

Progress Report on County Road Marking

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Joe had just started to clean the windshield of a customer's car when young Doc Smith braked his car to a halt in the driveway.

"Joe, I have an emergency at Ben Miller's farm. I understand it's near Wahoo. Can you help me?"

"Sure, Doc," Joe said. "Take this highway north about five miles, and then, instead of turning with the highway at the big pear orchard, continue straight ahead on the County Farm gravel road. It winds a bit, but after about two miles you'll come to a five-point intersection. Take the road that cuts slightly to the left, follow it to the second crossroad, then turn left. It's only about a mile from that corner to Wahoo. You'll have to inquire at the grocery store for Ben's farm. I reckon he's Jake Miller's boy who's farming for himself nowadays."

Then Joe remembered something a customer had said earlier that morning.

"Wait a minute, Doc. That bridge over Bailey's creek washed out last night. You'll have to detour after you reach Five Points. Go ahead to the first crossroad, turn left and after several jogs, you'll hit a T-road; turn right and go north about 80 rods and you'll see Wahoo down in the valley. You can't miss it!"

You can't blame Joe because Doc promptly got lost. He wasn't responsible for laying out the county road system. He was only trying to help.

These weird directions are typical of the hundreds which Joe and others must each day offer the public. They strongly suggest the

need for an orderly and systematic method of rural road identification and dwelling unit numbering.

BENEFITS OF IDENTIFICATION

Descriptions of real estate in both urban and rural areas have followed accepted practices for reasons of legality, ownership, taxation, and others. In addition, the naming of streets and the numbering of houses and business units in urban areas have been a necessity and a convenience for many years. Usually the naming and numbering have been done in an orderly and systematic manner, but little has been done in rural areas except for the naming and, more recently, the numbering of the principal rural highways.

The rapid development of motor vehicle transportation and the desire for more effective rural development and better community services in the counties of Indiana have increased the need for an orderly method of identifying local roads and homes in rural areas. Among the community services to benefit from such a procedure are the public utilities, fire protection, medical and veterinary aid, all types of delivery routes, and others of similar character. Improvement of the accounting and cost control methods of the county highway department is another benefit to be received through better identification.

A county road system that will provide for better community services and the general improvement of the area will require proper identification of local roads and rural dwelling units and an effective system for accounting and cost control.

RECENT ENABLING LEGISLATION

The development of a rural identification system was given impetus by two laws passed by the General Assembly of Indiana in 1953. Act No. 115 authorized the counties to prepare charts, signs, and maps designating thereon either a name or a number of all county roads. Act No. 230 pertains to the employment of clerical assistants by county highway departments, and prescribes a system of records to be kept by the counties.

The several sections of *Act No. 115* are given as follows:

SECTION 1. The county planning commission of any county, or in the event that county does not have a county planning commission, the board of commissioners of any county, may authorize the preparation of charts or maps on which the county roads shall be designated either by name or number and the Board of County Commissioners may authorize the purchase and

the installation of signs showing the number or name of said County road as designated on the maps or charts so prepared; provided, however, that in counties with a population of four hundred thousand (400,000) or more the planning commission shall, in addition to naming or numbering the roads, provide for the numbering of residences on such roads in such manner as to conform with streets in cities located in such counties.

SECTION 2. The county planning commission, or board of county commissioners, in the preparation of such charts or maps shall solicit the services of the county engineer and/or county surveyor who shall prepare such charts or maps. For such services the county engineer and/or county surveyor may be allowed a compensation in addition to the compensation he now receives as fixed by law, in an amount to be determined by the county planning commission or by the board of county commissioners subject to the approval of the county council. All expenses incidental to the preparation of such charts or maps, including the compensation of the county engineer and/or county surveyor, shall be out of the general fund of the county.

SECTION 3. Such charts or maps shall be available to all units of government free of charge. Such maps or charts shall be available to the general public at a charge to be determined by the county planning commission or board of county commissioners. Any money received from the sale of such charts or maps shall be deposited in the general fund of the county.

SECTION 4. Whereas an emergency exists for the immediate taking effect of this act, the same shall be in full force and effect from and after its passage.

