

A - 7 file

Research Project # 2

Bridge Numbering Study

(Set up before HRC)

HRC 2
~~HRC~~ BRIDGE NUMBERS

PROJECT COORDINATOR'S REPORT

OCTOBER 7, 1963

Mr. Hillis of the Sign Shop was contacted on October 7, concerning bridge sign installations. There have been 4 signs installed since last April. This was due to the overload created by the sudden addition and need for immediate signing of some 800 miles to the State Highway system.

Less than ten percent of the total number of bridges have been signed. To date, 810 signs have been installed of an original 8700 required. However, the 8700 total must be increased by the number required to sign the additional mileage transferred to the highway system.

Mr. Hillis said that they have resumed installation of bridge number signs after this five month delay.

by *W. P. Nelson*
William P. Nelson
Project Coordinator

HRC PROJECT 2, BRIDGE NUMBERING
PROJECT COORDINATOR'S VISIT - APRIL 30, 1963

Installation of the bridge numbers is proceeding satisfactorily. To date, 806 have been installed, which is almost 10 percent of the total signs which will be required to mark all bridges.

Distribution of the signs installed during April is not yet available, but at the end of March 586 signs had been installed on the following routes.

- Highway 70 - From Pulaski County to Memphis.
- Highway 67 - From Clark County to Missouri (except for Section 10 in Pulaski County).
- Highway 130 - From North Little Rock to Stuttgart.
- Highway 11 - From Stuttgart to Searcy.
- Highway 10 - In Pulaski County.
- Highway 9 - In Saline County.
- Highway 5 - From Little Rock to Hot Springs.

William P. Nelson
William P. Nelson
Project Coordinator

BRIDGE NUMBERING

Progress Report for Month of May

Mr. Hillis was contacted on June 6, 1963, concerning installation of bridge number signs during the month of May. Only a few were installed due to a full work load, and will be reported along with signs installed next month.

A meeting was scheduled for May 30 with Captain Brown, of the State Police, and about 30 troopers. This date was changed without notice. Captain Brown will be contacted about setting up another meeting. The purpose is to explain the bridge numbers and show the troopers how they can be used in accident reports and to suggest various uses for these established points of reference.

W. P. Nelson

W. P. Nelson
Research Coordinator

Subcommittee Report - HRC Project No. 2 - Bridge Number Study

Status of the Project as of March 1st, 1963

This project was conducted in two phases. The first of investigative phase was begun in April, 1962 and completed in January, 1963. A report on the findings and recommendations resulting the investigation entitled: "Research Project No. 2 - Bridge Numbers - Field Reference Points for the State Highway System", has been approved by the Highway Department and the Bureau of Public Roads subject to the condition that the bridge number signs be unreflectorized rather than reflectorized and that signs be installed only on the bridges.

Starting February 1, 1963, the Maintenance Division has begun executing phase II of the project, the installation of the signs. At present they have installed approximately 640 of the 8700 signs that will be required to complete phase II.

Expenditures to date have been:

Phase I (complete) - - - - \$1,979
Phase II (7% complete) - - \$561

FIELD REFERENCE NUMBERS
FOR
BRIDGE STRUCTURES

PREPARED BY
PLANNING AND RESEARCH DIVISION
ARKANSAS STATE HIGHWAY DEPARTMENT

REVIEWED AND APPROVED
BY
HIGHWAY RESEARCH COMMITTEE

MAY 1962

ARKANSAS STATE HIGHWAY DEPARTMENT
A STUDY OF METHODS TO LOCATE AND IDENTIFY FIELD REFERENCE
POINTS ON THE STATE HIGHWAY SYSTEM THROUGH THE
NUMBERING OF STATE HIGHWAY BRIDGES

I. Introduction:

One of the primary purposes of conducting the Highway Planning Survey Program, which is administered by the Planning and Research Division, is to provide an up-to-date inventory of all highway facilities in the State. A major element of the road inventory program is the method used to locate and identify individual segments of the road network, so that records pertaining to these individual segments can be properly kept. Since the beginning of the HPS Program, a route, section, log-mile system has been used to identify specific segments of or points on the statewide road network. These segments or points are shown on "route and section" maps prepared for the several individual roadway systems making up the statewide road network.

At the present time, the roadway segment or point location and identification system is only shown on these maps, and no route, section, log-mile reference points have been transferred to the field. This lack of ground reference points has hampered the road inventory program, because all inventory data come from field observations which have to be assigned to specific roadway routes and sections without knowing the exact, on-the-ground limits of the route segments. This has resulted in inaccurate data collecting and reporting and in difficulties in the keeping of accurate official records.

In addition to the needs of the road inventory program, there is the possibility of the creation of highway "control sections" to aid in the proper accounting of highway assets and expenditures. Currently, the route-and-section system is being used for this purpose; however, the Highway Department has not definitely established a policy in regard to fiscal "control sections." Since any method of identifying field reference points should preferably satisfy all needs the Highway Department may have for locating specific points on-the-ground; the establishment of "control sections" should be considered concurrently with the development of field reference points so that a system common to both purposes may be devised.

Proper field location of roadway segments could be accomplished by either marking the section boundaries and erecting intrasectional mile-posts or by locating fixed points within the section by their distance (log-mile) from the section terminus. The first method would necessitate the erection of more than 12,000 signs and mile-posts and would be very costly and difficult to properly maintain. However, the second system would utilize existing highway bridges as fixed points located and identified by the route, section, log-mile system, with a substantial saving in sign installation and maintenance costs since only approximately 8,700 signs and a limited number of posts would be required.

