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PREPARATION AND USE OF MAPS
FOR
HIGHWAY PURPOSES

- - - - -

by
Homer A. Hollingshead

—

A
T H E S I S
submitted to the faculty of the
SCHOOL OF MINES AND METALLURGY OF THE UNIVERSITY OF MISSOURI
in partial fulfillment of the work required for the
D E G R E E O F
CIVIL ENGINEER
Rolla, Mo.
1932

—

Approved by Joe B Butler
Professor of Civil Engineering.

41434

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LIST OF ILLUSTRATIONS

- Exhibit A - State Progress Map.
B - Iroquois County Progress Map.
C - Iroquois County Progress Map.
(Reduced size.)
D - Monroe County Progress Map
E - Monroe County Progress Map
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F - Strip Map, State Bond Issue Route 43.
G - Strip Map, State Bond Issue Route 140.
H - Right of Way Strip Map, State Bond Issue
Route 24.
I - Right of Way Strip Map, State Bond Issue
Route 134.
J - State Traffic Map (old style.)
K - State Traffic Map (1932)
L - DuPage County Traffic Map
M - Cook County Traffic Map
N.- Copy of Dr. Miller McClintock's Traffic
Volume Survey Plan.
O - Traffic Survey Station Map
P - Traffic Survey Map Chicago Metropolitan
Area
Q - Traffic Survey Map State of Illinois

PREPARATION AND USE OF MAPS FOR HIGHWAY PURPOSES

PART 1.

The Illinois highway system consists of about 10,000 miles of primary (state) roads, and 20,000 miles of secondary (county) roads.

The preparation of plans for a primary and secondary highway system of such size is an obvious step prior to construction and maintenance.

In order to coordinate administration, location, surveys, right of way, construction, maintenance, traffic, legal and political activity, maps of various scales and types are required.

This treatise will consider the types and classes of maps used by the state of Illinois for the purposes mentioned.

The location of the state system is controlled by law, in that routes are established between definite points, i.e. State Bond Issue Route 4, Chicago to East St. Louis, affording Chicago, Pontiac, Bloomington, Springfield, Carlinville, Edwardsville and East St. Louis, reasonable connections with each other.

The location of the county system is controlled by the County Board of Supervisors in each county, and may be altered subject to the State Aid Law, the principal requirement of which is that routes connect towns, cities and villages in the county, and with adjoining counties.

With these two systems in mind, it is apparent that progress and traffic maps are necessary for each. In addition, strip maps and various special maps are required.

PART 2.

Progress maps are used to show the status of construction of all routes at a given time. They are brought up to date from time to time as required.

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Page Two.

These are needed for both State and County work. Exhibit "A" is a typical state progress map, and indicates the status of construction on State routes on January 5, 1932. By addition of various colors to the legend, it is also used to show the status of additional activities such as the following:

- (a) Reconnaissance
- (b) Surveys and plans
- (c) Right of way
- (d) Maintenance
- (e) Decision for preferred location.

These progress maps are not printed for general distribution, but are for departmental uses mentioned above. They are also used to illustrate talks, and various publicity lines, such as at State and County Fairs, etc.

Exhibit "B" is a county progress map, scale one inch to the mile. From the legend, the three classes of roads - i.e. State, County and Township, can be readily determined. A complete set of new tracings for the one hundred and two counties has recently been made by the state. Existing highway maps, highway records, and U.S.G.S. topographic maps were used in their preparation. Each county built, and state supervised section of road improvement is shown on the tracing as soon as completed. State road progress is shown on the county tracings about twice a year, once in the middle, and once at the end of the construction season. These maps are used for departmental purposes in the supervision of county work done under jurisdiction of the state. There is a large variation in the size of Illinois counties, so it follows that a similar variation occurs in the size of the county maps on an inch to the mile scale. The larger counties require a large, unwieldy map which is unsuited to field use. These maps were, therefore, reduced by the offset process to uniform size of eleven by fourteen inches. Any differences in the proportion of the maps to this size were taken up in the margin, thus giving a set of maps of

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uniform size. By the use of a unit scale, instead of a fractional scale or a scale in miles, the change of scale from the original size to the offset print has no bearing on the usefulness of the small maps. In order to secure clear reductions, the map drafting was standardized as much as possible. The Wrico lettering guides were used for larger names, etc. and width of lines was designated for all types of roads, railroads, streams, town limits, etc. Exhibit "C" is a reduction of the full size map shown as Exhibit "B". Due to the fact that the offset process requires a metal or composition negative, the negatives cannot be revised to show current changes. It is, therefore, necessary to have a new set of maps run each time they are brought up to date. Since copies do not lose their usefulness for a year or more, reprints will probably be made annually.

Exhibits "D" and "E" show an original and a reduction, respectively, the offset process being somewhat different in detail from that used for Exhibit "C". The principal difference is that the plates for "C" were of paper composition, while those for "E" were of metal. The latter, is, of course, higher in cost, but a larger number of prints can be run from one plate. Reduction can be made in any proportion or to a fixed scale if desired. On account of the cost of making negatives, or plates, it is not practical to use this process for single copies, or small quantities.

PART 3.

Strip maps, as the name implies, are made from "strips" or sections of large scale maps, where a reasonable amount of detail is required. In order to follow the progress on individual routes, strip maps were prepared for each on an inch to the mile scale. Since state routes are located in a general way by law, the strip map can be made by tracing parts of the county maps from eight to twelve inches in width from the counties through which the route extends. Such details

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as section, township and range lines, streams, roads, railroads, towns, etc. are shown. It can be seen that a map of this nature is of great assistance in reconnaissance and location surveys, as well as for definite recording of progress on decisions, surveys and plans, status of contracts, construction progress and maintenance. Such maps are used as a source of information for posting and revising the progress and traffic maps both state and county. Weekly reports of resident construction engineers on each section of work are shown on office or work copies and from these the amount of pavement completed on a given date can be determined quite accurately. From time to time this progress is shown on the tracing so that it is revised to show major progress.

Exhibit "F" is a sample strip map for a route on which all pavement has been completed, while Exhibit "G" shows a route which is only partly located, and only one section of work has been built. It will be noted that complete file reference information is included for work completed.

Right of way strip maps show the location and general size and shape of right of way secured, as well as the acreage and name of owner. Borrow pits secured are also indicated. By shading alternate tracts in contrasting colors, separate tracts and boundaries show up clearly.

Exhibits "H" and "I" are of this type of strip map. These maps are usually made after all surveys and plans are completed, and the work is ready to place under contract. They are of value in locating right of way lines for setting right of way markers, as well as in maintenance operations, such as material storage, permits, etc. They are also valuable in locating and describing tracts on which right of way lines are in dispute. A right of way dedication (easement for highway purposes) is secured from each property owner. These dedications are recorded in the county recorder's office the same as any other deed. Each dedication

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carries a detailed sketch of the tract described in the dedication. Copies of these are held by the Division of Highways as part of the official records. Due to change of owner, incomplete description and irregular shape and size of the tracts, it is very difficult to locate dedications after they have been recorded a few years. By showing the name of owner, acreage and sheet and page of recording on the right of way strip map, all desired information is available. Exhibits "H" and "I" are both right of way strip maps. It will be noted that the scale is one inch to four hundred feet. The comparatively large scale is necessary for right of way work on account of the fact that many right of way tracts are quite small, especially near cities, where land has been subdivided. These maps are made in sections, fifteen by thirty inches in size, with a margin for binding at the left. They are assembled by routes, with the stationing continuous from one end of the route to the other. When each route is completed, a serviceable record of right of way secured is available.

PART 4.

Traffic maps are for the purpose of showing the mileage and condition of roads available to traffic. Until 1932, the traffic maps of Illinois, as well as most of the adjacent states, showed only those roads on the state system. The printed copies were made from a drawn tracing. The latter was prepared in the department by taking construction progress from strip maps. The drawn tracing was made the same size as the progress map, Exhibit "A". When completed, it was sent to the printer for photographic reduction and printing. The tracing was made on a larger scale than the printed map in order to obtain greater accuracy and detail than could be drawn on a tracing the size of the printed map.

A mileage schedule was printed on the back of the map, along with general information such as an

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explanation of the marking system, tables showing construction progress and a list of points of interest.

The mileage schedule was made by scaling distances from construction strip maps, using both linear and circular scales. By the use of a "hypotenuse" chart, showing mileages on the base and perpendicular legs, and the names of cities on the hypotenuse, the distance between cities can be determined. The objection to this method of showing mileage is that the reader cannot tell what routes the distance is figured on. In many cases, two routes between cities may appear to be of equal mileage when one is actually several miles shorter than the other.

The traffic map described above is illustrated by Exhibit "J".

When the Motor Fuel Tax Law was passed in 1929, one cent of the three cent tax was set aside for county road construction on the county highway (State Aid) systems. The total allotment to counties amounts to around ten million dollars annually. This may be used for any type of road improvement, including earth grading, traffic bound stone or gravel surfacing, water-bound and bituminous macadams, concrete, or brick, as well as necessary drainage structures. At an average cost (all types) of say twenty thousand per mile, around five hundred miles of roads can be improved annually. As a matter of fact, counties have building at the rate of approximately seven hundred miles annually, due to the fact that county highway taxes, bond issues and state refunds materially increase the amount of money available. As a result, many additional through routes have been opened to traffic, and it is therefore desirable to show these roads on the state traffic map. The Illinois traffic map for 1932 is shown as Exhibit "K". It will be noted that a large mileage of county roads are shown, as well as the type of improvement. This map differs from the old style maps in several ways. For one thing, it is a so called printed map, as it was not made from a

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reduction of a drawn map, but by transferring the details from state and county progress maps direct to the printing plate. Also, distances between cities are shown by mileage figures along the routes they are scaled for, so there can be no mistake as to routing for which they are intended. The back of the map is used to show routings through principal cities, which is of considerable value to the travelling public.

The county progress maps described under Part 1, are also serviceable as county traffic maps, due to the fact that an up to date picture of road improvement is shown. A number of counties show an advanced state of road improvement, due either to greater revenue for road purposes, or proximity of road building materials, or both. DuPage County is an example of this class, the map of which is shown as Exhibit "L". It will be noted that practically all of the township roads are improved, as well as the county and state roads. A large percentage of the mileage is surfaced with gravel and crushed stone, from fourteen to twenty feet in width. Due to traffic demands, as well as maintenance costs, the township and county highway organizations are using part of their available revenue to widen these roads up to thirty feet, and part for higher type surfacing, including bituminous retreads and concrete.

A number of counties having comparatively large highway revenues and a high mileage of improved roads, publish their own county traffic maps. Cook County is in this class, and one of their recent maps is shown as Exhibit "M". This map differs from the county maps made by the state in that a considerable area of adjoining counties is shown, and the legend does not show gravel, or any type of improvement other than paved roads.

The state copies of county maps discussed above are not printed for general distribution, but have been made up for departmental and county use. The base is a drawn tracing, from which blue prints, vandykes, white

PREPARATION AND USE OF MAPS FOR HIGHWAY PURPOSES

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prints and black line prints are made, as well as the reductions eleven by fourteen inches. It has been found that the original tracing must be retraced every three or four years in order to produce clean cut prints. Blue prints of the full size tracings are kept on file in the various departmental offices for any use required. The reduced size prints are bound in alphabetical order, and these bound sets are distributed to various department heads and assistants as needed.

PART 5.

Traffic Survey Maps are a recent development in highway work. They are for the purpose of showing the comparative volume of traffic on completed roads in order to determine which roads need widening or cut off routes to relieve traffic congestion. It may be anyone's contention that a particular road is not wide enough to carry traffic adequately, but a traffic survey, or count, over a period of several months, gives a reliable basis from which to work.

In the metropolitan areas, holiday and week end traffic frequently becomes so congested that the rate of speed is slowed down to as low as five to ten miles per hour. There is no doubt that provision should be made to widen such roads to forty feet, or build additional parallel roads as right of way conditions permit. The entire state system is nearing completion, but congestion of traffic has already required widening of many miles of eighteen and twenty foot pavement to forty feet.

It was felt that a number of additional roads should be placed on the widening program and also that additional roads should be improved as a "third system." For this reason, traffic counts were begun and developed into a general traffic survey with the accompanying maps to show the results.

It was desired to find the rural highway volumes

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uninfluenced by city and village loads. The traffic count system as laid out consisted of base, key and master stations. These classes of stations were located at important intersections when they did not occur within a city or village. The base stations represented only the traffic volume at the particular location where traffic was counted. Key stations were supposed to be representative of travel within a small area and it was thought that the volume at the key station had the same characteristics as a number of base stations in the immediate neighborhood. Considerable time was spent in selecting master stations, and they were supposed to have a characteristic similar to a large area or region.

