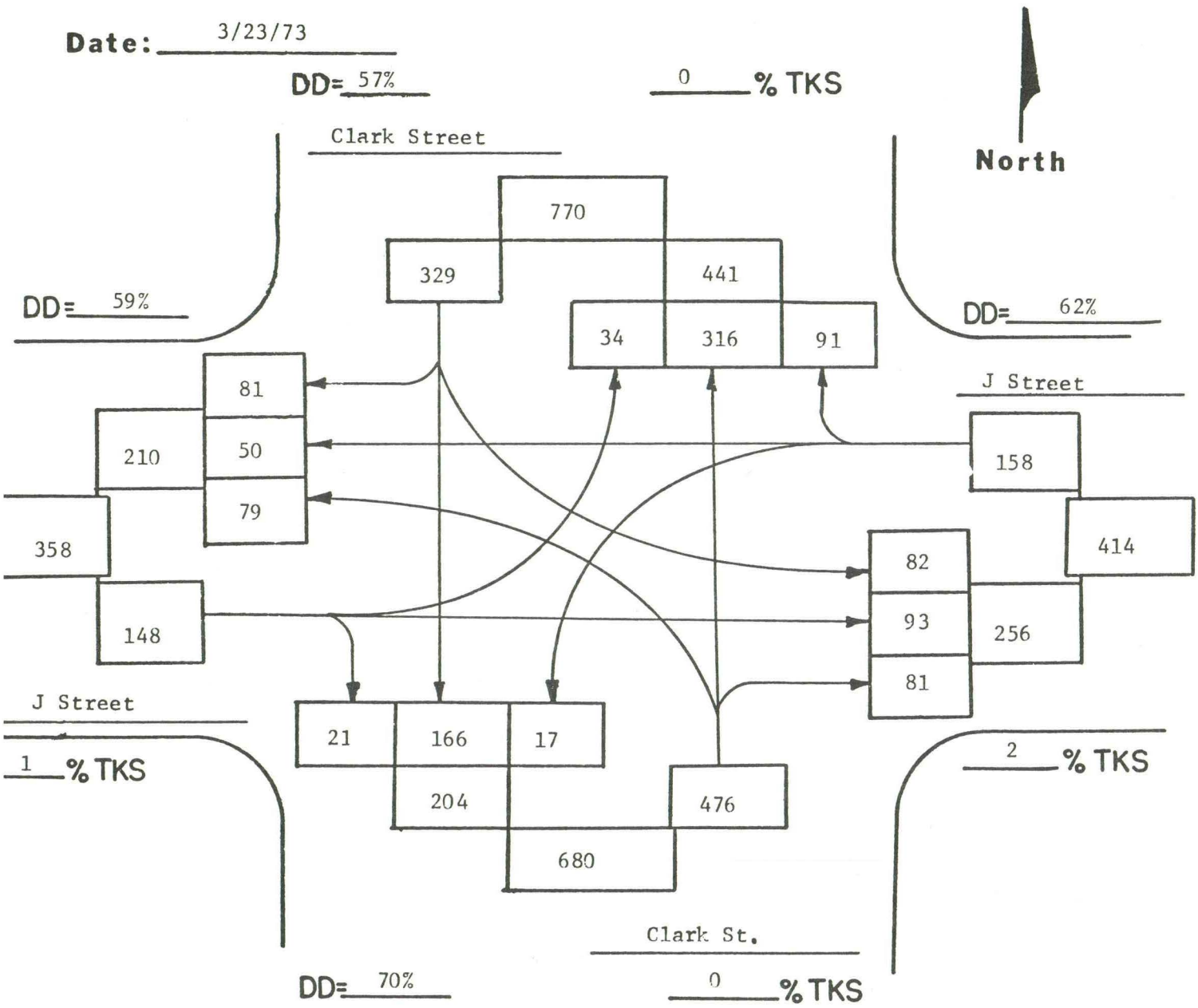
Figure B- 6

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection Clark and "J" Street **City:** Forest City, Iowa

Date: 3/23/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 7

(SEE PLATE NO.4)

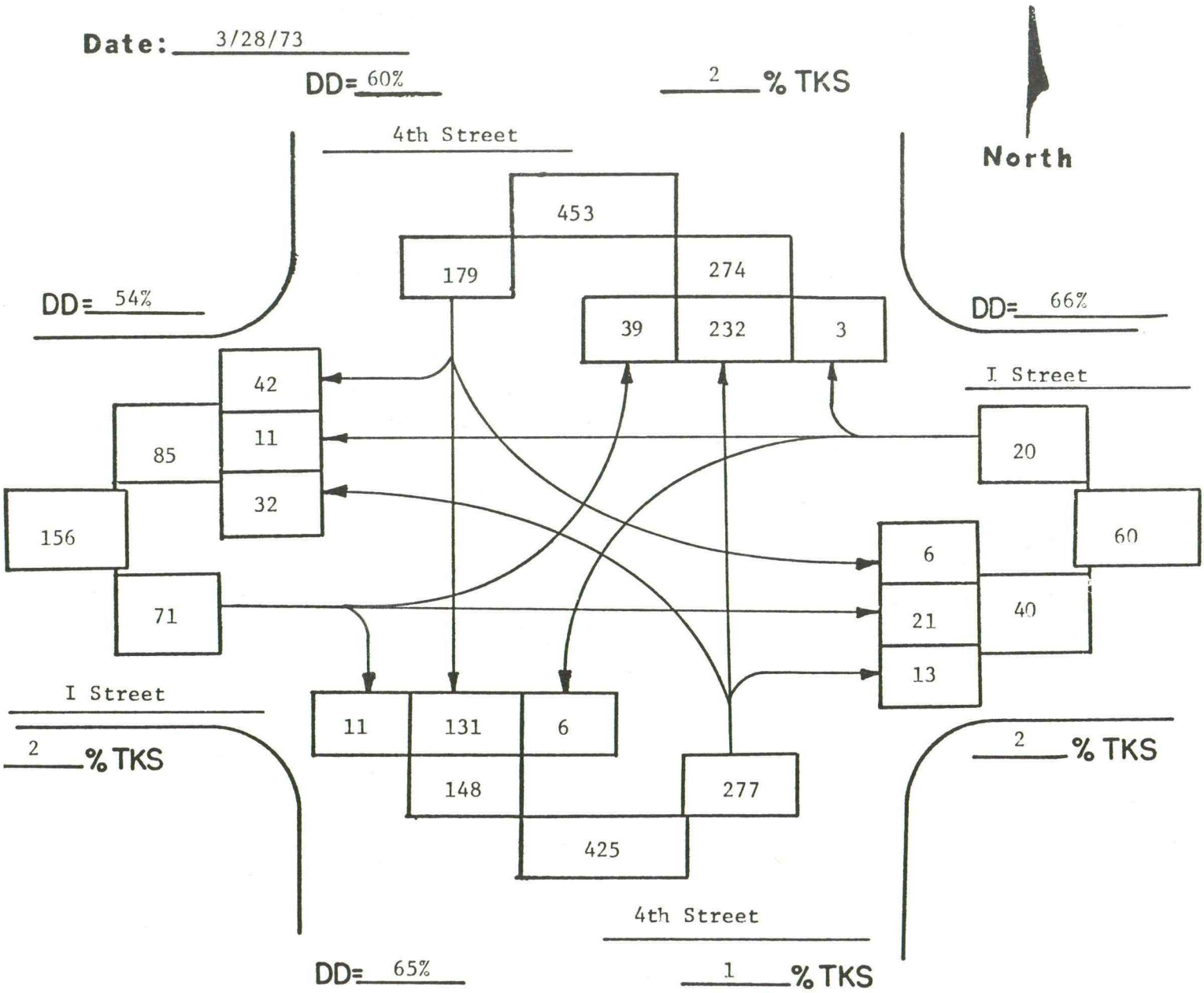
Figure B- 7

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection South 4th and East "I" **City:** Forest City, Iowa

Date: 3/28/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 8

(SEE PLATE NO.4)

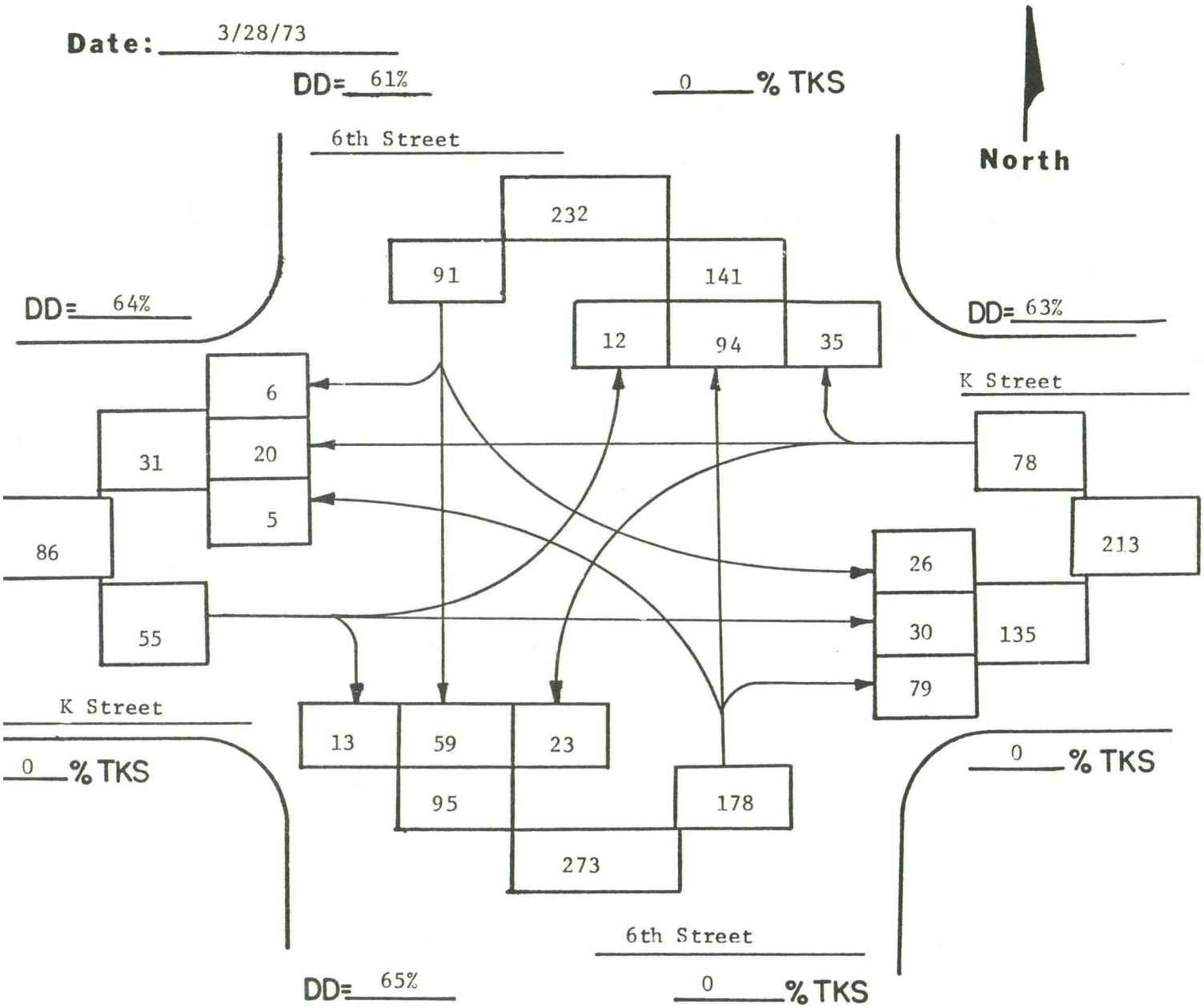
Figure B-8

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "K" and 6th Streets **City:** Forest City, Iowa

Date: 3/28/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 9

Figure B- 9 (SEE PLATE NO.4)

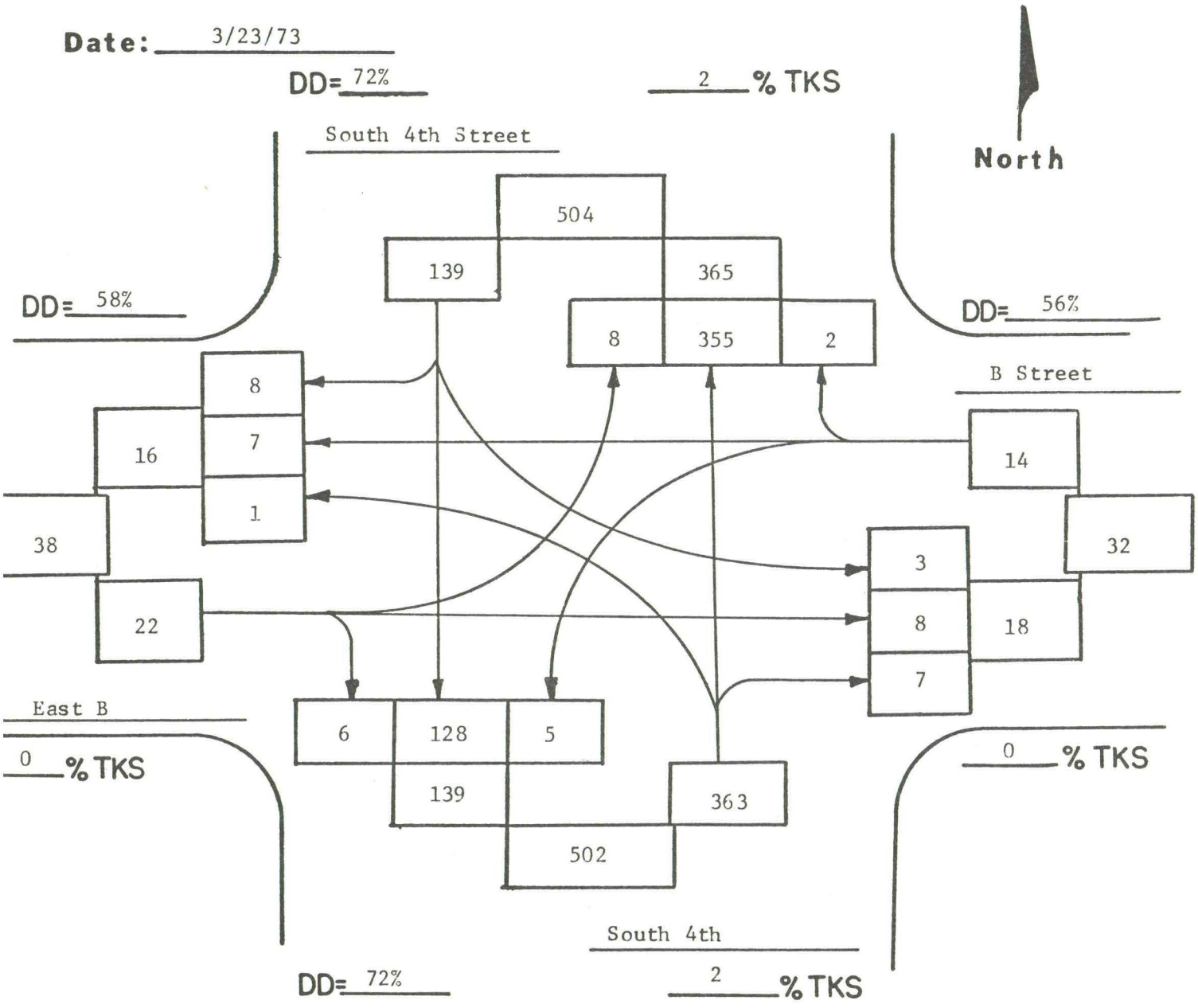
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection 4th and "B" Street **City:** Forest Citv, Iowa

Date: 3/23/73

DD= 72% 2 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 10

Figure B-10

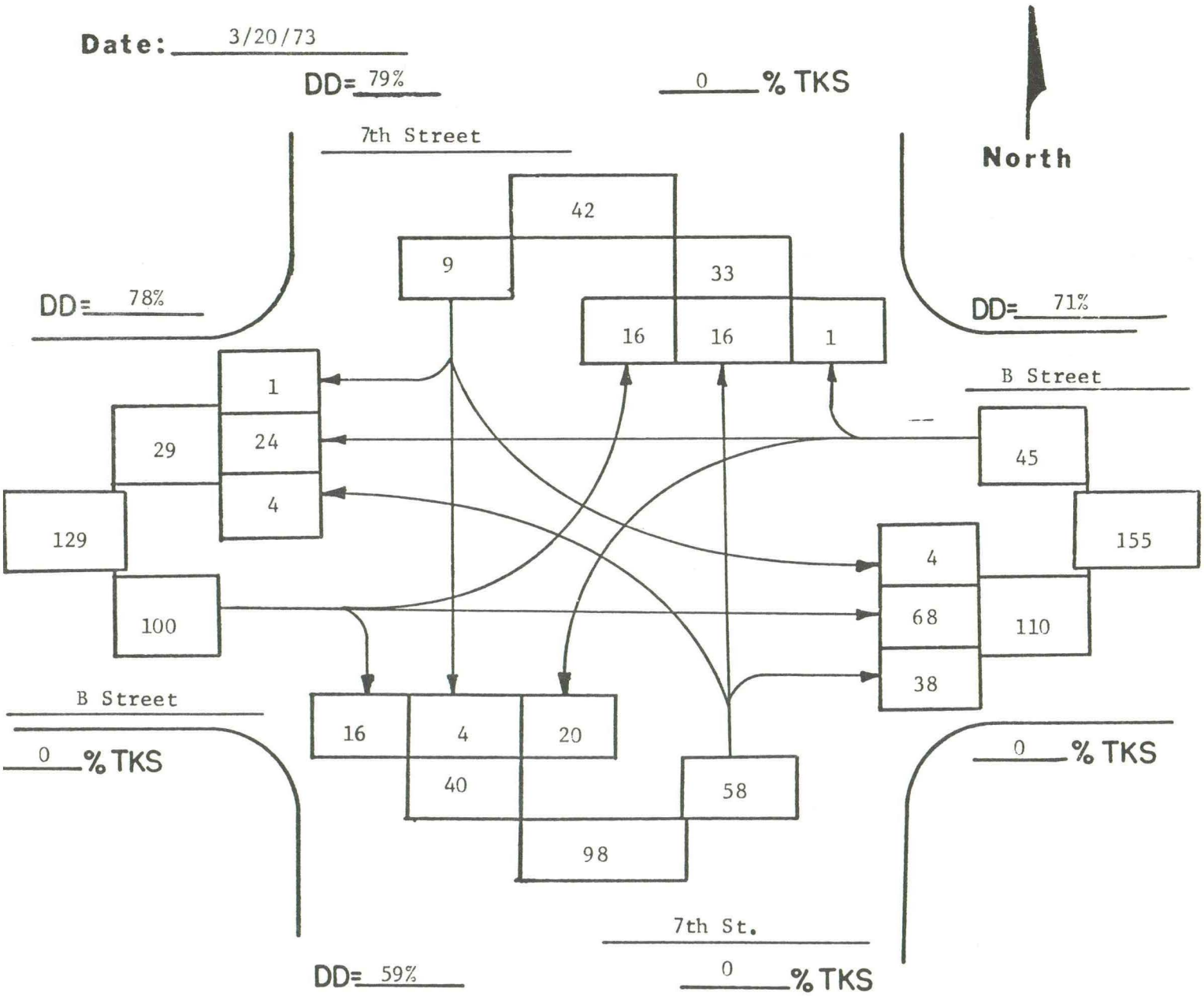
(SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "B" and 7th St. **City:** Forest City, Iowa

Date: 3/20/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 11

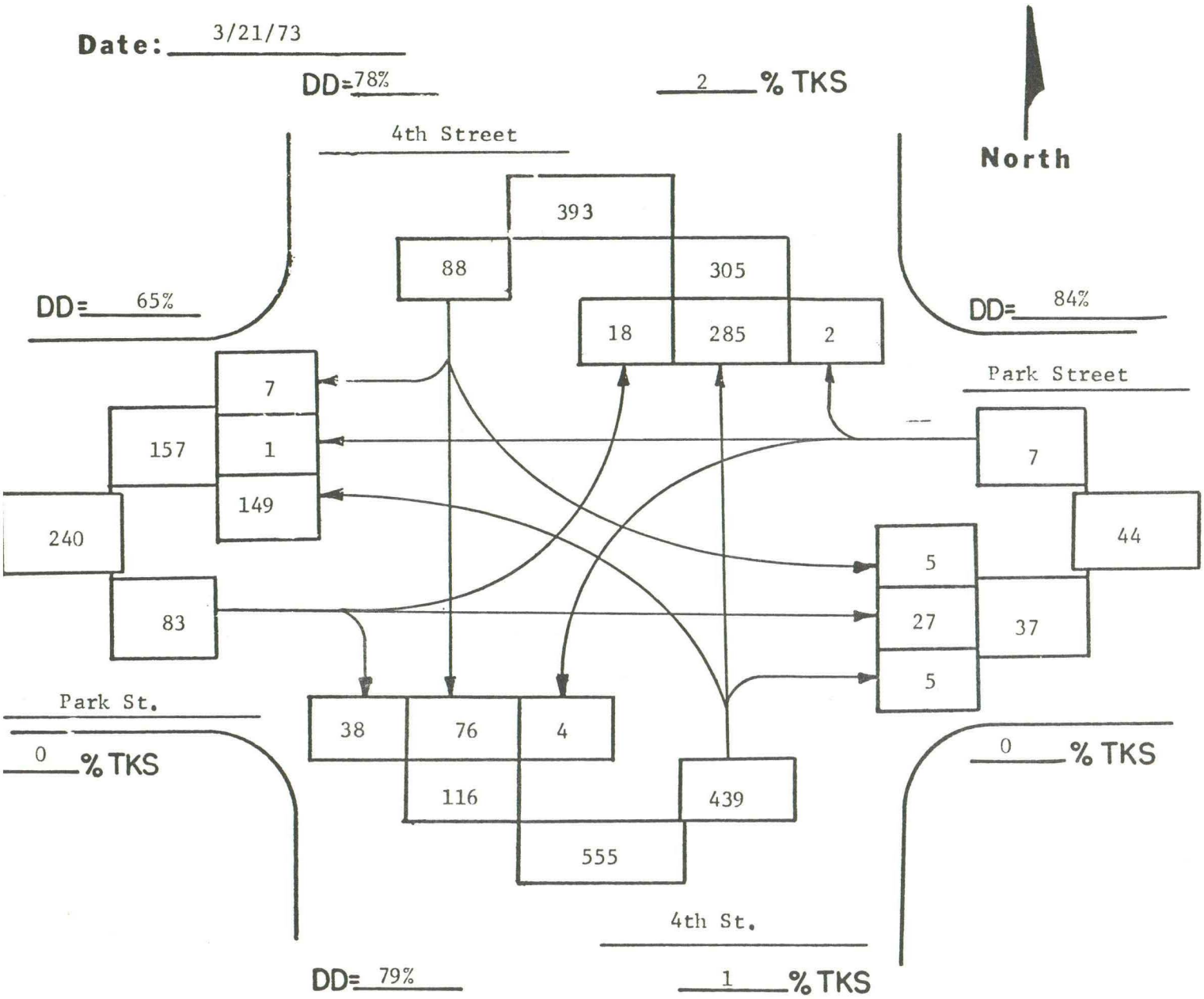
Figure B-11 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection 4th and Park **City:** Forest City, Iowa

Date: 3/21/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 12

Figure B-12 (SEE PLATE NO.4)

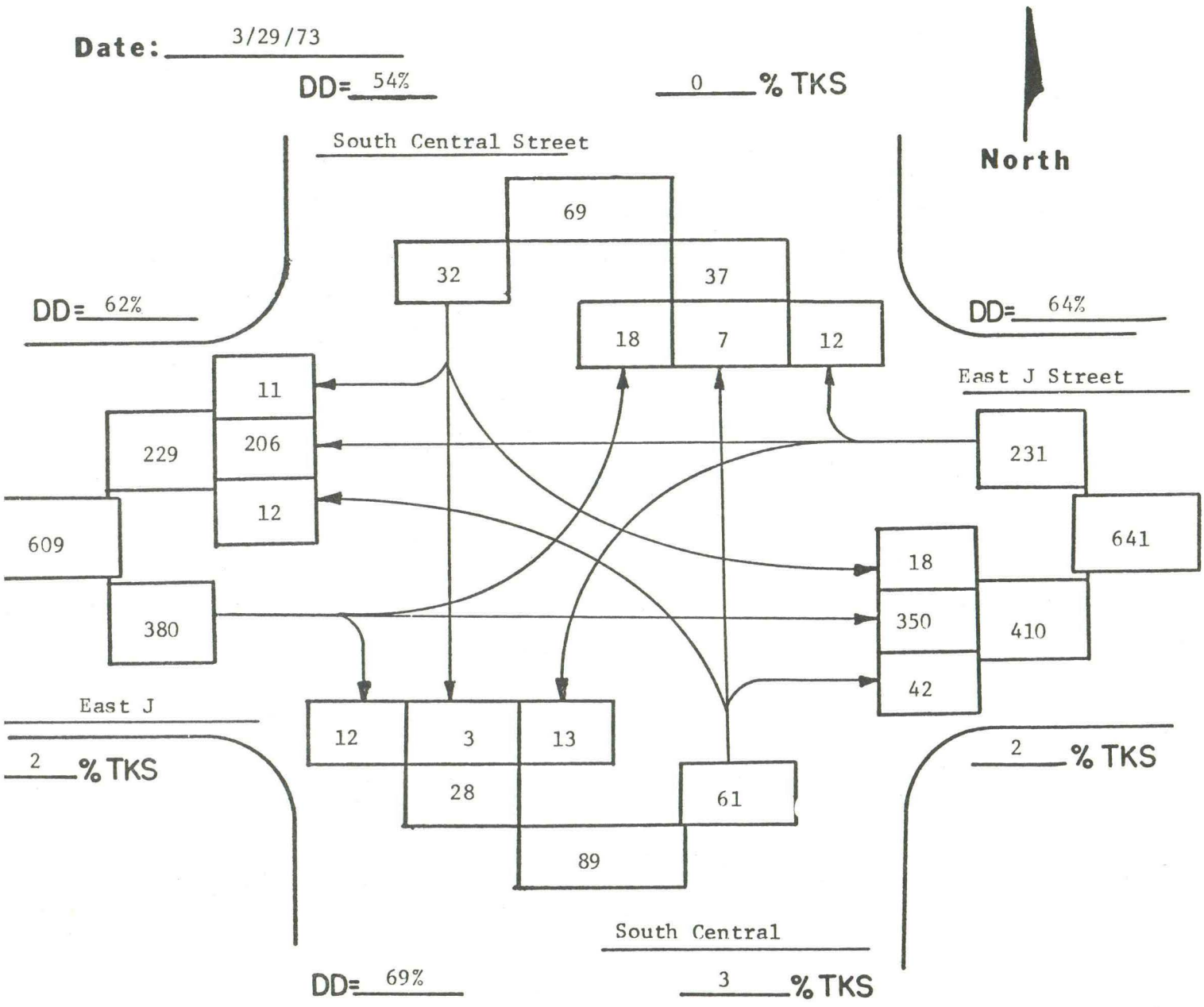
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection East "J" and Central St. **City:** Forest City, Iowa

Date: 3/29/73

DD= 54% 0 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 13

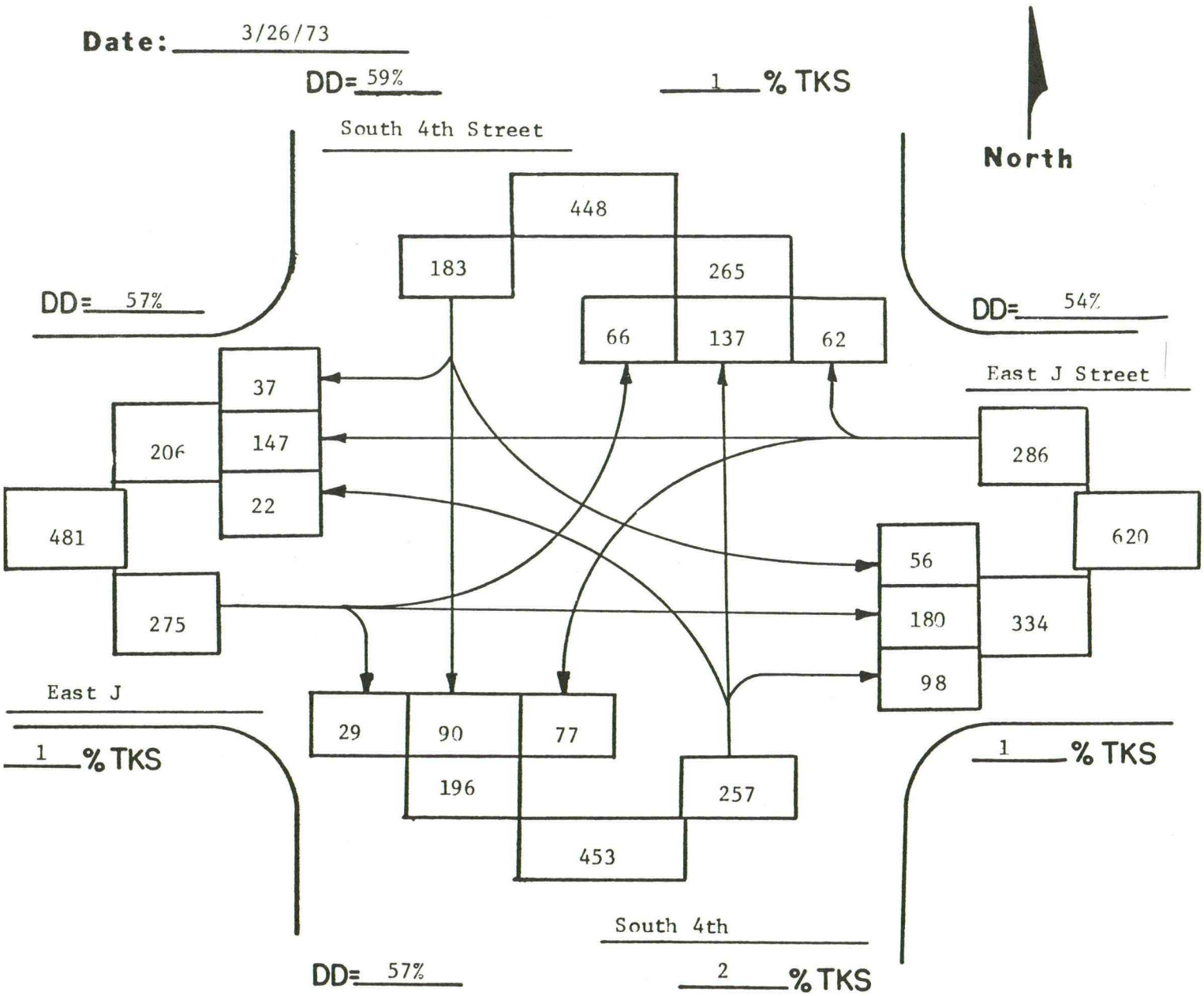
Figure B-13 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection East "J" and 4th St. **City:** Forest City, Iowa

Date: 3/26/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 14

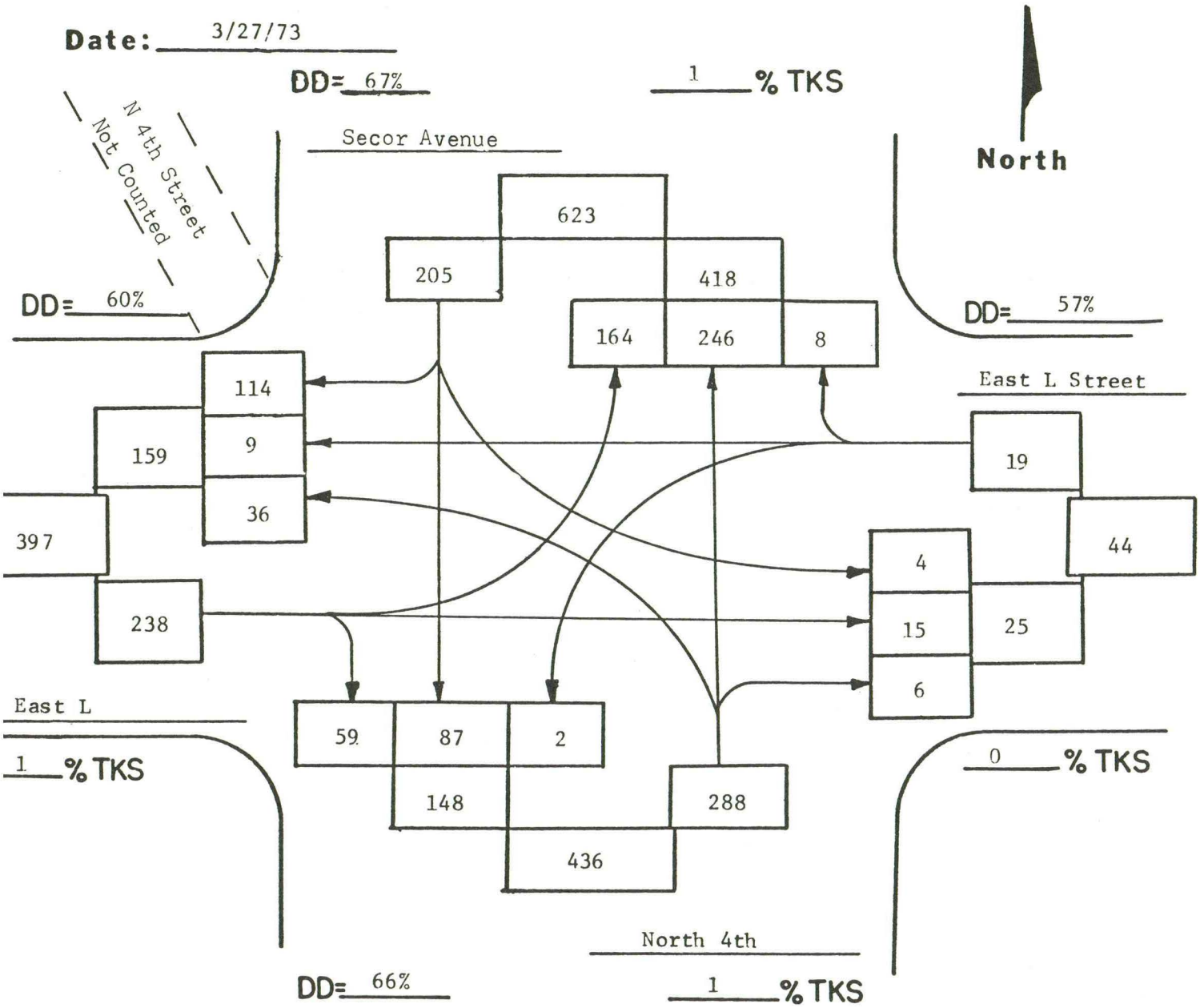
Figure B-14 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "L", 4th and Secor Ave. **City:** Forest City, Iowa

Date: 3/27/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 15

(SEE PLATE NO.4)