In addition to directly benefiting the Road Inventory part of the HPS Program, the establishment of known locations on the State Highway System through the identification of highway bridges by their route-section and log-mile could be used by Highway Department personnel in performance of many routine duties; such as reporting maintenance activity, locating and directing work parties, keeping bridge records, "tying down" field surveys, and maintaining fiscal control. The general public could use the numbering system as general reference points for many diverse purposes. Police officers could use the system to locate vehicle accidents, for reporting the accident, directing emergency vehicles, and for law enforcement functions. And, most importantly, the field reference points could be used in conjunction with the Highway Department-Civil Defense radio network to route traffic, control road repairs, or benefit the public safety during time of emergency.

There are now 4,349 bridges (structures 20 or more feet in length) on the Primary and Secondary State Highway System, or an average of one bridge every 2.57 miles, that could serve as known field reference points.

II. Scope of Study:

In consideration of these benefits, it is deemed desirable that the Planning and Research Division of the Arkansas State Highway Department undertake a study to determine the most feasible numbering system that would enable the bridges to be identified; locate definite field reference points; and denote route, section, log-mile, and "control sections"; then investigate methods of placing these numbers on all bridges on the State Highway System. The study would include investigation and determination of:

- A. The legend to be used to identify the bridge.
- B. The size, style, and color of the digits and letters comprising the legend.
- C. The methods to be used to affix the sign to the bridge structure.
- D. The most desirable place on the various types of bridge superstructures to affix the sign.
- E. A suggested plan of operation for installing the identification number on all bridge structures.
- F. The cost of installing and maintaining a bridge number system.

The total scope of this project also includes the actual installation on the bridges of the adopted method of identifying specific bridges in the field; however, this, the investigative phase, does not include sign installation within its scope. A final decision on installation will be made primarily on the basis of the findings of the investigative phase.

III. Method of Study:

Resolution of the above problems, which is the purpose of this

study, will be based mainly on three broad sources of data: (1) research of existing highway department files pertaining to highway route-and-section data; (2) inquiry, by questionnaire, of public officials who would use field reference points; and (3) field tests of various sign designs and attaching methods. The collection and analysis of the data will be performed in a series of steps as follows --

- A. The first step in the study will be to examine present highway department road inventory files to reveal information on the current route-section, log-mile system of identifying bridges and segments of the highway network. Information will be gathered particularly to show the number of route-sections, the distribution of route-section lengths, the number of highway bridges, the distribution of bridge lengths, and other data that would be indicative of the effectiveness of the route, section, log-mile system as a method of identifying field reference points and "control sections."
- B. The next step will be to determine the possible uses of a bridge numbering system by submitting questionnaires to Highway Department and State Police personnel who will use the numbering system to indicate the requirements they will place on the system. A minimum of 30 questionnaires will be completed and analyzed. These questionnaires will be filled in by personnel assigned to this research project in a personal interview with the selected highway and police personnel. A sample of this questionnaire is shown in the appendix.
- C. Then the procedure will be to examine the efforts of other state highway departments in the area of field reference points, the signing of such points, and the use of "control sections", by questionnaires and by library study of published reports. A sample of the questionnaire which will be mailed to the highway planning survey engineer of each state highway department is shown in the appendix.
- D. Following that, the course will be to compositely analyze all of the data collected under the first three steps, to establish criteria to govern the uses of the bridge numbering system and the design of the sign placed on the individual bridges.
- E. Next in order will be to design at least five different styles and sizes of signs in accordance with the criteria resulting from the last step. These signs will represent the most feasible types to be considered in detail.
- F. We will then examine and describe the various different types of bridge superstructures to determine methods of affixing the bridge identification signs on the structure. Bridge Design Division personnel, and office records and field observations will be used to reveal data on the various types of bridge superstructures now on the highway system, and road inventory personnel and records will be reviewed to select samples of each type and locate and inspect them in the field.

G. Lastly, samples of each type of sign selected under step E will be prepared and installed on representative samples of the various types of bridge superstructures determined in step F, to field test the sign design, sign legend, and method of attaching the sign to the bridge. The most feasible sign and method of attachment will be selected on the basis of sign readability, clearness of legend, cost of sign, and cost of attaching the sign to the bridge.

Handwritten initials and scribbles

IV. Project Personnel:

The investigative phases of this research project will be conducted by personnel now assigned to the Planning and Research Division of the Highway Department. The fabricating of the bridge number signs and the attaching of the signs to the structure would be performed by personnel now assigned to the Maintenance Division of the Highway Department.

V. Published Reports:

A final report on the investigative phase of this project will be prepared and submitted to the Highway Research Advisory Committee for approval. This report will set out the study procedures, data collected, data analysis, conclusions, and recommendations in accordance with the foregoing work plan. Conclusions relative to the most feasible sign design, the best methods of attaching the recommended sign to the bridge superstructure, and the cost of installing the bridge numbering sign system on all bridges on the State Highway System. Alternate methods and costs will be presented where appropriate. Sufficient details of sign designs and attachment methods will be included to enable the sign shop to fabricate the recommended type of sign and the Maintenance Division personnel to install the sign.

VI. Time and Cost Estimates:

It is estimated that the investigative phase of the project will take two calendar months.