The first count was made in August, 1931, and covered a period of one week. The base stations were counted from 7:00 A.M. to 11:00 A.M., and from 2:00 P.M. to 6:00 P.M., on Tuesday, August 25. The key stations were counted for a full twenty-four hour period on the same day. The master stations were counted from August 24 to August 28 for an eight hour period similar to the base station count, and Friday, Saturday and Sunday of that same week for a full twenty-four hour period. Additional counts were made in September and October, master stations only, for the base station period of right hours. In November, master stations were counted for the full twenty-four hour period. In December and January, these stations were again counted for an eight hour period, with additional recounts at selected base and key stations to check on results.

At the start of the survey three principal assumptions were made:

1. The traffic flow on Monday, Tuesday, Wednesday, Thursday and Friday is the same.
2. The relation of the twenty-four hour traffic flow to the eight hour traffic flow at a master station is assumed to be applicable to all base and key stations

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related to it.

3. It is assumed that the ratio of traffic volume at the master station to that at a related base or key station remains constant.

The 24 hour to 8 hour ratio at the various master stations over the State was determined. Taking the State as a whole, the variation between the 24 hour to 8 hour ratio and the actual 24 hour count was only about three quarters of one percent, thus proving that the skeleton method of traffic survey is accurate. The accuracy of this method depends largely upon the selection of the master and key stations and their related base and key stations.

All traffic counted was put in two classifications:

1. Passenger (a. Passenger auto
(b. Taxicabs
(c. Motor cycles
2. Commercial Vehicle (a. Trucks of all kinds
(b. Busses
(c. Horse drawn

The number of counting stations throughout the State was as follows:

1. Base	977
2. Key	106
3. Master	43
Total	<u>1126</u>

The men used for the count were taken from maintenance and construction organizations, and since the time they were engaged in the count was short and intermittent, there was no material interference with their regular duties. This method also permitted a comparatively low cost for traffic survey work.

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When it was found that the skeleton method proved accurate to three fourths of one percent, the results were tabulated and the volume of flow indicated on State route maps.

Exhibit "N" is a copy of the plan of a traffic volume survey of the Chicago area as worked up by Dr. Miller McClintock of the Erskine Foundation of Harvard University. This study was used as the fundamental from which the traffic volume survey was made for the entire State. Mr. M. J. Fleming, District Engineer, Ottawa, Illinois, is supervising State traffic survey work.

Exhibit "O" is a traffic survey station map, and shows the location of all classes of stations.

Exhibit "D" is a traffic survey map of the Chicago Metropolitan area and shows the result of the survey after counting and tabulating.

Exhibit "Q" is a traffic survey map of the entire State. It will be noted that the rise and fall of traffic volume between cities is quite apparent. This map shows an average week day of August, 1931. The flow for the fall and winter months showed approximately the same rise and fall of volume between cities, but a decline for the winter season shows to some extent. This map is a very good picture of traffic volume conditions, and can undoubtedly serve as a guide for laying out additional routes and widening existing pavements.

PART 6.

In addition to the maps described in parts 2 to 5, a number of others, not so important, have been made.

The organization of the department is divided into ten districts. Each district has a map of the area it covers, showing all roads, counties, cities, townships, etc. Drawn to a scale of 6 miles to 1 inch, these maps

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serve a purpose similar to the State progress maps, as well as showing personell assigned to various types of work. Since each map is five to six feet square, and the purpose obvious, no copy is included.

Material survey maps have been made to show location of road materials, such as sand, gravel, stone, etc. Location of deposits is indicated by marking them on a State base map, about the size of a traffic map.

Maps are also used by the Maintenance and Highway Police Bureaus for assignment of territory to personell, spotting location of accidents and other special purposes.

Part 7.

The main types of highway maps have been covered with the thought of showing the development of the map system, as well as the more recent types and purposes for which they are used.

It may appear that the cost of such a group of maps is high. Taken as a whole, map costs do run into many thousands of dollars annually. Whatever this cost may be, it is no doubt small in comparison to highway revenues, which amount to nearly fifty million dollars annually. The State traffic map is the only map of those described which is published in quantity for the public and its distribution is due to public demand in the same manner that road improvement is demanded.

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A PLAN FOR A TRAFFIC VOLUME STUDY
OF
THE CHICAGO AUTOMOTIVE REGION

- - -

PURPOSE: The purpose of this study is to obtain comprehensive facts relative to the distribution of traffic volume upon all important routes in the Chicago Automotive Region to be used as a basis for the evaluation of various types of highway improvement, and as a guide for subsequent and more detailed studies of traffic character and economics.

AREA: The area contained within the Chicago Automotive Region, as the expression is here used, lies generally within a radius of approximately fifty miles from the center of the City of Chicago, and is the territory in which the traffic effects of urban Chicago are primarily felt. It contains all or part of the following counties:

<u>Illinois</u> - Cook	Kane	DuPage	Livingston
Lake	Kendall	Will	
McHenry	Grundy	Kankakee	
<u>Wisconsin</u> - Kenosha			
Walworth			
Racine			
<u>Indiana</u> - Lake			
Porter			
LaPorte			

SCOPE OF STUDY It is the purpose of this plan to gain the maximum information consistent with reasonable simplicity and economy in the conduct of the study. It will reveal among other elements the following:

- (1) The pattern of highway traffic distribution, showing for each paved route in the Automotive Region the actual and relative amount of traffic carried.
- (2) Fluctuations in the volume of traffic, by hourly, daily, and seasonal periods revealing the relation of maximum to average and minimum flow, and the severity and duration of daily and weekly peaks.

EXHIBIT IV

- (3) Intersection character as shown by classification of through and turning movements.
- (4) The utilization of various routes by passenger and commercial vehicles.

AGENCIES
COOPERATING:
C

The area to be studied lies within various administrative jurisdictions having special interest in traffic facilitation and highway improvement. Their participation in the conduct of the studies is not only important but necessary. It is suggested that this participation can be made most effective by an analysis of functional rather than territorial interest. It is proposed therefore that the studies be conducted:

- (1) By the State Highway Department at all stations in territory within the Automotive Region lying within the State of Illinois, located upon routes over which the State has jurisdiction;
- (2) By the Cook County Highway Department at all stations within the County of Cook, including those within the City of Chicago located upon routes over which the County has jurisdiction;
- (3) By the City Traffic Engineer of Chicago, acting for the Committee on Traffic and Public Safety of the Chicago City Council at all other stations located within the City of Chicago;
- (4) By the State or County highway departments of the counties in Wisconsin and Indiana at all stations lying within their respective jurisdictions.

METHOD OF
STUDY

The plan of study has been designed to give all of the necessary information with a minimum expenditure of time and money. To this end four classes of stations have been devised as follows:

- (1) Base Stations. A base station has been located at each intersection of all important paved routes and at such other places as volume information may be necessary to prepare a detailed flow map. It is recommended that each base station be checked for one week day only for an 8 hour split shift; 7 A.M. to 11 A.M.; and 2 P.M. to 6 P.M. At this and all other stations, traffic

will be classified simply as private passenger or commercial.

- (2) Key Stations. Key stations have been located at typical and strategic points in each important district in the region. It is recommended that each key station be checked one week day only and for the full twenty-four hour period. This information will make possible the computation and interpolation of flow figures for the hours lacking in the base station counts and for the short count days at the master stations, giving the equivalent of a full twenty-four hour count for all stations.
- (3) Master Stations. Master stations have been designated for a relatively few locations which are considered typical of that part of the region in which they are located. It is recommended that they be checked for a full twenty-four hour period on three consecutive days - Friday, Saturday, Sunday - and on the same schedule as base stations for the remaining days of the week. They are designed to reveal daily variation in both volume and character of traffic during the week, and will make possible the plotting of a flow map for minimum, average, and peak days for both private passenger and commercial vehicles. By computation and interpolation the percentages derived from the master station counts can be applied to the key and base stations giving the approximate equivalent of a full week twenty-four hour count at all stations.
- (4) Periodic Stations. So far as possible the checking at the Base, Key and Master Stations described above should be conducted concurrently. This, however, will give only flow figures for one relatively short period of the year. It is recommended, therefore, that Master Station locations be rechecked (on the eight hour schedule used for Base Stations and for one week day only) each month for the twelve months next succeeding the beginning of the study (or if this is impossible, then not less than quarterly), thus giving an index as to seasonal variations, relation between maximum months and average and minimum months, and the basis for the computation of total annual flow, and average daily flow.

LOCATION OF STATIONS:

For simplicity the counties have been used as the territorial basis for the layout of stations. Locations are numbered ser-

ially in each county: Thus, Cook County 1, 2, 3, etc; Kane County 1, 2, 3, etc. The stations in each County are shown on the following series of county maps on which Key Stations are indicated by a large square and Master Stations by a large circle, and each location is described on the County list attached to each in which Key Stations are indicated by a "K" and Master Stations by an "M" following the numeral.

It is estimated that in the counties of Lake, Porter and LaPorte in Indiana, there will be 60 stations, of which 50 will be Base Stations, 3 Master Stations and 7 Key Stations.

SUMMARY OF STATIONS

	<u>Base Stations</u>	<u>Key Stations</u>	<u>Master Stations</u>
Cook (except Chicago)	175	11	2
Lake	39	3	1
McHenry	14	0	1
Kane	24	1	1
Kendall	3	0	0
Grundy	3	0	0
Livingston	1	0	0
DuPage	20	1	1
Will	19	1	1
Kankakee	6	1	1
	<hr/>	<hr/>	<hr/>
TOTAL	304	18	8

FORMS:

To obtain the desired information with the greatest possible accuracy special forms have been designed for this study. They are similar to those which have been used successfully in Massachusetts and in other jurisdictions. The two forms required, are shown immediately following this page.

The first is an instruction cover sheet which is to be filled out in the office when the counts are scheduled. It is designed to give the observer all of the general and special instructions required. The second sheet is the actual tally form to be used by the observer in recording movements by half hourly periods at the station which he covers.

For simplicity in handling, the forms should be made up in books with a cover sheet on each and with as many tally sheets as there are half hour periods in the counts to be made. The book should be backed with heavy cardboard, thus making it possible for the observer to have a solid writing foundation which he can easily hold in his hands.

It is especially important that the books be substantially bound at the top in order that they may not come apart. The books are to remain intact at all times and will eventually be so filed.

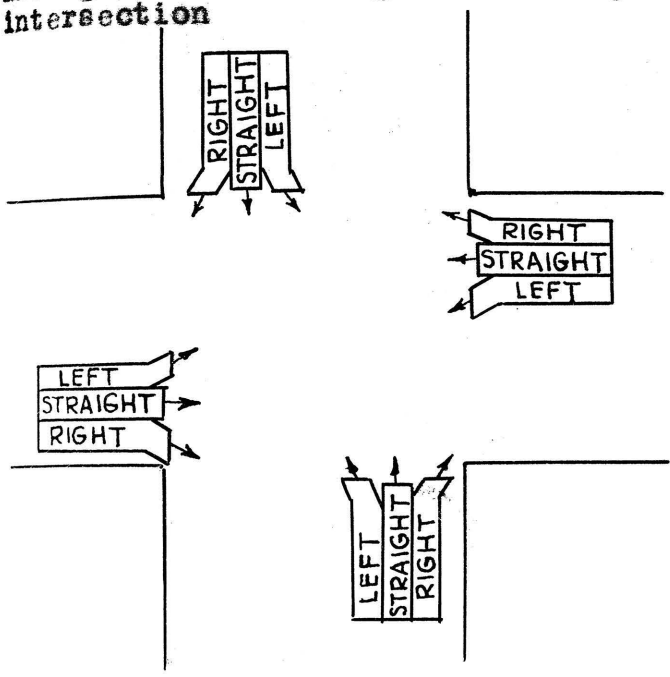
The following is a summary suggesting the number of books required:

1000 books with 16 tally sheets each

100 books with 48 tally sheets each

STATE OF ILLINOIS	: Station Number _____
DEPARTMENT OF PUBLIC WORKS	: City or Town _____
AND BUILDINGS	: Location _____
DIVISION OF HIGHWAYS	: Day _____ Date _____

Example of how the four squares are arranged for counting an ordinary intersection



If intersection is not an ordinary one, you will find sketch below indicating the movements to be recorded.

INSTRUCTIONS

Duty: You will report on or before _____ (A.M., P.M.), on the date and at the location indicated in the upper right corner of this sheet and count traffic in accordance with the instruction on this sheet from _____ (A.M., P.M.), to _____ (A.M., P.M.) and from _____ (A.M., P.M.) to _____ (A.M., P.M.).