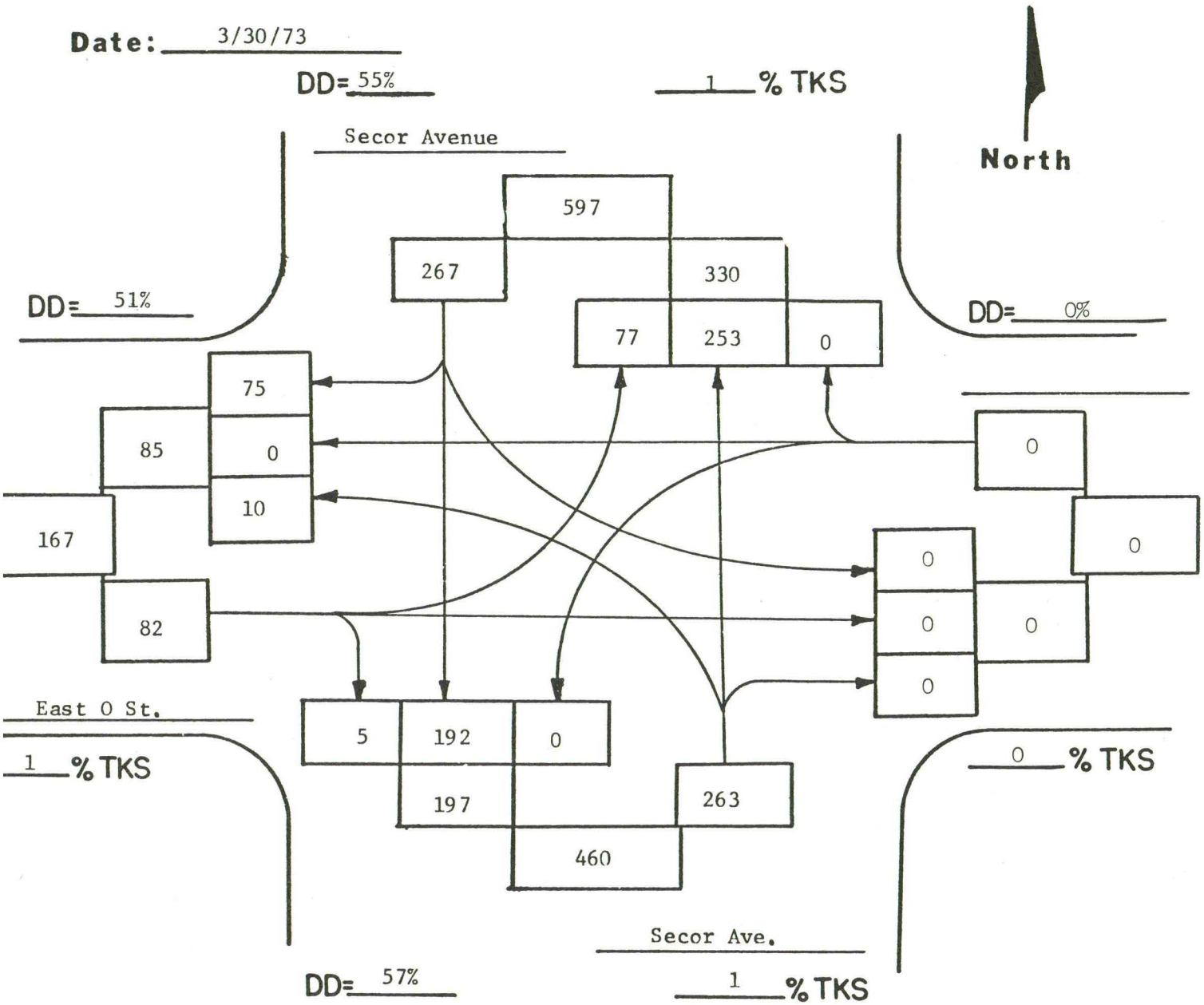
Figure B-15

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "O" and Secor Ave. **City:** Forest City, Iowa

Date: 3/30/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 16

(SEE PLATE NO.4)

Figure B-16

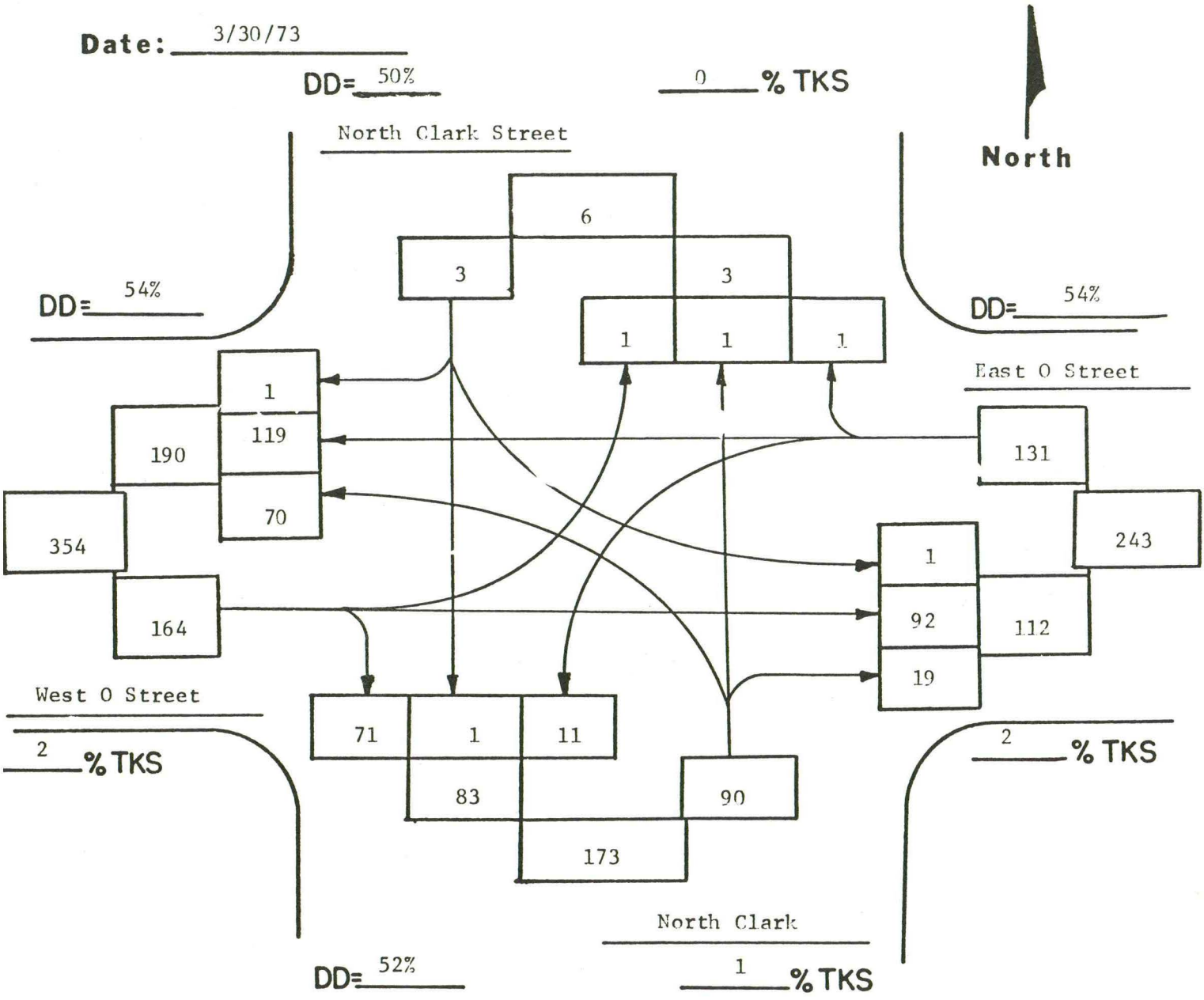
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection North Clark and "O" Street **City:** Forest City, Iowa

Date: 3/30/73

DD= 50% 0 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 17

(SEE PLATE NO.4)

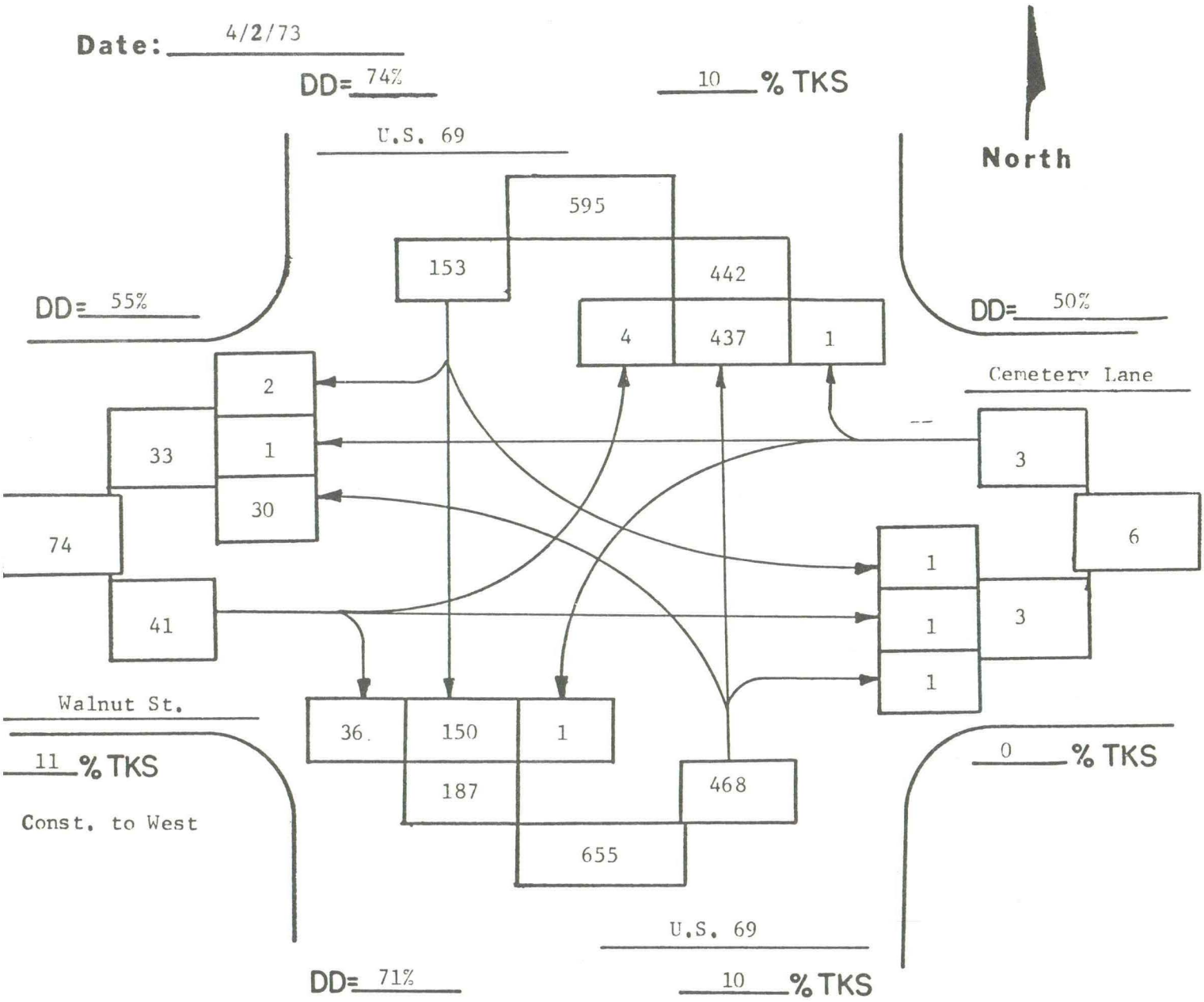
Figure B-17

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection U.S. 69 and Woodland Dr. **City:** Forest City, Iowa

Date: 4/2/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 18

(SEE PLATE NO.4)

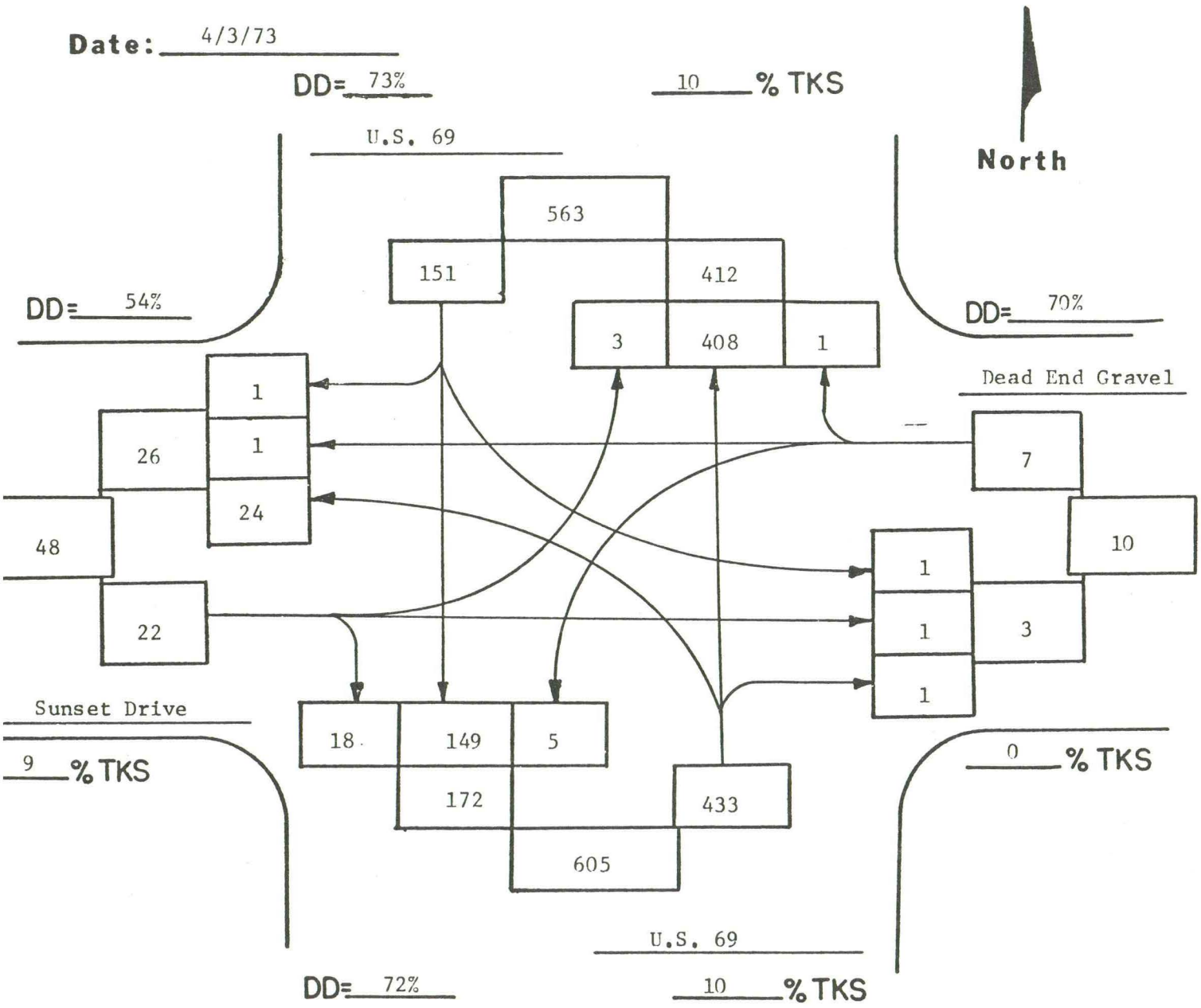
Figure B-18

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection U.S. 69 and Sunset Drive **City:** Forest City, Iowa

Date: 4/3/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 19

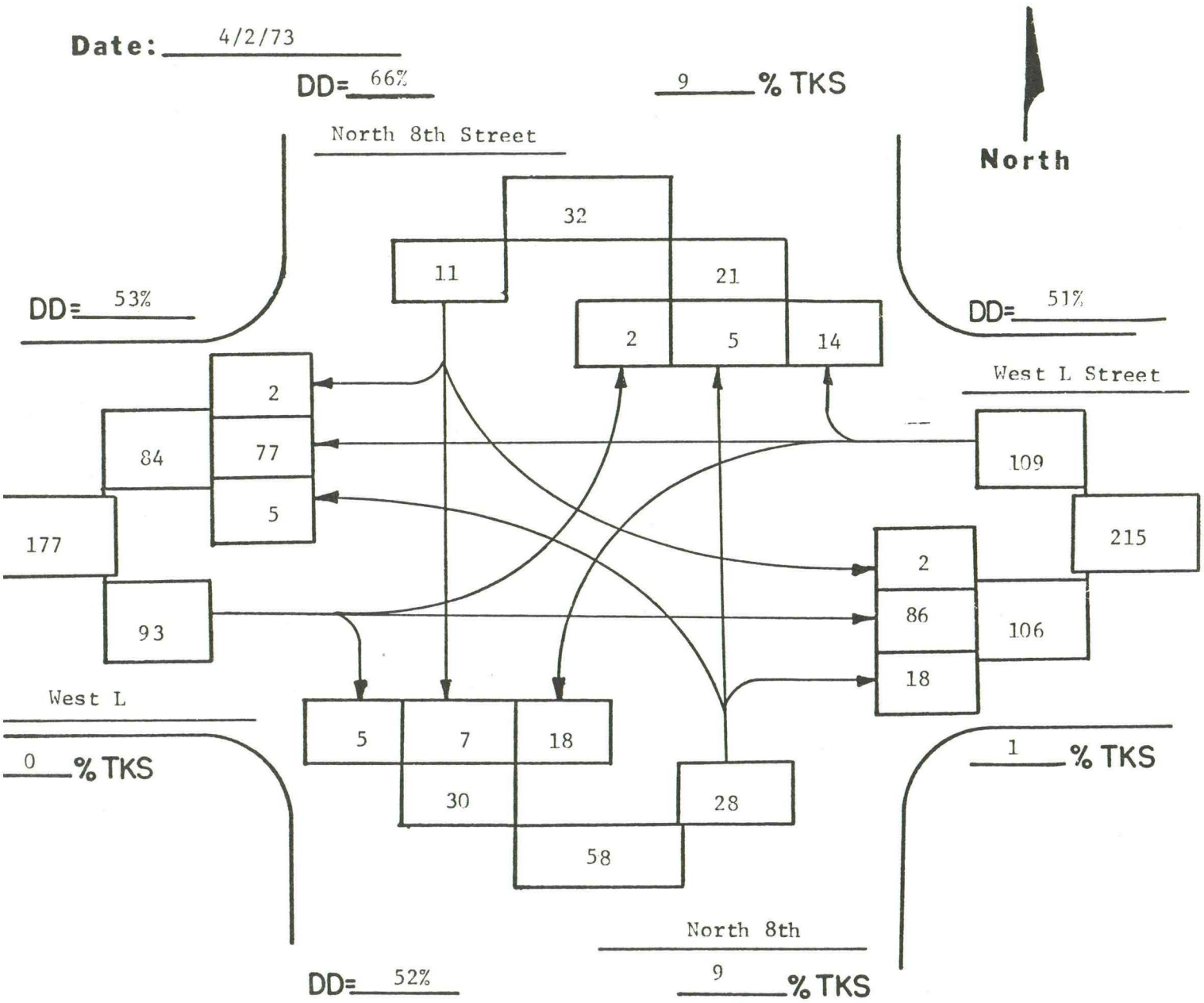
Figure B-19 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection North 8th and West "L" **City:** Forest City, Iowa

Date: 4/2/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 20

(SEE PLATE NO.4)

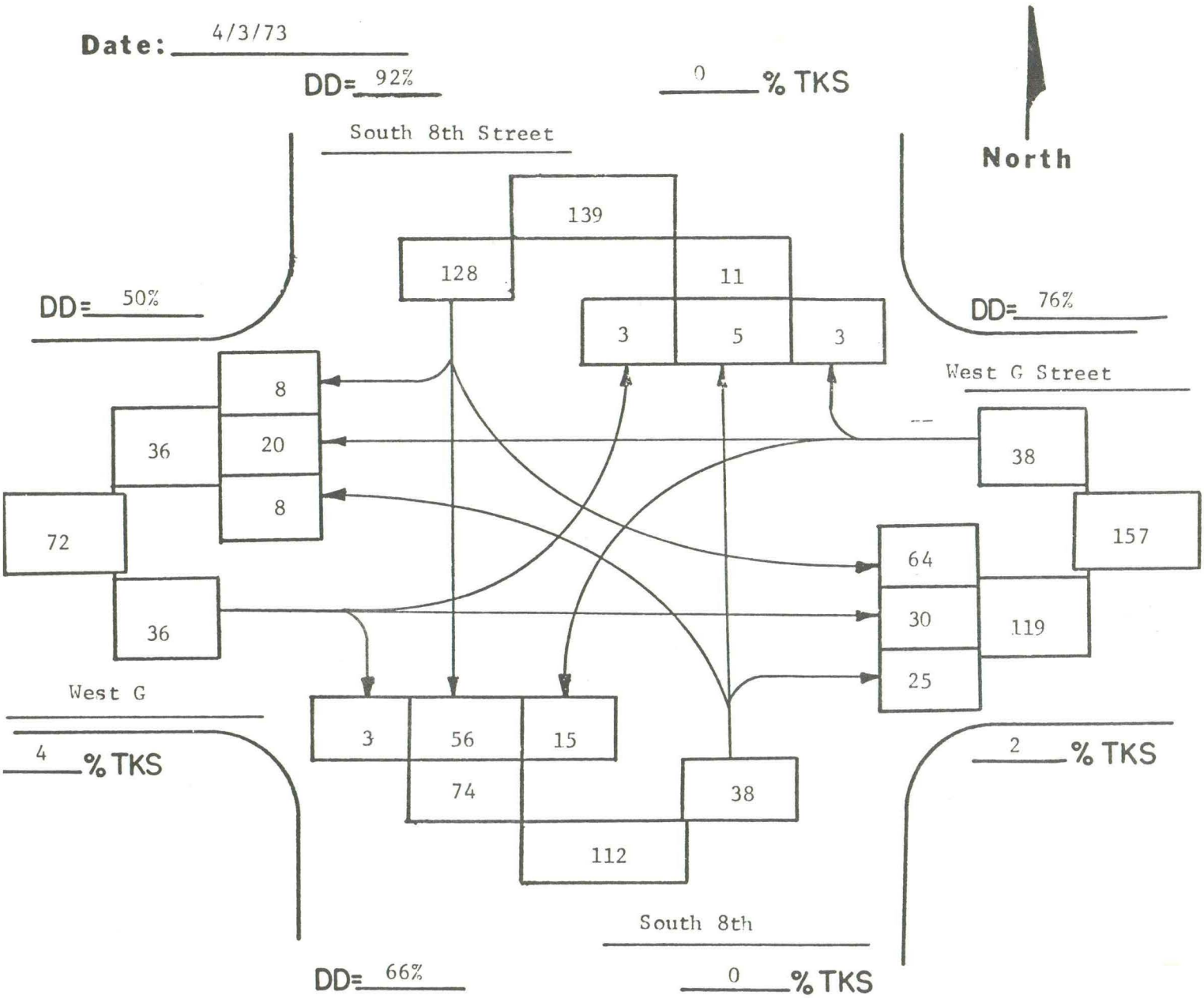
Figure B-20

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection West "G" and South 8th **City:** Forest City, Iowa

Date: 4/3/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 21

(SEE PLATE NO.4)

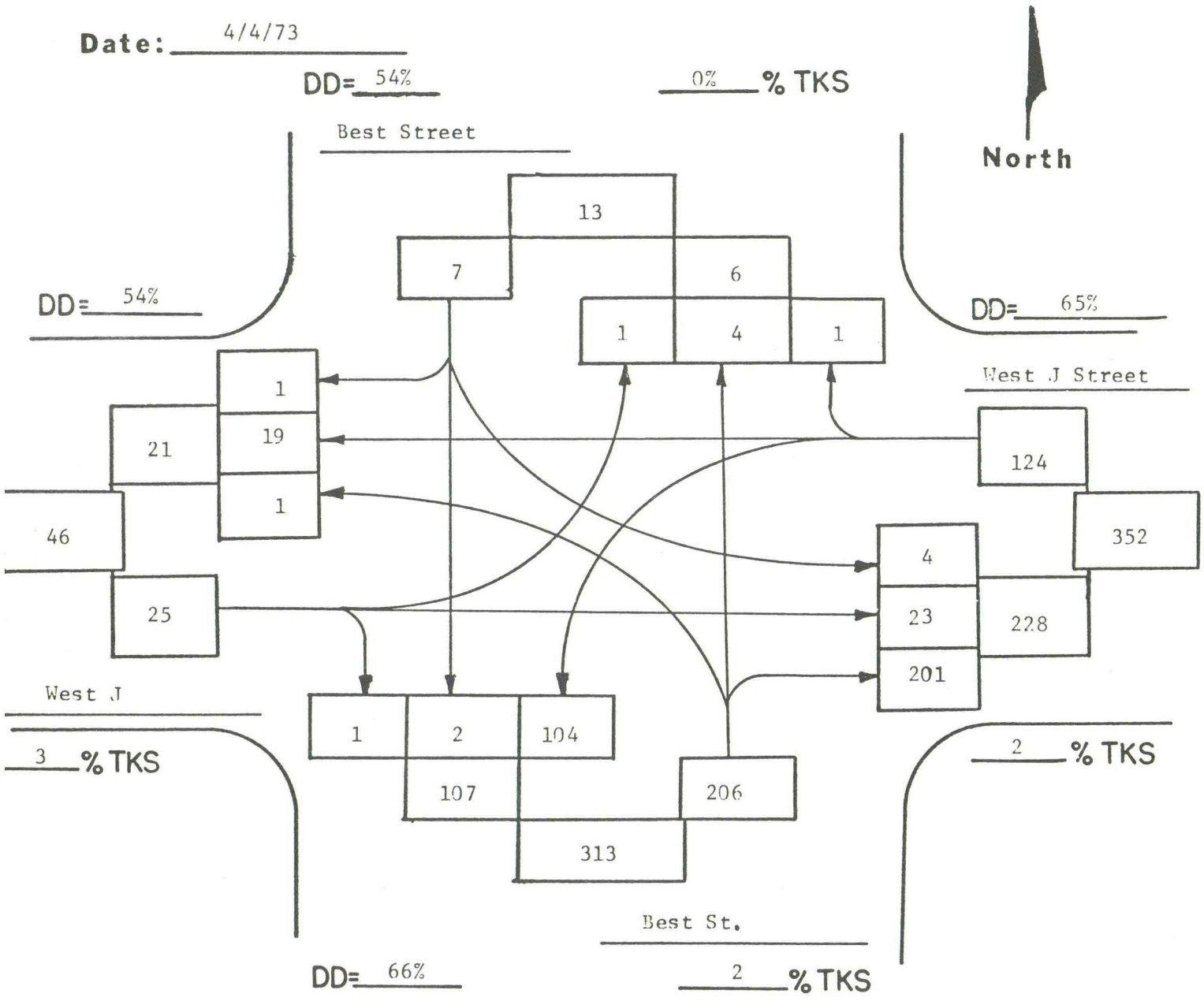
Figure B-21

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection West "J" and Best Street **City:** Forest City, Iowa

Date: 4/4/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 22

(SEE PLATE NO.4)

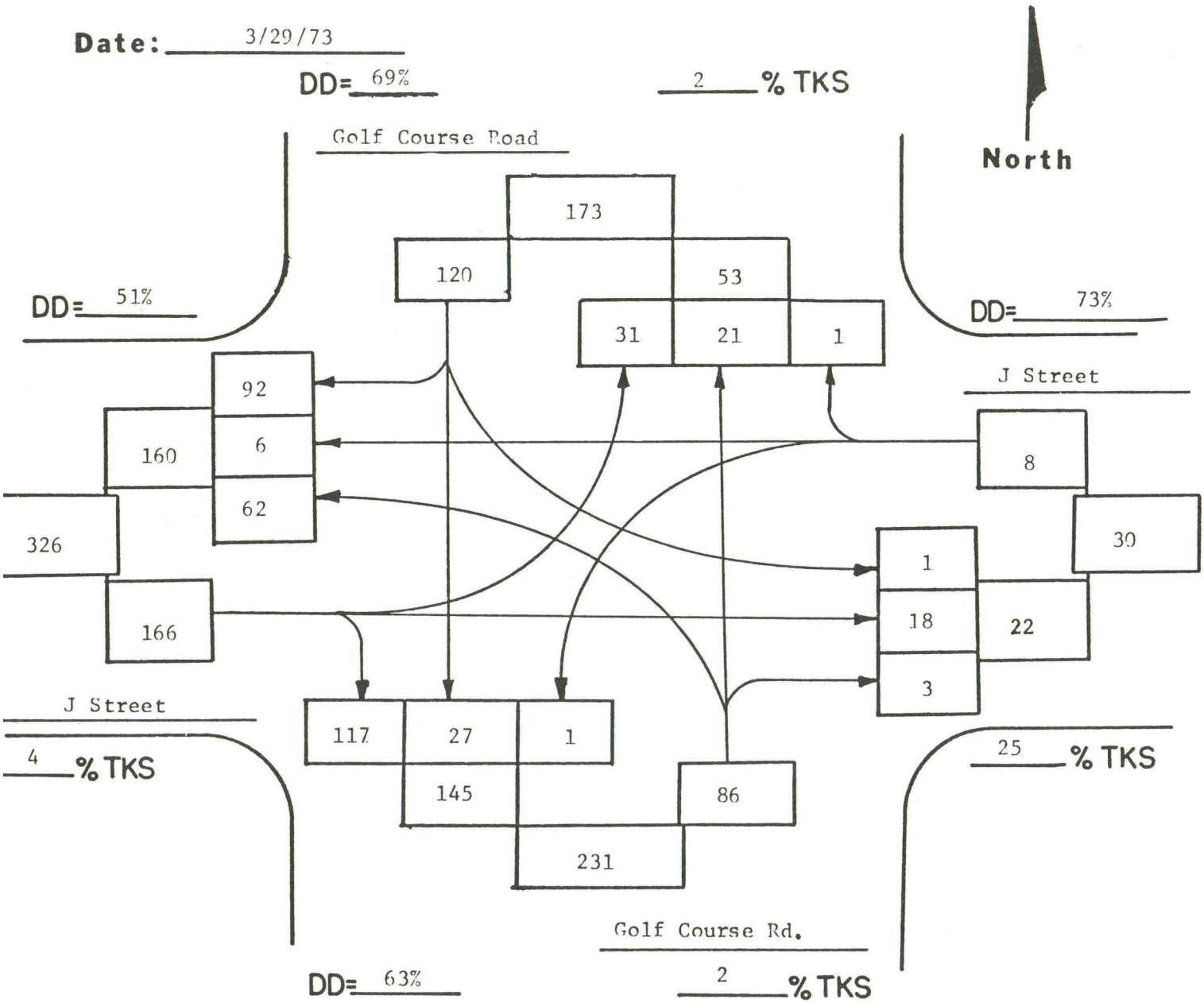
Figure B-22

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "J" St. and Golf Course Rd. **City:** Forest City, Iowa

Date: 3/29/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 23

(SEE PLATE NO.4)

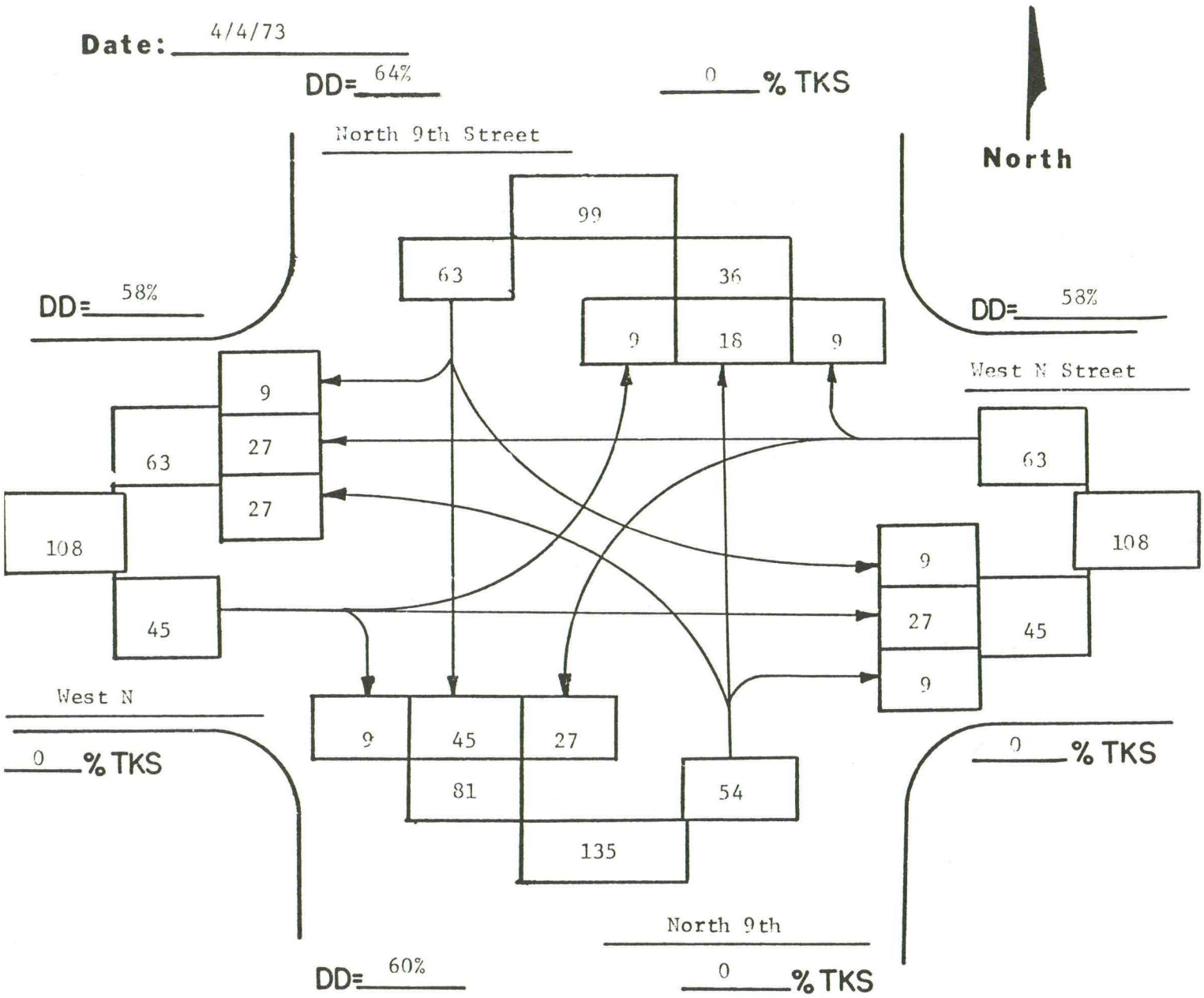
Figure B-23

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection West "N" and North 9th **City:** Forest City, Iowa

Date: 4/4/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 24

Figure B-24 (SEE PLATE NO.4)