It is further estimated that the total project cost would be as follows:

Investigative Phase	=	\$ 2,000
Installation Phase	=	20,000
Total Project Cost	=	\$22,000

VII. Source of Funds:

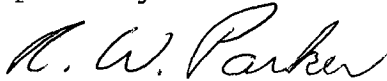
This project would be part of the State's HPS program; thus, financial support would come from both State Highway Department and Bureau of Public Roads funds as follows:

State Funds	=	\$ 6,167
Federal Funds	=	15,833
Total	=	\$22,000

VIII. Authority:

This working plan has been prepared and submitted to the Highway Research Advisory Committee under the general authority extended to the Engineer of Planning and Research of the Arkansas State Highway Department to engage in highway research activities that serve the interest of the Highway Department.

Prepared by:



R. W. Parker, Research Engineer

Recommended Approval:



J. R. Henderson, Engineer of Planning and Research

State: _____

Organization: _____

Position: _____

Name: _____ Date: _____

1. Does your State now have a system of established field highway reference points? yes _____; no _____

2. What was the primary reason for establishing the reference point system?

3. Is this system used to establish fiscal "control-sections"? yes _____; no _____ If not, how are fiscal "control-sections" established? _____

4. What method is used to establish the points? Mile Posts _____; bridge numbering _____; other (please describe) _____

5. What system is used to locate highway reference points:
Log-mile from statewide zero mile point _____; log-mile from route-section zero mile point _____; log-mile from county zero-mile point _____; other (please describe) _____

6. How are the points identified in the field: Posts _____; signs _____; painted on structure _____; painted on pavement _____; other (please describe) _____

7. Please describe a typical point identification marker. _____

8. Any general comments you may care to make: _____

The Highway Department is investigating the possibility of establishing on-the-ground reference points on the State Highway System by placing a sign or marker on each State Highway Bridge denoting the highway route numbers, the highway route section, and the log-mile from the section terminus. Your answers to the following questions will help insure that the most feasible numbering system is adopted.

Organization: _____

Position: _____

Duty (Job Description): _____

How would you use a system of locating and identifying reference points on the State Highway System in performance of your duty? _____

How would the fact that State Highway Bridges (structures longer than 20 feet) would serve as reference points affect your use of the reference point system?

What special consideration should be given in the design and placement of the bridge signs to enable you to make use of the bridge as a reference point?

1. Legend of sign _____

2. Location of sign _____

3. Color of sign _____

4. Size of sign _____

a. Minimum desirable speed of vehicle at which sign can be easily read. _____

b. Minimum desirable distance at which sign can be easily read. _____

5. Would reference point be used during night hours? _____

General Comments: _____

Questions answered by: _____

Answers recorded by: _____

Date _____

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

August 31, 1966

Mr. Gordon F. Turner
Stanley Sound
915 West 23rd Street
North Little Rock, Arkansas

Re: Highway Bridge Numbers

Dear Mr. Turner:

Your request for information concerning the highway bridge numbers has been referred to this office. Our Research Section was responsible for the signs being posted and the information shown on them. We were therefore considered the appropriate source for the information you requested.

Enclosed are a short narrative concerning the signs, instructions for determining a location by using these signs, and a photograph of a sample sign. The sign indicates Route 270, Section 13, city route at log-mile 16.48. The plus (+) symbol shows that travel is in the direction of increasing mileage.

If any other information or explanation concerning these signs is desired, we will try to furnish it.

Yours very truly,

Walter E. Hicks
Director of Highways

J. R. Henderson, Engineer
Planning and Research

BGK/ebg
Enclosures

A - File

HRC - 2

Bridge Numbering Project

INTER OFFICE MEMORANDUM

DATE May 7, 1965

TO: Mr. Van Campbell, Traffic Services Division
FROM: Bob Kessinger, P & R Project Coordinator
SUBJECT: Bridge Numbering Project, HRC-2.

Attached is a copy of my record of bridges not numbered. Some of the ones listed may have been signed but not included in the listing made up by the sign shop. Others are probably 22 foot RCB's which you did not sign. You can check my record against yours to see why these were not signed.

In some instances more signs have been charged to a section than there are bridges. Listed are the ones I have in my records.

BGK:mb
Att.

Route & Section	County	Bridges	Signs Changed	Date
139-S-3	Clay	2	4	10-25-63
			4	10-8-64
220-S-1	Crawford	2	8	10-23-64
64-S-2	Crawford	21	18	10-11-63
			20	11-16-64
			CR. 9	3-12-65
139-S-2	Greene	4	8	10-8-64
			2	10-25-63
355-S-1	Howard	4	8	4-3-64
			CR. 4	4-13-64
67-S-19	Lawrence	3	6	3-28-63
			6	11-6-63
32-S-3	Little River	1	4	4-3-64
237-S-1	Miller	6	16	4-3-64
			CR. 12	4-27-65
1-S-6	Monroe	4	8	4-13-64
			CR. 4	4-20-64
			CR. 4	4-27-65
5-S-16	Stone	6	16	10-11-64
170-S-1	Washington	2	2	2-20-63
			4	2-19-65
67-S-12	White	10	22	3-28-63
80-S-2	Yell	9	18	3-26-65
			CR. 8	4-27-65

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

Research

COPY

April 14, 1965

Mr. V. E. Harvey
Division Engineer
Bureau of Public Roads
3128 Federal Office Building
Little Rock, Arkansas

Dear Mr. Harvey:

This is to advise that the "Bridge Numbers" project has been completed in accordance with your letter of January 8, 1963.