What to count: Unless otherwise directed, the vehicles entering the intersection are the only ones counted. Each entering vehicle is tabulated as to direction and as a truck or passenger vehicle. Trucks include trucks of all kinds, busses, horse drawn vehicles and street cars. Passenger vehicles include private passenger automobiles, taxicabs and motorcycles.

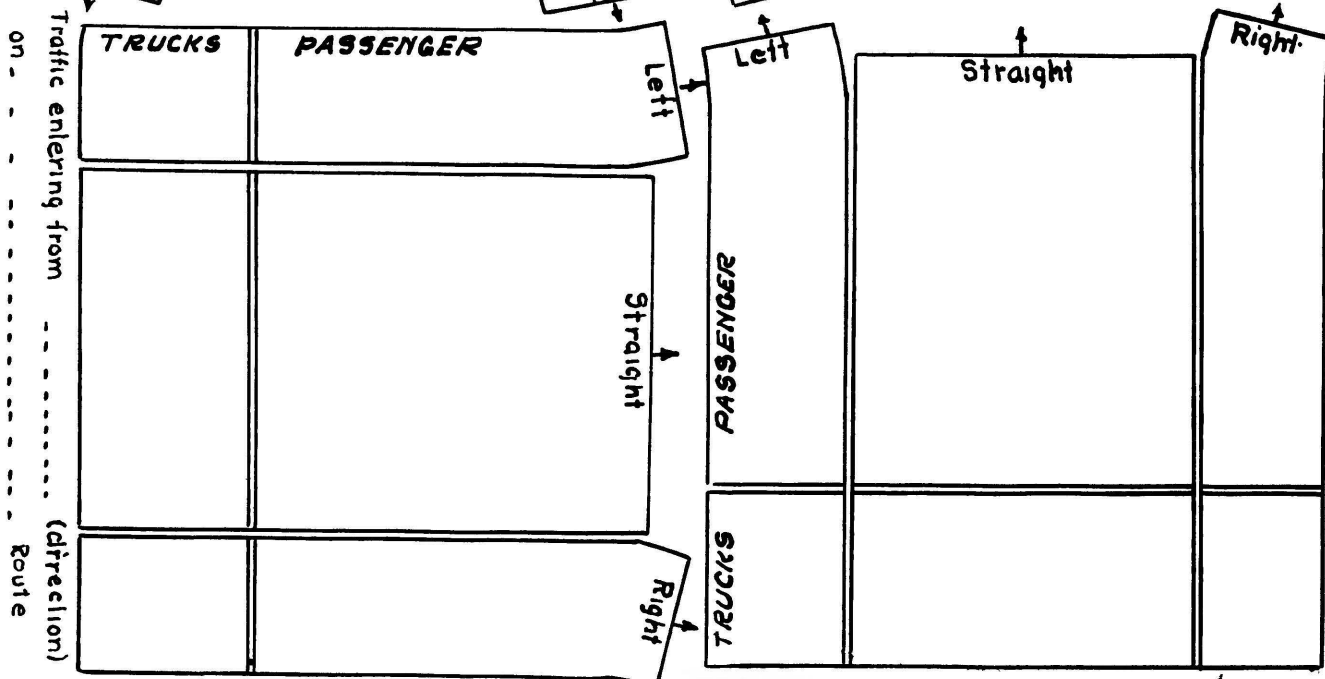
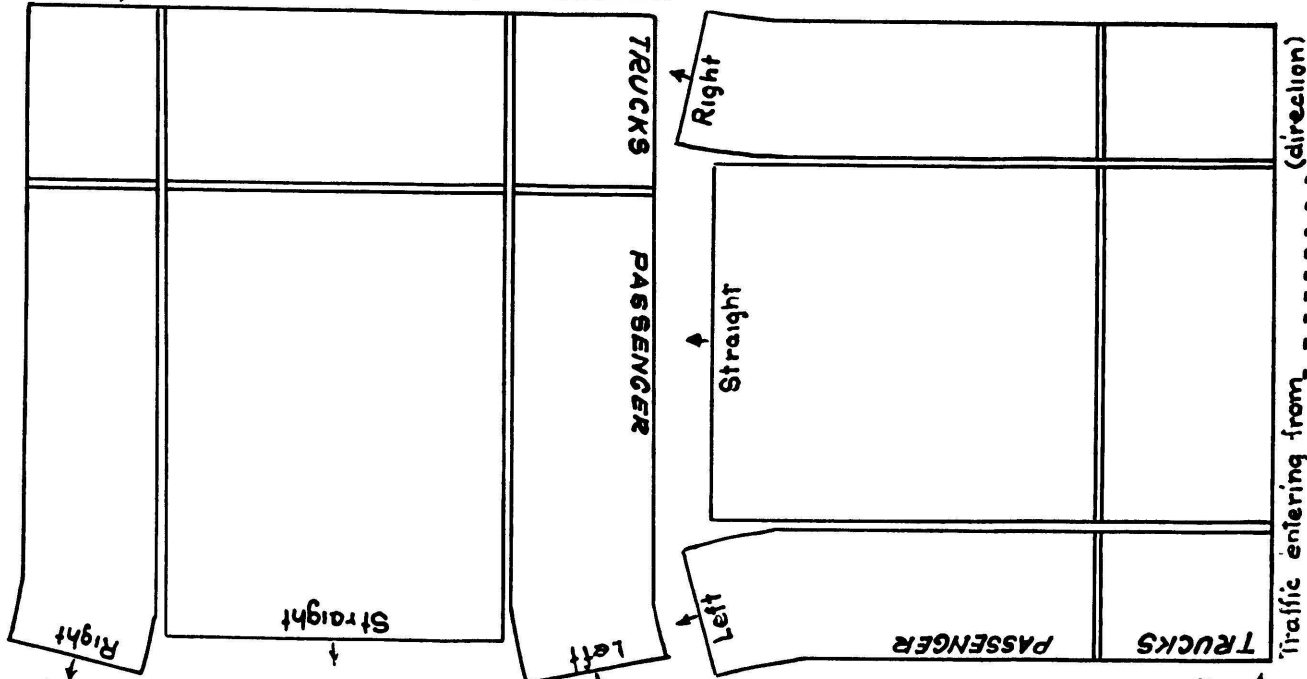
Tally Sheet: Each stream of traffic entering the intersection is represented by one of the four squares on each tally sheet. The top of the tally sheet always represents north unless otherwise indicated on this instruction sheet. The first tally sheet in this book is marked to indicate the square to be used for each entering stream of traffic counted.

Use of Sheet: Use the customary tally system of making four vertical marks and a fifth one diagonally through the four, the combined tally representing five vehicles. Each page in this book is to be used for one-half hour only. At the expiration of each one-half hour, the time must be entered at the bottom of the sheet finished and a new sheet started promptly. Daylight saving or Central standard time will be used according to instruction which will be given you before the count begins.

- Equipment:**
1. A watch.
 2. Two or more medium hard pencils.
 3. A good eraser.
 4. A knife or pencil sharpener.

Checker's Names.....

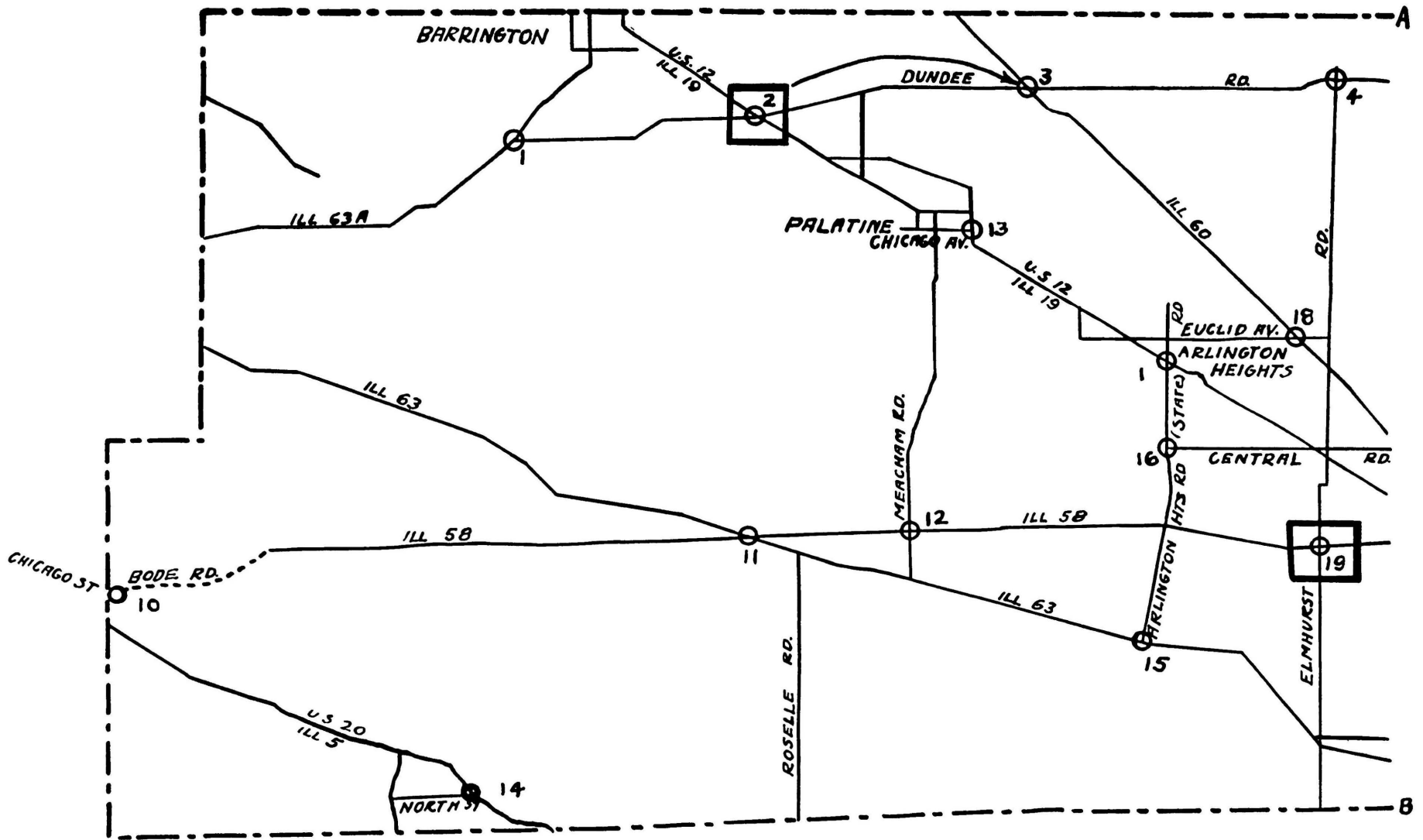
Traffic entering from ----- (direction)
 on ----- Route



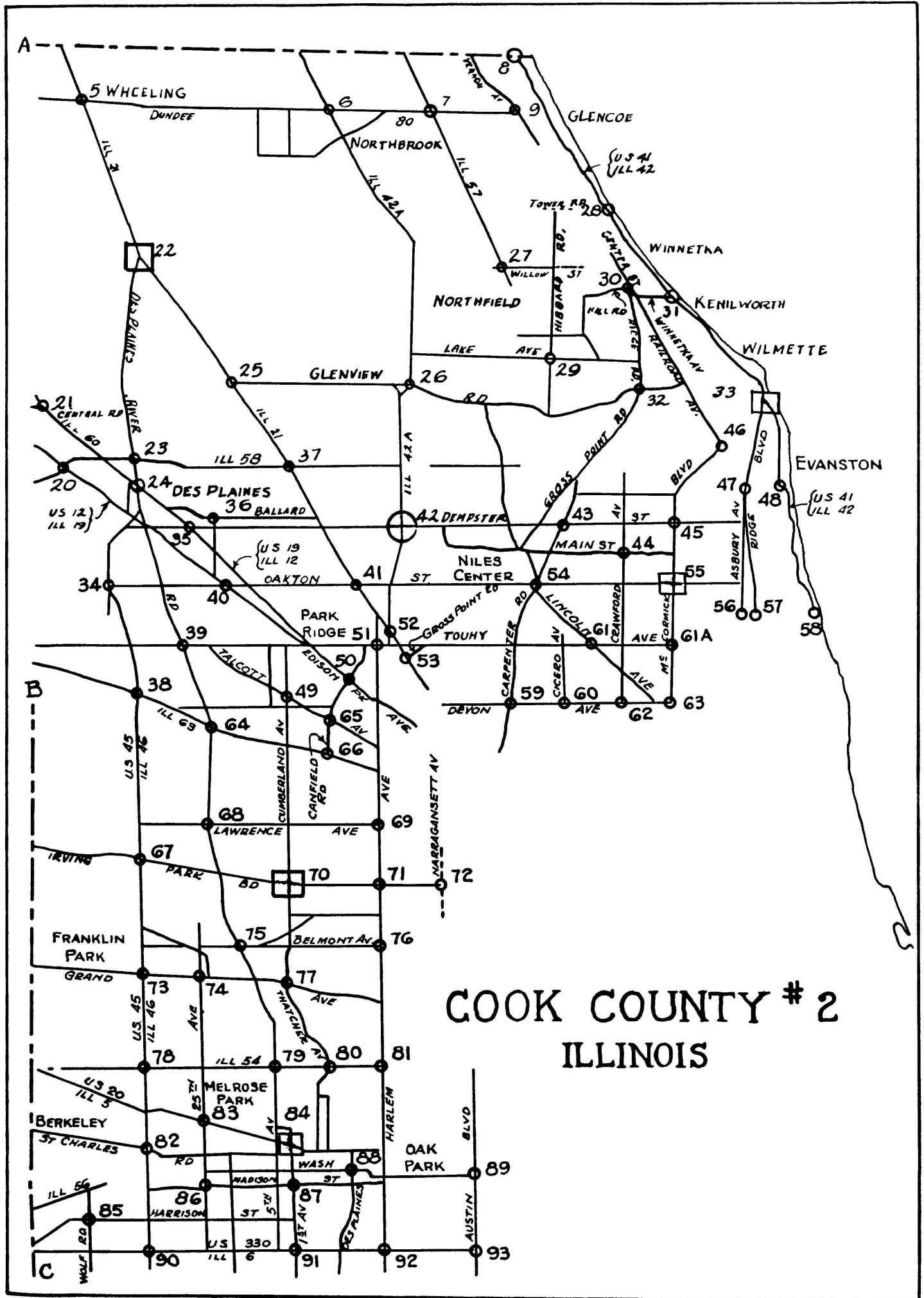
Traffic entering from ----- (direction)
 On ----- Route