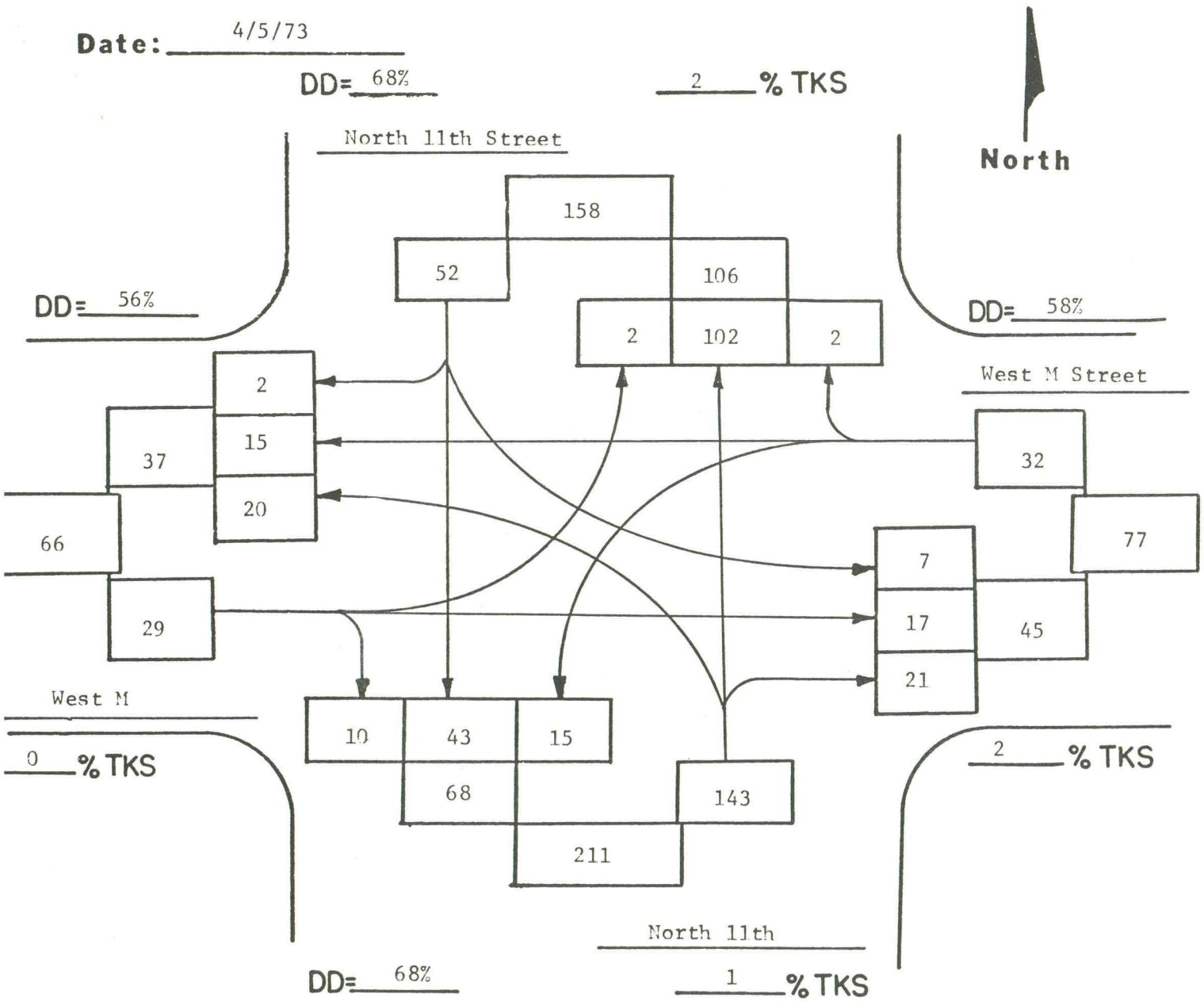
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "M" St. and 11th St. **City:** Forest City, Iowa

Date: 4/5/73

DD= 68% 2 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 25

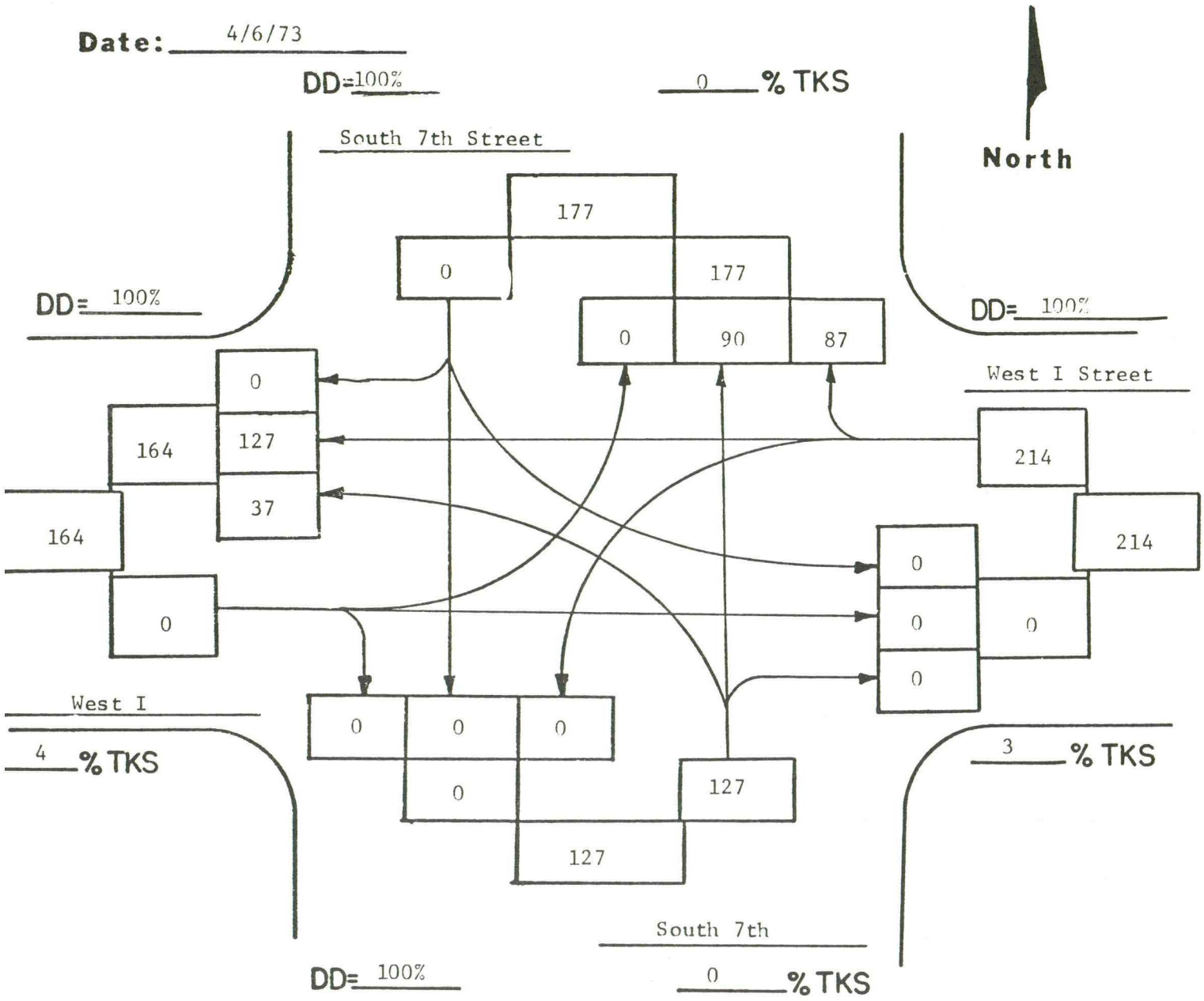
Figure B-25 (SEE PLATE NO.4)

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection West "I" and South 7th **City:** Forest City, Iowa

Date: 4/6/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 26

Figure B-26 (SEE PLATE NO.4)

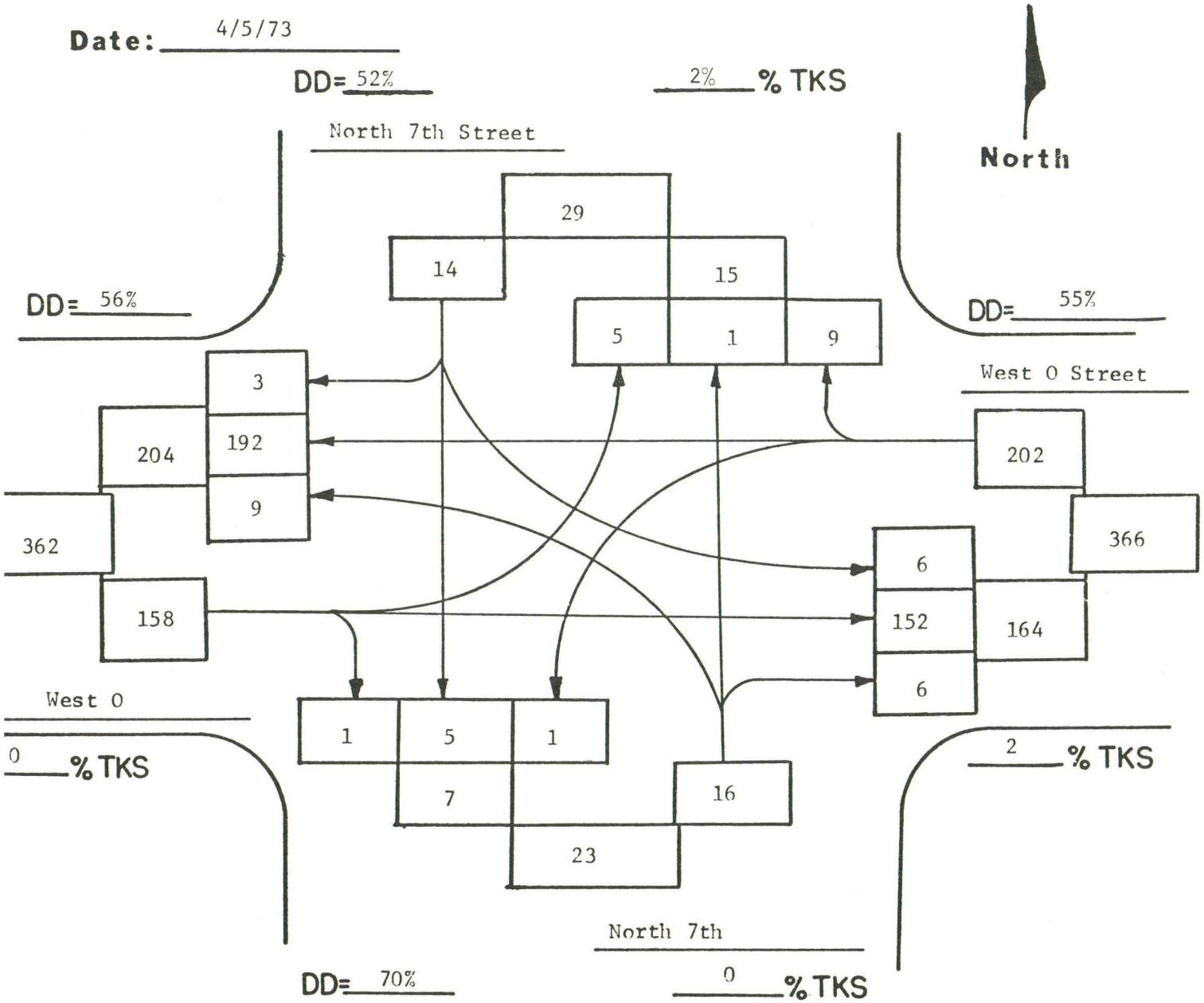
VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection West "O" and North 7th **City:** Forest City, Iowa

Date: 4/5/73

DD= 52% 2% % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 27

(SEE PLATE NO.4)

Figure B-27

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "J" and West St. **City:** Forest City, Iowa

Date: 4/6/73

DD= 66% 2 % TKS

North

North West Street

DD= 66%

DD= 66%

East J Street

East J

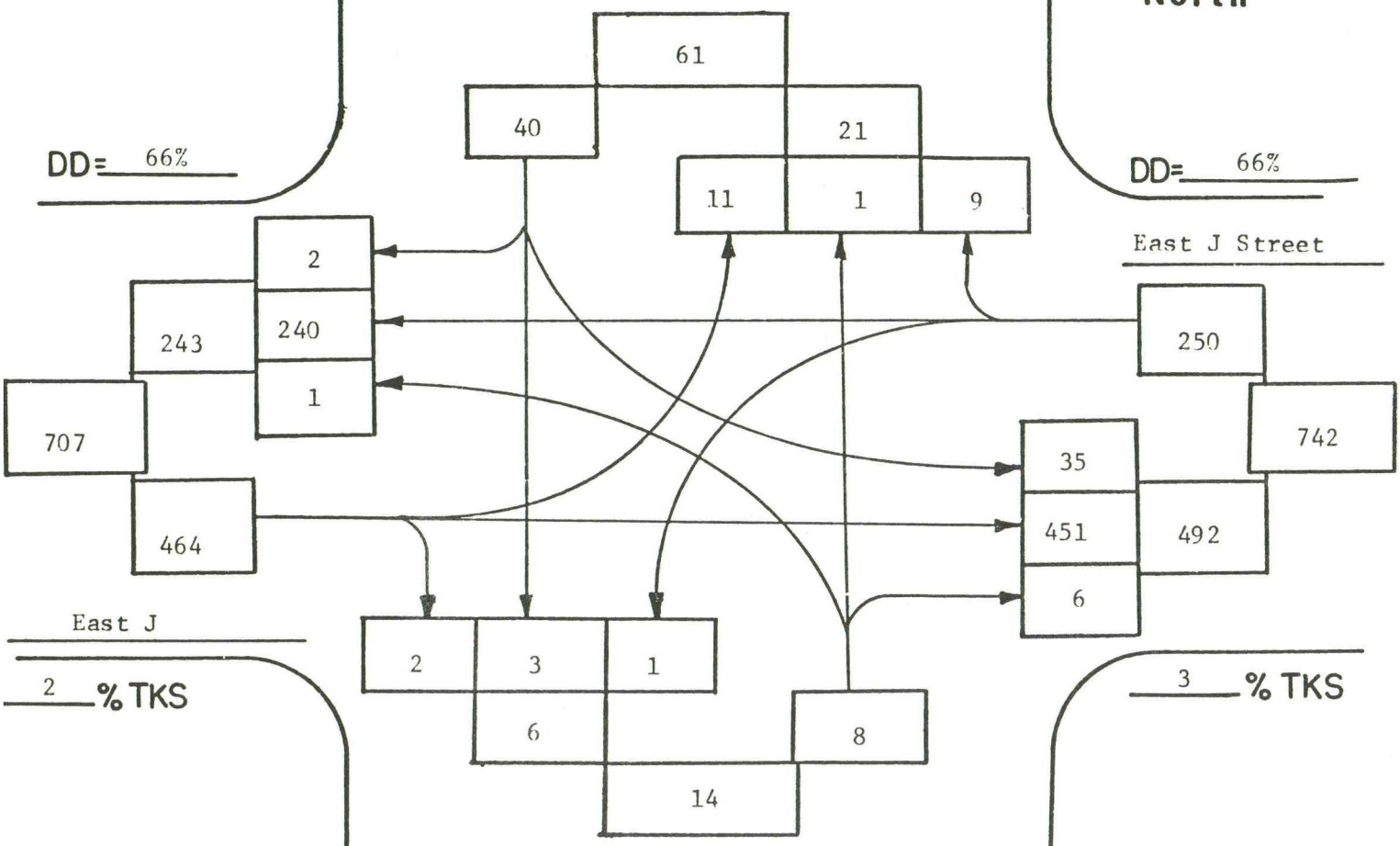
2 % TKS

3 % TKS

North West St.

DD= 57%

0 % TKS



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 28

(SEE PLATE NO.4)

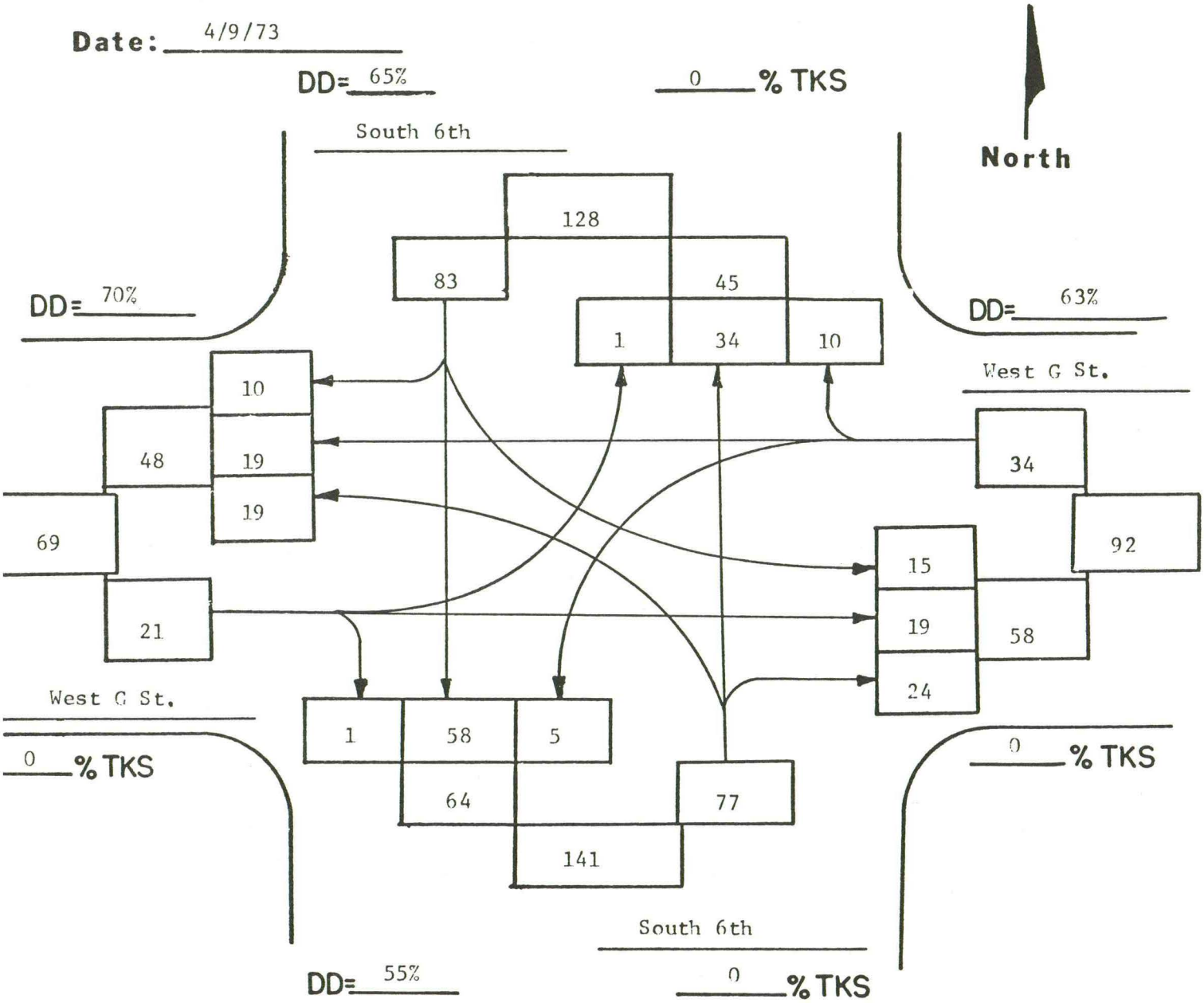
Figure B-28

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection West "G" and South 6th **City:** Forest City, Iowa

Date: 4/9/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 29

(SEE PLATE NO.4)

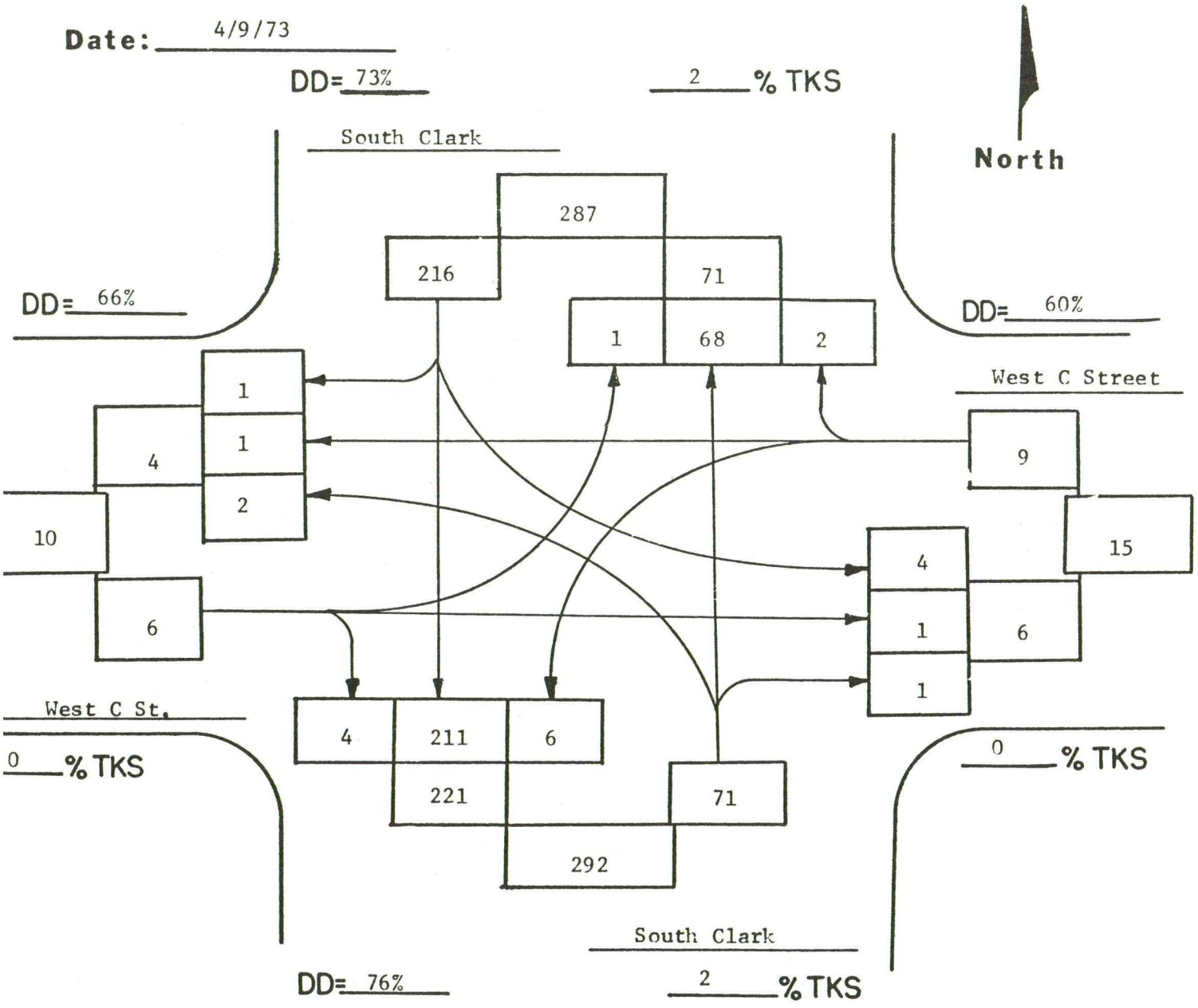
Figure B-29

VEHICULAR TURNING MOVEMENTS

30TH HIGHEST HOUR TRAFFIC

Location: Intersection "C" and South Clark Sts. **City:** Forest City, Iowa

Date: 4/9/73



MANUAL INTERSECTION VEHICULAR COUNT LOCATION 30

Figure B-30 (SEE PLATE NO.4)

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION US 69 & IOWA 9 DATE: 22 MARCH 1973

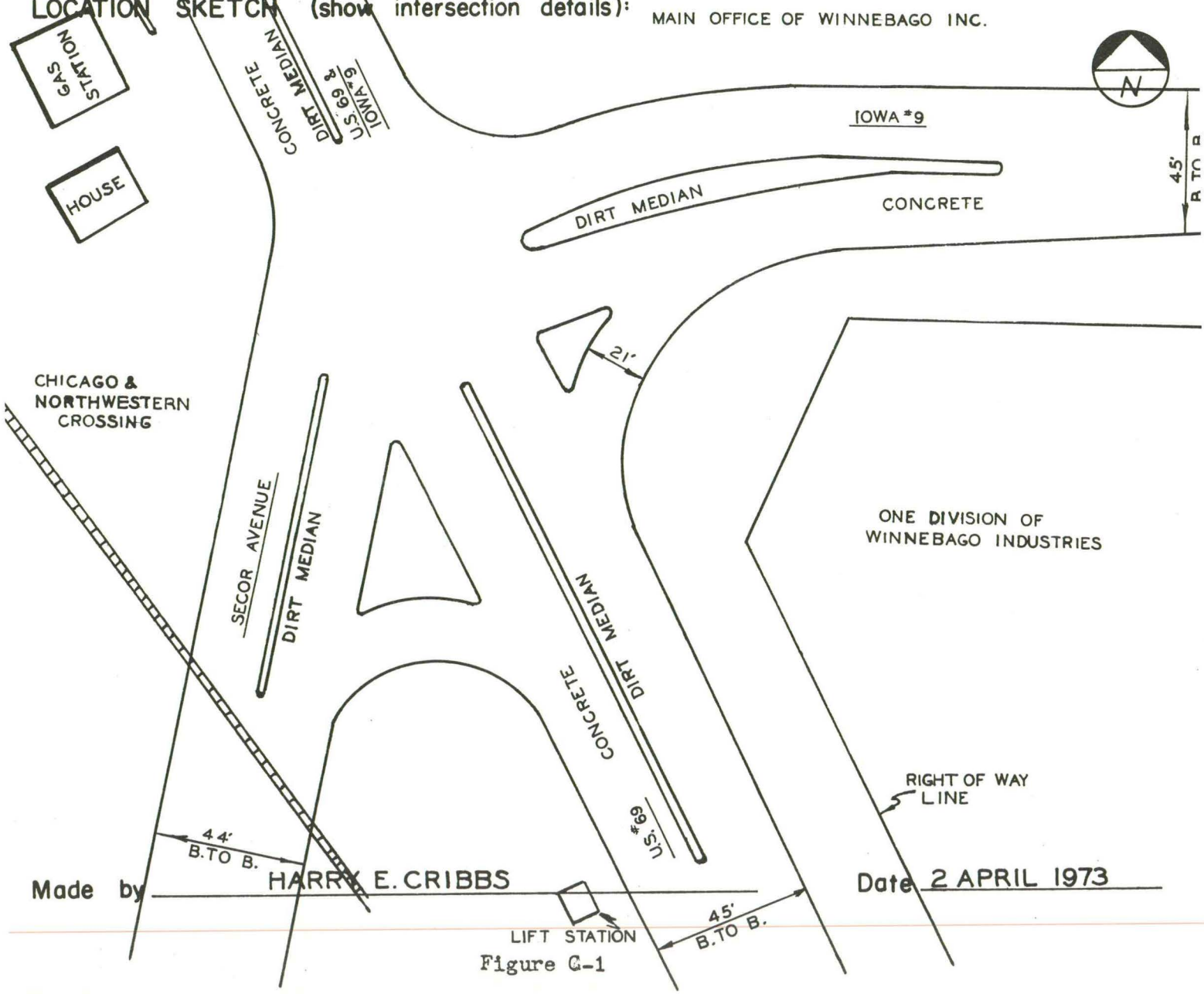
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or No TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: INTERSECTION TO HAVE SIGNAL LIGHTS INSTALLED
FOR FURTHER DETAILS, SEE PLATE 9

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 2 APRIL 1973

Figure C-1

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION US.69 & "J" STREET DATE: 26 MARCH 1973

CITY: FOREST CITY COUNTY: WINNEBAGO

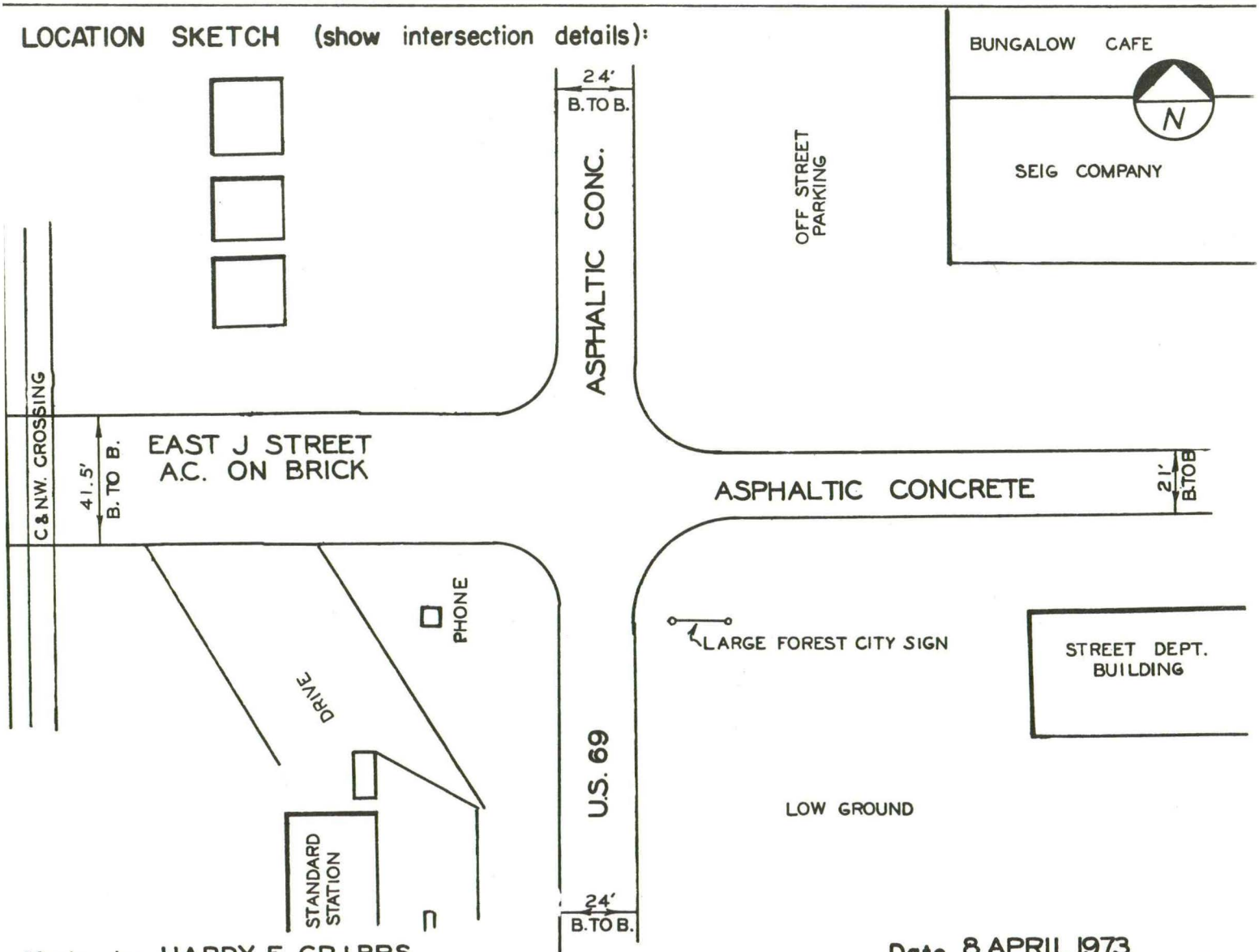
SIGNALIZED: Yes or No TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: TRAFFIC SIGNALS TO BE INSTALLED

FOR DETAILS OF INTERSECTION, SEE PLATE 10

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 8 APRIL 1973

Figure C-2

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: Intersection U.S.69 and 4th Street DATE: March 27, 1973

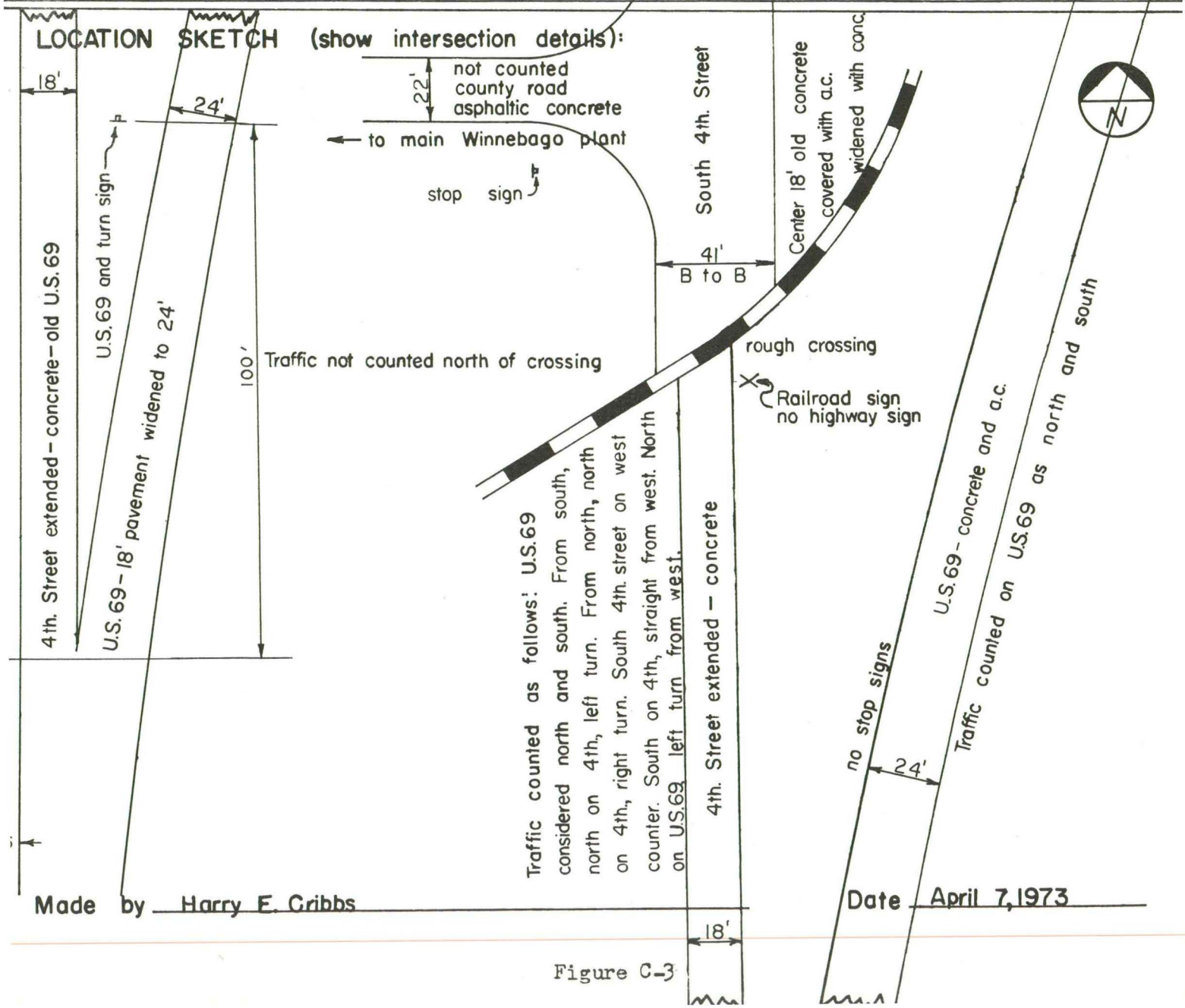
CITY: Forest City COUNTY: HANCOCK

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: Part of the traffic from the main Winnebago plant turns south onto 4th. Street, then those going north on U.S.69, make a left turn and cross U.S.69 to get in the east lane. A very bad intersection, cars are often two abreast.