It may be observed that Act No. 115 appears to have several shortcomings—

1. There is no provision for uniformity, nor authority for uniformity, in the development of county road-marking systems.
2. There are no specifications for the marking of roads in terms of accepted practices, as set forth in the *Manual of Uniform Traffic Control Devices for Streets and Highways*.
3. There is no provision for the numbering of rural dwelling units in counties with populations of less than 400,000 persons.
4. There is no specific statement as to the source of funds available for the purchase of road markers.

5. There is no provision for priority in marking. Roads should be rated by accepted methods and a priority assigned in terms of the rating and an established budget.
6. There is no provision for the maintenance of rural road markers.

The several sections of *Act No. 230* are given as follows:

SECTION 1. The board of county commissioners of any county shall be required to employ a clerical assistant or assistants for the county highway department of such county, which assistant or assistants are competent to keep accurate books and records of such departments as required by the state board of accounts: Provided, however, that the provisions of this section shall not apply to any county in which there is employed, in the county highway department, a competent bookkeeper.

SECTION 2. The state board of accounts shall prescribe a system of records that shall be kept by the county highway department which system of records will adequately reflect the following:

1. The total outstanding liabilities of the department at all times.
2. The cost and maintenance of the department.
3. The cost of materials and equipment used by the department.
4. An accurate inventory of all equipment, materials and supplies.

SECTION 3. Whereas an emergency exists for the more immediate taking effect of this act, the same shall be in full force and effect from and after July 1, 1953.

The Act requires that the counties shall employ competent assistance to maintain general accounting records, but it does not provide for—

1. A systematic inventory of the condition and needs of roads, culverts, and bridges in terms of the volume and character of the traffic on county roads.
2. A cost record of the operation and maintenance of equipment.
3. An equipment amortization schedule.
4. A cost record showing costs for the construction and maintenance of roads and road sections and of bridges.

These Acts were discussed by county officials attending the 1953 Purdue Road School, and later representatives of the Indiana Association of County Commissioners and of the County Highway Supervisors Association met with staff members of the Joint Highway Research Project, Purdue University, and requested assistance in the development of a uniform method of identifying county roads and rural dwelling units. The procedures described herein were submitted and subsequently adopted by the Indiana Association of County Commissioners.

UNIFORM SYSTEM IS DESIRABLE

A uniform system of identification and control is desirable. Each county should serve as a basic unit, but identification methods should be uniform for all counties in the state. If the specifications and methods are uniform, the residents in one county can easily interpret the county road marking and dwelling unit numbering in adjacent or distant counties.

The establishment, use, and evaluation of accounting and cost control procedures that are uniform throughout the state, will facilitate the work of the State Board of Accounts and assist the county officials who are responsible for the planning and programming of an effective system of rural roads.

The identification and location of county roads relative to established base lines in each of the 92 counties of Indiana may be accomplished in a manner similar to that used for state highways, but certain basic characteristics of the local-road problem must be considered in the development of the procedure.

In general, the character of travel on the local-roads is predominately intra-county, but it includes some inter-county and inter-state movement. Most of this local-road travel is to-and-from the county seat, or other trade areas in the county, and in adjacent counties. The patch-work of short-section and variable-direction local-roads does not always lend itself to the development of continuous routes within a county or between counties.

Thus, it is desirable that the methods used for identification and relative location of roads and in the numbering of rural homes should be closely associated with the character of the travel on these roads, be county-wide and uniform throughout the state, provide for continuity with adjacent counties when possible, and employ engineering survey techniques.

LAND SURVEY PRINCIPLES FOLLOWED

Fundamental guides in the development of a uniform system of rural road marking and dwelling unit numbering are found in the principles of the U. S. Land Survey. The State-Wide Highway



RECOMMENDED BASE LINES FOR RURAL ROAD MARKING SYSTEM

Fig. 1. Recommended base lines for rural road marking system.

Planning Survey, conducted in Indiana in the late 1930's, used these basic principles in the development of the General Highway and Transportation Maps of the 92 counties. In this study, similar principles were used to establish the base lines needed in the development of the method for rural road and home identification.

In applying these principles to naming and numbering, each county of Indiana is divided into four quadrants, as illustrated in Figure 1, *Recommended Base Lines for Rural Road Marking*. The base lines of the quadrant coincide with a projection of the Range and Township line intersection near the center of each county.