The tabulation sheet is for a half hour from -----M to -----M

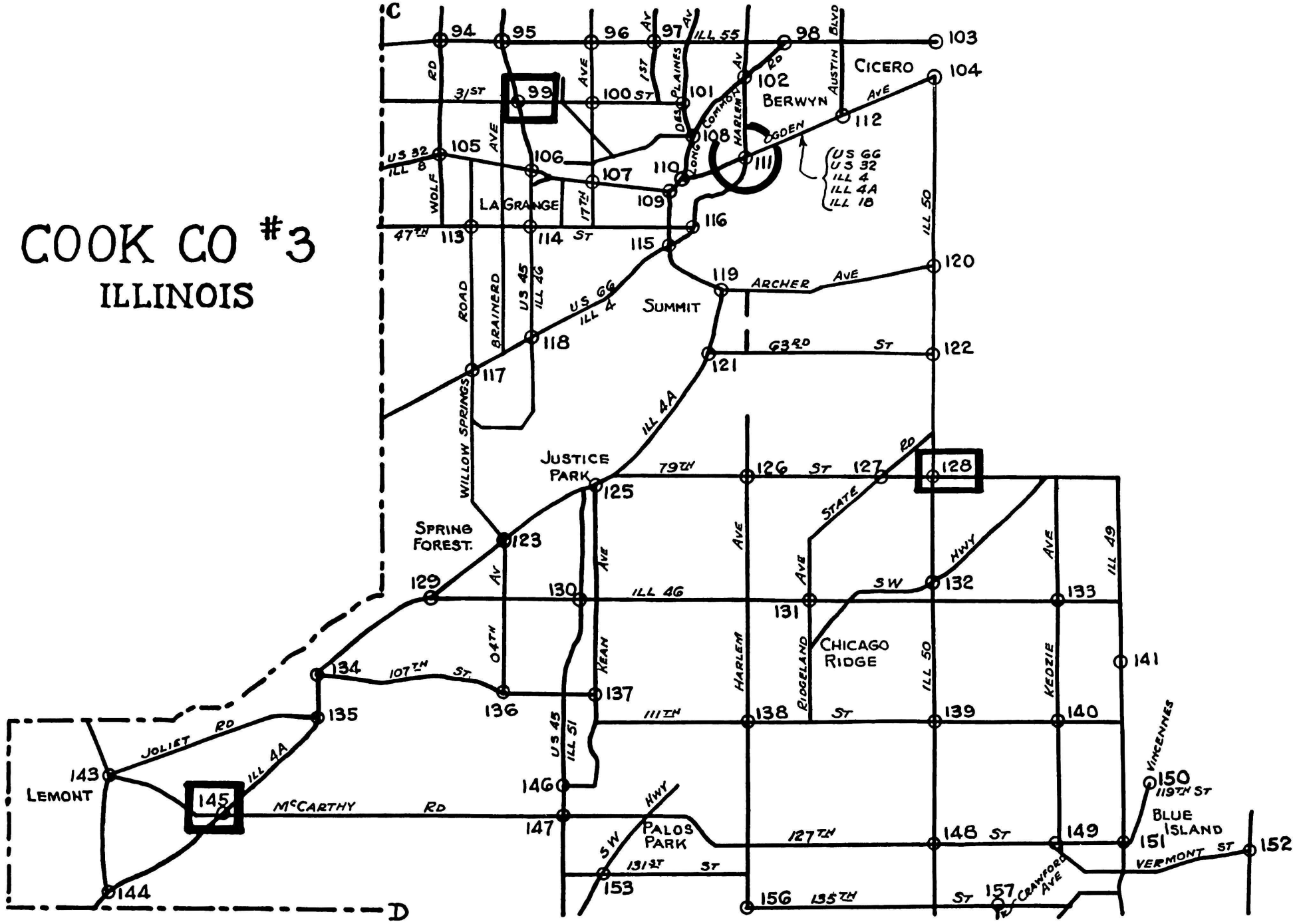
Weather -----

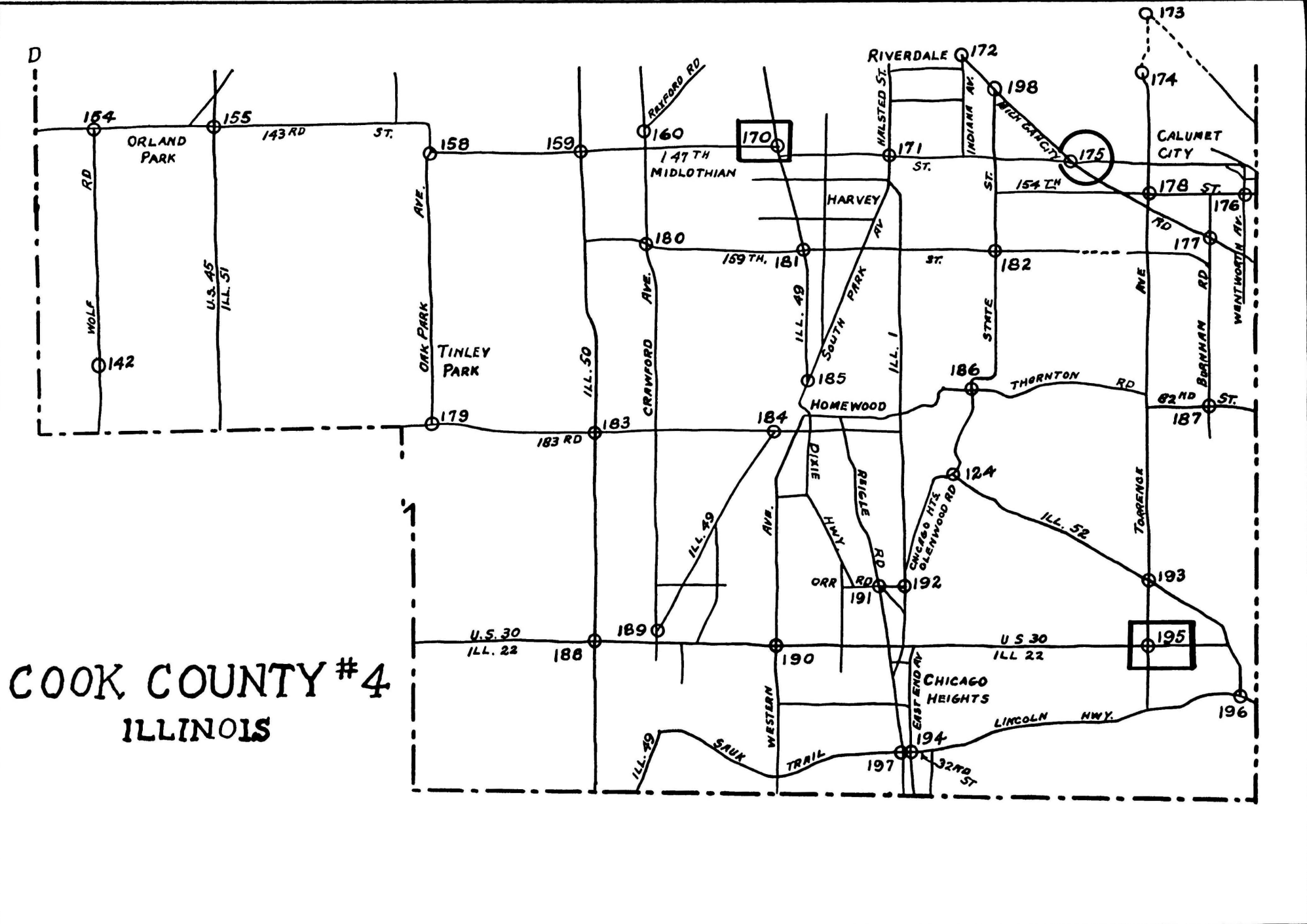


COOK COUNTY #1
ILLINOIS



COOK CO #3 ILLINOIS





<u>station</u>	<u>Intersection Description</u>
26	Ill. 42-A at Glenview Road on the easterly side of Chicago River
27	Ill. 57 at Willow Street in Northfield
28	Ill. 42 (Sheridan Road) At Tower Road in northerly part of Winnetka
29	Lake Avenue at Hibbard Road
30	Ridge Road (Church Road) at West Railroad Avenue (Center St.) in Winnetka
31	Ill. 42 at Winnetka Avenue
32	Ridge Road at Wilmette Avenue in Wilmette
33-K	Ill. 42 at Ridge Avenue in Evanston
34	Ill. 46 at Oakton Street
35	Ill. 19 (Northwest Highway or Rand Road) at Dempster Street
36	Ballard Road at Potter Road
37	Ill. 21 at Ill. 58
38	Ill. 63 (Higgins Road) at Ill. 46 (Mannheim Road)
39	River Road at Touhy Avenue
40	Busse Highway at Oakton Street
41	Ill. 21 at Oakton Street
42-M	Ill. 42-A at Dempster Street
43	Dempster Street at Niles Center Road (Carpenter Road)
44	Crawford Avenue at Main Street
45	Dempster Street at McCormick Boulevard
46	West Railroad Avenue at McCormick Boulevard
47	West Railroad Avenue at Asbury Avenue
48	Ill. 42 at Chicago Avenue in Evanston
49	Gumberland Avenue at Talcott Road
50	Ill. 19 (Northwest Highway) at Oliphant Avenue in Norwood Park, Chicago

<u>station</u>	<u>Intersection Description</u>
51	Harlem Avenue at Touhy Avenue
52	Ill. 21 at 42-A
53	Ill. 21 at Grosse Point Road (Harts Road)
54	Oakton Street at Niles Center Road (Carpenter Road)
55-K	Oakton Street at McCormick Boulevard
56	Asbury Avenue (Western Avenue) at Howard Street
57	Ridge Avenue at Howard Street
58	Ill. 42 at southeast corner of Calvary Cemetery, Evanston
59	Carpenter Road at Devon Avenue
60	Cicero Avenue at Devon Avenue
61	Touhy Avenue at Lincoln Avenue
62	Devon Avenue at Crawford Avenue
63	Devon Avenue at McCormick Boulevard
64	River Road at Ill. 63 (Higgins Road)
65	Ill. 62 (Talcott Road) at Canfield Road
66	Ill. 63 at Canfield Road
67	Ill. 46 at Irving Park Boulevard
68	River Road at Lawrence Avenue
69	Harlem Avenue at North Avenue
70-K	Irving Park Boulevard at Cumberland Avenue
71	Harlem Avenue at Irving Park Boulevard
72	Irving Park Boulevard at Narragansett Avenue
73	Ill. 46 at Grand Avenue
74	Grand Avenue at Rose Street (25th Avenue)
75	River Road at Belmont Avenue
76	Harlem Avenue at Belmont Avenue