LOCATION SKETCH (show intersection details):



Made by Harry E. Cribbs Date April 7, 1973

Figure C-3

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: WEST ENTRANCE CO RD FROM CRYSTAL LAKE DATE: 20 MARCH 1973

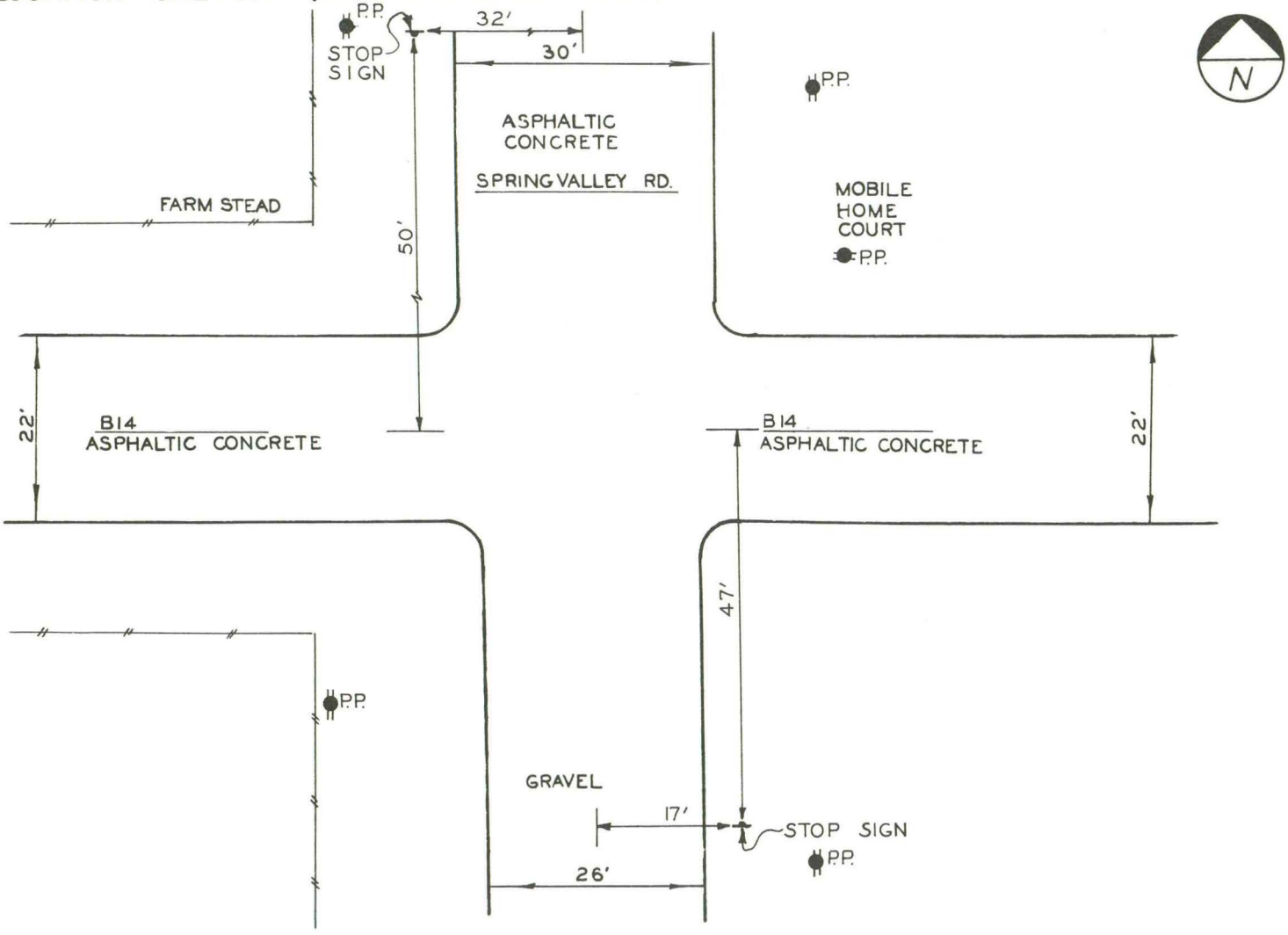
CITY: FOREST CITY COUNTY: HANCOCK

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by R. F. PAYER Date 20 MARCH 1973

Figure C-4

ASSOCIATED ENGINEERS, INC.

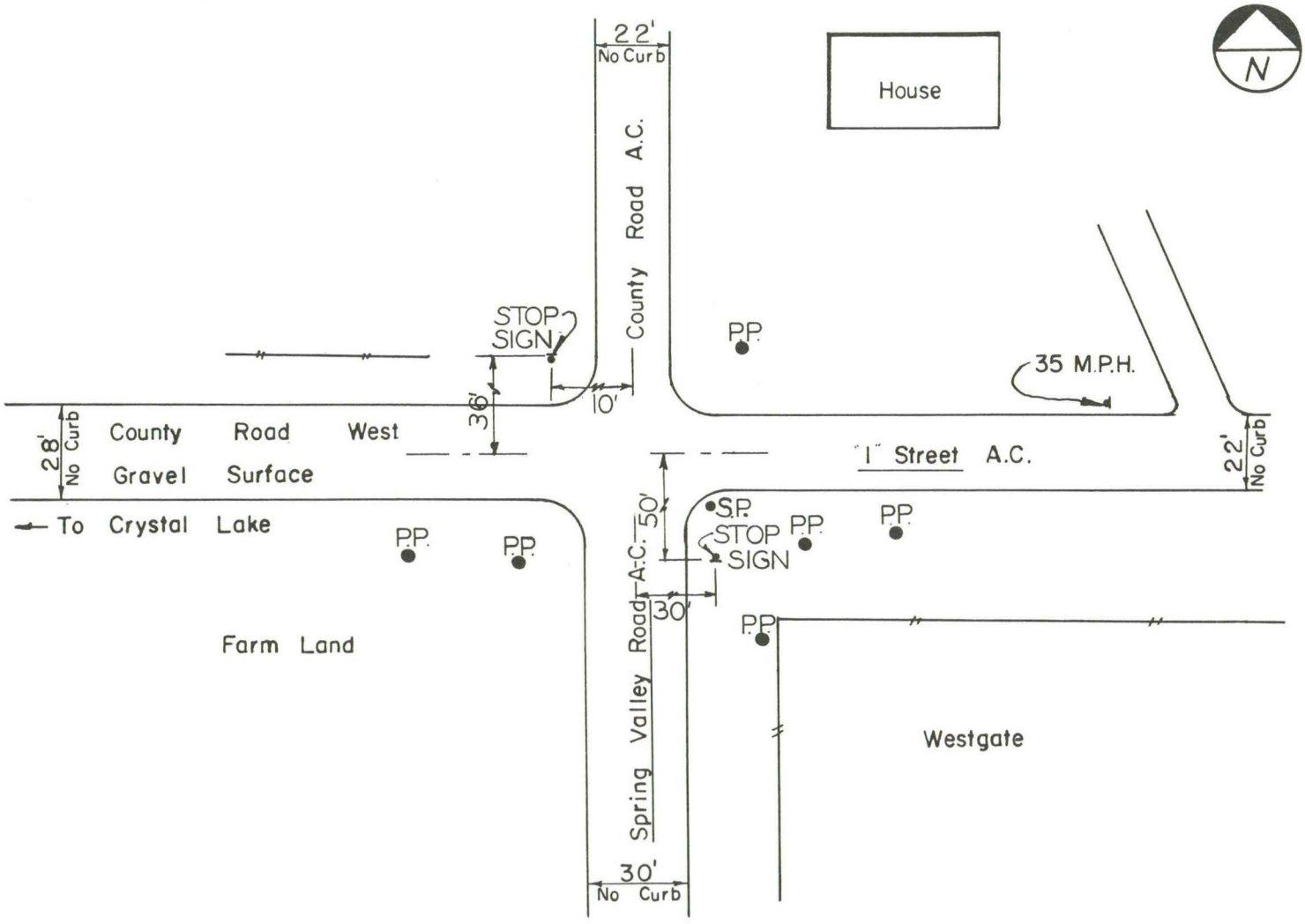
TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "I" STREET & SPRING VALLEY ROAD DATE: MARCH 21, 1973
CITY: FOREST CITY, IOWA COUNTY: WINNEBAGO
SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by Harry E. Cribbs Date March 21, 1973

Figure C-5

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "O" ST., CO. RD. A42 & BEST ST. DATE: 22 MARCH 1973

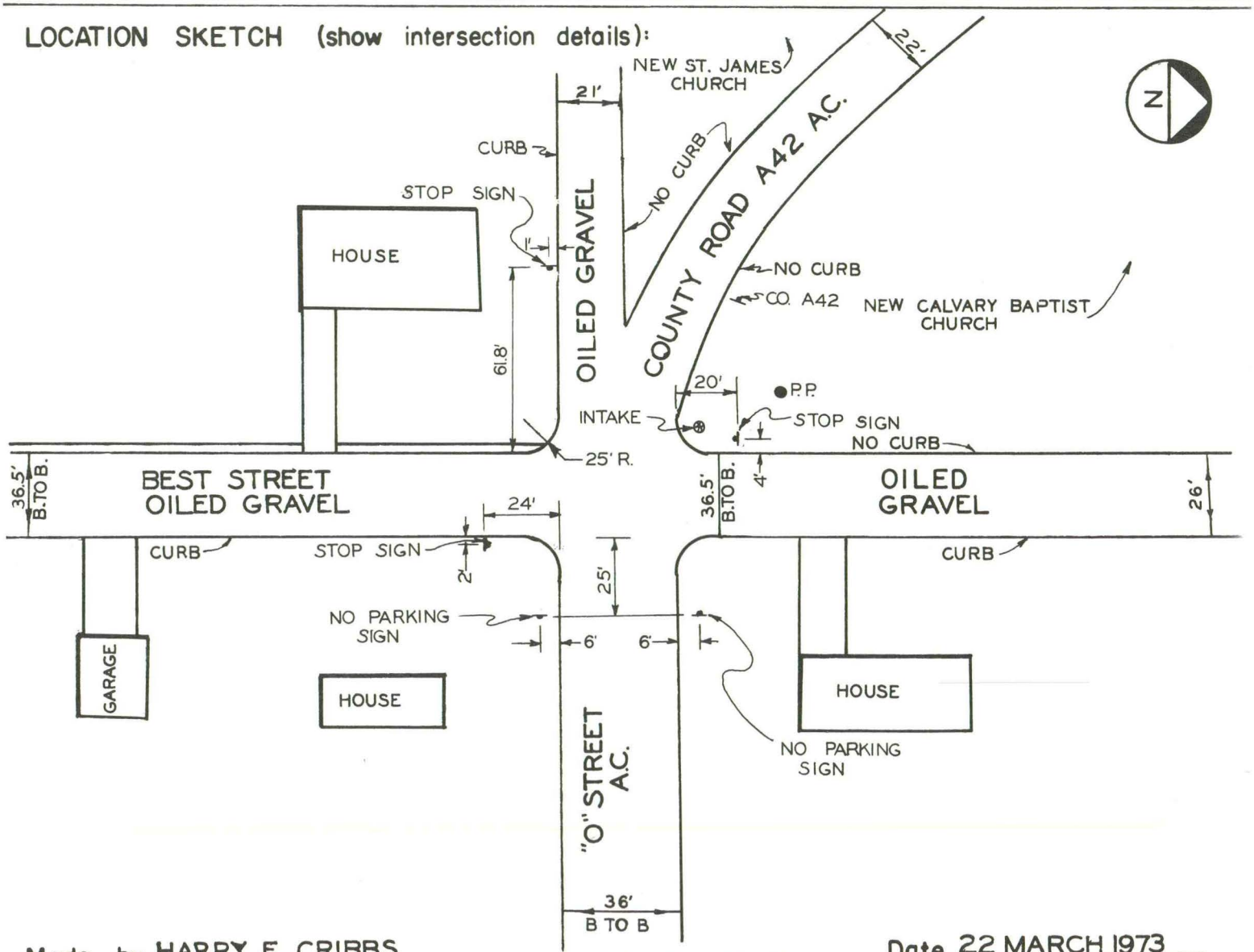
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: COUNTY ROAD A42 IS A 22' TOP HOT MIX ASPHALTIC CONCRETE ROAD INTERSECTING THE NORTH SIDE OF BEST STREET. AT THE PRESENT THERE IS NO ENTRANCE FROM COUNTY ROAD A42 TO EITHER OF THE NEW CHURCHES.

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 22 MARCH 1973

Figure C-6

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION CLARK & "J" STREET DATE: MARCH 23, 1973

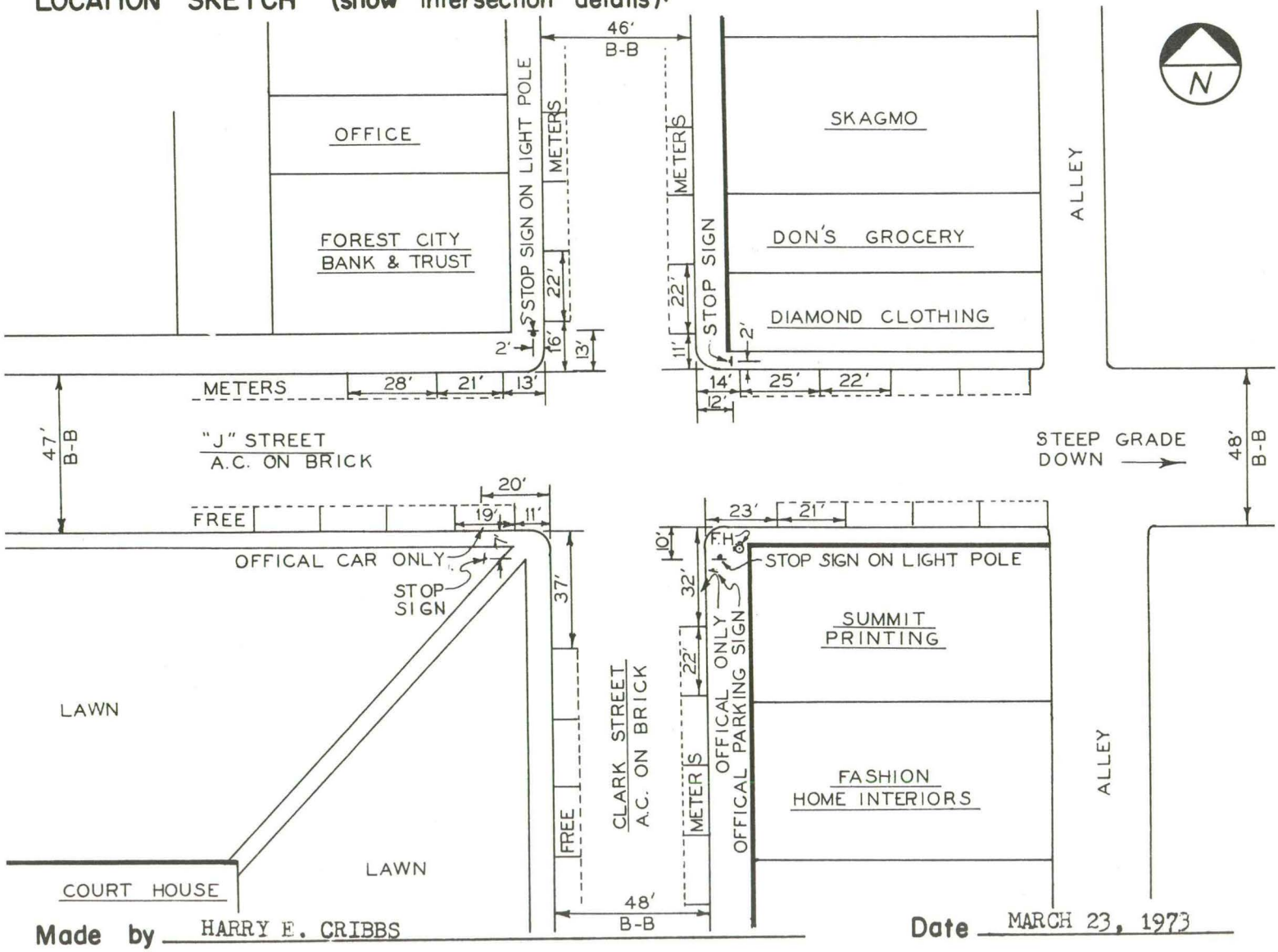
CITY: FOREST CITY, IOWA COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: "J" STREET EAST IS ON A STEEP GRADE FOR ONE BLOCK TO 4th STREET.

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date MARCH 23, 1973

Figure C-7

ASSOCIATED ENGINEERS, INC.

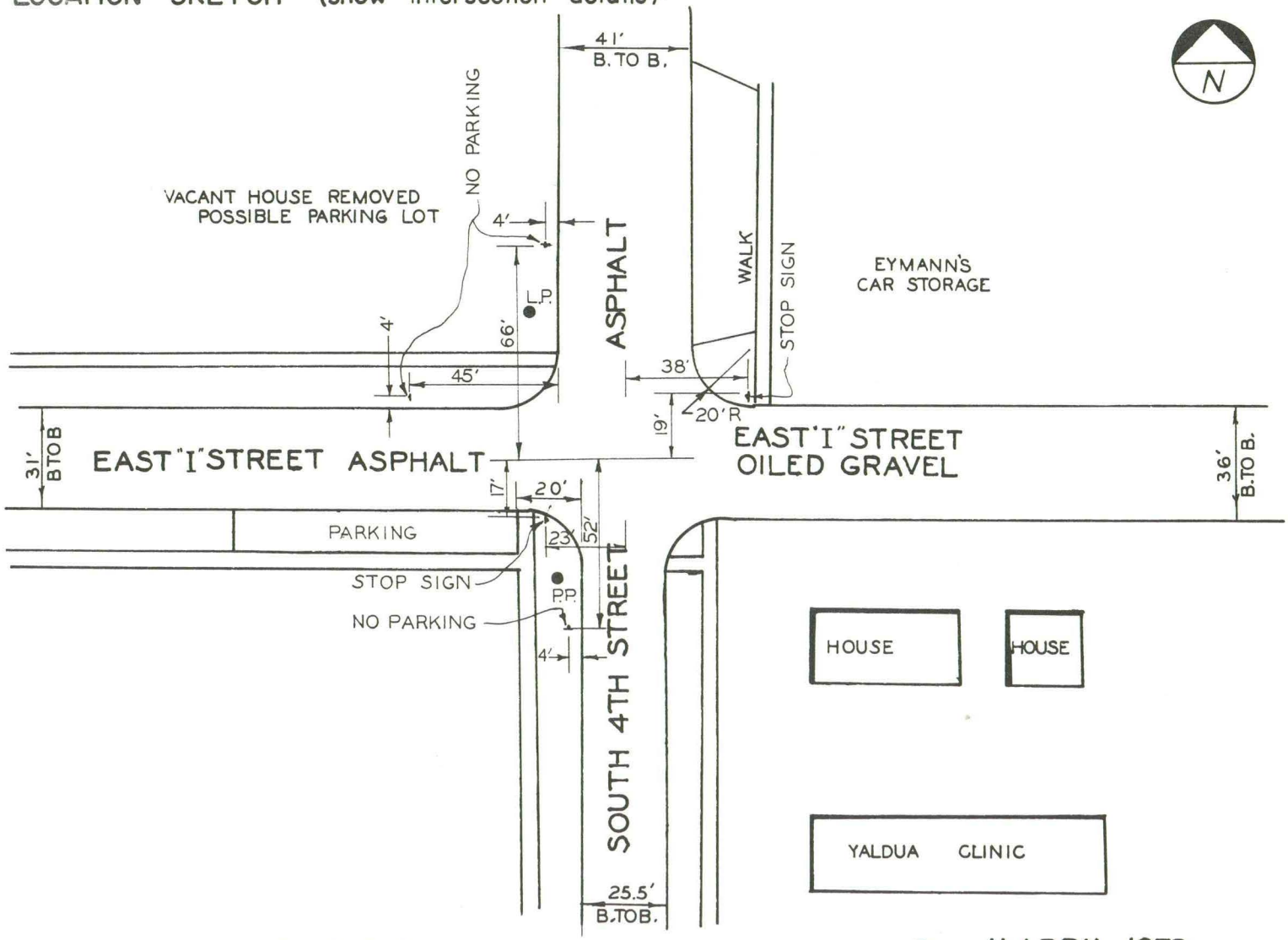
TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION SOUTH 4TH & EAST "I" STREET DATE: 28 MARCH 1973
CITY: FOREST CITY COUNTY: WINNEBAGO
SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 11 APRIL 1973

Figure C-8

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "K" & 6TH STREETS DATE: 28 MARCH 1973

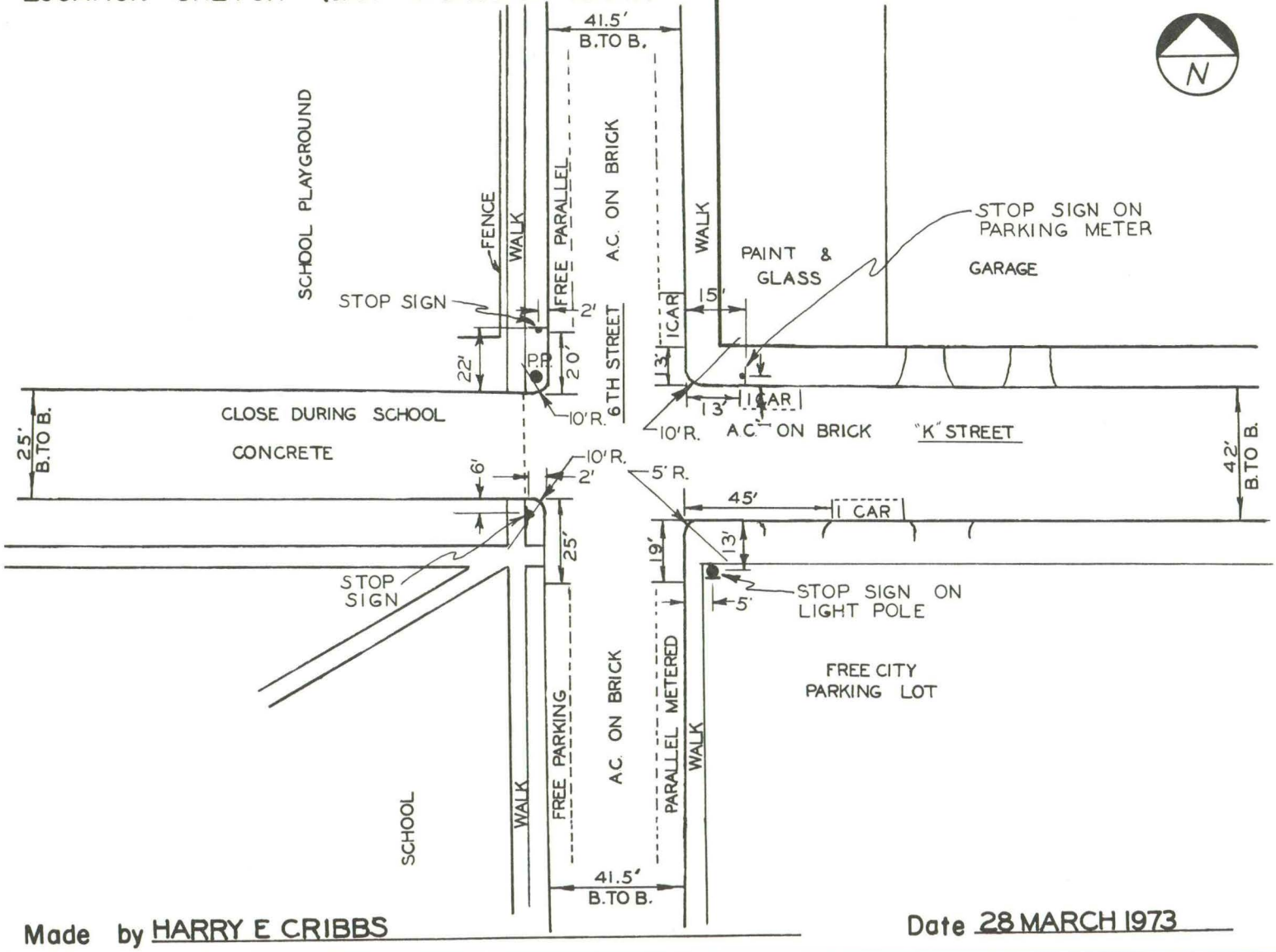
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: "K" STREET WEST IS OPEN EXCEPT DURING SCHOOL HOURS

LOCATION SKETCH (show intersection details):



Made by HARRY E CRIBBS Date 28 MARCH 1973

Figure C-9

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION 4TH & "B" STREETS DATE: 23 MARCH 1973

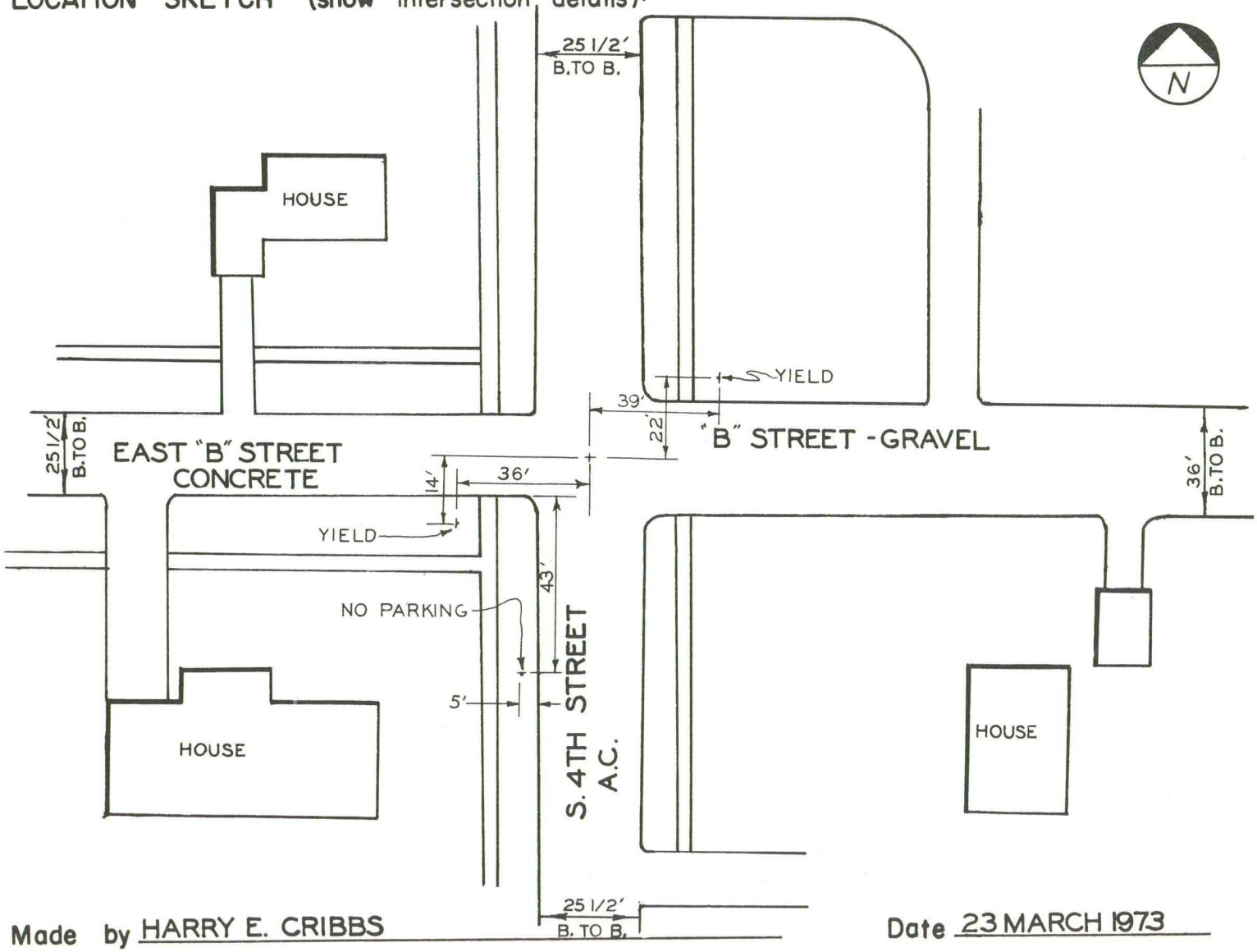
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 23 MARCH 1973

Figure C-10

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "B" STREET & 7th STREET DATE: MARCH 20, 1973

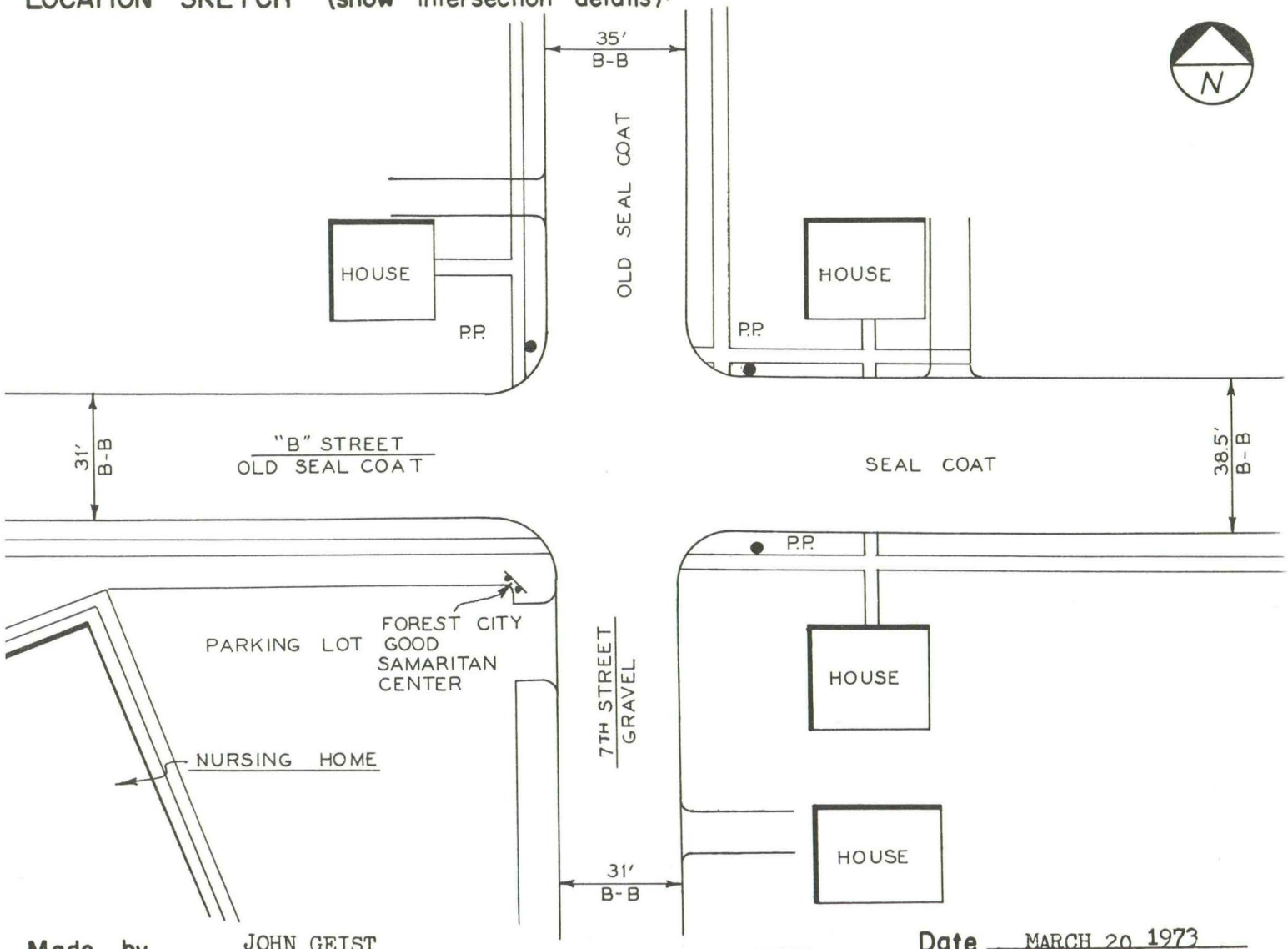
CITY: FOREST CITY, IOWA COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by JOHN GEIST Date MARCH 20, 1973

Figure C-11

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

REVISED 21 DECEMBER 1973 *

LOCATION: INTERSECTION 4TH & PARK STREETS DATE: 21 MARCH 1973

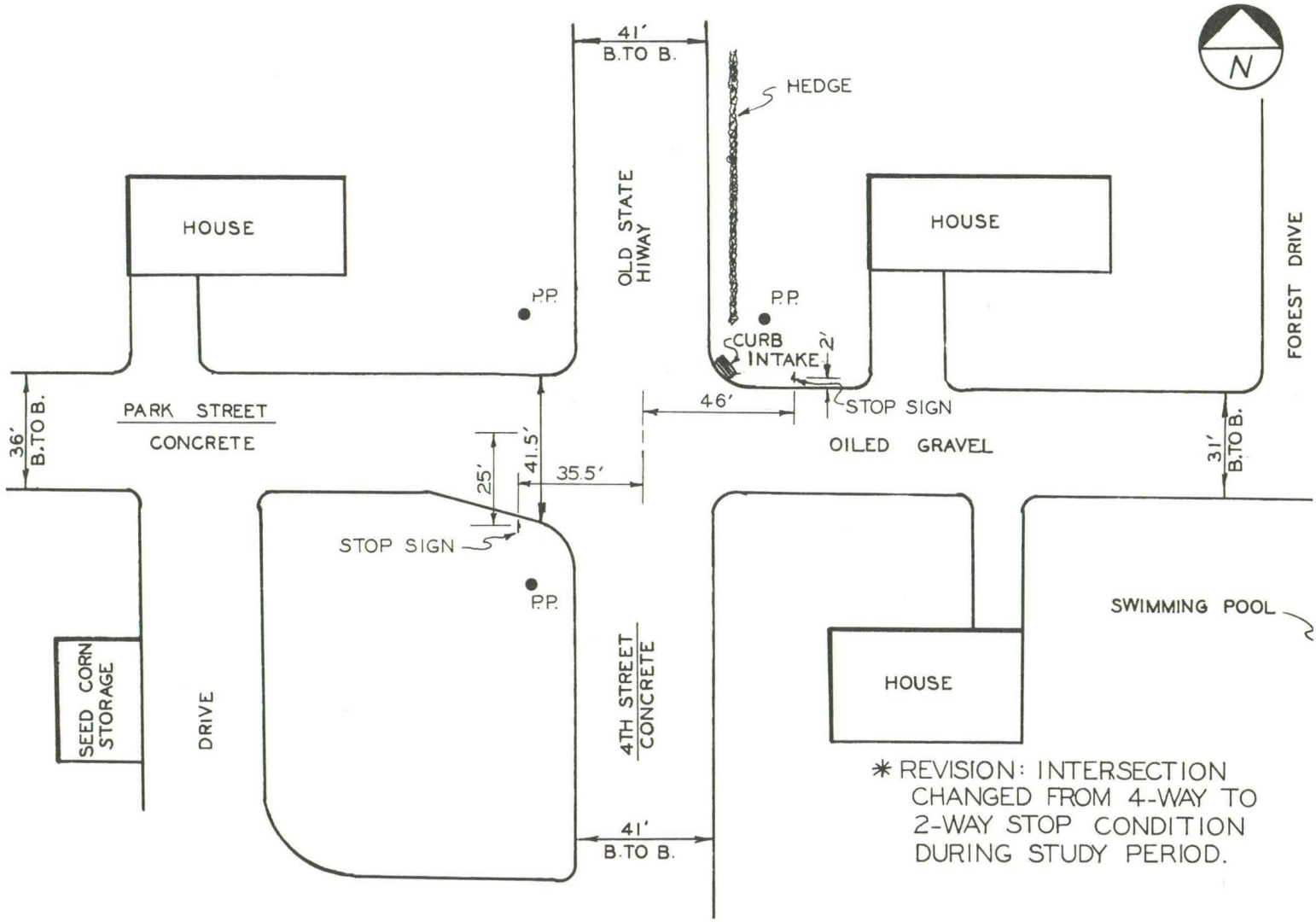
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: THE CENTER 18' OF 4TH IS CONCRETE COVERED WITH ASPHALT IT WAS WIDENED RECENTLY WITH CONCRETE ON EACH SIDE. THE FOREST CITY MUNICIPAL SWIMMING POOL IS A LITTLE OVER A BLOCK EAST OF THIS INTERSECTION OFF OF PARK STREET.

LOCATION SKETCH (show intersection details):



* REVISION: INTERSECTION CHANGED FROM 4-WAY TO 2-WAY STOP CONDITION DURING STUDY PERIOD.