Figure 1 illustrates how the intersections of Range and Township lines near the center of each county in Indiana coincide with section lines, and, when extended to each county boundary, they form the baselines of the North-East, North-West, South-East, and South-West Quadrants of the county. Many of the intersecting range and township lines are relatively close to the county seats, and when feasible, coincide with the base lines of adjacent counties to provide for continuity.

This continuity is also illustrated in Figure 1 where the Second Principal Meridian forms the range base lines in Clinton, Boone, Hendricks, Morgan, Monroe, Lawrence, Orange, and Crawford counties. It also shows continuity of township base lines in LaPorte, St. Joseph, Elkhart, LaGrange, and Steuben counties. Additional examples of continuity may also be observed.

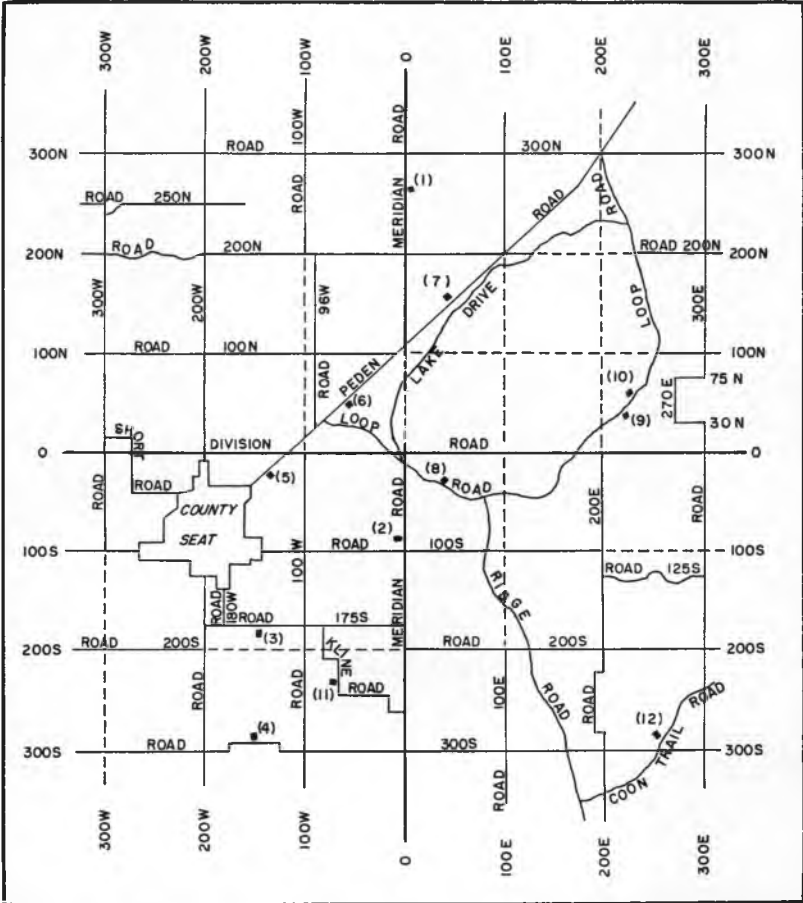
If roads are located along all or part of the east-west and north-south base lines, they are designated as Division Road and Meridian Road, respectively.

ROADS NUMBERED BY DISTANCE

Section line roads and others paralleling these base lines form a rectangular coordinate system with Division Road and Meridian Road serving as base lines, as illustrated in Figure 2, *Examples of Road and House Designations*. The numbers assigned to these section line roads and other parallel roads represent the progressive distance of each road from the base lines.

The first section line parallel to a base line is designated by the number 100, followed by the letter of direction (N, S, E, or W) from the base line. Thus, the first section east of the north-south line (Meridian Road) is designated as 100 E, and a road along that section line is designated as Road 100 E. Similarly, a section line road 3 miles south of the east-west base line (Division Road) would be designated as Road 300 S.

Roads parallel to the base line roads, but located between section lines, are assigned their relative position and number by dividing each section (about one mile) into one-hundredths of a mile. Progressive numbers are assigned to show the position relative to sections and approximate distance from the base lines. Thus, a road along a quarter-section line that is about $1\frac{3}{4}$ miles south of the east-west base line (Division Road) would be designated as Road 175 S.