<u>Station</u>	<u>Intersection Description</u>
77	Grand Avenue at Cumberland Avenue
78	Ill. 46 at Ill. 54 (North Avenue)
79	Ill. 54 (North Avenue) at Fifth Avenue, Maywood
80	Ill. 54 (North Avenue) at Thatcher Road
81	Ill. 54 (North Avenue) at Harlem Avenue
82	Ill. 46 at Ill. 64 (St. Charles Road)
83	Ill. 5 at 25th Avenue
84-K	Ill. 5 at First Avenue
85	Wolf Road at Harrison Street
86	25th Avenue at Madison Street north of Railroad grade crossing
87	Madison Street at First Avenue
88	Washington Boulevard at Des Plaines Avenue
89	Ill. 5 (Washington Boulevard) at Austin Boulevard
90	Ill. 6 at Ill. 46
91	Ill. 6 at First Avenue
92	Ill. 6 at Harlem Avenue
93	Ill. 6 at Austin Boulevard
94	Ill. 55 (22nd Street) at Wolf Road
95	Ill. 46 at Ill. 55
96	Ill. 55 at 17th Avenue (Maple Avenue)
97	Ill. 55 at First Avenue
98	Ill. 55 at Riverside Drive
99 -K	Ill. 46 at 31st Street
100	31st Street at 17th Avenue (Maple Avenue)
101	31st Street at DesPlaines Avenue
102	Harlem Avenue at Riverside Drive (Longcommon Road)

Cook County Cont'd

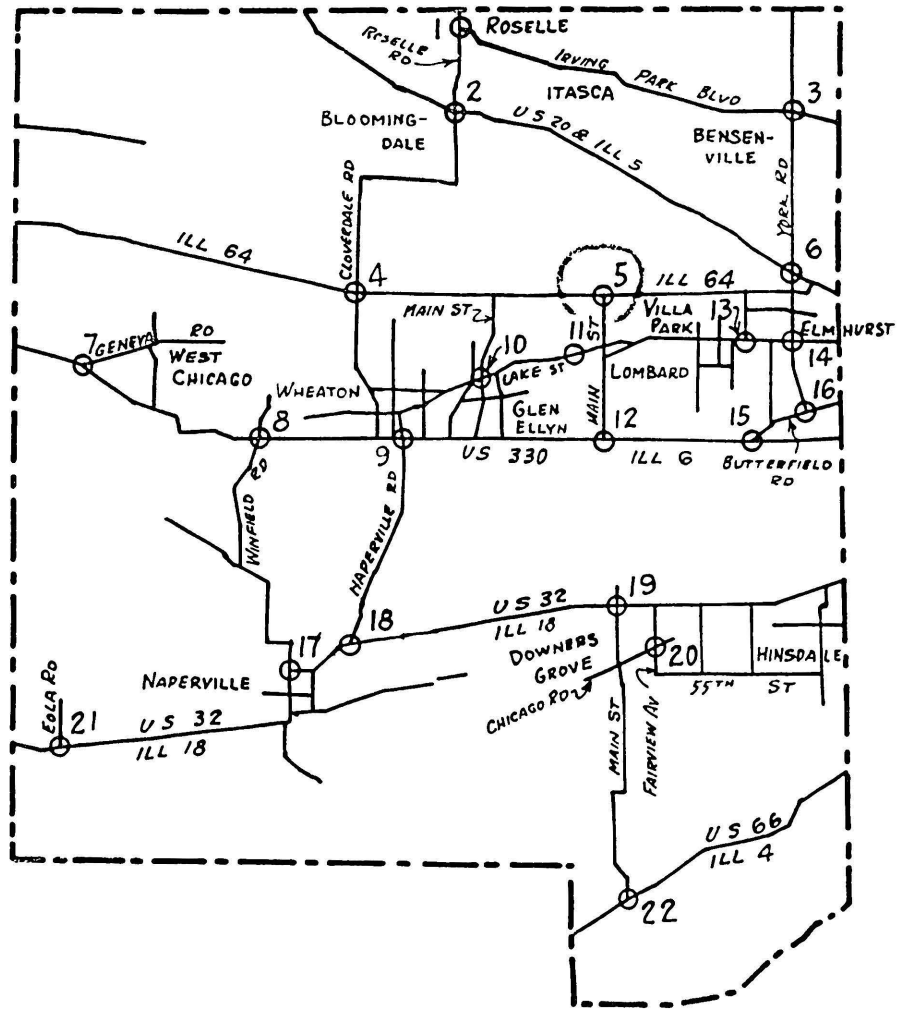
Page -5-

<u>Station</u>	<u>Intersection Description</u>
103	Ill. 55 (22nd Street) at Cicero Avenue
104	Ill. 18 at Cicero Avenue
105	Ill. 18 at Wolf Road
106	Ill. 18 at Ill. 46 (Fifth Avenue) North of the Railroad grade crossing.
107	Ill. 18 at Maple Avenue (17th Avenue)
108	Longcommon Road at Forrest Avenue and Woodside Road (DesPlainesAve
109	Ill. 18 at Lawndale Avenue
110	Ill. 18 at (St.) in Lyons
111-M	Ill. 18 (Ogden Avenue at Ill. 4 (Harlem Avenue)
112	Ill. 18 at Austin Boulevard
113	47th Street at Willow Springs Road (Gilbert Avenue)
114	Ill. 46 at 47th Street
115	Ill. 4 at Lawndale Avenue
116	Ill. 4 at 47th Street
117	Ill. 4 at Willow Springs Road
118	Ill. 4 at Ill. 46
119	Ill. 4-A (Archer Avenue) at Lawndale Avenue
120	Ill. 50 (Cicero Avenue) at Archer Avenue
121	Ill. 4-A at 63rd Street
122	Ill. 50 (Cicero Avenue) at 63rd Street
123	Ill. 4-A at Willow Springs Road
124	Ill. 52 at Glenwood-Thornton Road
125	Ill. 4-A at Kean Avenue
126	Ill. 46 at Harlem Avenue
127	Ill. 46 at State Street about 1 mile west of Cicero Avenue

<u>station</u>	<u>Intersection Description</u>
128-K	Ill. 50 (Cicero Avenue) at Ill. 46 (79th Street)
129	Ill. 4-A at 95th Street
130	Ill. 51 at 95th Street
131	95th Street at Ridgeland Avenue
132	Ill. 50 (Cicero Avenue) at Southwest Highway
133	95th Street at Kedzie Avenue
134	Ill. 4-A at 107th Street
135	Ill. 4-A (Archer Avenue) at 111th Street
136	107th Street at 104th Avenue
137	107th Street at Kean Avenue
138	111th Street at Harlem Avenue
139	Ill. 50 at 111th Street
140	111th Street at Kedzie Avenue
141	Western Avenue at 103rd Street
142	Wolf Road at a point just north of Wabash Railroad
143	McCarthy Road (Stephen Street) at Ill. 4-A (Illinois Street) in Lemont
144	Ill. 4-A (Archer Avenue) at State Street about 2 miles south of Lemont
145-K	McCarthy Road at Archer Avenue about 2 miles east of Lemont
146	Ill. 51 at 119th Street
147	Ill. 51 at McCarthy Road (123rd Street)
148	Ill. 50 (Cicero Avenue) at 127th Street
149	Kedzie Avenue at Canal Feeder Road (Vermont Street)
150	Vincennes Avenue at 119th Street
151	Western Avenue at Burr Oak Avenue (127th Street)
152	Ill. 49 (Ashland Avenue) at Vermont Street
153	Southwest Highway at 131st Street
154	143rd Street at Wolf Road

<u>Station</u>	<u>Intersection Description</u>
155	Ill. 51 at 143rd Street
156	Harlem Avenue at 135th Street
157	135th Street at Crawford Avenue
158	147th Street at Ridgeland Avenue
159	Ill. 50 (Cicero) Avenue) at 147th Street
160	Crawford Avenue at Rexford Road
161 to 169 inclusive (NOT ASSIGNED TO ANY STATION)	
170-K	Western Avenue at 147th Street extending westerly from Western Avenue
171	Ill. 1 (Halsted Street) at 147th Street (Sibley Boulevard)
172	Indiana Avenue at Layden Avenue (Michigan City Road)
173	Torrence Avenue at 130th Street
174	Torrence Avenue at 138th Street
175-M	147th Street (Sibley Boulevard) at Michigan City Road
176	Wentworth Avenue at 154th Street
177	Burnham Avenue at Michigan City Road
178	Torrence Avenue at 154th Street
179	163rd Street at Ridgeland Avenue
180	Crawford Avenue at Ill. 53 (159th Street)
181	Ill. 53 (159th Street) at Dixie Highway
182	Ill. 53 (159th Street) at State Street (Chicago Road)
183	Ill. 50 at 183rd Street
184	Ill. 49 at 183rd Street
185	Dixie Highway at South Park Avenue, northwest of the I.C. Railroad
186	Homewood-Lansing Road (Margaret Street) at Vincennes Road (William St.) in Thornton
187	Burnham Avenue at Ridge Road (Main Street) in Lansing.

<u>Station</u>	<u>Intersection Description</u>
188	Ill. 50 at Ill. 22
189	Ill. 49 at Ill. 22
190	Ill. 22 at Western Avenue
191	Reigle Road at 203rd Street (Joe Orr Road)
192	Ill. 1 (Halsted Street) at 203rd Street (Joe Orr Road)
193	Ill. 52 at Torrence Avenue
194	East End Avenue at Sauk Trail in South Chicago Heights
195-K	Ill. 22 at Torrence Avenue
196	Ill. 52 at South Trail
197	Ill. 1 at Sauk Trail on east side of C. & E. I. Railroad in South Chicago Heights.



DUPAGE COUNTY
ILLINOIS

DU PAGE COUNTY

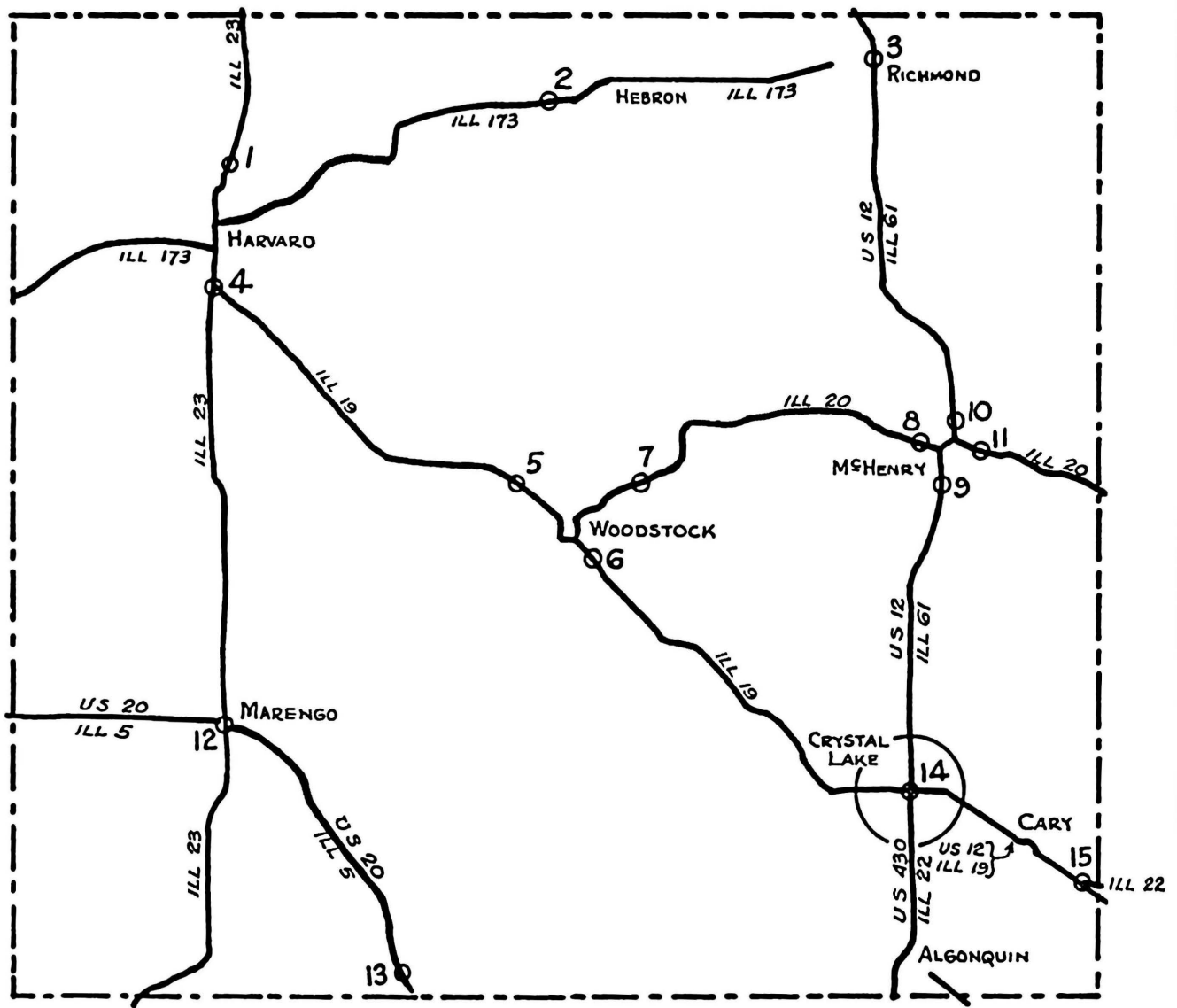
<u>STATION</u>	<u>Intersection Description</u>
1	Roselle Road at Irving Park Boulevard in Roselle
2	Ill. 5 at Roselle Road in Bloomingdale
3	Irving Park Boulevard and York Road in Bensenville
4	Ill. 64 at Cloverdale Road
5-M	Ill. 64 at Main Street near the north limits of Lombard
6	Ill. 5 at York Road near the north limits of Elmhurst
7	Ill. 6 at Geneva Road about 1.5 mile west of West Chicago
8	Ill. 6 at Winfield Road near the south limits of Winfield
9	Ill. 6 at Naperville Road in Wheaton
10	Main Street at (st.) in Glen Ellyn
11	Lake Street at (st.) in Lombard
12	Ill. 6 at Main Street south of Lombard
13	St. Charles Road at (St.) in Elmhurst
14	St. Charles Road at York Street in Elmhurst
15	Ill. 6 at Ill. 56 (Butterfield Road)
16	Ill. 56 at York Road at south edge of Elmhurst
17	Ill. 18 at Warrenville Road near north limits of Naperville
18K	Ill. 18 at Naperville Road
19	Ill. 18 and Main Street near north limits of Downers Grove
20	Chicago Road at Fairview Ave. in easterly part of Downers Grove
21	Ill. 18 at Ill. 59 south of Eola
22	Ill. 4 at Lemont Road