Made by HARRY E. CRIBBS Date 21 MARCH 1973

Figure C-12

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION EAST "J" STREET & CENTRAL STREET DATE: MARCH 29, 1973

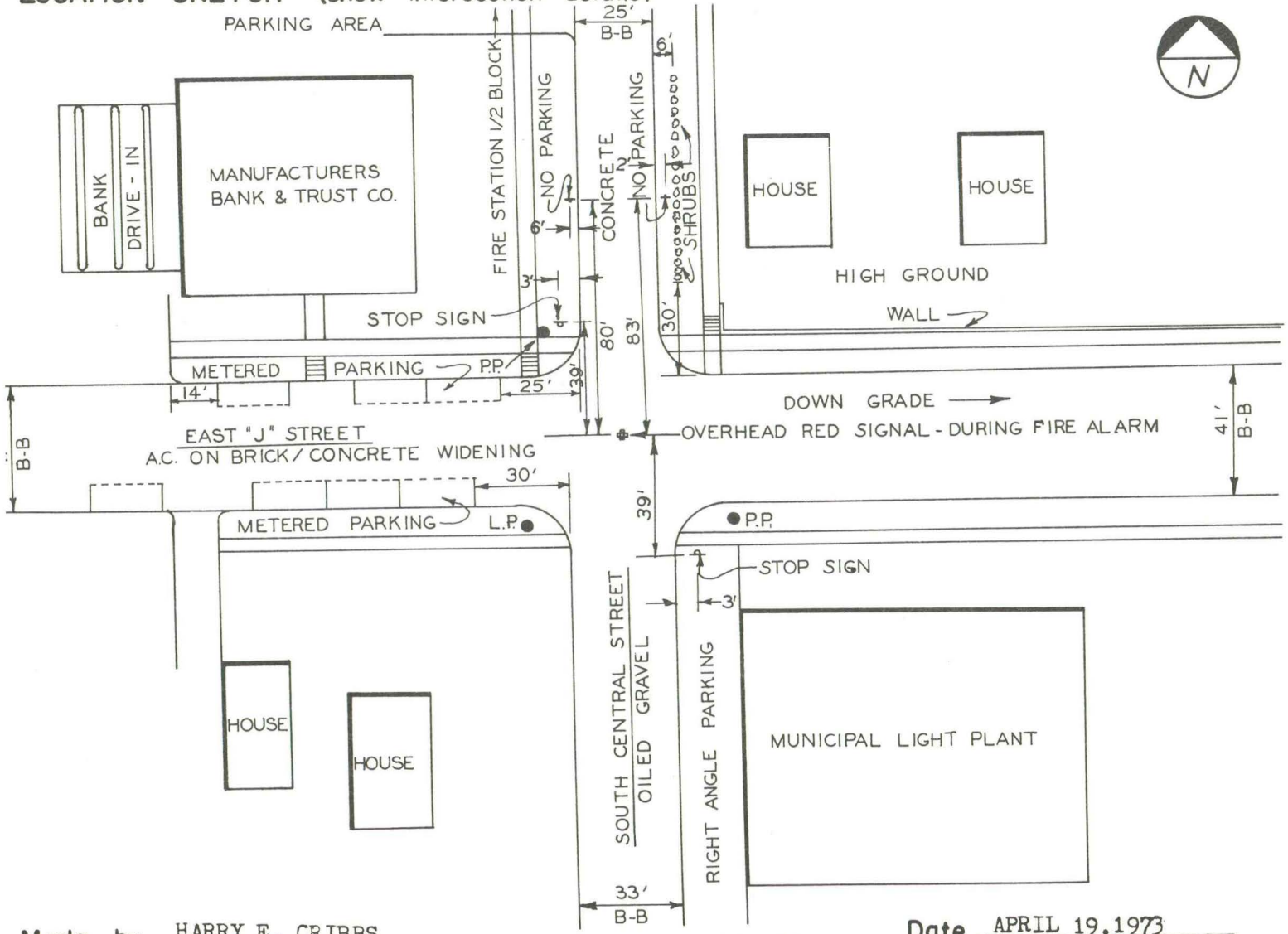
CITY: FOREST CITY, IOWA COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: THE CITY FIRE STATION FRONTS ON NORTH CENTRAL AT THE OTHER END OF THE BLOCK, NORTH OF THE BANK.

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date APRIL 19, 1973

Figure C-13

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION EAST "J" & 4TH STREET DATE: MARCH 26,1973

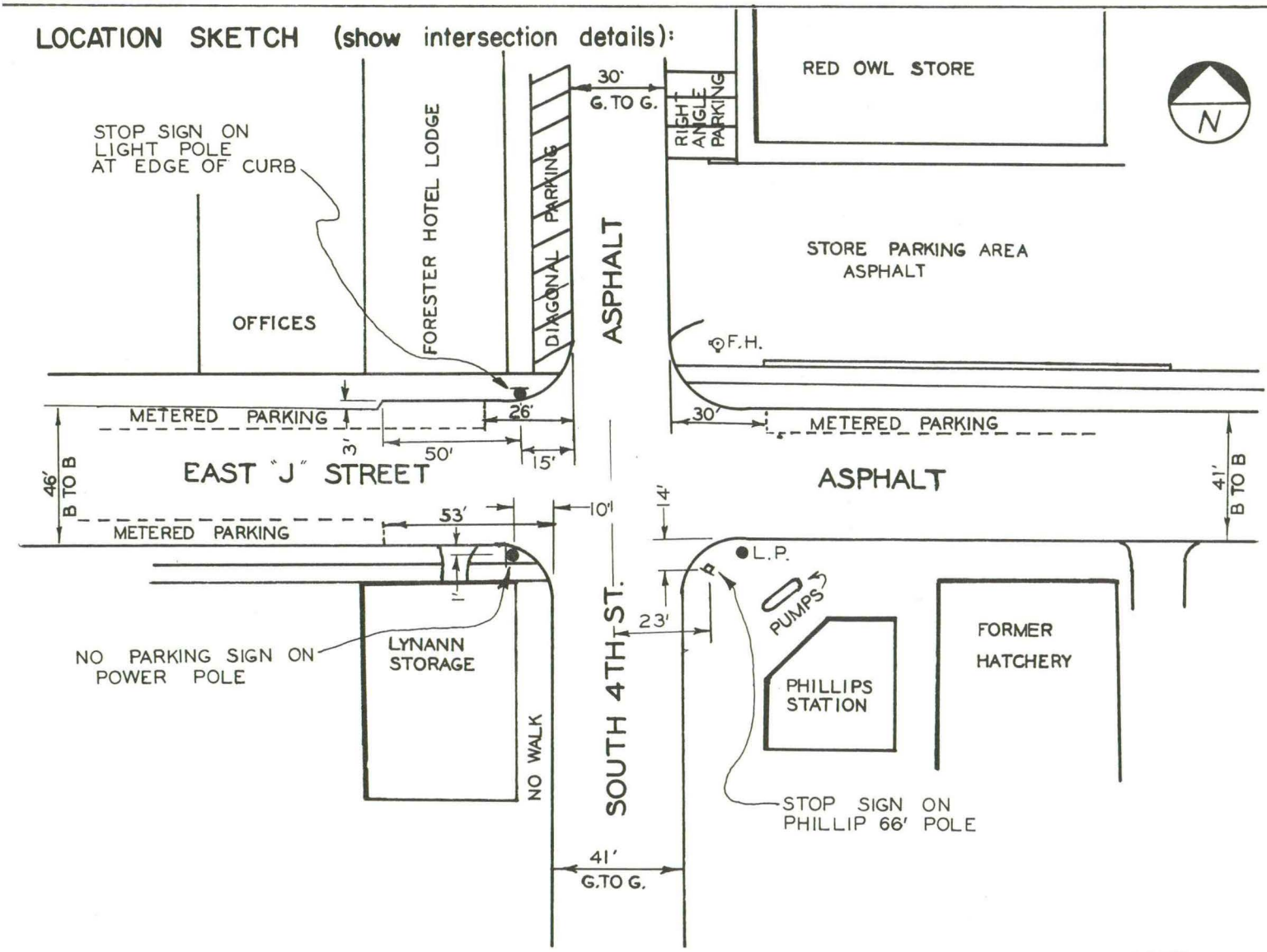
CITY: FOREST CITY IOWA COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date APRIL 9, 1973

Figure C-14

ASSOCIATED ENGINEERS, INC.

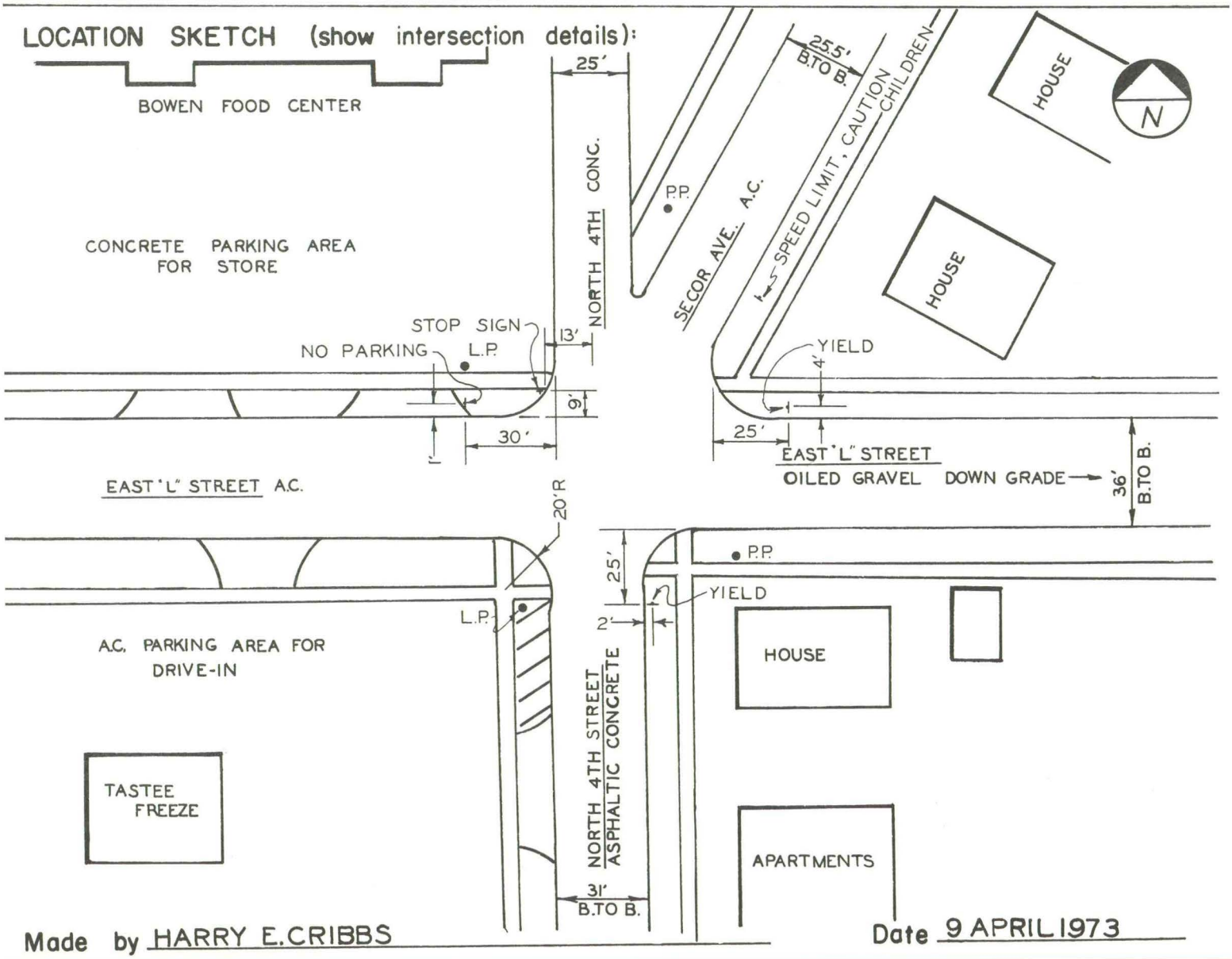
TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "L", 4TH & SECOR STREETS DATE: 27 MARCH 1973
CITY: FOREST CITY COUNTY: WINNEBAGO
SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: SECOR AVE. WAS COUNTED AS NORTH

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 9 APRIL 1973

Figure C-15

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "O" STREET & SECOR AVE. DATE: 30 MARCH 1973

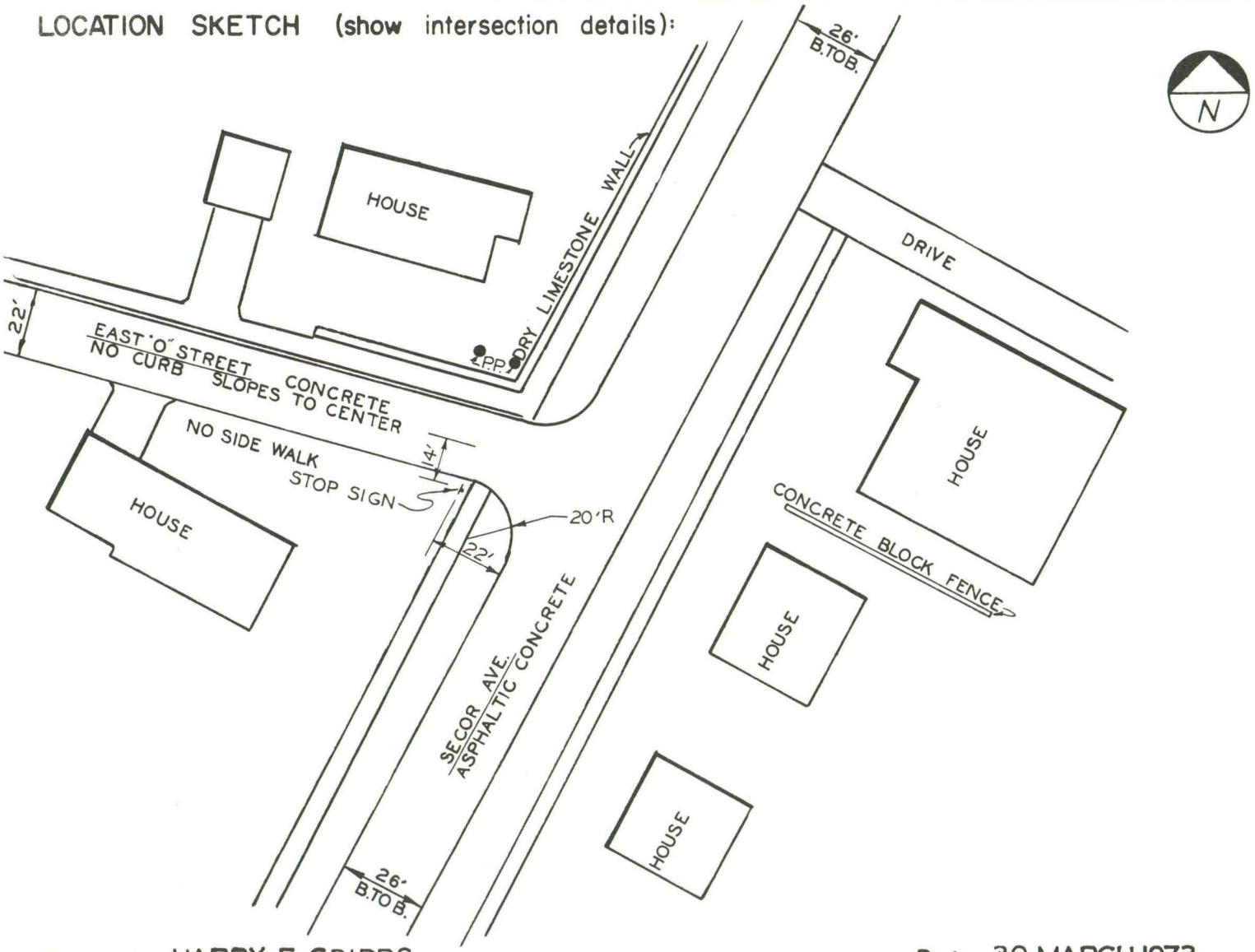
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: "O" STREET HAS CONSIDERABLE TRAFFIC FOR A 22' STREET

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 30 MARCH 1973

Figure C-16

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION NORTH CLARK & "O" STREET DATE: MARCH 30, 1973

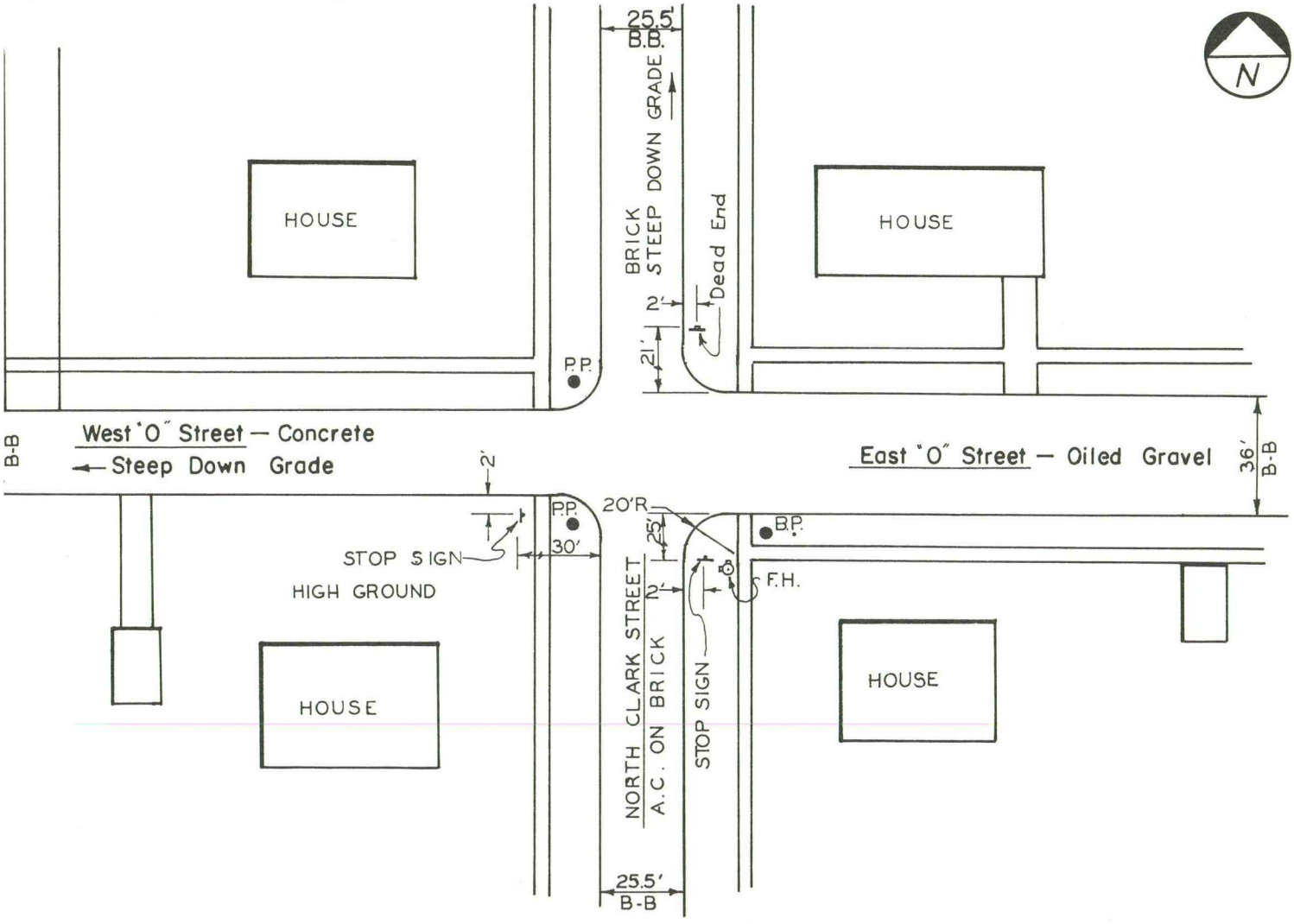
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: CLARK STREET ENDS ONE BLOCK NORTH OF "O" STREET

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date MARCH 30, 1973

Figure C-17

ASSOCIATED ENGINEERS, INC.

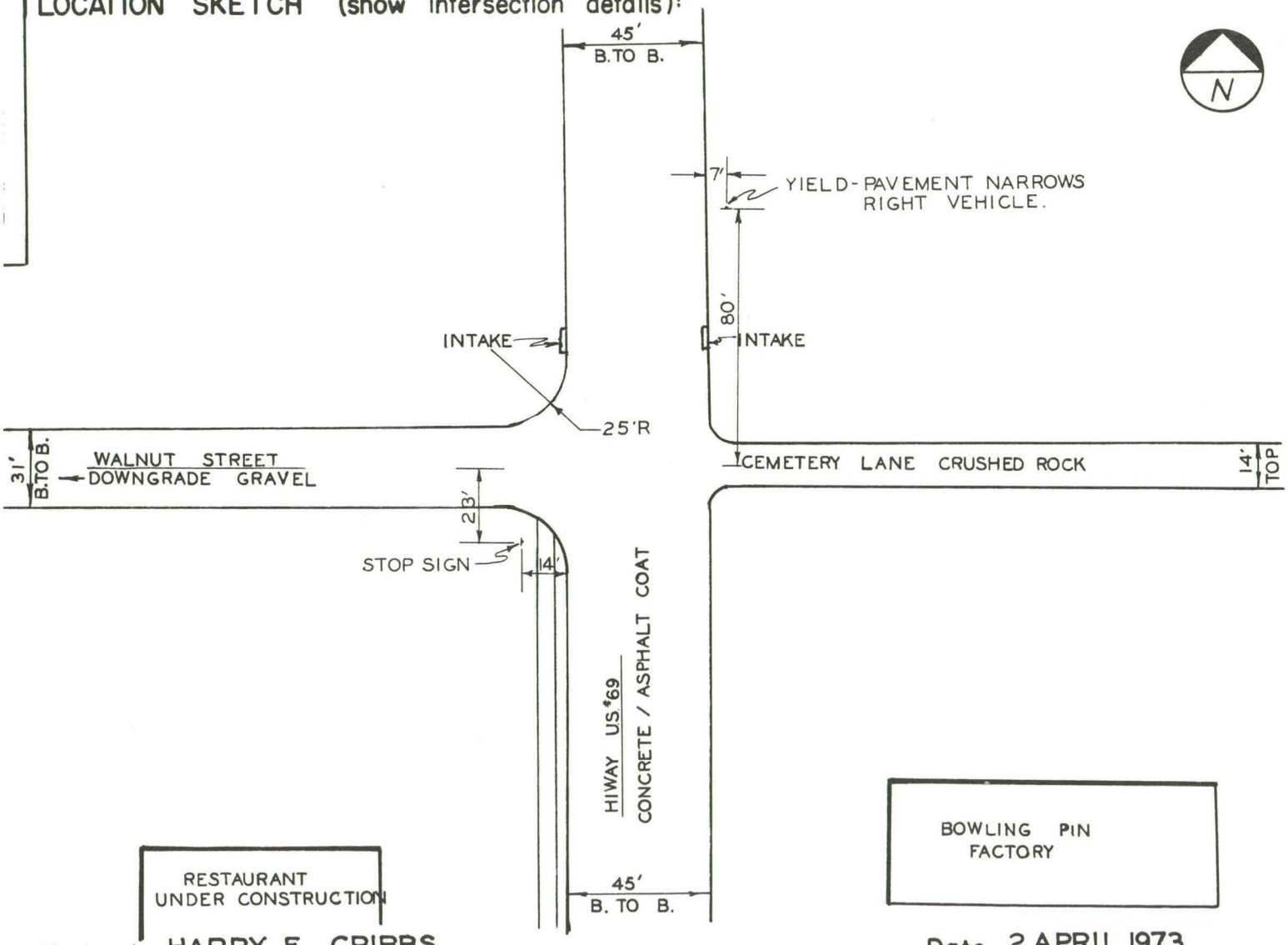
TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION U.S. 69 & WALNUT STREET DATE: 2 APRIL 1973
CITY: FOREST CITY COUNTY: WINNEBAGO
SIGNALIZED: Yes or No TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: THE CITY MAP & THE STREET SIGN CALL THE STREET WALNUT, INSTEAD OF WOODLAND DRIVE.

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 2 APRIL 1973

Figure C-18

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION US 69 & SUNSET DRIVE DATE: 3 APRIL 1973

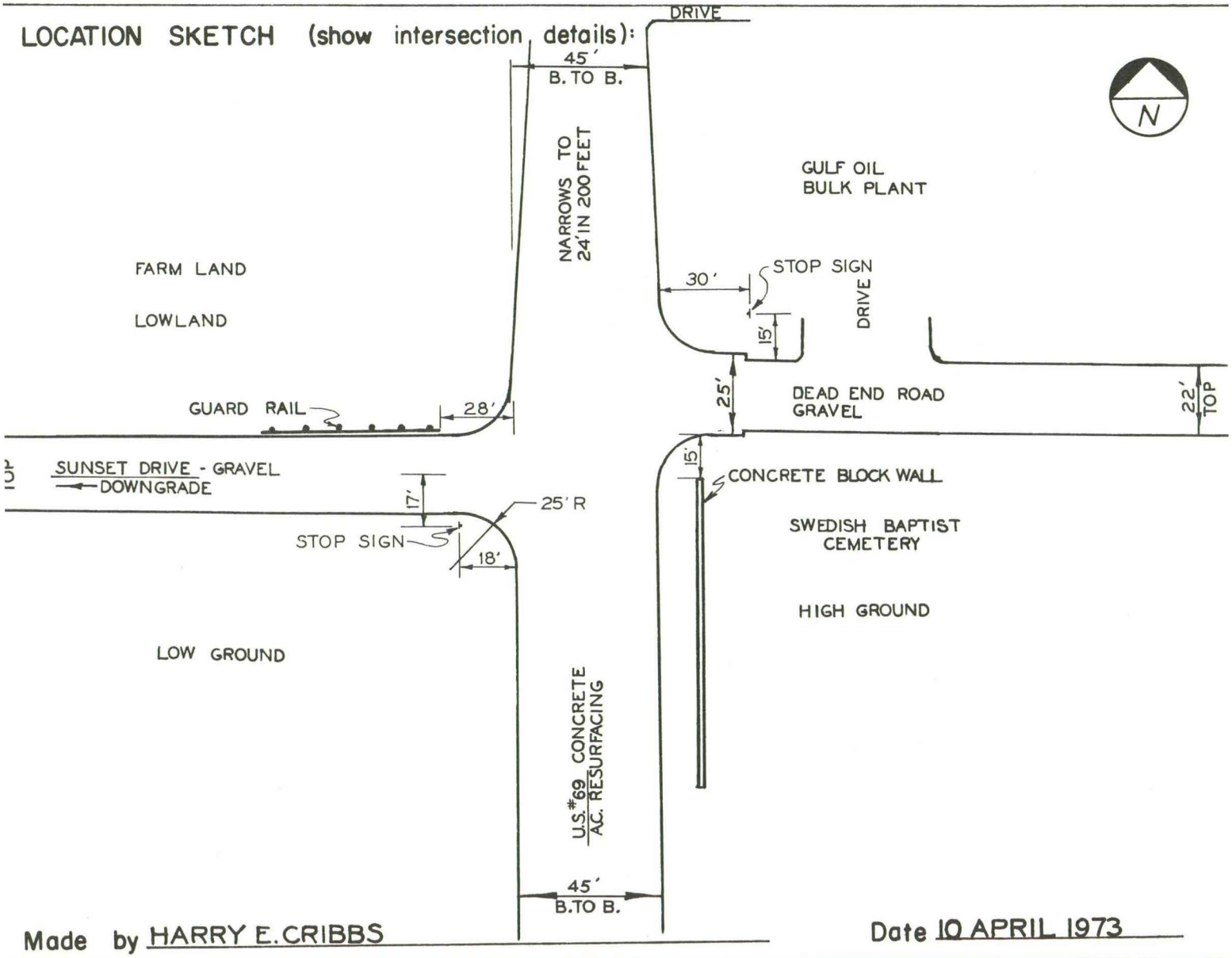
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or No TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 10 APRIL 1973

Figure C-19

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION NORTH 8TH & WEST "L" STREET DATE: 2 APRIL 1973

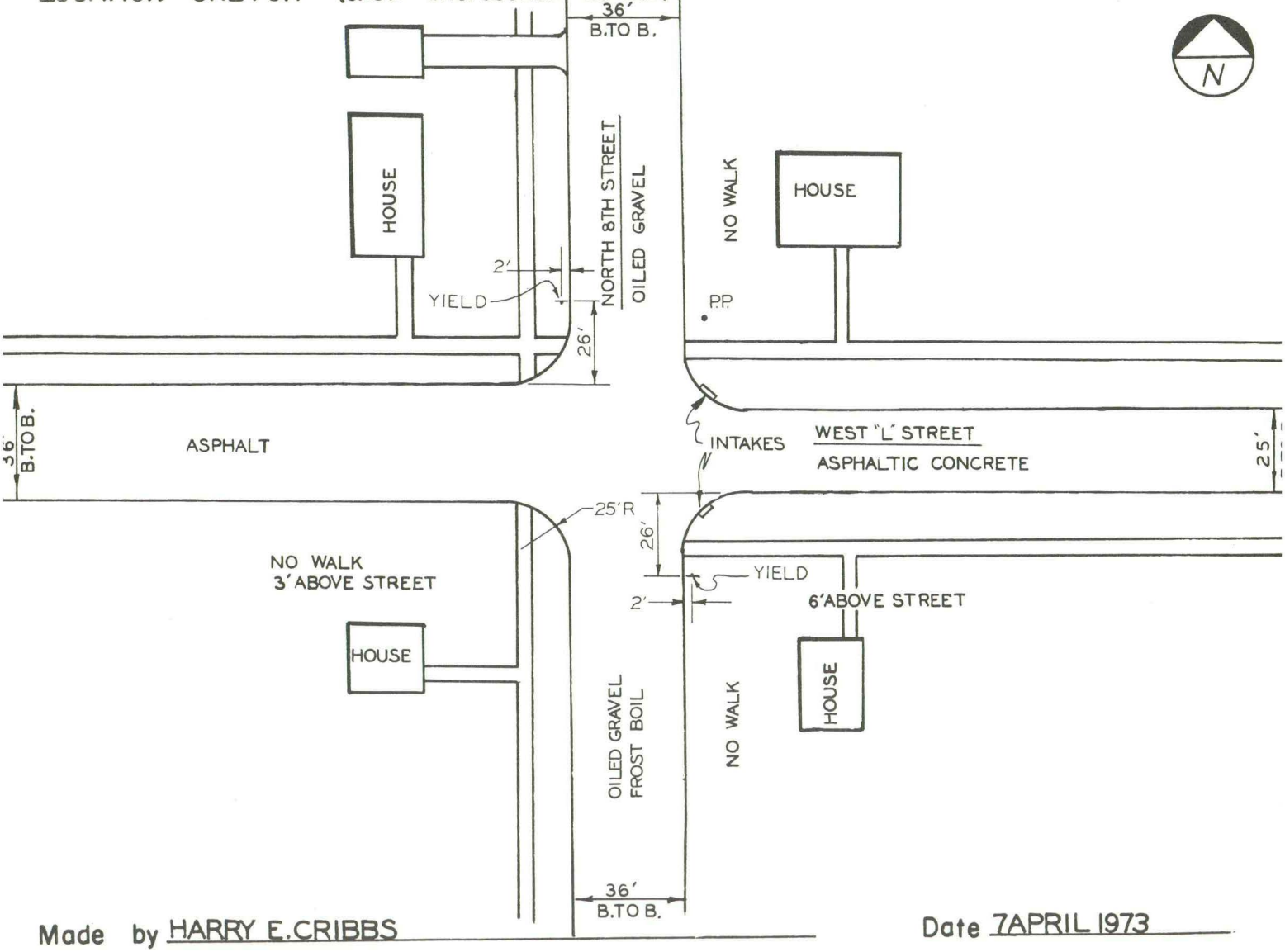
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 7 APRIL 1973

Figure C-20

ASSOCIATED ENGINEERS, INC.