- | | |
|-------------------------|--------------------------------|
| (1) 263N MERIDIAN ROAD | (7) 151N 43E PEDEN ROAD |
| (2) 88S MERIDIAN ROAD | (8) 28S 39E LOOP ROAD |
| (3) 144W ROAD 175S | (9) 39N 222E LOOP ROAD |
| (4) 151W ROAD 300S | (10) 51N 230E LOOP ROAD |
| (5) 21S 134W PEDEN ROAD | (11) 238S 69W KLINE ROAD |
| (6) 52N 56 W PEDEN ROAD | (12) 285S 252E COON TRAIL ROAD |

Fig. 2. Examples of road and house designations.

The numbers assigned to intersecting roads on this grid system clearly show the approximate distance and their position relative to parallel section roads and base roads. Figure 3, *Typical County Road Identification Signs*, illustrates the legend on road signs at an intersection that is 17 and 50/100 miles north and 4 and 35/100 miles east of the intersecting base lines.

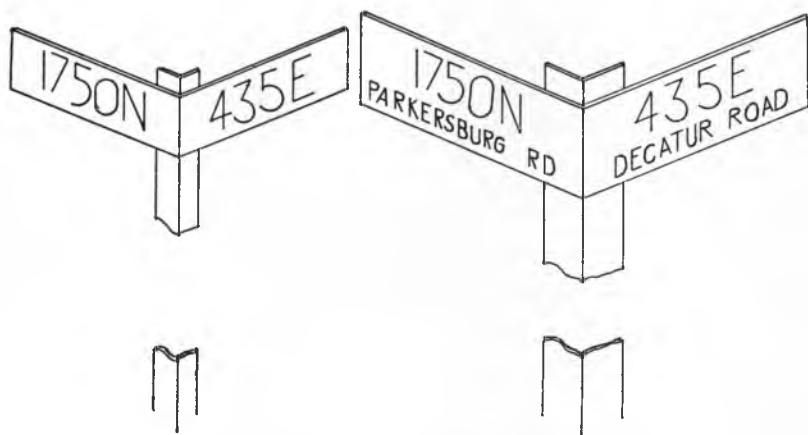


Fig. 3. Typical county road identification signs.

Local road names may be used, but all maps, road signs, and directories should utilize grid designations. It is obvious that if road names were eliminated, the cost of road signs and printing would be appreciably lower. In either case, the sign should conform with the approved practices.

SPECIAL "PROBLEM" ROADS

Diagonal, curving, and joggling roads present a problem because they change direction, and, thus it is difficult to assign a distance number or direction letter to all segments of the road. The following general principles should be used when applicable:

1. Roads with irregularities of less than one-tenth of a mile from the normal east-west or north-south location should carry the same number designation throughout, as illustrated by Roads 300 S, 200 N, and 125 S in Figure 2.
2. If an individual straight-line jog in an east-west or north-south road exceeds one-tenth of a mile, it should be considered as a separate road and assigned a number, as illustrated by Road 96 W, and by jogs 30 N, 75 N, and 270 E in Figure 2.

3. Loop roads formed by slight deviations due to topographical and cultural barriers should be considered as straight roads, as illustrated by the loop formed near the intersection of Road 250 N with Road 300 W in Figure 2.
4. Roads with irregularities, except for a single straight-line jog, exceeding one-tenth of a mile from the normal east-west or north-south location should be named, as illustrated by Peden Road, Loop Road, and Kline Road in Figure 2.

Where an east-west, north-south, or variable direction road coincides with a road in the State Highway system, the legend of the intersection sign should also include the number of the State Highway route.

Each county should number (and name when necessary) all roads within the county and the county line roads (and houses) on its south and west boundaries. Counties adjacent to Illinois, Michigan, and Ohio may assign the name State Line Road to boundary roads.

SIMILAR SYSTEM FOR HOUSE NUMBERS

House numbering is accomplished through application of the basic grid system used in road identification. Thus, the house numbering system gives the relative position of the rural residences to about the nearest one-hundredth of a mile from the section lines.

It must be remembered that the last two digits of a house number refers to hundredths of a mile in a section and that digits to the left represent section lines to the nearest whole mile. For example, the number 1225 E means that the house is about 12 and 25/100 miles east of the base line. In this example the direction letter designation in the house number, when combined with the direction letter designation in the road number, indicates the quadrant of the county in which the house is located.