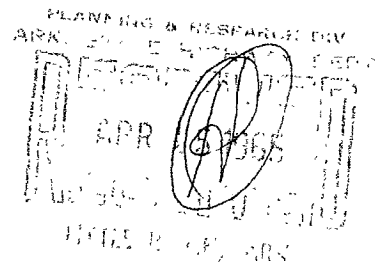
Yours truly,

Mack Sturgis
Director of Highways

By *Otha Hewitt*
Otha Hewitt, Chief
Traffic Services Division

OH:bjs

cc Planning and Research
Mr. Wm. L. Moore
Mr. R. B. Winfrey



REGION SIX

ARKANSAS
LOUISIANA
OKLAHOMA
TEXAS

①

P4R

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
3128 Federal Office Building
Little Rock, Arkansas

March 10, 1965

IN REPLY REFER TO:
NPR Research - Arkansas
Field Bridge Numbering Project

Mr. Mack Sturgis
Director of Highways
State Highway Department
Little Rock, Arkansas

Dear Mr. Sturgis:

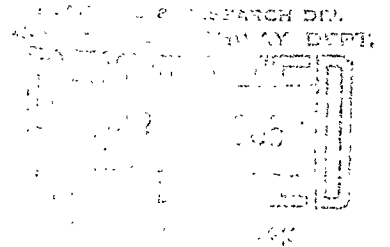
With the preparation of the NPR work program for fiscal year 1966 about to get underway, we have been reviewing certain records and progress reports for the projects contained in the present program.

Our review points out that on the subject project, sign erection started in March 1963, two years ago. Of the approximately 9700 signs to be erected 7800 are now in place.

It would seem desirable that an effort be made to install the remaining signs prior to July 1, 1965, so that this same item would not appear on the next work program. We will appreciate your efforts in gaining completion of this work.

Sincerely yours,

V. E. Harvey
Division Engineer



cy - Asst Chief Engr

- RR (201) ✓

- 309.42/A

1 - cy 1/2 Traffic Services

1 ✓ ✓ Research

RECEIVED

MAR 11 1965

OFFICE ENGINEER
ARKANSAS STATE HIGHWAY DEPT.

INTER OFFICE MEMORANDUM

Research Sec
G

DATE May 5, 1964

TO: Mr. Otha Hewitt, Chief, Traffic Services Div.

FROM: J. R. Henderson, Engineer of Planning and Research

SUBJECT: Installation of Bridge Numbers

Attached is a copy from the Bureau of Public Roads of a letter dated April 23, 1964, on the subject of "Improvement of high-accident locations . . .". This correspondence was initiated by a letter from President Lyndon Johnson to the Secretary of Commerce, dated March 23, 1964, and the Bureau seems quite anxious that the State take all steps possible toward eliminating spot locations with a high-accident rate.

As you know, we receive our accident reports on rural state highways from the reports prepared by the State Police Department. In order for this office to determine exactly where an accident occurred along a section of highway, it needs to be referenced to the log-mile where it happened. The erection of the bridge number signs on all routes and sections will enable the State Police to tie in the exact location of accidents. During the last few months, we have had a lot of difficulty with their reports, because they make no reference to any log-mile point on the accident report. As soon as these markers are installed over the State, we intend to have a school with the State Police to teach them how to use these signs in reporting accidents.

Attached hereto is the latest report I have on the installation of the bridge markers; which was dated April the 8th and shows approximately 36% of the signs have been installed. In connection with this work, I am well aware of the following points:

First, so far as your operations are concerned, this has to be a 'fill-in' job, because your primary function is marking, signing, and then maintaining of these items;

Second, there is presently in effect a "freeze" on ordering materials that are not absolutely essential to day-to-day operations. We assume that this slowdown in ordering materials will be lifted as of July the 1st.

With these two restrictions on the installation of bridge markers fully in mind, we will appreciate your fullest cooperation in the erection of as many of the bridge marker signs as time and materials will permit, because we feel that the State Police cannot give us correct information on accident locations until these log-mile markers are all in place.

JRH:bw
att. (2)
cc: Research Section

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

x
7

February 18, 1964

Mr. Al Rose, Editor
The Camden News
Camden, Arkansas

Dear Al:

The following may be of interest to motorists traveling the State Highways.

The Highway Department has installed small signs as shown in the attached picture, at all bridges in the State, and that are of value to Highway employees working along the road and could be of value to motorists traveling the highways. It is noted in the picture, the first numeral is 7, then 4, then 7.91. The meaning of the numbers indicate Highway 7, Section 4, and 7.91 miles from a beginning point. Odd numbered highways are north and south routes and even numbered highways are east and west routes. These highway route numbers are shown on the State Highway Maps, and for Highway Department records are broken into sections, and the sections extend numerically and in order from south to north and from west to east. For example, the above Highway 7, Section 1 begins at the Louisiana Line, and extends to the intersection with Hwy. 167 south of El Dorado. Section 2 begins at Hwy. 82 and extends to the Ouachita County Line. Section 3 extends from Ouachita County Line to the intersection with Hwy. 79 at Van Buren and Madison Avenue in Camden. Hwy. 7 ends here and begins again where it leaves Hwy. 79 north of the Ouachita River. Hwy. 7, Section 4 begins at this point and extends to the Dallas County Line and increases numerically northward to the Missouri Line.