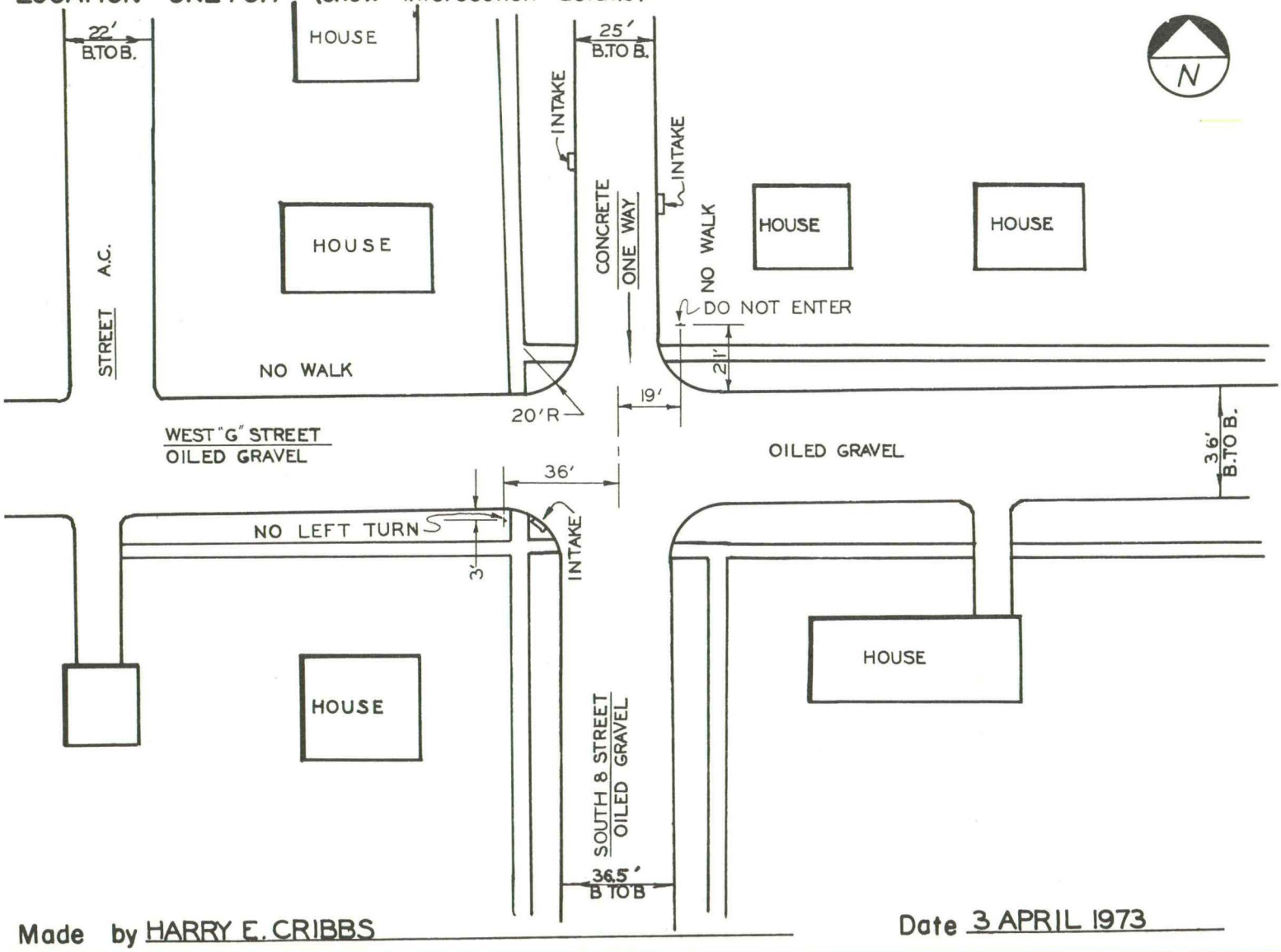
TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION WEST "G" & SOUTH 8TH STREET DATE: 3 APRIL 1973
CITY: FOREST CITY COUNTY: WINNEBAGO
SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: A FEW CARS WENT NORTH THE WRONG WAY ON SOUTH 8TH NORTH OF "G" STREET

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 3 APRIL 1973

Figure C-21

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION WEST "J" & BEST STREET DATE: 4 APRIL 1973

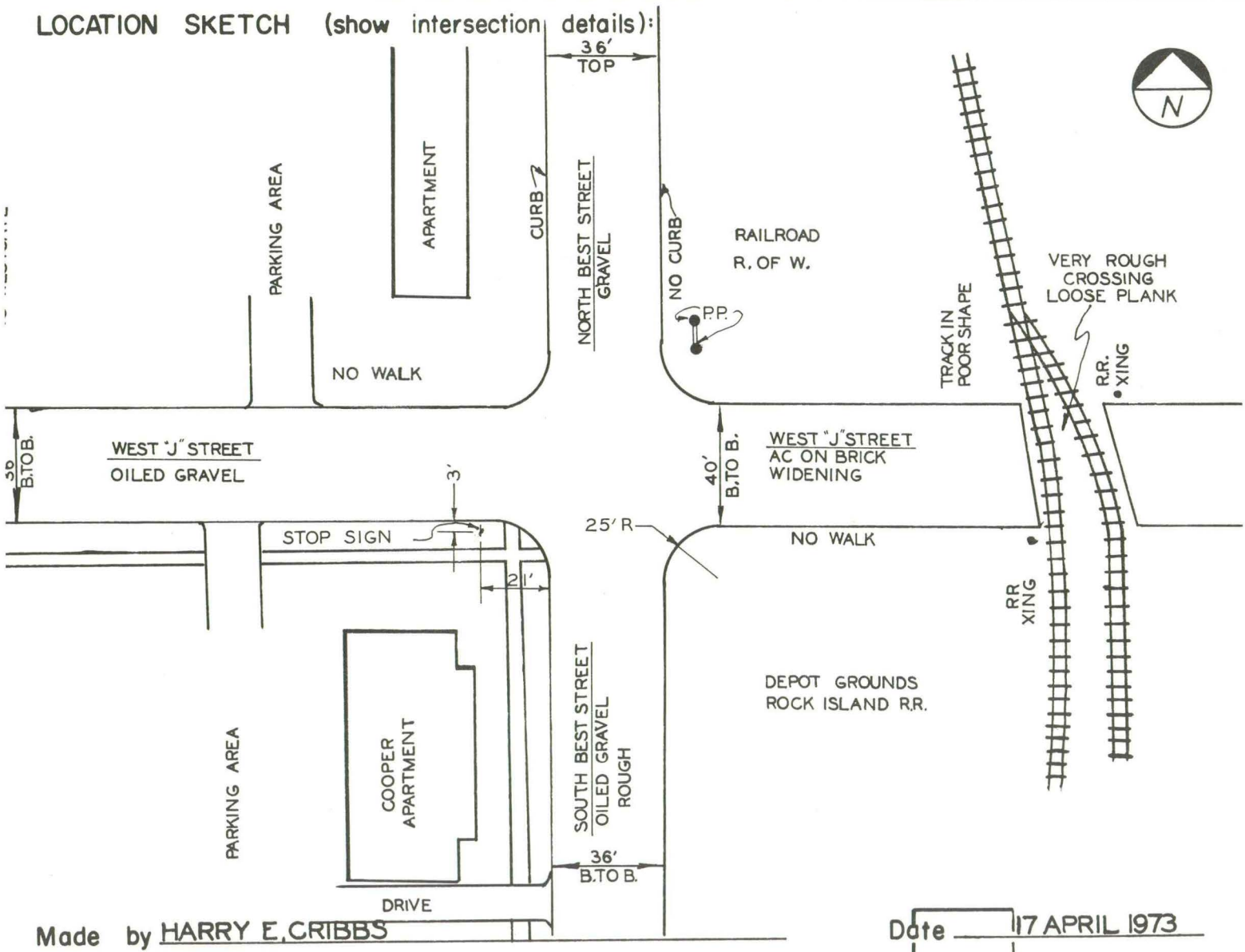
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 17 APRIL 1973

Figure C-22

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "J"STREET & GOLF COURSE ROAD DATE: MARCH 29, 1973

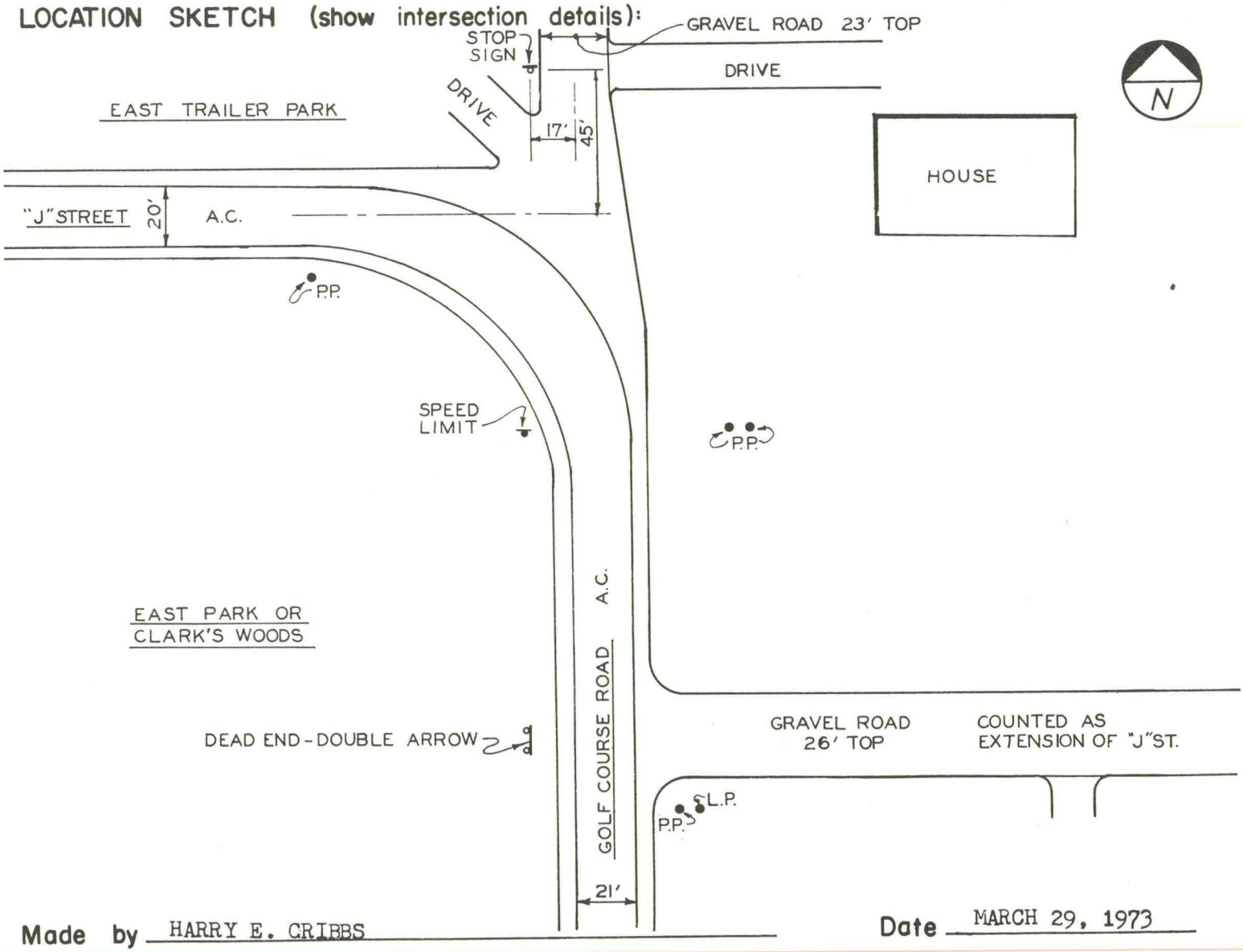
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: THE GRAVEL ROAD TO THE EAST WAS CONSIDERED AS BEING AN EXTENSION OF "J" STREET.

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date MARCH 29, 1973

Figure C-23

HOUSE

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION WEST "N" & NORTH 9TH STREET DATE: 4 APRIL 1973

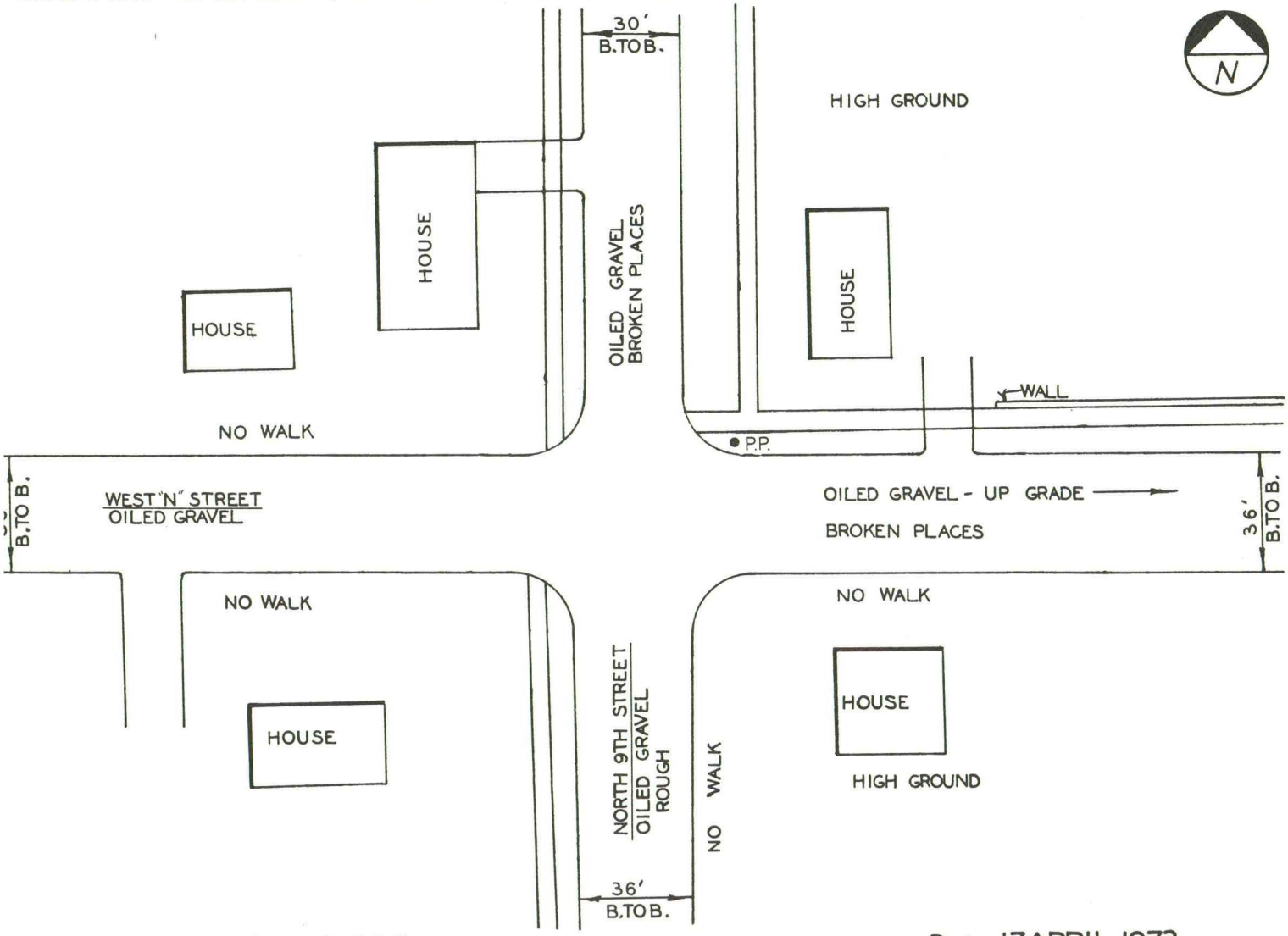
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 17 APRIL 1973

Figure C-24

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "M" & 11th STREET DATE: APRIL 5, 1973

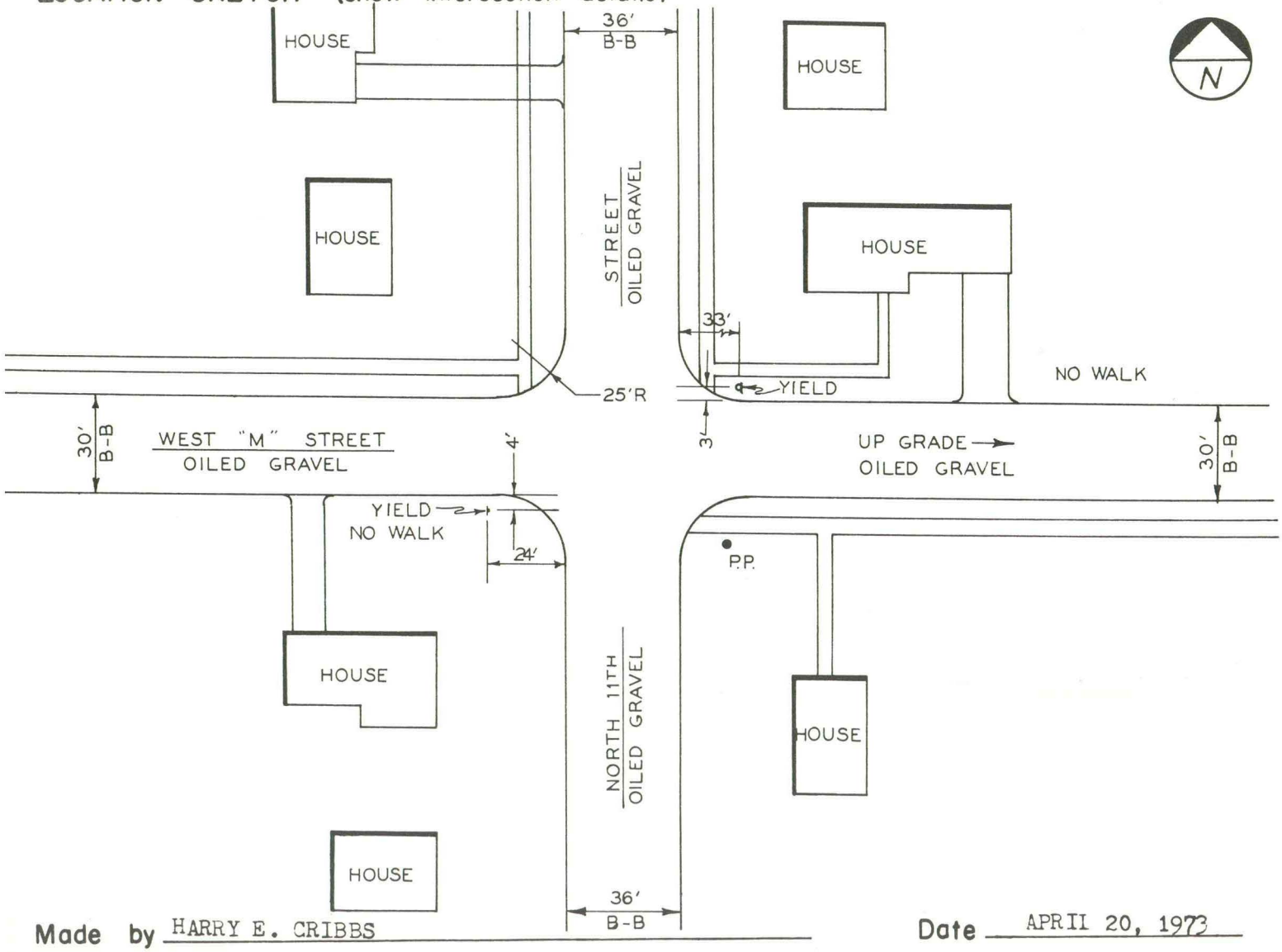
CITY: FOREST CITY, IOWA COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date APRII 20, 1973

Figure C-25

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION WEST "I" & SOUTH 7TH STREETS DATE: 6 APRIL 1973

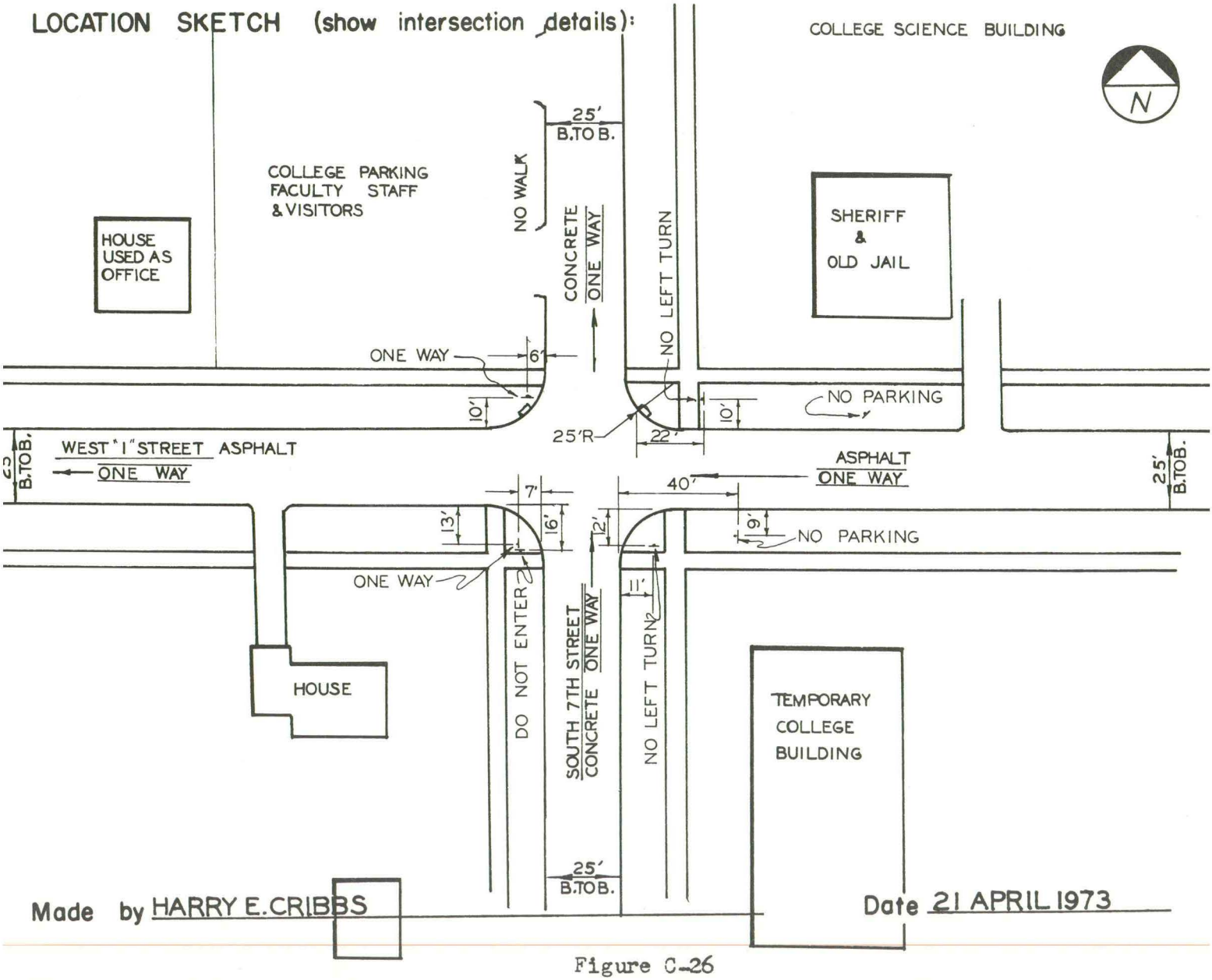
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: SOME OF THE ONE WAY SIGNS NEED MAINTENANCE

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 21 APRIL 1973

Figure C-26

ASSOCIATED ENGINEERS, INC.

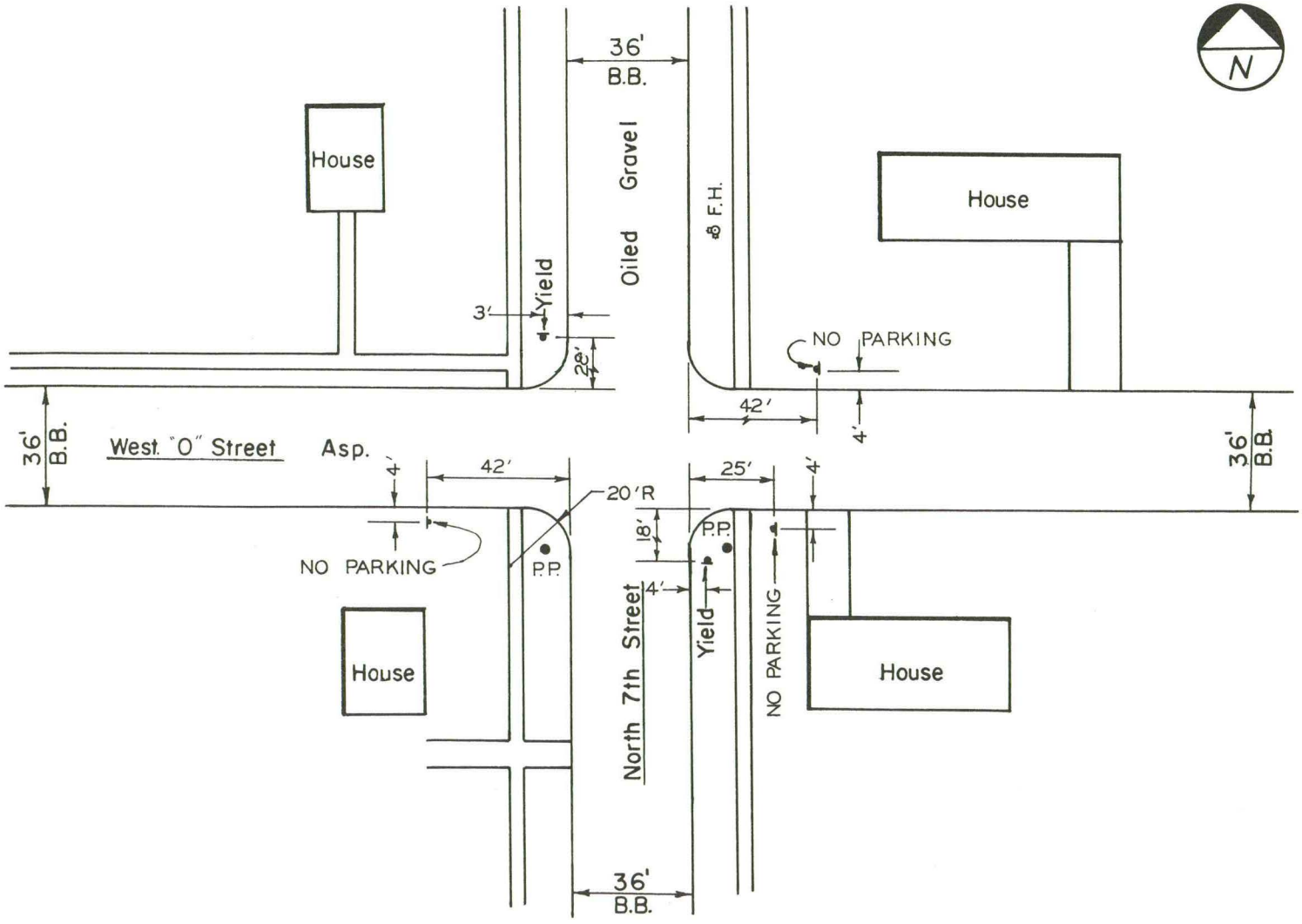
TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION WEST "O" AND NORTH 7TH STREETS DATE: APRIL 5, 1973
CITY: FOREST CITY, IOWA COUNTY: WINNEBAGO
SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date APRIL 20, 1973

Figure C-27

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "J" & WEST STREETS DATE: 6 APRIL 1973

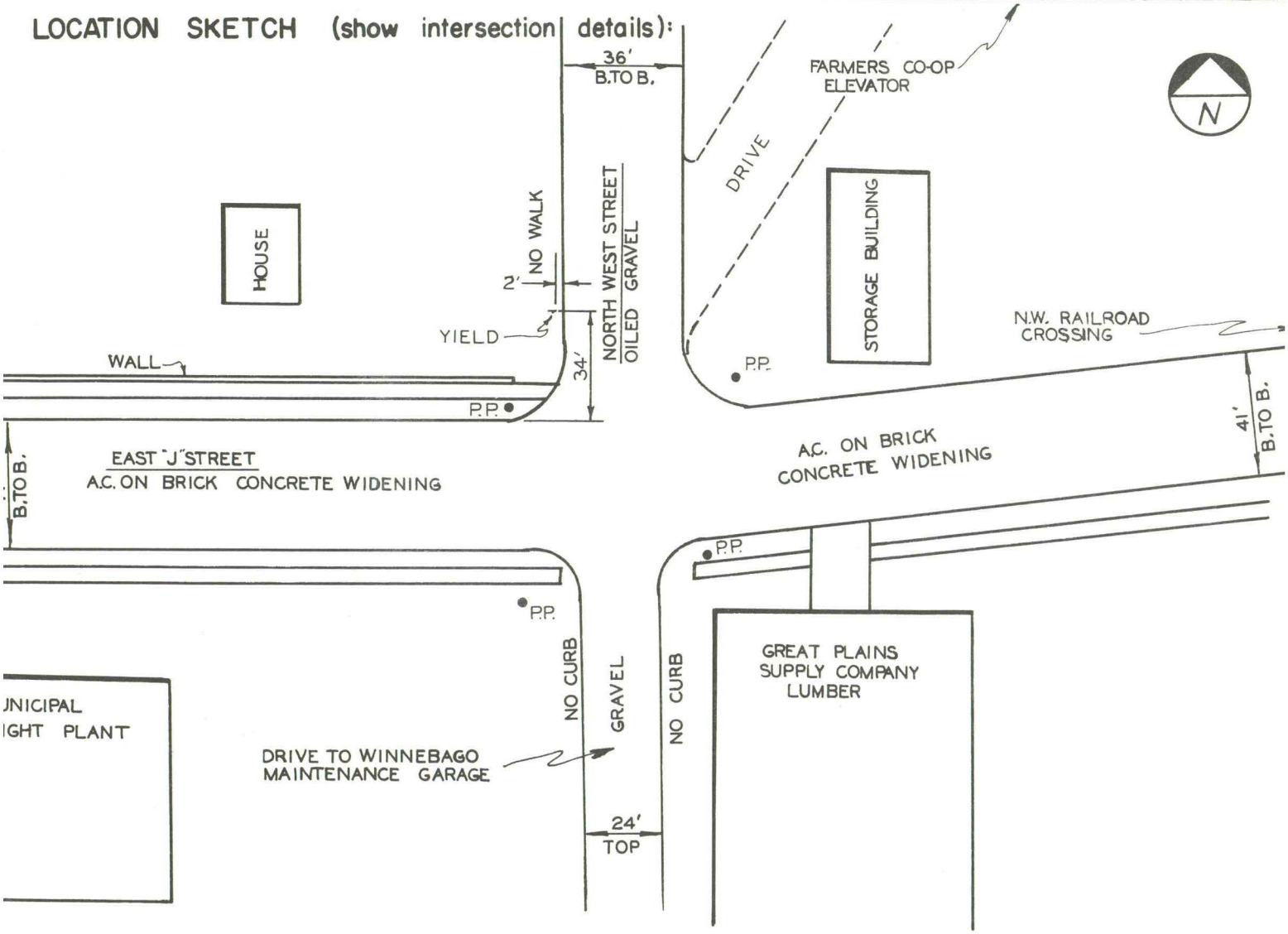
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 6 APRIL 1973

Figure C-28

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION WEST "G" & SOUTH 6 THE ST. DATE: 9 APRIL 1973

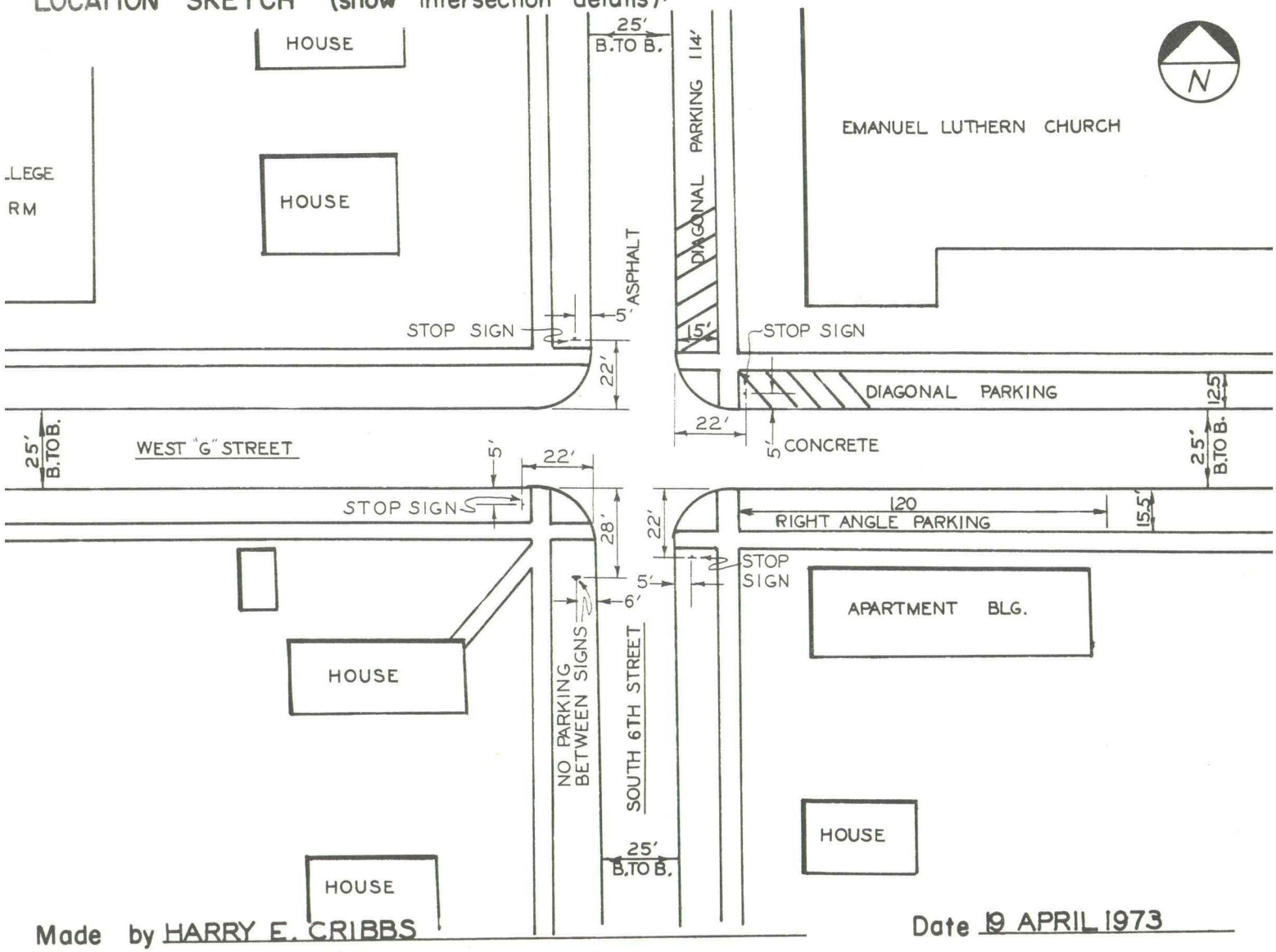
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: "G" STREET BETWEEN 6TH & CLARK WITH PARKING ON BOTH SIDES LEAVING VERY LITTLE ROOM FOR TRAFFIC

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 19 APRIL 1973

Figure C-29

ASSOCIATED ENGINEERS, INC.

TRAFFIC COUNT LOCATION SKETCH

LOCATION: INTERSECTION "C" & SOUTH CLARK STREET DATE: 9 APRIL 1973

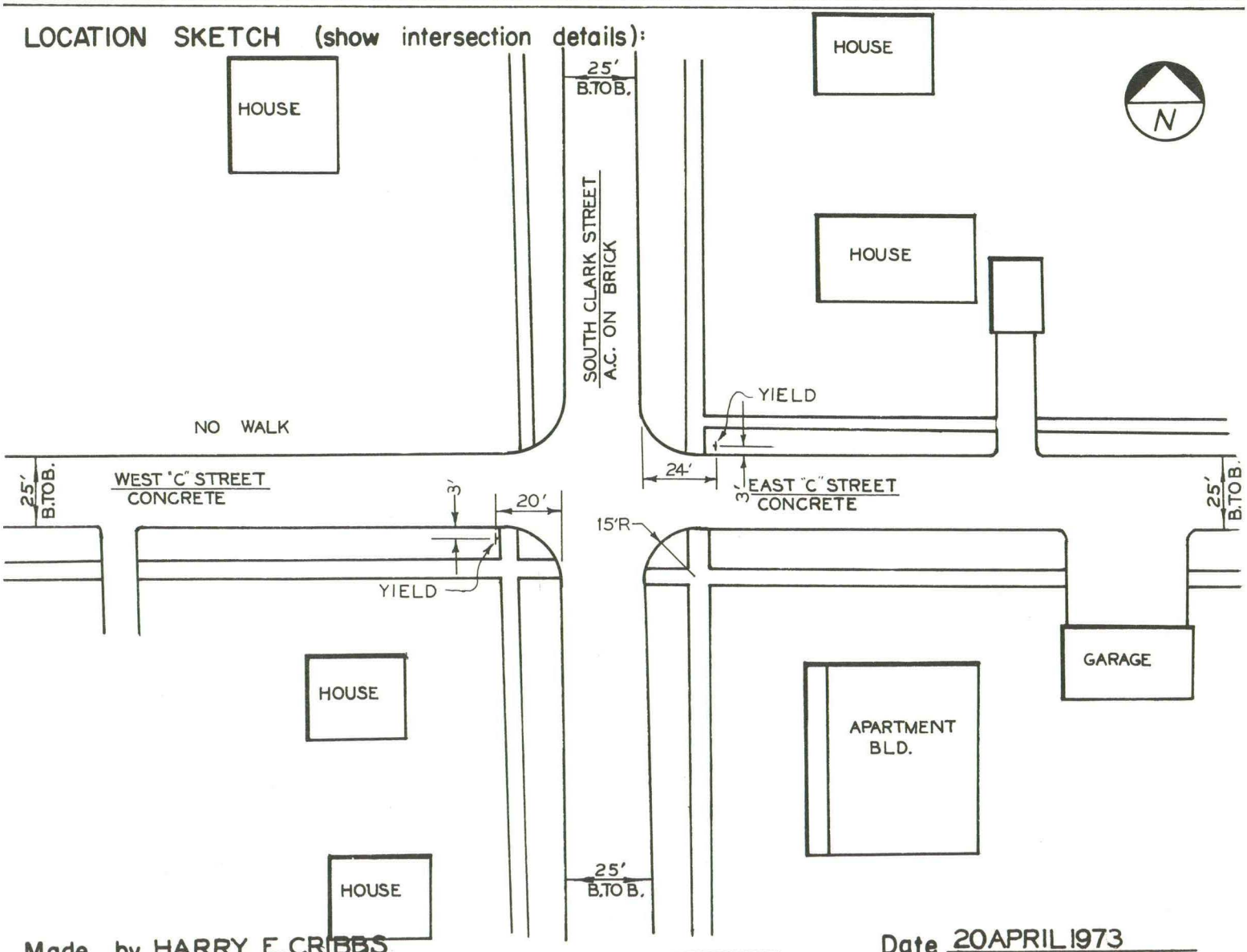
CITY: FOREST CITY COUNTY: WINNEBAGO

SIGNALIZED: Yes or (No) TRAFFIC ACTUATED or FIXED TIME

TRAFFIC SIGNAL CYCLE LENGTH		Green	Amber	Red
	E - W	sec.	sec.	sec.
	N - S	sec.	sec.	sec.