Houses along east-west or north-south roads could be assigned true coordinate positions, but they would be easier found if numbered as follows:

1. Odd-hundredths (29, 201, 325) are assigned to houses on the North or East side of a road.
2. Even-hundredths (30, 202, 324) are assigned to houses on the South or West side of a road.

Examples 1-4 of Figure 2 illustrate the method of numbering houses on roads classified as east-west or north-south roads.

House numbers on diagonal, curving, and jogging roads follow the distance and position concept used in the location and numbering of roads, as illustrated in Figure 2. The rectangular coordinate system

is applied with equal facility to roads of variable direction. The application of this system, calibrated to the mile, tenth of a mile, and one-hundredth of a mile gives the distance and direction of a house relative to the base lines.

Example (5) of Figure 2 illustrates how a house at that position on Peden Road is assigned the number 21S 134W Peden Road. The 21S indicates that the dwelling unit is about 21/100 miles south of Division Road, and the 134W indicates that it is about 1 and 34/100 miles west of Meridian Road. Examples (6-12) also illustrate how houses on variable direction roads are assigned numbers by this method.

The assignment of odd or even numbers, as prescribed for numbering houses on east-west or north-south roads, is not practical. The true coordinates, however, give the position relative to the base lines and permits easy location.

AIRPHOTOS AID LOCATION

House numbering by the rectangular coordinate method becomes a relatively easy procedure where airphotos are available for the county. Transparent overlays of the proper grid system give an accurate location of each dwelling unit. In addition, the use of recent airphotos of proper scale gives an accurate presentation of all roads, houses, bridges, and other cultural information without laborious and costly field work and facilitates the development of current county highway maps.

Where a road of the State Highway system coincides with a road classified as an east-west or north-south road or as a variable direction road, it may be desirable to include the State Route number as a part of the rural address.

MINIMUM STANDARDS FOR ROAD SIGNS

Road signs should conform with standards suggested in the "Manual of Uniform Traffic Control Devices for Streets and Highways." The following minimum standards are suggested to provide for economy of design and for uniformity, legibility, and visibility of the signs:

Color and Visibility of Sign Black letters or numbers on a white background are recommended. The signs should be reflectorized, and at critical intersections they should also be illuminated.

Legend The letters or numerals of the primary legend (Road number or name, as illustrated in Figure 4) should be at least 4 inches high, while those of the secondary legend (supplementary

name) should be at least 2 inches high. The size, shape, and spacing of the letters and numerals should conform to the standards available from the Bureau of Public Roads.

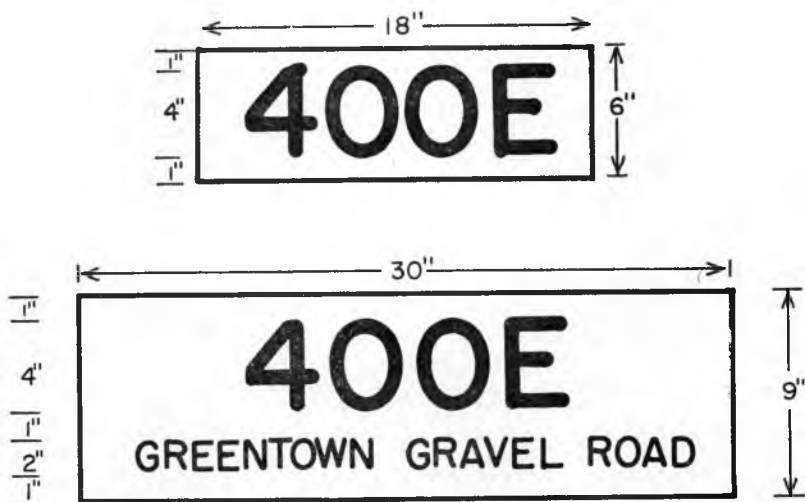


Fig. 4. Minimum and maximum sizes of local rural road signs.

Sign Plate Specifications A horizontal rectangle, with a minimum height of 6 inches, is required for signs limited to a primary legend. The height must be 9 inches when a secondary legend is used. The length may vary from 18 inches to 30 inches, depending upon the legend. Sheet iron or steel signs should be 18 gage or heavier, depending upon size and rigidity desired; other materials should have sufficient rigidity. Double-faced signs should be used.