The above picture was taken at Freco Bridge on Hwy. 7, Section 4, and the large numeral 7.91 shows that the bridge is 7.91 miles north from its beginning at the junction with Hwy. 79. In using this information as one travels over the State and observing these signs and the numerals, the first number is the highway number, the second is the section number and the bottom figure is the distance south or west from either the last intersection of this highway and another highway or from a County Line. Thus, in observing mileages along routes by noting the bottom numerals one can determine the remaining distance to be traveled, from the total distance shown on the highway maps. For example, in the above picture at Freco Creek Bridge on Hwy. 7, the distance from the bridge is 7.91 miles to the junction with Hwy. 79 at the Ouachita River Bridge. The highway map shows Amy to be eleven miles from the Junction. It is then indicated that the distance from Freco Bridge to Amy is 3.09 miles.

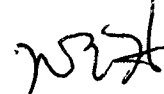
Copy to Cooper
Hewitt

Research
G

It must be remembered that the mileages in nearly all cases increase from south to north and from west to east, and the sections change at all county lines and at many intersections with other highways and the mileage at these points changes to zero. The use of the signs is of value in establishing one's location along the road. If the traveler desires to give a location along the road, he may give the route and section number and the mileage as shown on the plates at the bridge ends, then the mile number. The last figure would locate him on the road. Hwy. 7 section number changes at the Ouachita - Dallas County Line and the section number changes from Section 4 to Section 5 and the mileage starts again with zero.

Another use for the mileage plates is in checking the speedometer mileage between the mileage plates. An average speedometer will read between 3% and 4% above the actual mileage. These distances are obtained from readings of calibrated odometers.

Yours very truly,



W. E. Hicks
District Engineer

WEH/ac

cc: Mr. J. R. Henderson ✓



Gross &

SEP 23 1963

STATE HIGHWAY ENGINEER
D. C. GREER

COMMISSION
HERBERT C. PETRY, JR., CHAIRMAN
HAL WOODWARD
J. H. KULTGEN

TEXAS HIGHWAY DEPARTMENT

AUSTIN 14, TEXAS

September 20, 1963

IN REPLY REFER TO
FILE NO. D-18

Mr. J. R. Henderson, Engineer
Planning and Research
Arkansas Highway Department
Highway Building
Little Rock, Arkansas

Subject: "Bridge Numbers - Field Reference Points"

Dear Mr. Henderson:

We have received your letter of June 4, 1963, with the copy of the report "Bridge Numbers - Field Reference Points for the State Highway System" attached.

In looking over the report, the system you have designed should be very adequate for setting permanent reference markers.

We appreciate the copy of your report for our use.

Sincerely yours

D. C. Greer
State Highway Engineer

J. A. Waller mcs
J. A. Waller, Chief Engineer
of Maintenance Operations

EMS:smf

Handwritten initials

NEW MEXICO
STATE HIGHWAY COMMISSION

Parker

COMMISSION

JOHN F. SUDDERTH, CHAIRMAN, HOBBS
L. E. MURRAY, VICE CHAIRMAN, FARMINGTON
DR. JOHN Q. THAXTON, SECRETARY, RATON
FRANK TATSCH, MEMBER, SILVER CITY
WAYNE COLLINS, MEMBER, SANTA FE



T. B. WHITE
CHIEF HIGHWAY ENGINEER

I - Arkansas

P. O. BOX 1641
SANTA FE, NEW MEXICO

June 26, 1963

Mr. J. R. Henderson, Engineer
Planning and Research
Arkansas Highway Department
Little Rock, Arkansas

Dear Mr. Henderson:

Thank you for the copy of "Bridge Numbers - Field Reference Points".
We are pleased to have this information for study and reference.

Although we initiated a control section numbering system some years ago, there has been much discussion but no positive action toward establishing a consistent overall field reference system. The advantages of field reference points are most obvious, but the difficulties of establishing and maintaining a statewide system have not been satisfactorily resolved. Your publication provides an interesting and promising approach to these problems. We would be pleased to be advised of your findings with regard to longitudinal and transverse point location on the Interstate System. //

Very truly yours,

T. B. WHITE
Chief Highway Engineer

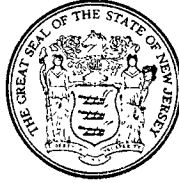
By

H. S. Wiley
H. S. Wiley
Planning Director

HSW:AWS:dp

(Handwritten initials)

7-1-63



IN REPLY PLEASE REFER TO

Bridges

WRS:S

State of New Jersey
STATE HIGHWAY DEPARTMENT
DWIGHT R. G. PALMER, COMMISSIONER
TRENTON 25

June 21, 1963

Mr. J. R. Henderson, Engineer
Planning and Research
State Highway Department
Little Rock, Arkansas

Dear Mr. Henderson:

Reference is made to your letter of June 4, 1963 and to your report on "Bridge Numbers - Field Reference Points for the State Highway System."

A review of the manual leaves the impression that you have developed a very good method of numbering and locating major bridge structures.

This Bureau is now completing the project of assigning control section numbers to the entire State Highway System. Maps and descriptions are now in the final stage of preparation.

Your Bridge Numbering Manual will be kept in our file for future reference. Should it be decided that the bridges on the State Highway System be assigned identification numbers, your system will serve as an excellent guide. The feasibility of such a system and the question as to whether or not it would serve the best interests of our Department would be determined by a study of the problem when the Control Sections are complete.

Very truly yours,

STATE HIGHWAY DEPARTMENT

Keith Rosser
Supervising Engineer
Bureau of Planning and Traffic

PLANNING & RESEARCH DIV.
STATE HIGHWAY DEPT.
JUN 21 1963
LITTLE ROCK, ARK.