LAKE COUNTY

<u>STATION</u>	<u>Intersection Description</u>
1	Ill. 21 at Ill. 59 at Antioch
2	Hickory Corners
3	Ill. 42A at Ill. 173
4K	Ill. 42 (St.) at Ill. 173 (St) in Zion
5	Ill. 59 at Grand Avenue
6-K	Ill. 21 at Grand Avenue in Lake Villa
7	Ill. 42A at Wadsworth Road
8	Ill. 59 at easterly city limits of Fox Lake
9	Grand Avenue at Milburn Road about 5 miles west of Gurnee
10	Ill. 172 at Grand Avenue
11	Ill. 42A at Grand Avenue
12	Ill. 42 (St.) at Grand Avenue in Waukegan
13	Ill. 42 (St.) at Washington Street in Waukegan
14	Ill. 42 (St.) at Belvidere Street in Waukegan
15	Ill. 59 and 60 at cross-road about 2 mil. south of Fox Lake
16	Ill. 21 at cross-road about 2-2/10 miles N.W. of Belvidere Rd.
17	Ill. 20 at cross-road 1/4 miles west of Volo
18	Ill. 20 at Ill. 60 at Volo
19	Ill. 20 at paved cross-road about 2 miles West of Ill. 21
20M	Ill. 21 at Ill. 20 in Grays Lake
21	Ill. 172 at Ill. 20
22	Ill. 20 at Ill. 68
23	Ill. 42A at Ill. 20
24	Ill. 21 at Ill. 173
25	Ill. 42 at north limits of Great Lakes Training Station
26	Ill. 60 at Ill. 176 in Wauconda

LAKE COUNTY CONT.

<u>Station</u>	<u>Intersection Description</u>
27	Ill. 176 at paved cross-road in Ivanhoe
28	Ill. 21 at Ill. 176 (Park Avenue) in Libertyville
29K	Ill. 42A at Ill. 176 and Ill. 68
30	Ill. 42A at Ill. 176 3/10 mi. west of Lake Bluff Railroad Station
31	Ill. 42 at Rockland Road in Lake Bluff
32	Ill. 21 at Ill. 59A
33	Ill. 42 at Deerpath Avenue in Lake Forest
34	Ill. 22 at Ill. 59 about 2miles west of Lake Zurich
35	Ill. 60 at Ill. 22 in Lake Zurich
36	Ill. 21 at cross-road 2/10 mile north of Ill. 22
37	Ill. 21 at Ill. 22
38	Ill. 42A at Ill. 22
39	Ill. 42 at (St.) near north end of Fort Sheridan
40	Ill. 19 at Ill. 59 at Barrington
41	Ill. 42A at Deerfield Road in Deerfield
42	Green Bay Road at Central Avenue in Highland Park
43	Ill. 42 at Central Avenue in Highland Park



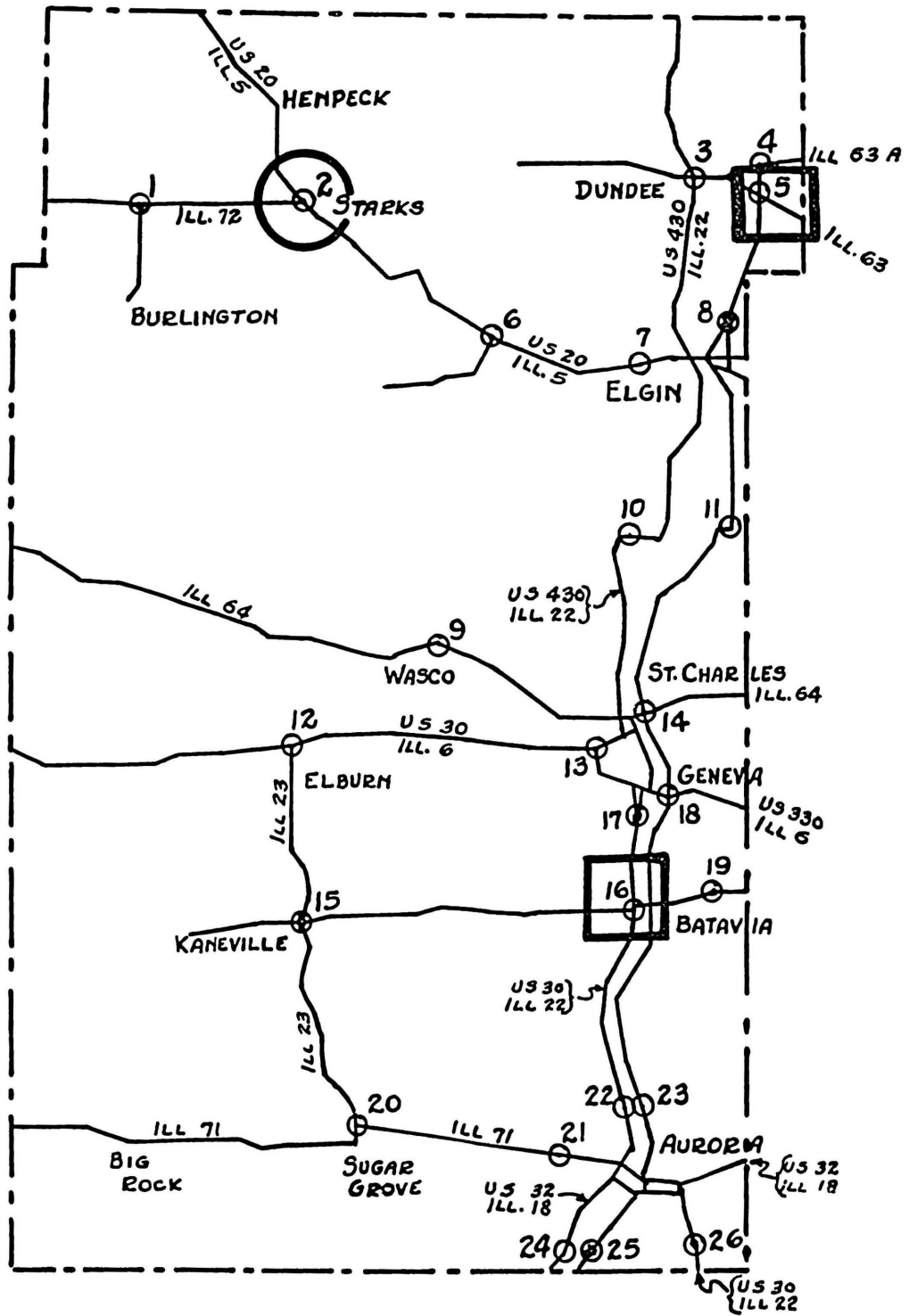
MCHENRY COUNTY

ILLINOIS

MCHEMRY COUNTY
Intersection Description

STATION

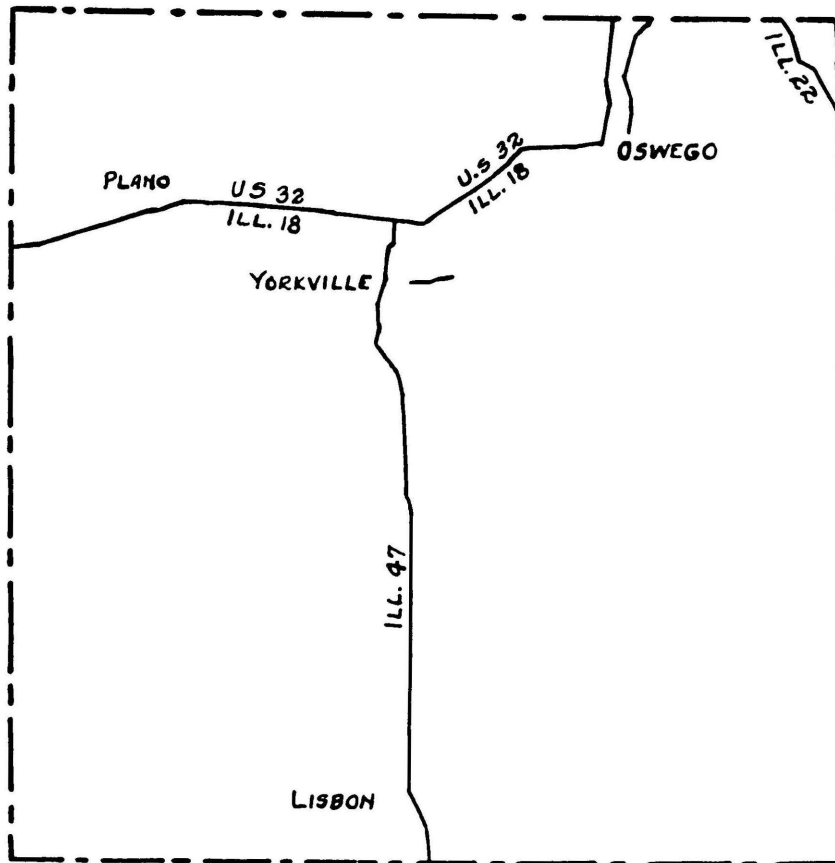
1	Ill. 23 about 1½ miles north of Harvard
2	Ill. 173 at cross-road about 1.5 mile west of Hebron
3	Ill. 61 at Ill. 173 in Richmond
4	Ill. 19 at Ill. 23 about 3 miles south of Harvard
5	Ill. 19 at cross-road about 2 miles north-west of Woodstock
6	Ill. 19 at cross road at southerly limits of Woodstock
7	Ill. 20 at cross road about 2 miles northeast of Woodstock
8	Ill. 20 near westerly limits of McHenry
9	Ill. 61 near southerly limits of McHenry
10	Ill. 61 near northerly limits of McHenry
11	Ill. 20 near easterly limits of McHenry
12	Ill. 5 at Ill. 23 in Marengo
13	Ill. 5 at cross-road 1/2 mile north of Kane Co. line
14M	Ill. 19 at Ill. 22 and Ill. 61
15	Ill. 19 at Ill. 22 in Fox River Grove