Mounting Height Roadside conditions will, in general, have a significant effect upon the mounting height of the signs. The signs should be mounted on a fixed metal post. In rural areas the lower edge of the signs should be not less than 5 feet above the maintained edge of the road surface; in suburban or other areas under the jurisdiction of the counties, where obstructions may be caused by parking, a minimum elevation of 7 feet above the road or curb is required.

Sign Location For intersections with average daily traffic volumes in excess of 250 vehicles per day, signs should be placed on diagonally opposite corners so that they will be on the far right hand side of the intersection for traffic on the more im-

portant road. (See Figure 5.) Signs indicating both roads should be erected at each location. In general, they should be placed not less than six feet nor more than 10 feet from the maintained edge of the road, and should be placed as close to the corner as practicable, facing traffic on the cross road.

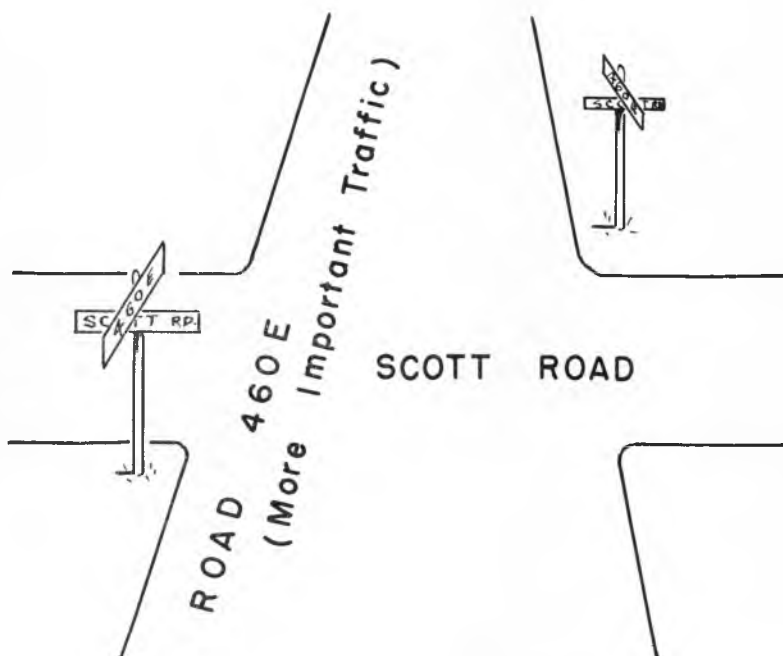


Fig. 5. Road identification signs at intersection where average daily traffic volume exceeds 250 vehicles per day.

At intersections with less than 250 vehicles per day, signs indicating both roads should be placed on the one corner with the greatest visibility.

A priority of erecting signs should be adopted by the county. It should be based upon those factors normally included in sufficiency rating procedures. Roads which perform the greatest community service should be marked prior to those of lesser importance.

FINANCING ROAD MARKING

The cost of adequate signs and road markings and of proper maintenance is estimated to be about one or two per cent of the annual county budget for highways. This financing may be accomplished by

county appropriation of funds, service club project, commercial development, or other methods.

Maps indicating county road markings and house numbers should be prepared in accordance with the established principles. It is reasonable to assume that directories of rural residents might serve a useful purpose and that the sale of maps and directories could aid in financing the project.

All records of operation, construction, and maintenance of county roads should be in accordance with the principles of road marking and house numbering. Accounting and cost control records that are easily applied to the county road or parts thereof are essential to adequate road planning and programming.

THE STATUS OF ROAD MARKING

The proposed system was presented at several district meetings of the Indiana Association of County Commissioners during June and September of 1953. In addition, discussions have been presented to about twenty group meetings in the state. About one-third of the counties have reported an active program of road marking. Some have adopted the system on principle; others have installed signs on their county roads.

The adoption and installation of a uniform rural road and house identification system will greatly facilitate the use of these roads for fire protection, law enforcement, medical and veterinary aid, delivery service, and the general development of rural communities. In addition, if this system is supplemented by proper accounting and control procedures the highway tax dollar will be spent in a more effective manner.