Parker



STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
MONTPELIER
Highway Planning Division

June 21, 1963

Mr. J. R. Henderson, Engineer
Planning and Research
State of Arkansas Highway Dept.
Highway Building
Little Rock, Arkansas

Dear Mr. Henderson:

We have received your very interesting and timely report on "Bridge Numbers-Field Reference Points for the State Highway System," and wish to congratulate you on the research of this problem.

We are considering the use of such bridge numbers and I am sure your report will be of great interest and assistance in determining the method of procedure.

Very truly yours,

A handwritten signature in cursive script, appearing to read "H. F. Farrington".

H. F. Farrington
Highway Planning Engineer

HFF:jrf



J. C. WOMACK
STATE HIGHWAY ENGINEER

EDMUND G. BROWN
GOVERNOR OF CALIFORNIA

Parker
John Erreca
DIRECTOR

STATE OF CALIFORNIA
Department of Public Works

SACRAMENTO

June 20, 1963

DIVISION OF HIGHWAYS
PUBLIC WORKS BUILDING
P. O. Box 1499
SACRAMENTO 7

PLEASE REFER TO
FILE No.

Mr. J. R. Henderson, Engineer
Planning and Research
Arkansas Highway Department
Highway Building
Little Rock, Arkansas

Dear Mr. Henderson:

Thank you for your report on "Bridge Numbers--
Field Reference Points for the State Highway System."

We believe your system has considerable merit,
though the feature requiring a re-designation due to
realignment mileage changes could prove troublesome.

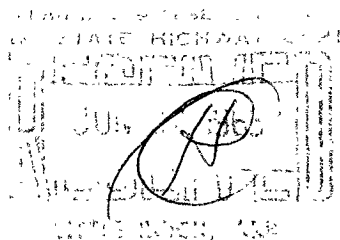
Though we have no field reference point system
yet operative, we have been utilizing a post mile designation,
similar in origin to the one you employ, but unchanging so
long as a particular ground point remains on the road system.
We must admit, however, that its use has involved data
processing problems which we hope to reduce with increasing
experience. We would be very interested in your own
experience with the system you are putting into effect.

Sincerely,

J. C. WOMACK
State Highway Engineer

By

C. G. Beer
C. G. Beer
Urban Planner





~~XXXXXXXXXXXX~~
GOVERNOR
JAMES A. RHODES

STATE OF OHIO

Department of Highways

COLUMBUS 15

Parker

~~XXXXXXXXXXXX~~
DIRECTOR
P. E. MASHETER

June 17, 1963

Mr. J. R. Henderson, Engineer
Planning and Research
Arkansas State Highway Department
Highway Building
Little Rock, Arkansas

Dear Mr. Henderson:

Receipt is acknowledged of your letter and report pertaining to bridge numbers and field reference points.

The procedure outlined in the report seems adequate and should prove useful to many agencies within the department.

Ohio plans to identify structures on the Interstate system in the same manner as other state routes.

Thank you for the report.

Very truly yours,

F. J. Murray

F. J. Murray, Engineer
Bureau of Planning Survey

[Handwritten initials]

FRED L. HENLEY, *Chairman*
P.O. Drawer 970
Caruthersville

HENRY D. BRADLEY, *Vice Chairman*
c/o News-Press and Gazette
St. Joseph

A. D. SAPPINGTON, *Member*
MFA Insurance Building
Columbia

ROY E. MAYES, SR., *Member*
P.O. Box 718
Carthage

T. R. BEVERIDGE, *Ex-Officio*
Rolla

MISSOURI

STATE HIGHWAY COMMISSION



JEFFERSON CITY, MISSOURI

June 17, 1963

Yorker
M. J. SNIDER, *Chief Engineer*
Jefferson City

R. A. CURRIE, *Ass't Chief Eng.*
Jefferson City

DEAN WILSON, *Ass't. to the Chief Eng.*
Jefferson City

LEO F. BECKETT, *Ass't to the Chief Eng.*
Jefferson City

ROBERT L. HYDER, *Chief Counsel*
Jefferson City

MRS. IRENE WOLLENBERG, *Secretary*
Jefferson City

HIGHWAY PLANNING: Report - "Bridge Numbers - Field Reference
Points for the State Highway System"

Mr. J. R. Henderson
Engineer of Planning and Research
Arkansas State Highway Department
Highway Building
Little Rock, Arkansas

Dear Mr. Henderson:

This is to acknowledge receipt of your letter of June 4, 1963, transmitting a copy of your report "Bridge Numbers - Field Reference Points for the State Highway System". This is an interesting report and it appears that you have a practical and useful method for the establishment of a field reference point system.

In regard to the development of a reference point system for locating points both longitudinally and transversely on Interstate highways, we do not have a system at this time nor is it contemplated for the near future.

Very truly yours,

James R. Turner
James R. Turner
Highway Planning Engineer

AF

COMMONWEALTH OF VIRGINIA

Research

H. H. HARRIS, COMMISSIONER
W. RANDELL CHILTON, LANCASTER, VA.
S. S. FLYTHE, MARTINSVILLE, VA.
R. S. HOLLAND, VIRGINIA BEACH, VA.
GEORGE C. LANDRITH, ALEXANDRIA, VA.
BURGESS E. NELSON, MT. JACKSON, VA.
W. M. SCLATER, JR., MARION, VA.
TUCKER C. WATKINS, JR., SOUTH BOSTON, VA.
R. S. WEAVER, JR., VICTORIA, VA.



DEPARTMENT OF HIGHWAYS
RICHMOND 19, VA.