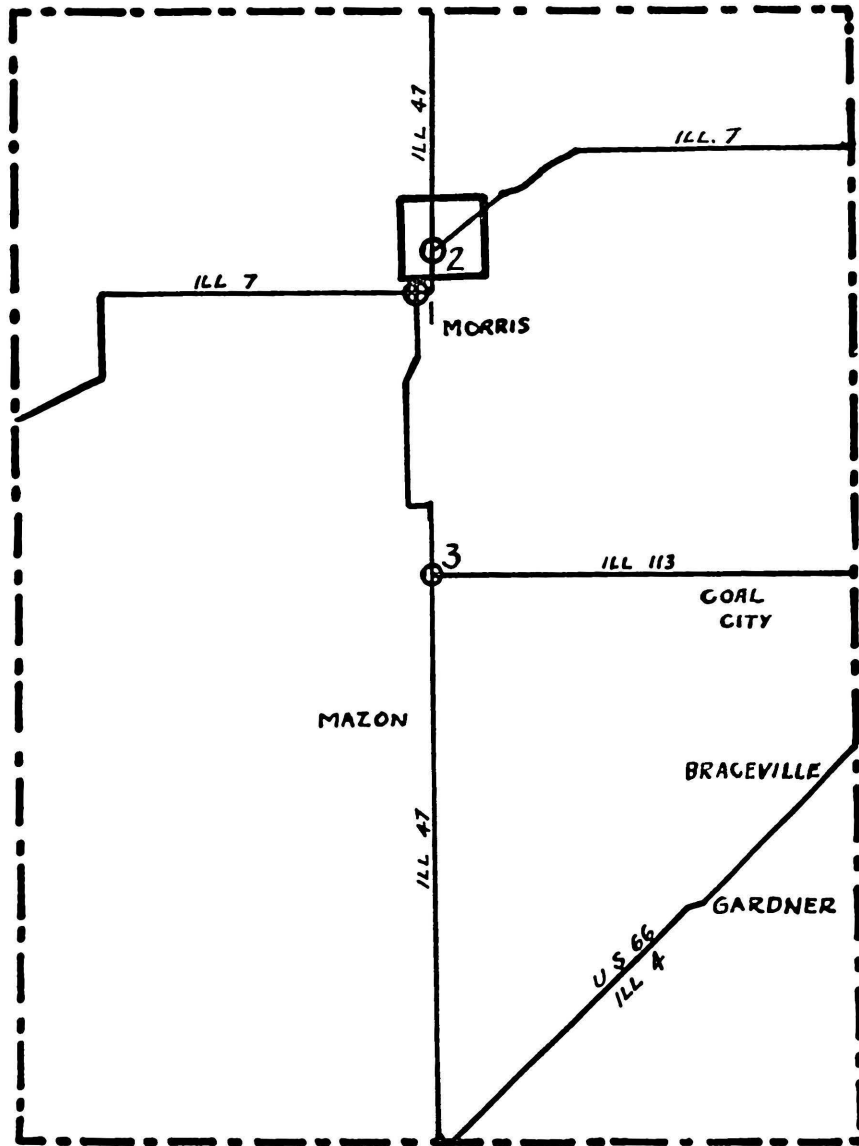
KANE COUNTY
ILLINOIS

KANE COUNTY

<u>STATION</u>	<u>Intersection Description</u>
1	Ill. 72 at Burlington Road
2H	Ill. 5 at Ill. 72
3	Ill. 22 at Ill. 63 (St.) near westerly limits of Dundee
4	Ill. 63 (Dundee Road) at East River Road
5K	Ill. 63 (Higgins Road) at East River Road
6	Ill. 5 at Plato Center Road
7	Ill. 5 at cross-road near westerly limits of Elgin
8	Dundee Avenue at Liberty Street in northern part of Elgin
9	Ill. 64 about 5 miles west of St. Charles
10	Ill. 22 at cross-road about 4 miles north of St. Charles
11	East River Road about 5 miles northeast of St. Charles
12	Ill. 6 at Ill. 47
13	Ill. 6 at Prairie Avenue near west limits of St. Charles
14	Ill. 64 at East River Road (St.) in St. Charles
15	Ill. 47 at Kaneville Road
16K	Ill. 22 at Kaneville Road In Batavia
17	Ill. 22 at Third Street in the south part of Geneva
18	Ill. 6 at East River Road (St.) in Geneva
19	Batavia Road at cross-road about 1.5 miles east of Batavia
20	Ill. 71 at Ill. 47 about 1 mile north of Sugar Grove
21	Ill. 71 at cross road about 1.5 mile west of Ill. 22 in Aurora
22	Ill. 22 at cross road about 1.5 miles north of Ill. 71
23	East River Road at cross road about 2 miles north of Ill. 18
24	Ill. 18 at road across river in Montgomery
25	East River Road at road across river in Montgomery
28	Ill. 22 at cross road about 1.5 miles south of Ill. 18



KENDALL COUNTY
ILLINOIS



GRUNDY COUNTY
ILLINOIS

KENDALL COUNTY

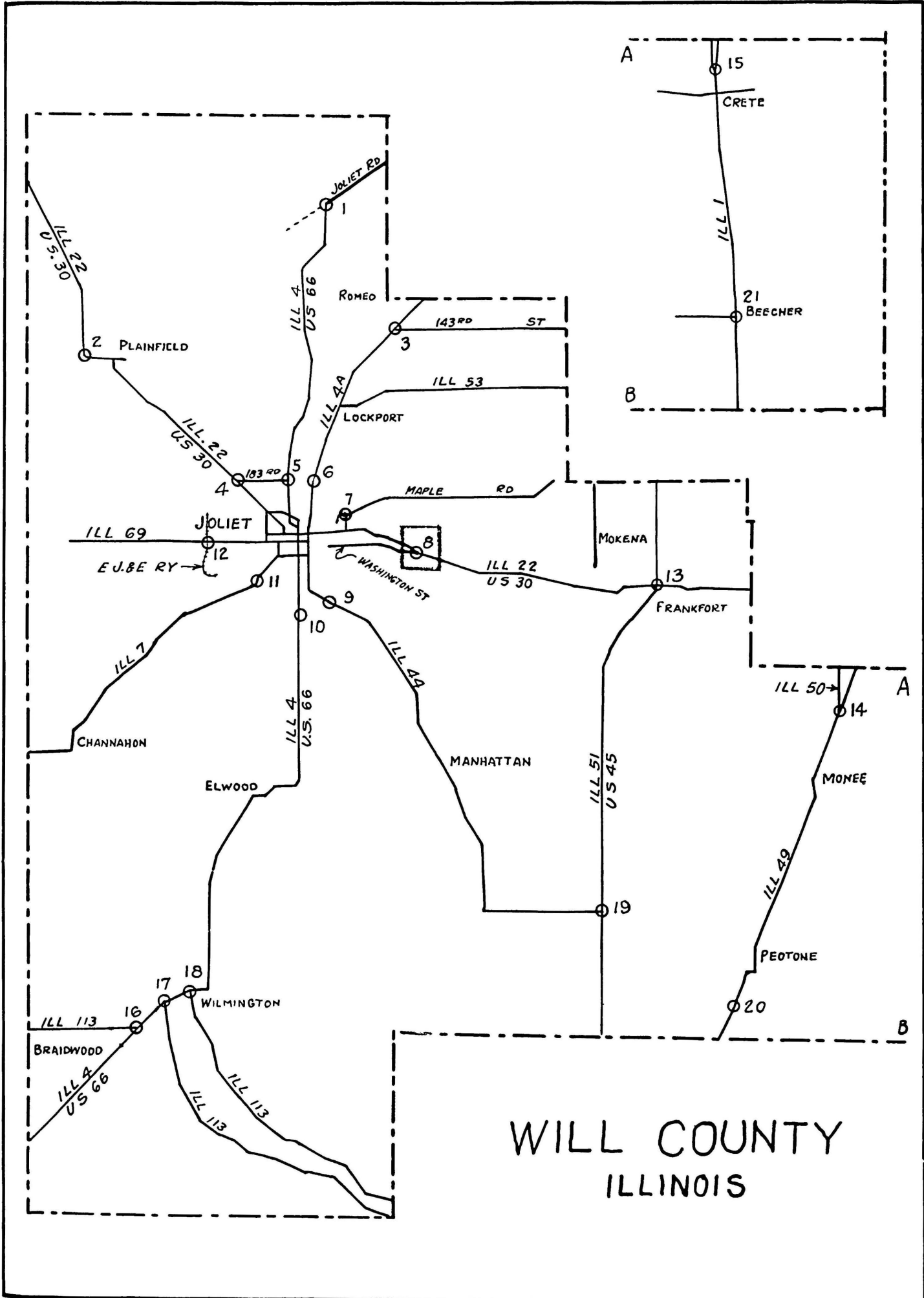
<u>Station</u>	<u>Intersection Description</u>
1	Ill. 18 at cross road 1 mile east of westerly boundary line
2	Ill. 18 at Ill. 47
3	Ill. 47 at cross road about 1 mile south of Lisbon Center

GRUNDY COUNTY

1	Ill. 7 at Ill. 47 at northerly limits of Morris
2K	Ill. 7 and Ill. 47 about 1 mile north of northerly limits of Morris
3	Ill. 47 and Ill. 113

LIVINGSTON COUNTY

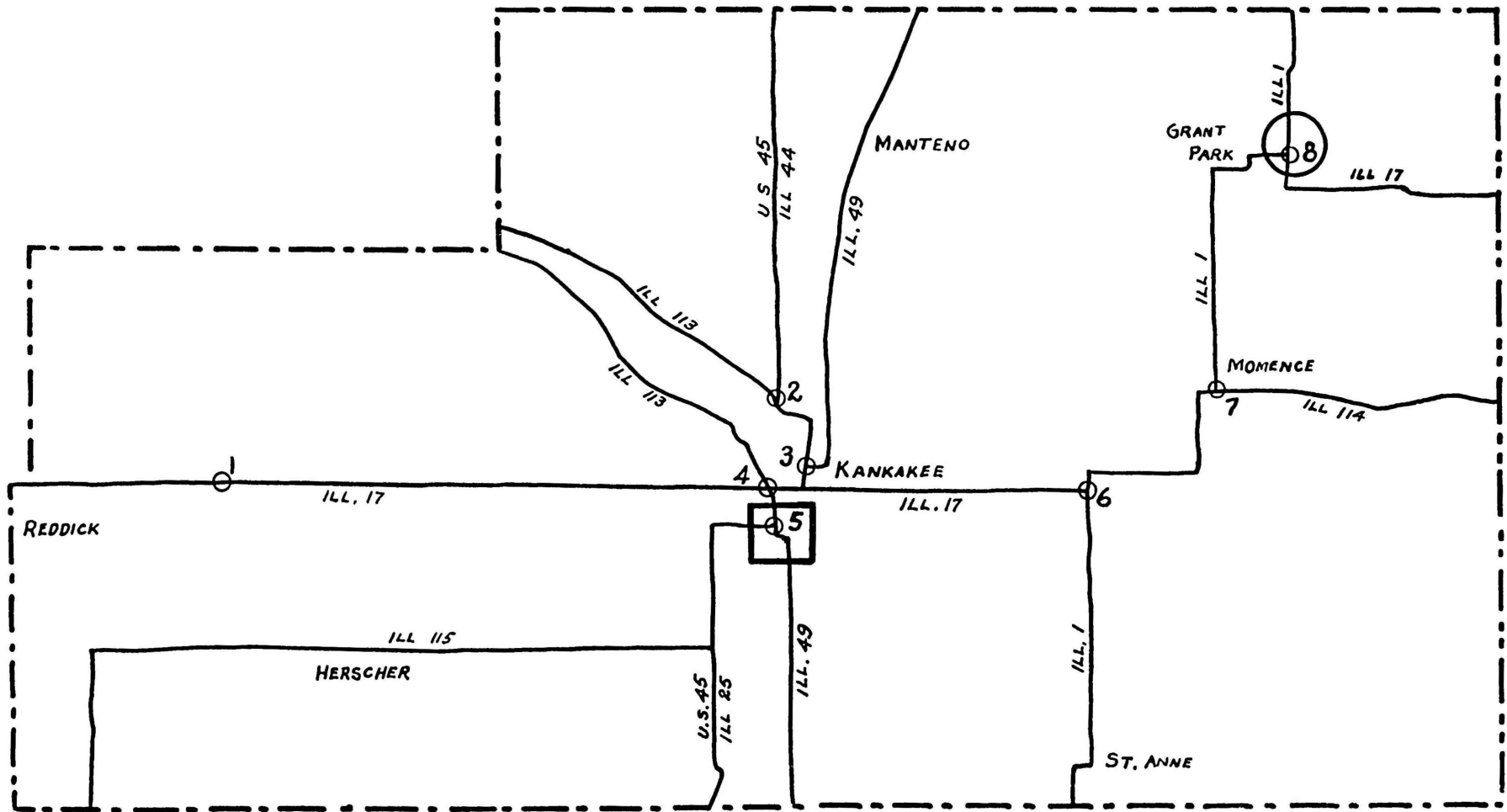
1	Ill. 47 at Ill. 4 about 1 mile northeast of Dwight
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WILL COUNTY
ILLINOIS