REMARKS: _____

LOCATION SKETCH (show intersection details):



Made by HARRY E. CRIBBS Date 20 APRIL 1973

Figure C-30

PREPARED BY ASSOCIATED ENGINEERS INC.

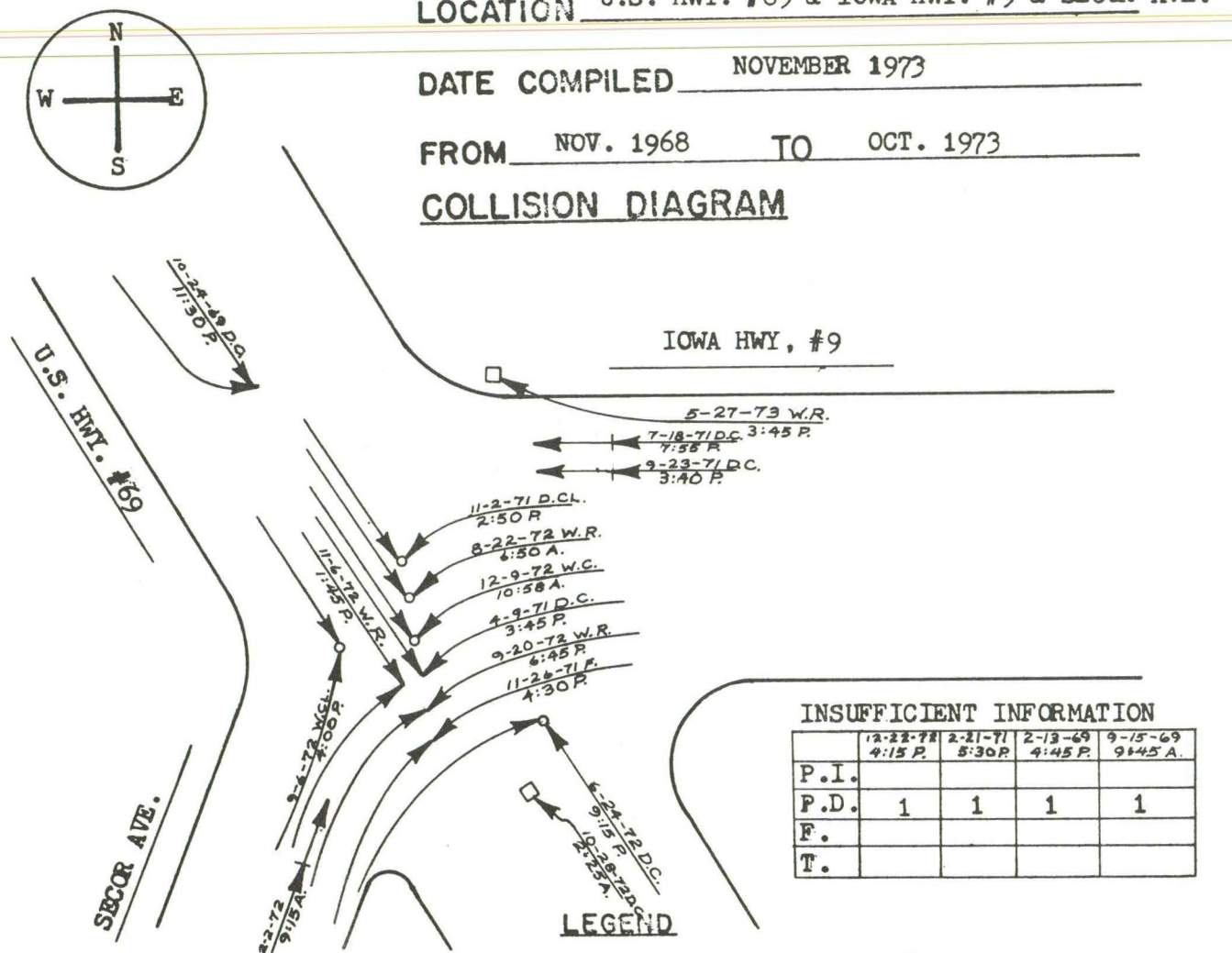
FOR THE CITY OF FOREST CITY, IOWA

LOCATION U.S. HWY. #69 & IOWA HWY. #9 & SECOR AVE.

DATE COMPILED NOVEMBER 1973

FROM NOV. 1968 TO OCT. 1973

COLLISION DIAGRAM



INSUFFICIENT INFORMATION

	12-22-72 4:15 P.	2-21-71 5:30 P.	2-13-69 4:45 P.	9-15-69 9:45 A.
P.I.				
P.D.	1	1	1	1
F.				
T.				

LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE

TIME : A=AM P=PM
PAVEMENT: D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES		3	2	5		2		2		5	2	7
APPROACHING SAME DIRECTIONS			2	2			2	2			4	4
APPROACHING OPP. DIRECTIONS			2	2							2	2
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT			1	1			1	1			2	2
OTHER ACCIDENT			4	4							4	4
TOTALS		3	11	14		2	3	5		5	14	19

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-1

PREPARED BY ASSOCIATED ENGINEERS INC.

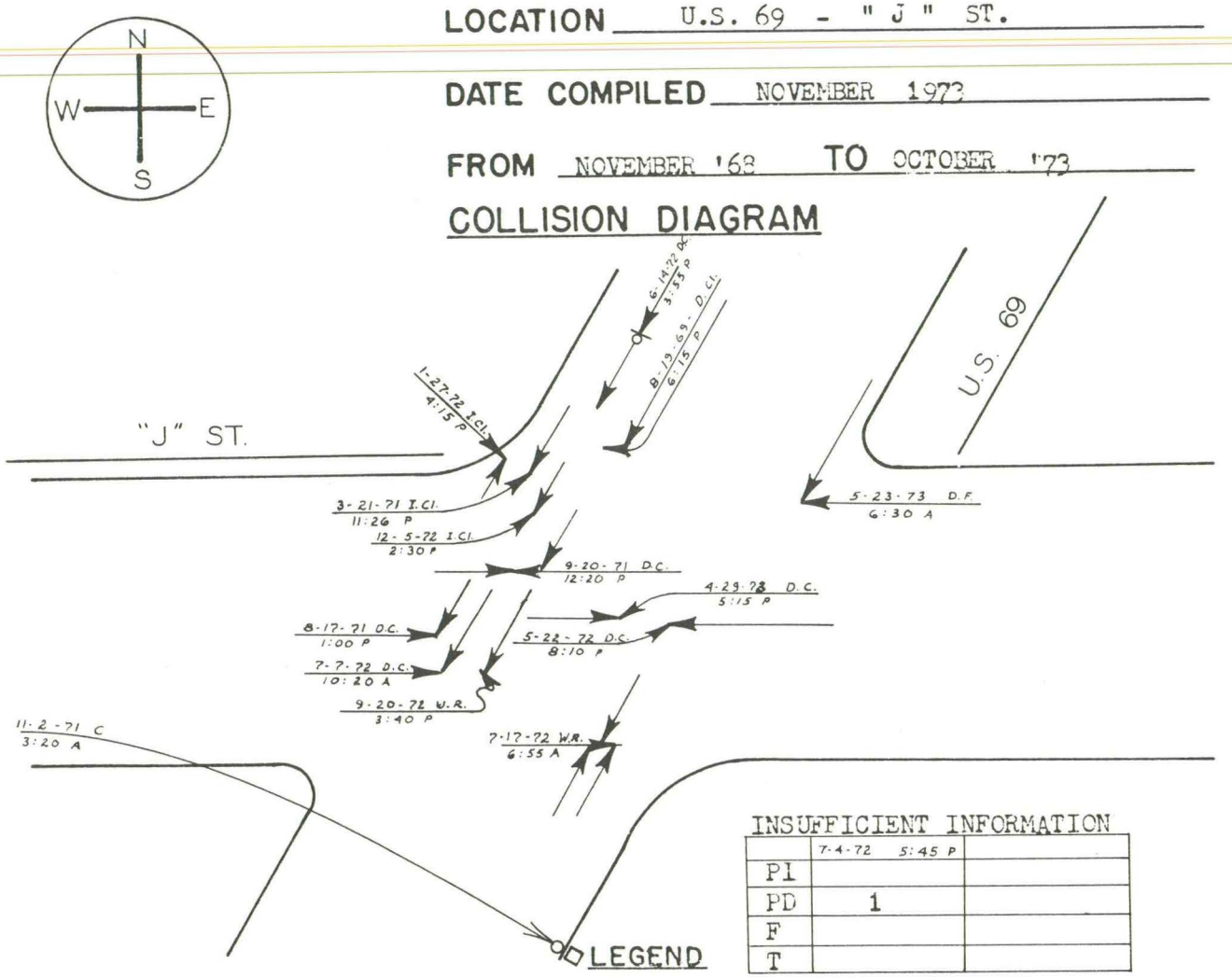
FOR THE CITY OF FOREST CITY, IOWA

LOCATION U.S. 69 - "J" ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



INSUFFICIENT INFORMATION

	7-4-72 5:45 P	
PI		
PD	1	
F		
T		

LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN Cl.-CLOUDY SL=SLEET S=SNOW

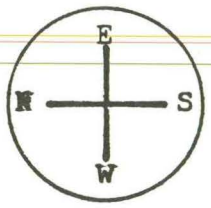
ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			6	6			3	3			9	9
APPROACHING SAME DIRECTIONS		1	1	2						1	1	2
APPROACHING OPP. DIRECTIONS			1	1			1	1			2	2
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT						1		1		1		1
OTHER ACCIDENT			1	1							1	1
TOTALS		1	9	10		1	4	5		2	13	15

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-2

PREPARED BY ASSOCIATED ENGINEERS INC.

FOR THE CITY OF FOREST CITY, IOWA



LOCATION U.S. HWY. #69 & 4th St.

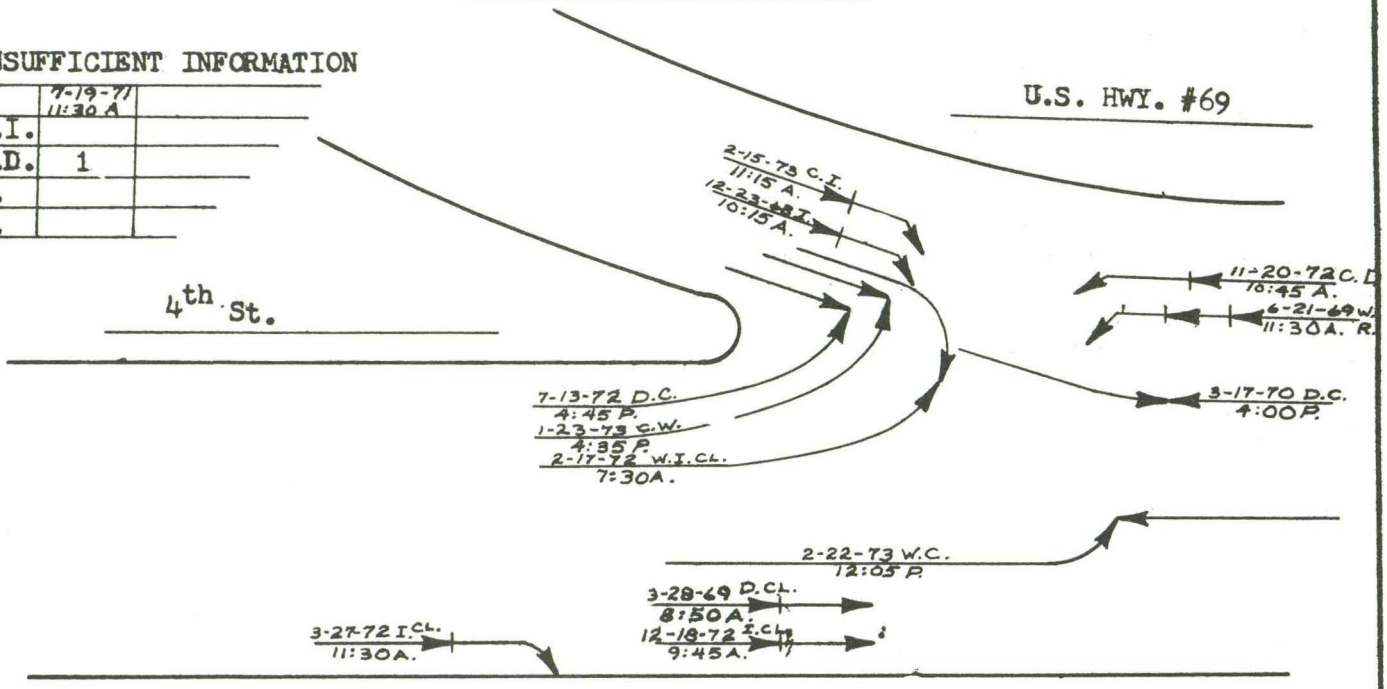
DATE COMPILED NOVEMBER 1973

FROM NOV. 1968 TO OCT. 1973

COLLISION DIAGRAM

INSUFFICIENT INFORMATION

	7-19-71 11:30 A
P.I.	
P.D.	1
F.	
T.	



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT: D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			3	3							3	3
APPROACHING SAME DIRECTIONS			7	7							7	7
APPROACHING OPP. DIRECTIONS			2	2							2	2
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT			1	1							1	1
TOTALS			13	13							13	13

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-3

PREPARED BY ASSOCIATED ENGINEERS INC.

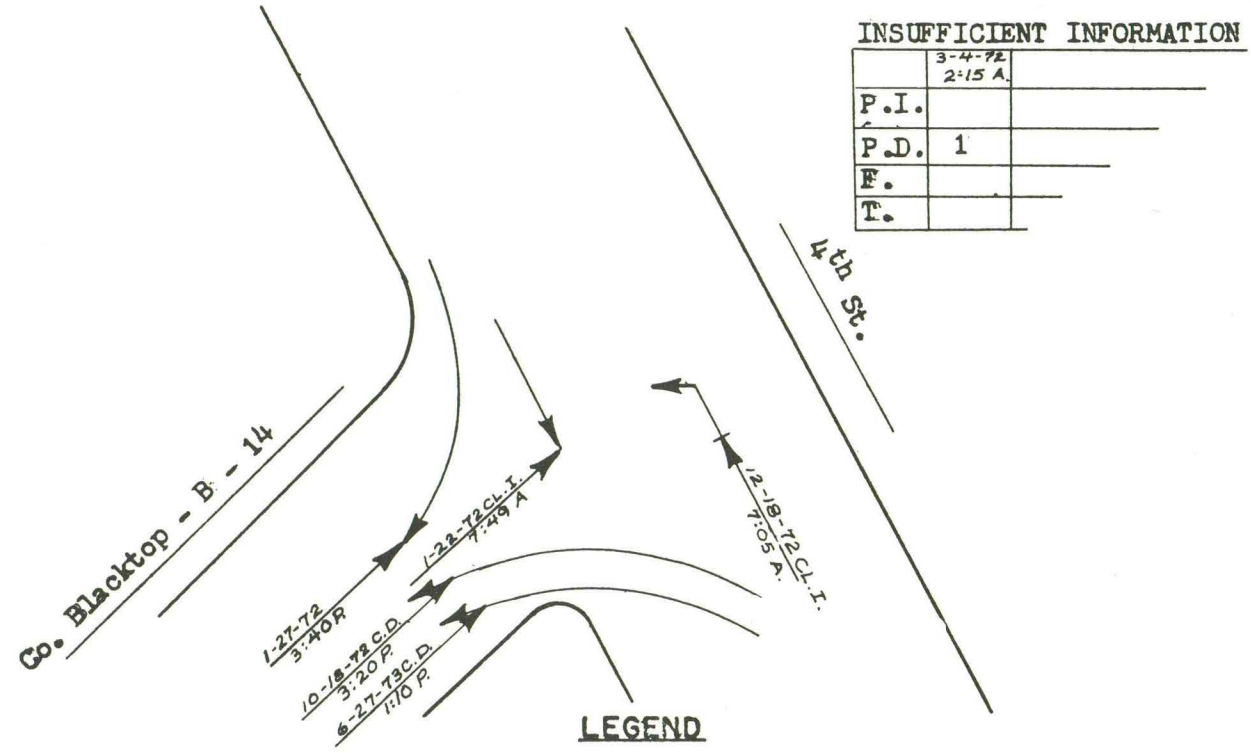
FOR THE CITY OF FOREST CITY, IOWA

LOCATION Co. B-14 & 4th St.

DATE COMPILED NOVEMBER 1973

FROM NOV. 1968 TO OCT. 1973

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			4	4							4	4
APPROACHING SAME DIRECTIONS			1	1							1	1
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS			5	5							5	5

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-4

PREPARED BY ASSOCIATED ENGINEERS INC.

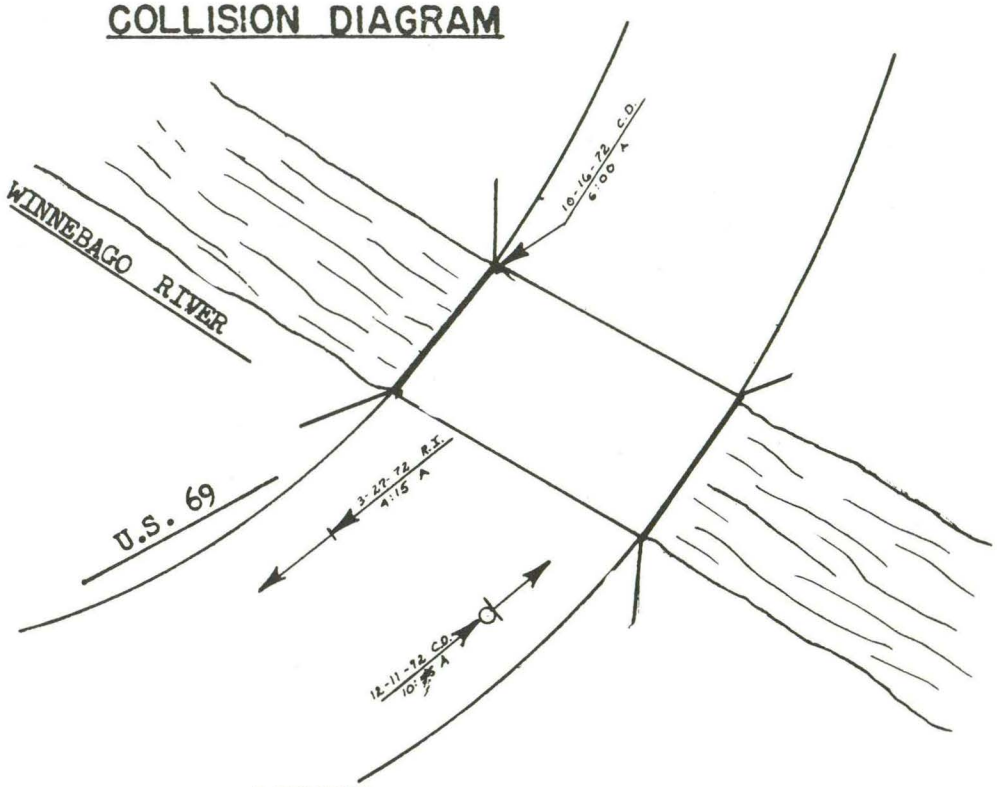
FOR THE CITY OF FOREST CITY, IOWA

LOCATION U.S. 69 - BRIDGE

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES												
APPROACHING SAME DIRECTIONS		1		1			1	1		1	1	2
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT							1	1			1	1
TOTALS		1		1			2	2		1	2	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-5

PREPARED BY ASSOCIATED ENGINEERS INC.

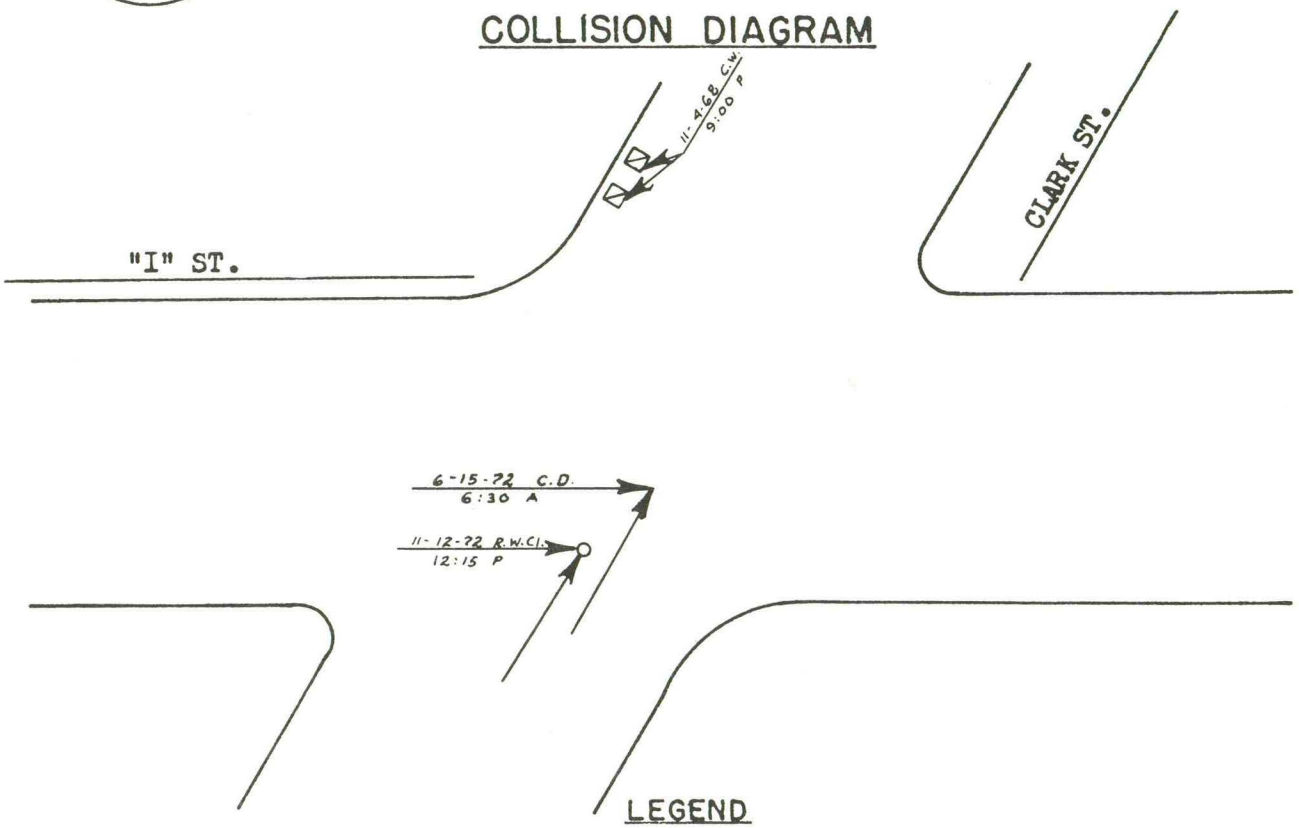
FOR THE CITY OF FOREST CITY, IOWA

LOCATION CLARK ST. - " I " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F-FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES		1		1			1	1		1	1	2
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT							1	1			1	1
TOTALS		1		1			2	2		1	2	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-6

PREPARED BY ASSOCIATED ENGINEERS INC.

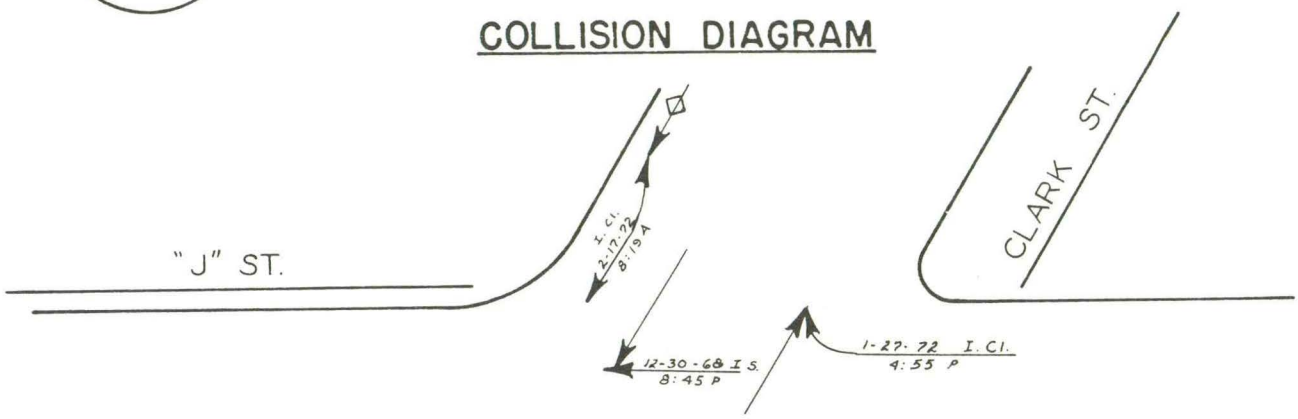
FOR THE CITY OF FOREST CITY, IOWA

LOCATION CLARK - " J " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



INSUFFICIENT INFORMATION

	6-7-71 5:36 P	12-9-72 3:15 P
PI		
PD	1	1
F		
T		

LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D= DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN Cl.-CLOUDY SL= SLEET S= SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			3	3			1	1			4	4
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT			3	3							3	3
TOTALS			6	6			1	1			7	7

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-7

PREPARED BY ASSOCIATED ENGINEERS INC.

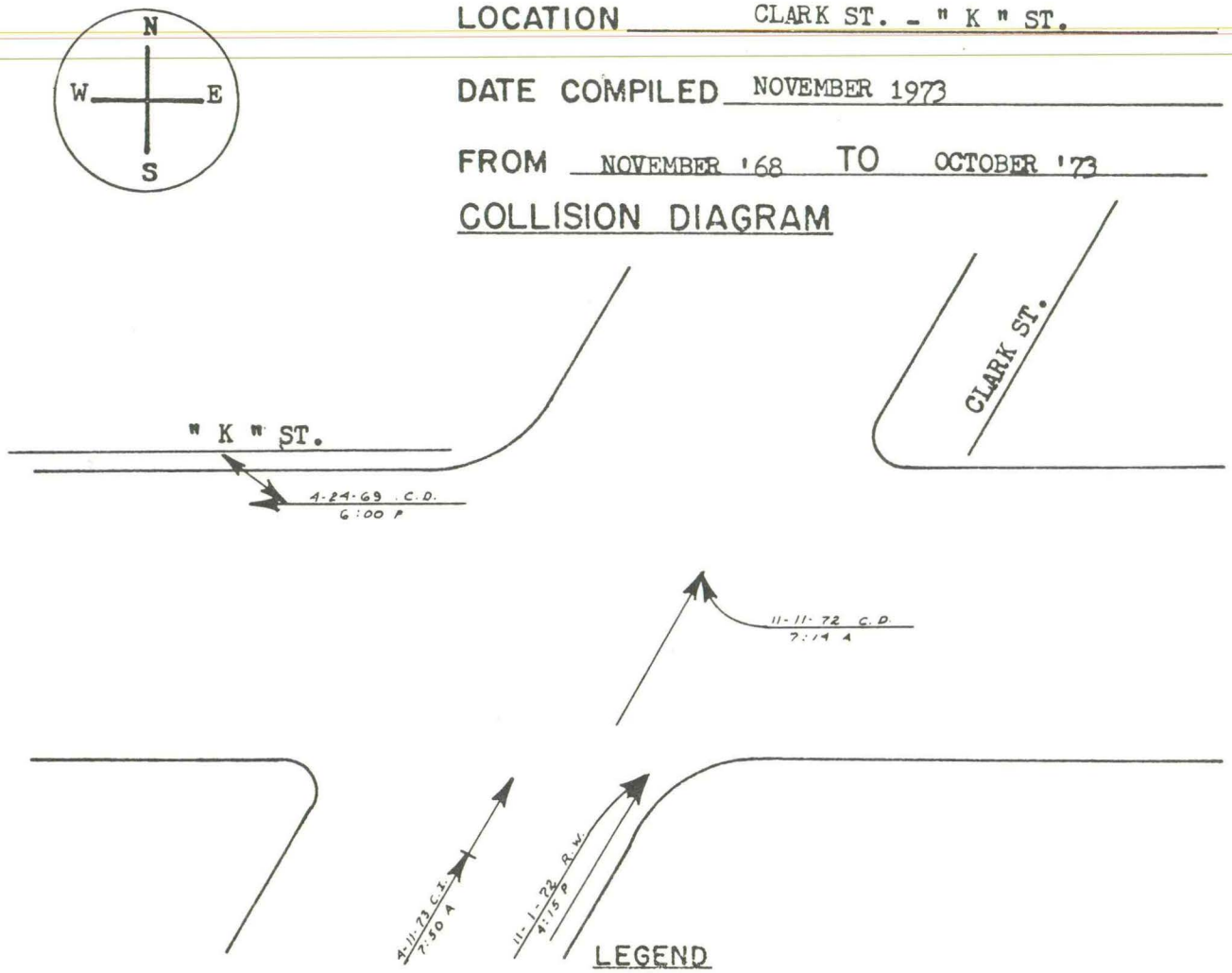
FOR THE CITY OF FOREST CITY, IOWA

LOCATION CLARK ST. - " K " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D= DRY
I=ICY W=WET
WEATHER : C=CLEAR
F=FOG R=RAIN
CL=CLOUDY SL= SLEET S= SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			1	1							1	1
APPROACHING SAME DIRECTIONS			2	2							2	2
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT			1	1							1	1
TOTALS			4	4							4	4

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-8

PREPARED BY ASSOCIATED ENGINEERS INC.

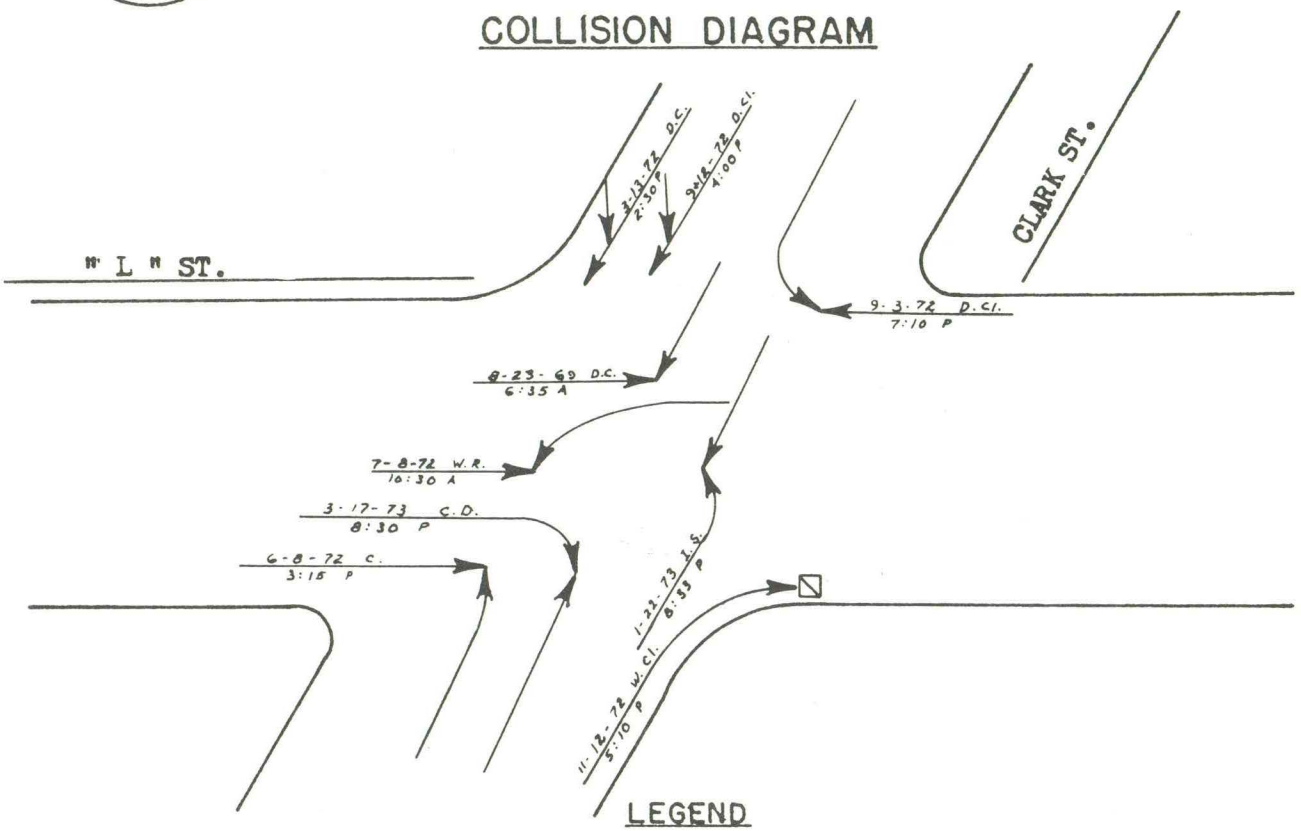
FOR THE CITY OF FOREST CITY, IOWA

LOCATION CLARK ST. - " L " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D= DRY I=ICY W=WET
WEATHER : C=CLEAR F-FOG R=RAIN CL=CLOUDY SL= SLEET S= SNOW

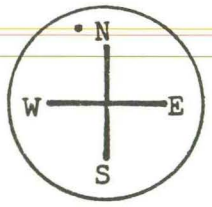
ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			2	2			2	2			4	4
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS			1	1			1	1			2	2
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT			3	3							3	3
TOTALS			6	6			3	3			9	9

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T = TOTAL

Figure D-9

PREPARED BY ASSOCIATED ENGINEERS INC.

FOR THE CITY OF FOREST CITY, IOWA



LOCATION BEST & "I" ST.

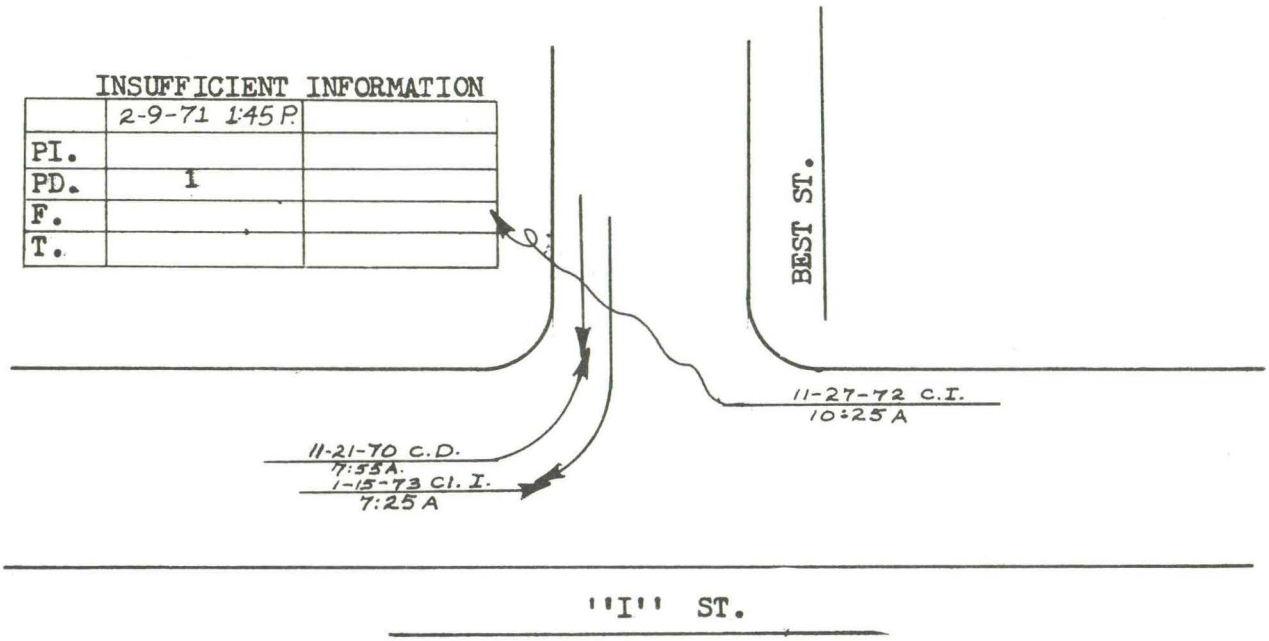
DATE COMPILED NOVEMBER 1973

FROM NOV. 1968 TO OCT. 1973

COLLISION DIAGRAM

INSUFFICIENT INFORMATION

	2-9-71 1:45 P.	
PI.		
PD.	1	
F.		
T.		