F. A. DAVIS
DEPUTY COMMISSIONER & CHIEF ENGINEER
D. B. FUGATE, ASSISTANT CHIEF ENGINEER
D. N. HUDDLE, ASSISTANT CHIEF ENGINEER
GEO. D. FELIX, RIGHT OF WAY ENGINEER
A. B. EURE, FISCAL DIRECTOR
T. ASHBY NEWBY, PURCHASING AGENT
CHARLES NELSON, DIRECTOR OF PERSONNEL

June 14, 1963

IN REPLY PLEASE REFER TO

**Planning
Interstate System**

Mr. J. R. Henderson
Engineer, Planning and Research
State of Arkansas Highway Department
Highway Building
Little Rock, Ark.

Dear Mr. Henderson:

Thanks a million for your letter of June 4, 1963 attaching a copy of your recent project "Bridge Numbers-Field Reference Points for the State Highway System."

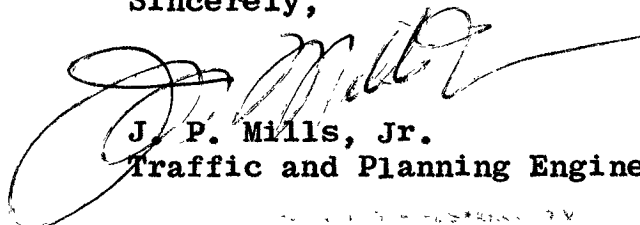
The report appears to be the result of a most comprehensive study and congratulation for doing a good job.

Our program as to point location on the Interstate System is not even in the talking stage. We will not do anything about it until at least one route is completed in its entirety.

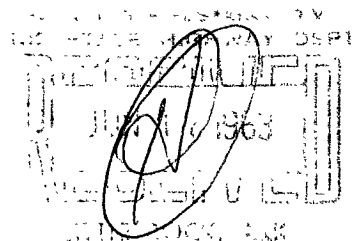
Nearly all accidents on the Interstate are occurring at interchanges and for this reason, we are furnishing detailed type sketches of different interchanges to our State Police for their use in identifying locations.

Thanks again and whenever we can be of service, be sure to call on us.

Sincerely,


J. P. Mills, Jr.
Traffic and Planning Engineer

JPM:TR
CC: Mr. D. N. Huddle
Mr. K. M. Wilkinson



State



of Arkansas
HIGHWAY DEPARTMENT

HIGHWAY BUILDING



LITTLE ROCK

Enclosed is a copy of our report on "Bridge Numbers-Field Reference Points for the State Highway System." This report is partially based on data received from your Highway Department in answer to a questionnaire sent out last May.

The signs recommended in the report are now being installed by our Traffic Services Division, and we have received some reports on their usefulness to our field personnel. Statewide news releases have explained the bridge signs to the general public, and meetings are being scheduled with the State Police to promote the use of the field reference points in accident reporting.

Data received from the individual state highway departments in answer to our questionnaire reveals, as you may expect, that almost all states have some method of identifying points on their highway systems; however, the systems used vary widely in form if not in purpose. We found that only a few states had developed a bridge numbering system and none had used bridges as part of a field reference point system. In fact, less than 45% of the states have installed any type of field markers for reference points.

With approximately 10% of the signs installed, we have found the unit cost to be about \$0.85 per sign, not including the cost of installation. This amounts to \$1.70 per bridge, or a total cost of \$7,395 to sign all State Highway bridges with a 12" x 12", non-reflectorized sign on an aluminum blank. It is estimated that the signs will last at least five years.

To complete our field reference point system, we are now developing a method of locating points, both longitudinally and transversely, on Interstate-type highways. Since the Interstate Highway System is nationally oriented, we believe that the method we develop to locate points along the centerline and on the cross-section of these highways

REGION SIX

ARKANSAS
LOUISIANA
OKLAHOMA
TEXAS

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
3128 Federal Office Building
Little Rock, Arkansas

March 11, 1963

IN REPLY REFER TO:
Arkansas HPR Research
Bridge Numbering Project

Mr. F. R. Oliver
Director of Highways
State Highway Department
Little Rock, Arkansas

Dear Mr. Oliver:

Your letter of March 5, 1963, outlined the procedures to be followed in making changes to HPR-1(1) for the manufacture of bridge signs in connection with the bridge numbering project. Under these procedures the sign shop will maintain the basic documents to support the unit cost of the signs. The Division of Planning and Research will make changes to the current work program after the signs are installed.

The procedures as outlined are considered satisfactory.

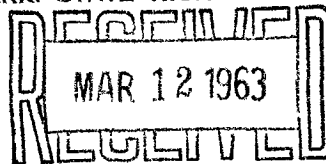
Sincerely yours,

V. E. HARVEY

V. E. Harvey
Division Engineer

2CY PANDR

PLANNING & RESEARCH DIV.
ARK. STATE HIGHWAY DEPT.



LITTLE ROCK, ARK.

RECEIVED

MAR 12 1963

OFFICE ENGINEER
ARKANSAS STATE HIGHWAY DEPARTMENT

Parker

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

March 5, 1963

Mr. V. E. Harvey
Division Engineer
Bureau of Public Roads
Little Rock, Arkansas

Arkansas HPR - Research
Bridge Numbering Project

Dear Mr. Harvey:

This is to advise you that the Department accepts the Bridge Numbering Project under the ruling made and with the stipulations contained in your letter of January 8, 1963.