WILL COUNTY

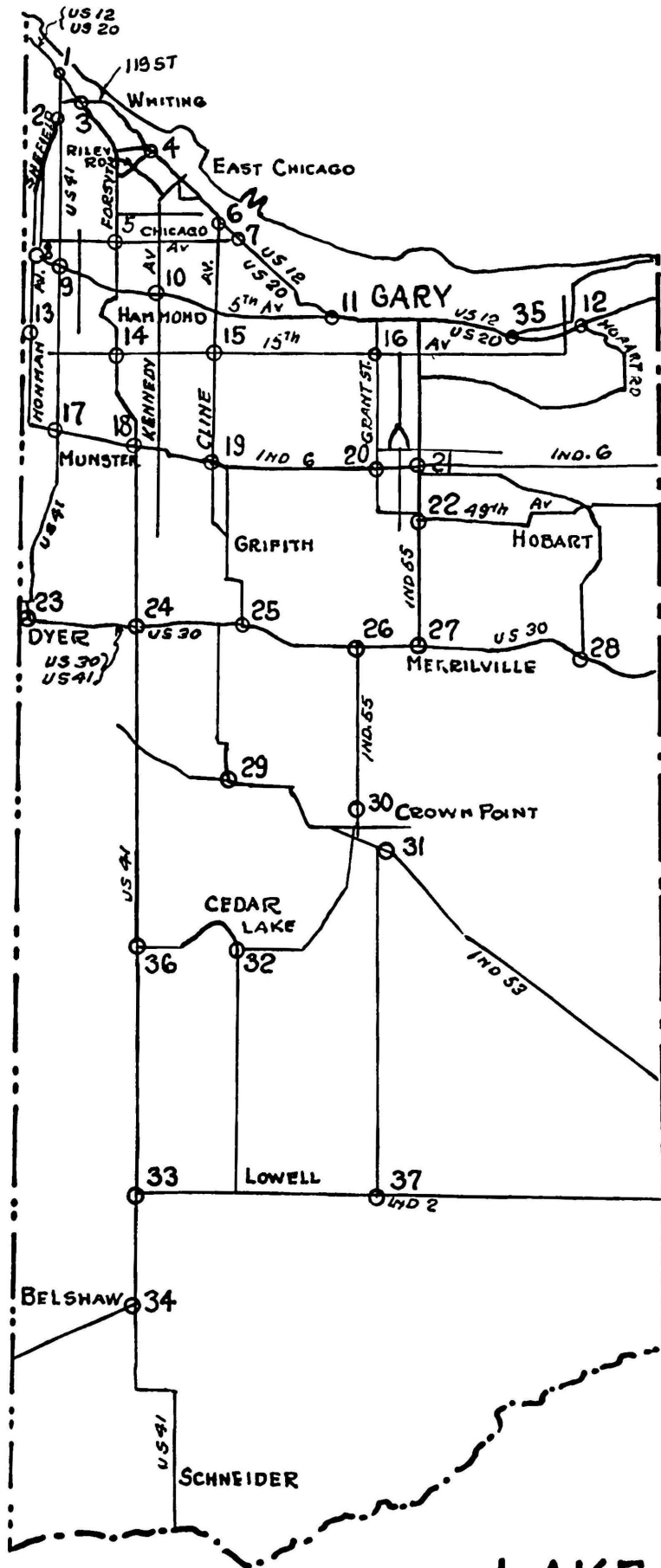
<u>Station</u>	<u>Intersection Description</u>
1	Ill. 4 at Ill. 66
2	Ill. 22 at Ill. 66 about 1 mile west of Plainfield
3	Ill. 4A at 143rd Street
4	Ill. 22 at cross road about 2 miles northwest of Joliet
5	Ill. 4 at cross road near northerly limits of Joliet
6	Ill. 4A at cross road near the old State prison at northerly edge of Joliet
7	Spring Creek Road (St.) at (St.) near easterly edge of Joliet
8K	Ill. 22 at (Road) about 4 miles east of Joliet
9	Ill. 44 at cross road about 3 miles south of Joliet
10	Ill. 4 at cross road about 3 miles south of Joliet
11	Ill. 7 at road across Des Plaines River in Rockdale
12	Ill. 69 at E.J.&E. crossing about 3 miles west of Joliet
13	Ill. 22 at Ill. 51
14	Ill. 49 at Ill. 50
15	Ill. 1 at fork of road about 1 mile south of Cook Co. line
16M	Ill. 4 at Ill. 113 about $2\frac{1}{2}$ miles southwest of Wilmington
17	Ill. 4 at Ill. 113 on the west side of Kankakee river about one mile west of Wilmington
18	Ill. 4 at Ill. 113 on the east side of Kankakee river near the center of Wilmington
19	Ill. 44 at Ill. 51
20	Ill. 49 at cross road about 2 miles south of Peotone
21	Ill. 1 at (St.) near the easterly edge of Beecher



KANKAKEE COUNTY
ILLINOIS

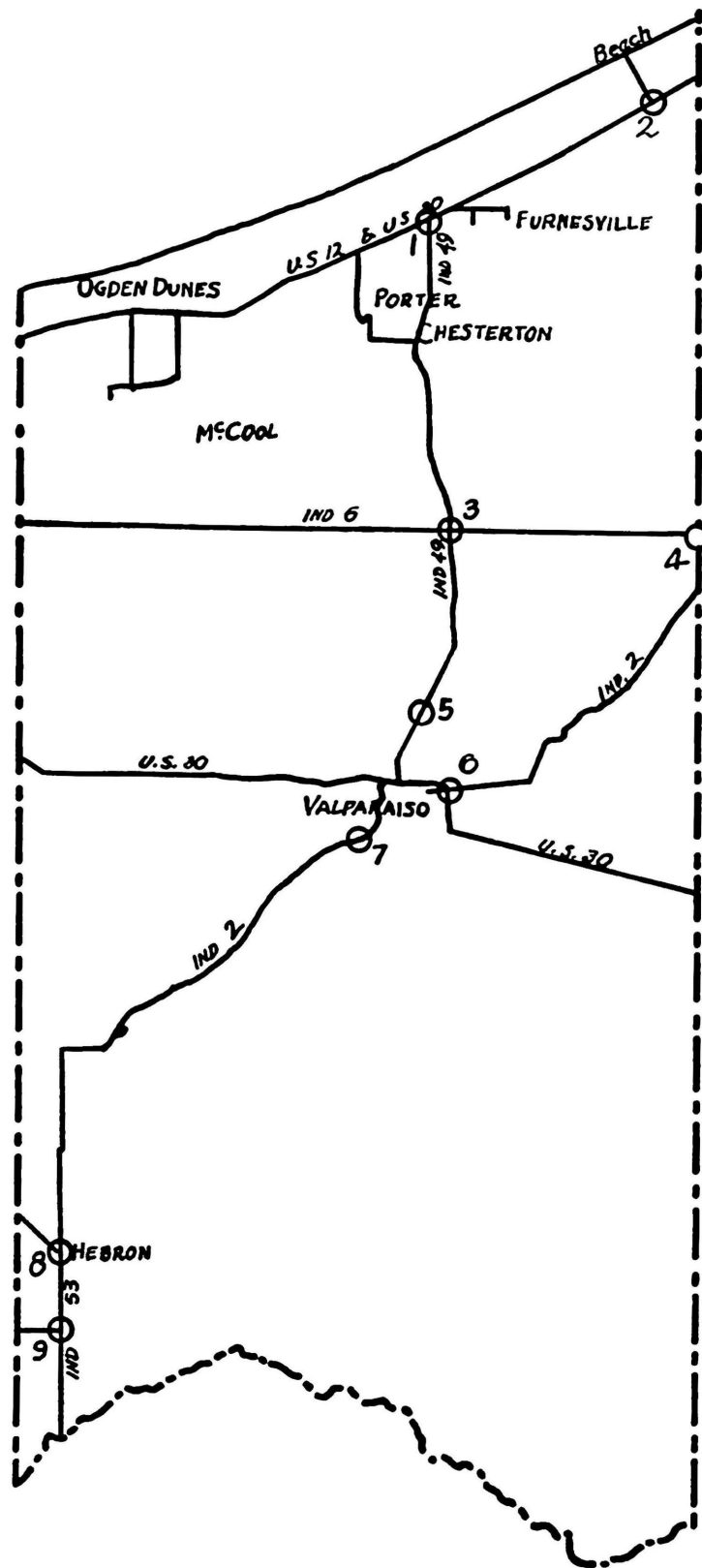
KANKAKEE COUNTY

<u>Station</u>	<u>Intersection Description</u>
1	Ill. 17 at cross roads near Union Hill
2	Ill. 44 at Ill. 113 in Bourbonnais
3	Ill. 49(St.) at Ill. 44 (St.) in Kankakee
4	Ill. 17 at Ill. 113 on west side of Kankakee river in West Kankakee
5K	Ill. 49 at Ill. 25 in the southerly limits of Kankakee
6	Ill. 1 at Ill. 17
7	Ill. 1 at Ill. 114
8M	Ill. 1 at Ill. 17 about 1 mile east of Grant Park

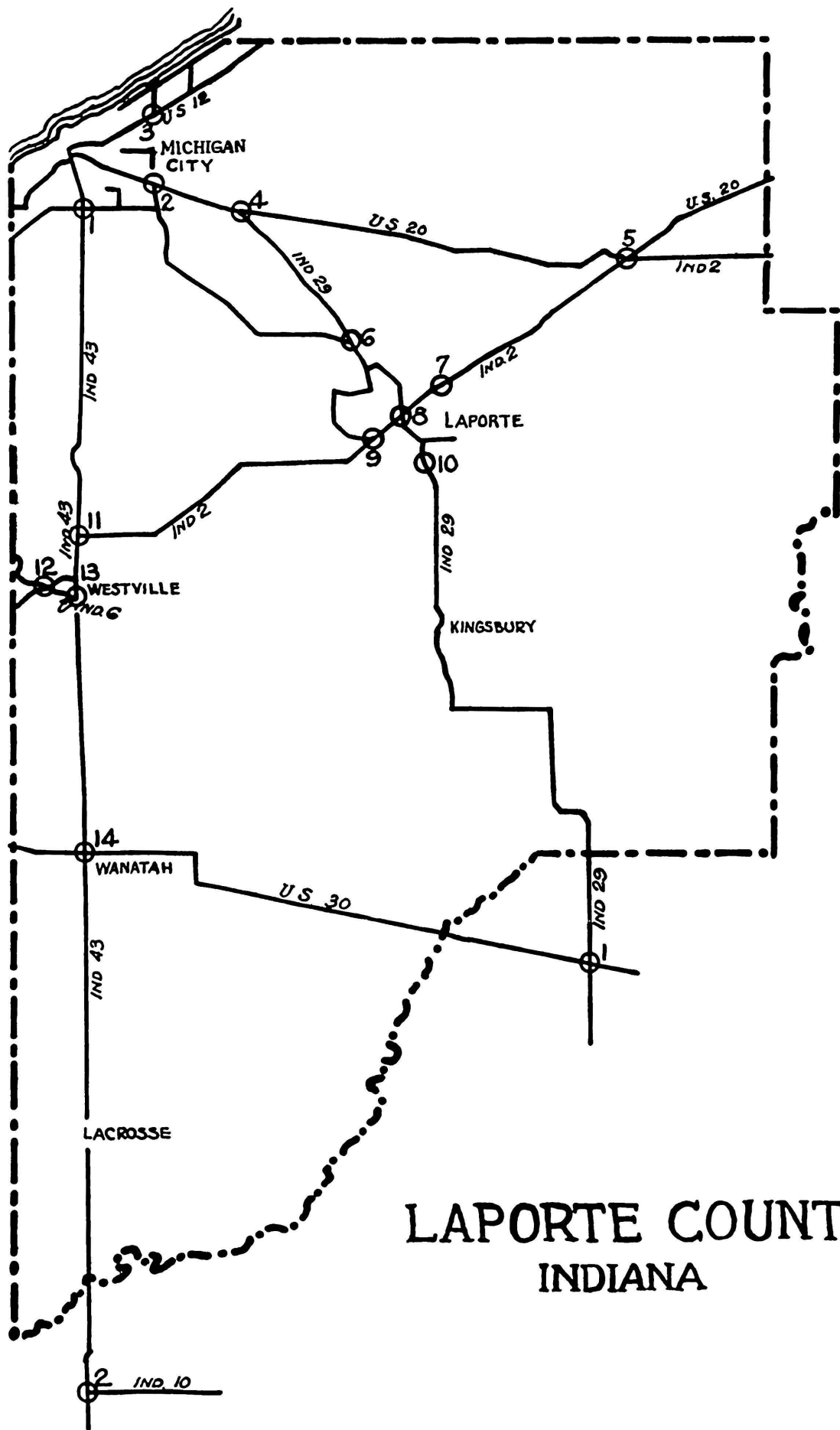


LAKE COUNTY

INDIANA



PORTER COUNTY
INDIANA



LAPORTE COUNTY INDIANA