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			2	2							2	2
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT			2	2							2	2
TOTALS			4	4							4	4

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-10

PREPARED BY ASSOCIATED ENGINEERS INC.

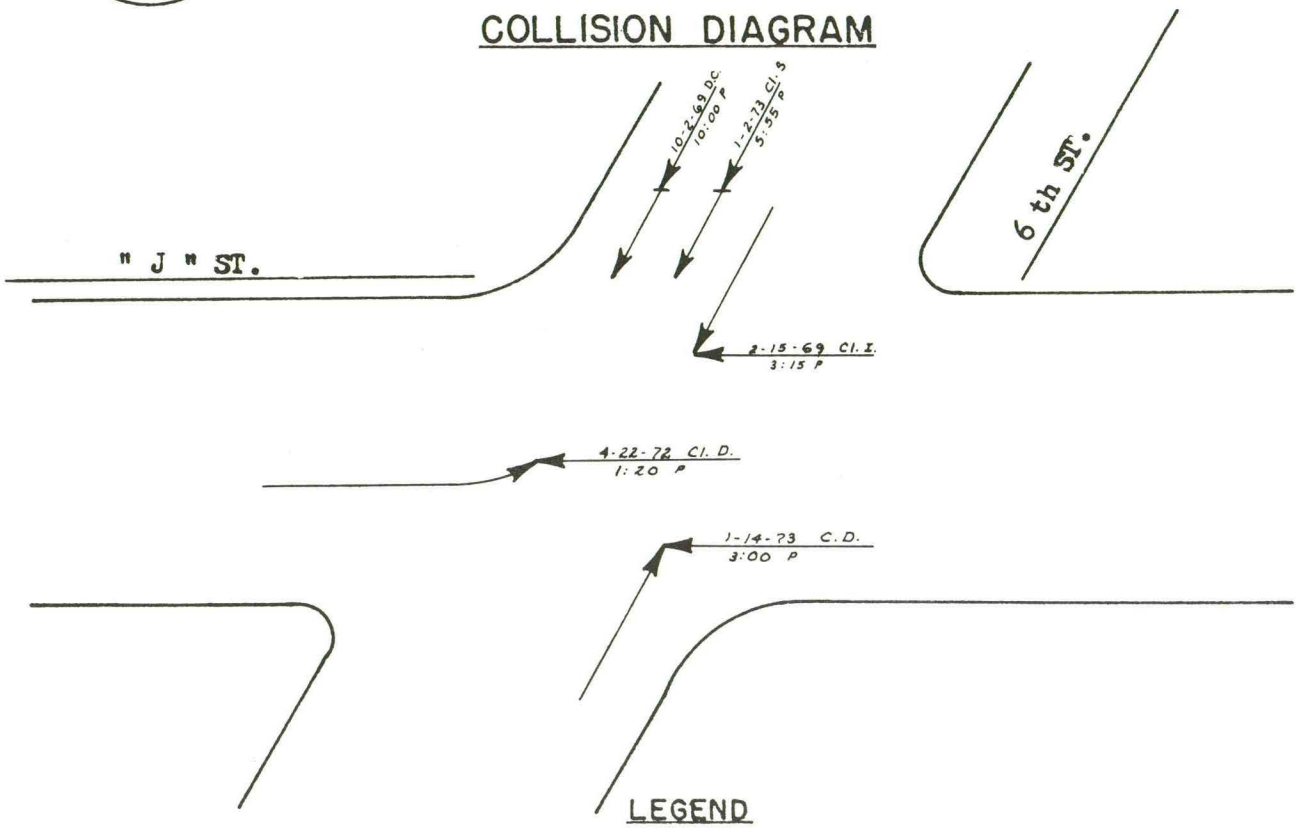
FOR THE CITY OF FOREST CITY, IOWA

LOCATION 6 th ST. - " J " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F-FOG R=RAIN CL=CLOUDY SL= SLEET S= SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			2	2							2	2
APPROACHING SAME DIRECTIONS			1	1			1	1			2	2
APPROACHING OPP. DIRECTIONS			1	1							1	1
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS			4	4			1	1			5	5

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T = TOTAL

Figure D-11

PREPARED BY ASSOCIATED ENGINNERS INC.

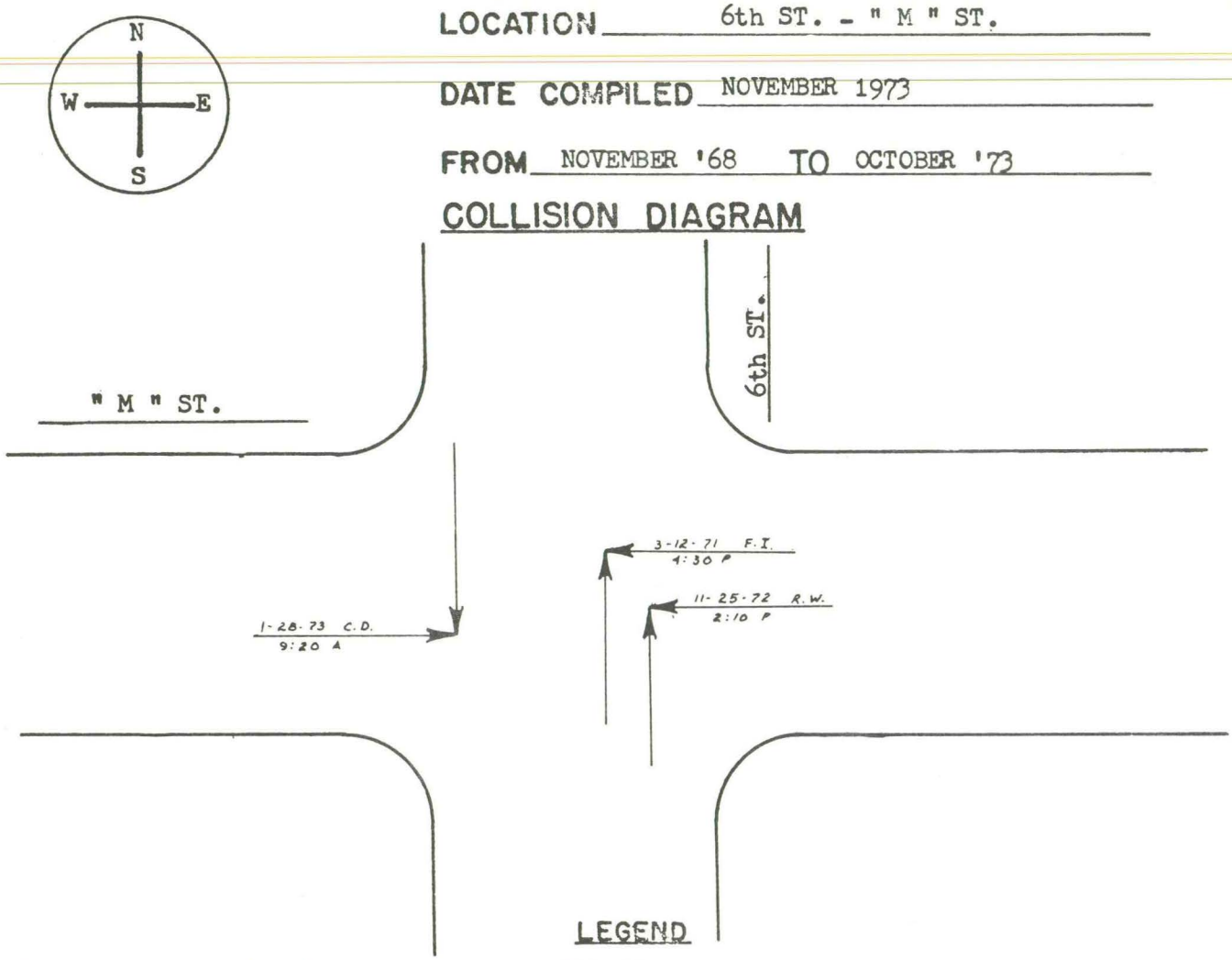
FOR THE CITY OF FOREST CITY, IOWA

LOCATION 6th ST. - " M " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT: D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			3	3							3	3
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS			3	3							3	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-12

PREPARED BY ASSOCIATED ENGINEERS INC.

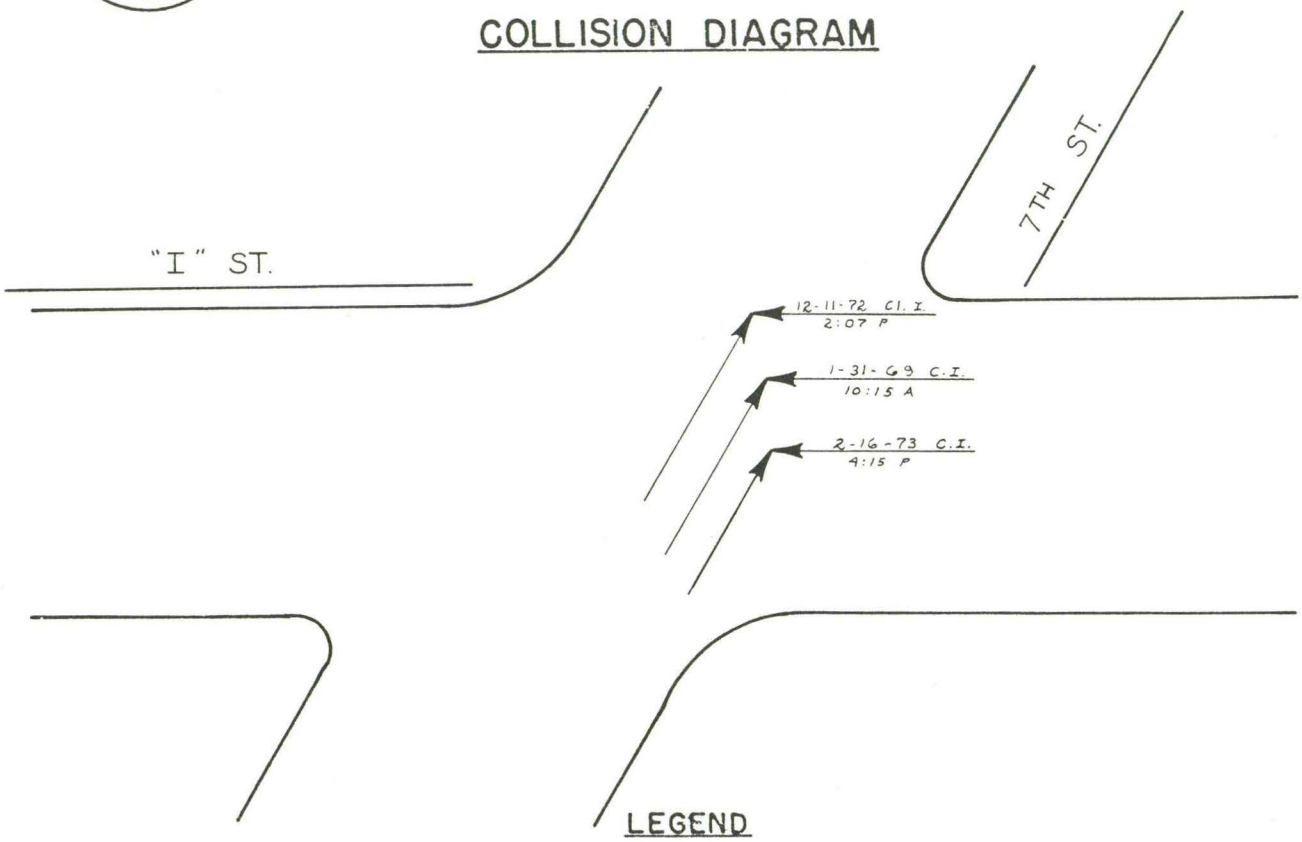
FOR THE CITY OF FOREST CITY, IOWA

LOCATION 7th ST. - " I " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
CI-CLOUDY
TIME : A=AM P=PM
PAVEMENT: D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			3	3							3	3
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS			3	3							3	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T = TOTAL

Figure D-13

PREPARED BY ASSOCIATED ENGINEERS INC.

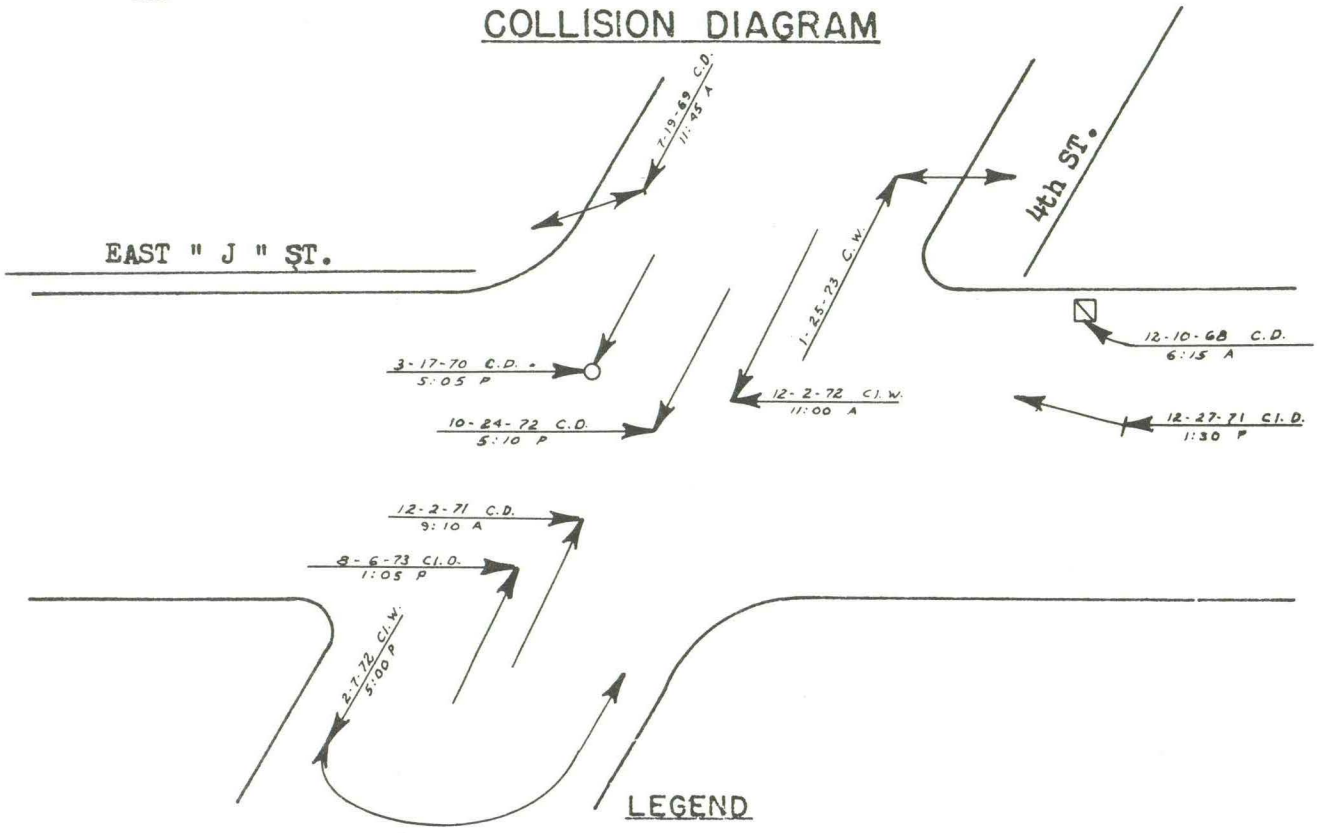
FOR THE CITY OF FOREST CITY, IOWA

LOCATION 4th ST. - " J " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES		1	4	5						1	4	5
APPROACHING SAME DIRECTIONS			1	1							1	1
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT			3	3			1	1			4	4
TOTALS		1	8	9			1	1		1	9	10

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-14

PREPARED BY ASSOCIATED ENGINEERS INC.

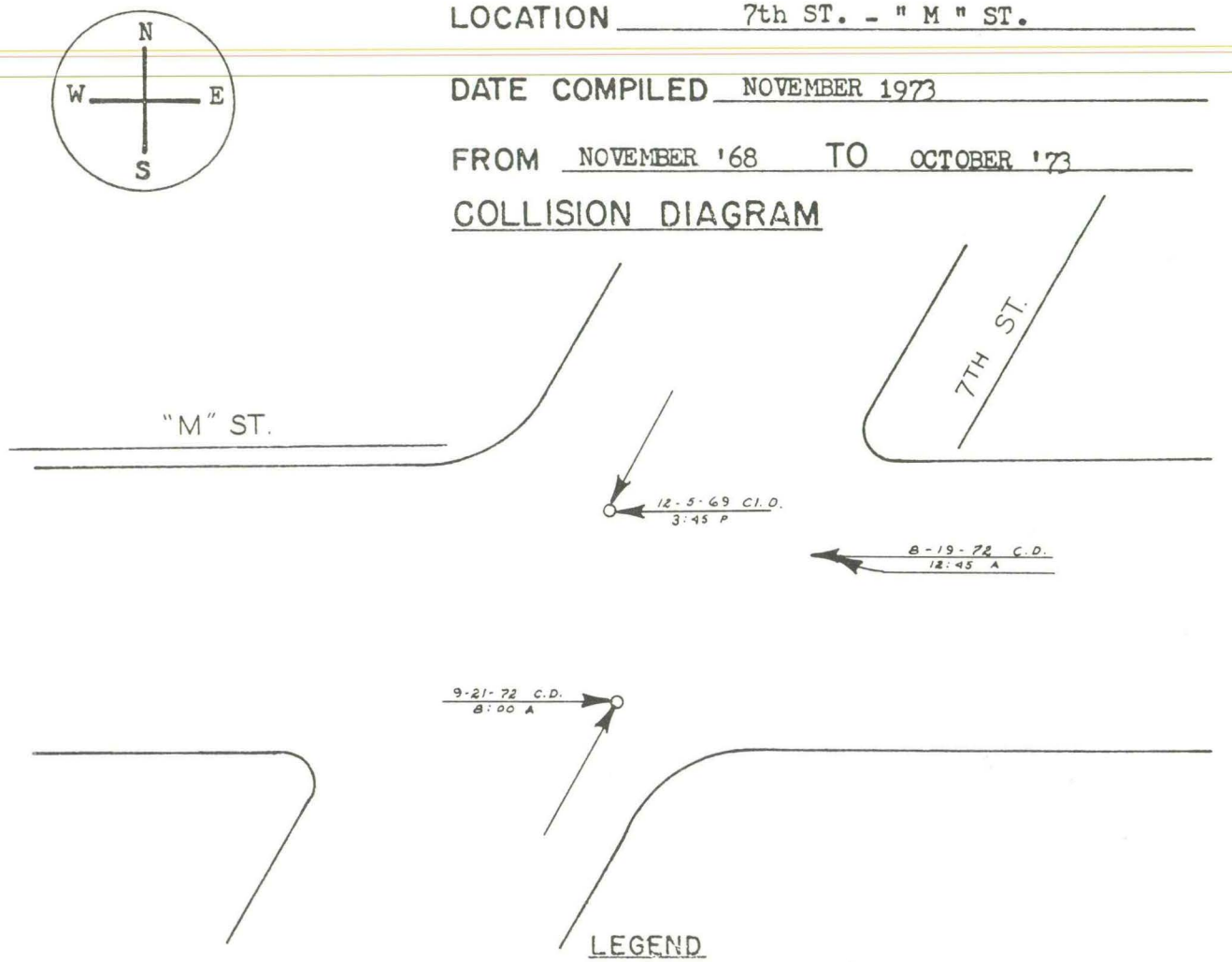
FOR THE CITY OF FOREST CITY, IOWA

LOCATION 7th ST. - " M " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES		2		2						2		2
APPROACHING SAME DIRECTIONS							1	1			1	1
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS		2		2			1	1		2	1	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-15

PREPARED BY ASSOCIATED ENGINEERS INC.

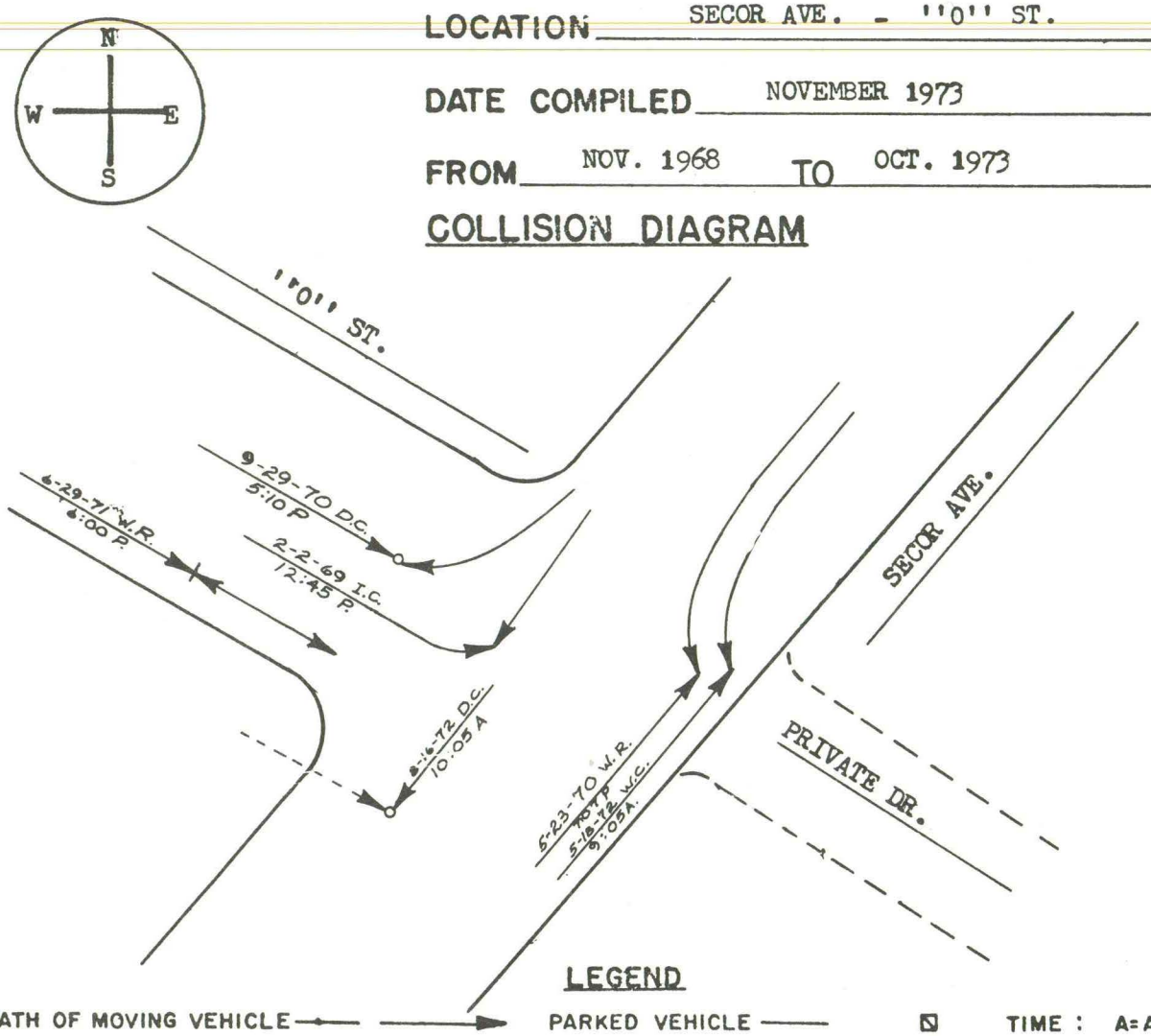
FOR THE CITY OF FOREST CITY, IOWA

LOCATION SECOR AVE. - "O" ST.

DATE COMPILED NOVEMBER 1973

FROM NOV. 1968 TO OCT. 1973

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT: D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL= SLEET S= SNOW

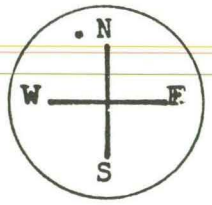
ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			2	2							2	2
APPROACHING SAME DIRECTIONS			1	1							1	1
APPROACHING OPP. DIRECTIONS			1	1			1	1			2	2
PEDESTRIAN ACCIDENT		1		1						1		1
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS		1	4	5			1	1		1	5	6

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-16

PREPARED BY ASSOCIATED ENGINEERS INC.

FOR THE CITY OF FOREST CITY, IOWA

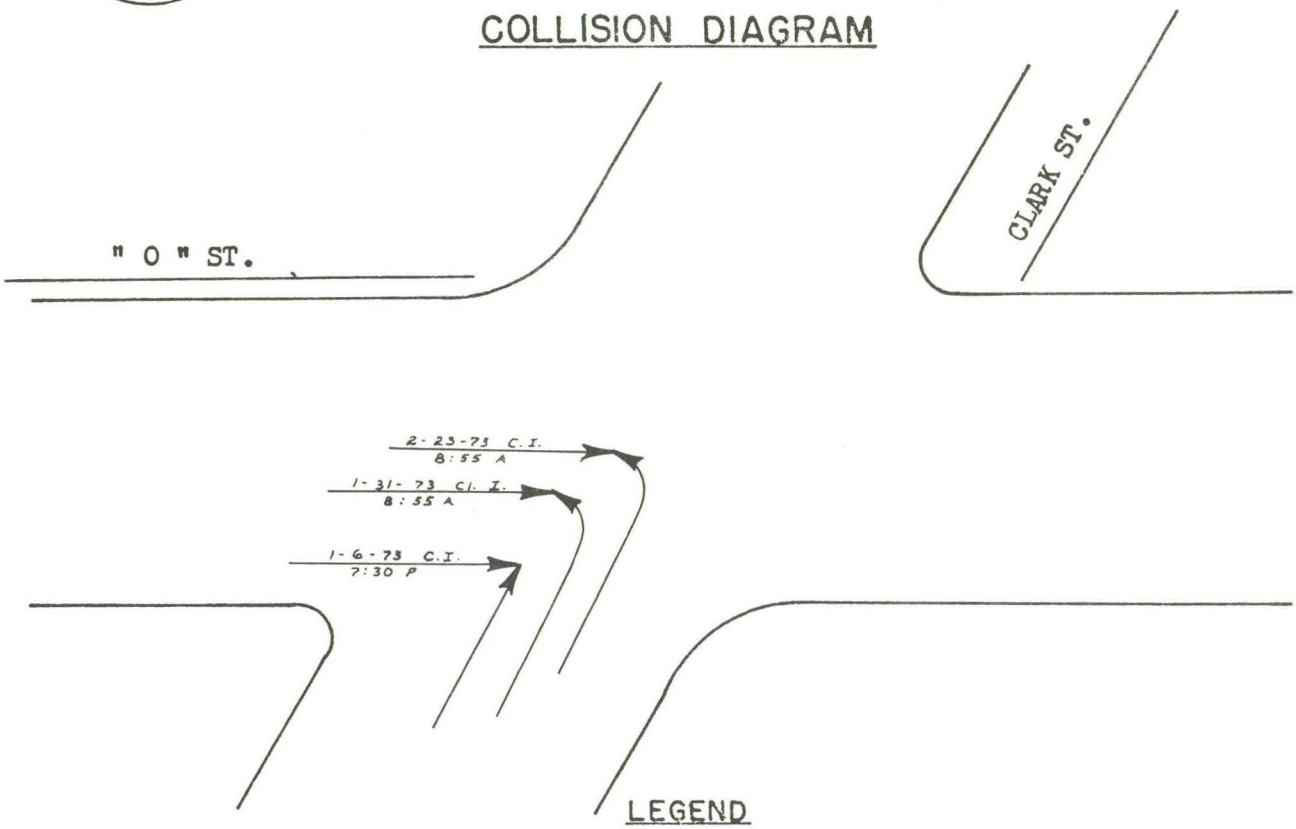


LOCATION CLARK ST. - " O " ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F-FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES			2	2			1	1			3	3
APPROACHING SAME DIRECTIONS												
APPROACHING OPP. DIRECTIONS												
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS			2	2			1	1			3	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-17

PREPARED BY ASSOCIATED ENGINEERS INC.

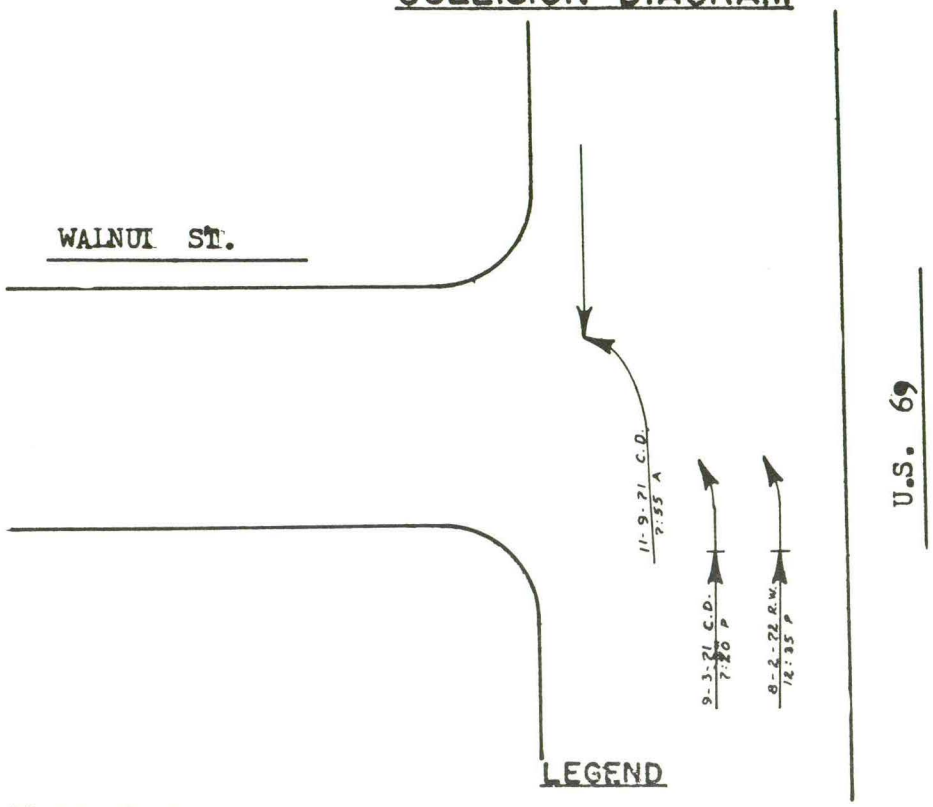
FOR THE CITY OF FOREST CITY, IOWA

LOCATION U.S. 69 - WALNUT ST.

DATE COMPILED NOVEMBER 1973

FROM NOVEMBER '68 TO OCTOBER '73

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT : D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN CL=CLOUDY SL=SLEET S=SNOW

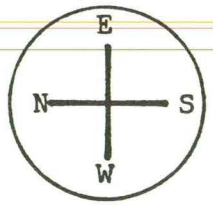
ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES												
APPROACHING SAME DIRECTIONS			1	1			1	1			2	2
APPROACHING OPP. DIRECTIONS			1	1							1	1
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT												
OTHER ACCIDENT												
TOTALS			2	2			1	1			3	3

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-18

PREPARED BY ASSOCIATED ENGINEERS INC.

FOR THE CITY OF FOREST CITY, IOWA

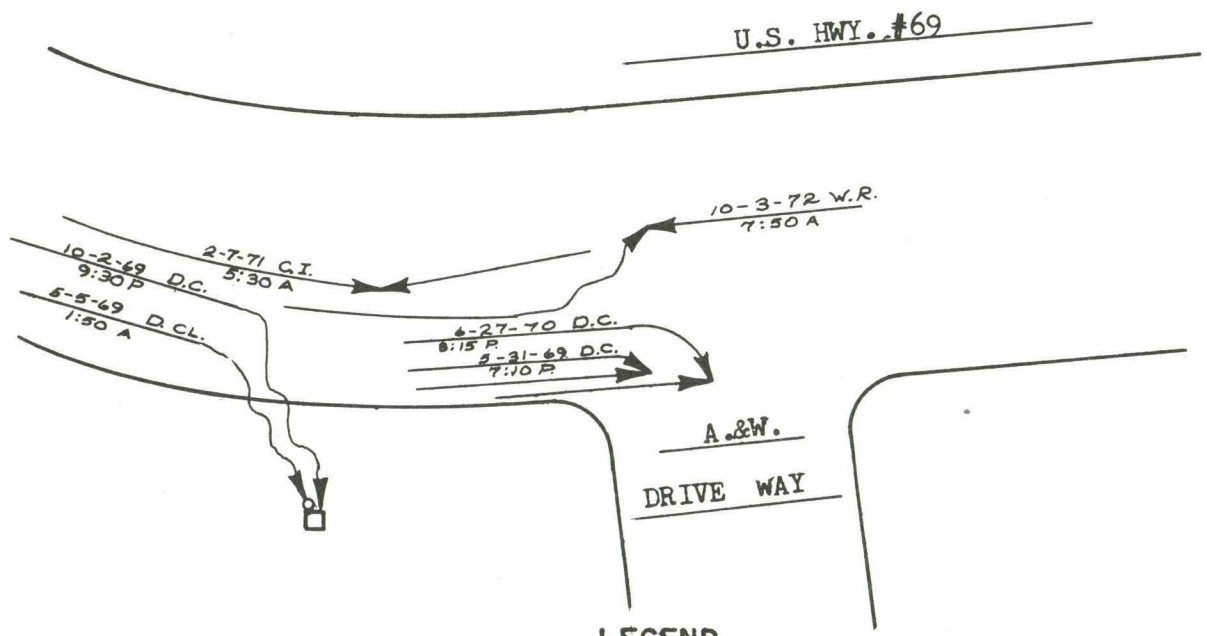


LOCATION U.S. HWY. #69 & A.&W.

DATE COMPILED NOVEMBER 1973

FROM NOV. 1968 TO OCT, 1973

COLLISION DIAGRAM



LEGEND

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
NON FATAL
REAR END COLLISION
PARKED VEHICLE
FIXED OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE
TIME : A=AM P=PM
PAVEMENT: D=DRY I=ICY W=WET
WEATHER : C=CLEAR F=FOG R=RAIN
CL=CLOUDY SL= SLEET S= SNOW

ACCIDENT SUMMARY	7AM TO 7PM				7PM TO 7AM				TOTALS			
CLASSIFICATION BY TYPES	F	PI	PD	T	F	PI	PD	T	F	PI	PD	T
APPROACHING AT RIGHT ANGLES												
APPROACHING SAME DIRECTIONS							2	2			2	2
APPROACHING OPP. DIRECTIONS			1	1			1	1			2	2
PEDESTRIAN ACCIDENT												
FIXED OBJECT ACCIDENT		1		1			1	1		1	1	2
OTHER ACCIDENT												
TOTALS		1	1	2			4	4		1	5	6

F= FATAL PI= PERSONAL INJURY PD= PROPERTY DAMAGE T= TOTAL

Figure D-19