We are now submitting for your approval the following procedure for charging the manufacture of the signs to funds under agreement in Job Number E426 of HPR-1(1):

1. The signs will be manufactured in the Highway Department Sign Shop upon the request of either the Traffic Services Division or the District in which the signs are to be installed.
2. The Sign Shop will determine the actual cost of each group of signs manufactured and will maintain documents to support the unit cost figure.
3. The Planning and Research Division will maintain records showing the number of signs installed on each route and section.
4. The Planning and Research Division will request reimbursement periodically on the basis of the records mentioned in items 2 and 3, above.

Very truly yours,

F. R. Oliver, Director

RWP:bw
cc: Office Engineer

J. R. Henderson, Engineer
Planning and Research

INTER OFFICE MEMORANDUM

February 12, 1963

DATE

TO: Mr. R. B. Winfrey, Engineer of Maintenance
FROM: J. R. Henderson, Engineer of Planning and Research
SUBJECT: Bridge Numbering Project

We supplied you a copy of the Bureau letter of January 31, 1963, advising that only the manufacture of the bridge numbering signs would be reimbursable from Federal funds and that no assistance could be given in the cost of erecting the signs on the bridges.

We trust that you will now see fit to go ahead with the manufacture of the signs and, as schedules permit, erect these at bridge ends. However, we do not propose that the erection be considered as a major project that must be completed in the immediate future. It is our thought that this work might be handled at less cost through the Districts as a part of their regular maintenance operations than through assigning the work to a special sign crew. The installation work does not have any completion date, and we do not feel that maintenance money which might be needed more urgently for other work should be expended for this.

Submitted herewith for the use of the Sign Shop in manufacturing the markers is one copy of the State Highway Bridge Log by route and section, dated January 1, 1962. This information is being updated, and a new IBM listing should be ready within two to three weeks. We would be glad to supply each District with their portion of this log if you desire. At the present time, the Sign Shop may proceed in making the bridge markers in accordance with numbers shown in the book, EXCEPT for the route sections listed on the attached sheet.

As soon as the new Bridge Log is available, this office will be glad to work closely with the Sign Shop to be sure that bridge numbers are correct within the limits of jobs that are under construction. Please advise us when you authorize the Sign Shop to begin work on manufacturing the markers.

This office will also assist the Sign Shop in preparing the cost data in form acceptable to the Bureau.

JRH:bw
cc: Mr. Ward Goodman
Mr. R. W. Parker

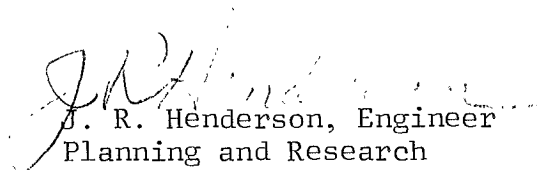
att.

must also be nationally acceptable. As far as we can determine, only one other state, Michigan, is giving consideration to point location on Interstate-type highways. We would appreciate receiving your comments on this.

Thank you again for complying with the questionnaire, and we hope the enclosed report will be of interest to you.

Yours truly,

Ward Goodman
Deputy Director and Chief Engineer
(Acting Director)


J. R. Henderson, Engineer
Planning and Research

RWP:bw
encl.

**ROUTE SECTIONS WHERE BRIDGE NUMBERS BEING REVISED -
Do Not Make Markers for These Until New IBM
List is Available**

Route	Section	Route	Section
1	4 - 5 - 7	74	3
4	2 - 3	79	10
5	11	82	6
7	5	88	3
8	14	106	1
9	3	114	ALL
12	3	115	3
20	ALL	117	1
21	1 - 3	129	2
24	1	148	2
25	3 - 6 - 9	166	1
36	1	167	1
39	9	217	1
41	3	219	1
42	1 - 3	228	1
53	3	238	1
62	8 Spur	267	1
64	17	270	2
67	10	355	5
70	5		

ARKANSAS
LOUISIANA
OKLAHOMA
TEXASU. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
3128 Federal Office Building
Little Rock, Arkansas

January 31, 1963

IN REPLY REFER TO
Arkansas HPR - Research
Bridge Numbering ProjectMr. F. R. Oliver
Director of Highways
State Highway Department
Little Rock, Arkansas

Dear Mr. Oliver:

Your letter of January 22, 1963, states that our conditions of approval dated January 8 for the research project "Bridge Numbers - Field Reference Points" are acceptable with the exception of stipulation No. 3. This stipulation being that the cost of installing the signs, which is a labor charge, will be absorbed by the section of the Highway Department which installs the signs as recommended in the report. We have again reviewed the background of the project as well as the report itself, and we feel that the conditions of approval are warranted.

You will recall our discussions during the early stages of the development of the study that the project was considered to be less in scope than would normally be expected for research studies. However, the study was considered a satisfactory tool for acquainting the newly formed research section and the contemplated research committee with the administration procedures involved. It was also thought that cost of the actual installation of the signs would be borne by the Highway Department. This thought is borne out in your report on pages 1, 16, and 21.

Your letter indicates that we may have misled you in our April 24, 1962, correspondence, particularly through condition No. 4 which has to do with subsequent maintenance. That same correspondence pointed out that the final report of the investigative phase of the study would be submitted for review and approval prior to fabricating and installing the signs. Our review of the report raises some questions because of the spacing of the mileage markers. The recommendations contained in the report would result in markers spaced at a maximum of six miles, which is so great that their utility for accident or other traffic control studies would be negligible.

R. W. Venter

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

January 22, 1963

Mr. John W. Courter
Division Engineer
Bureau of Public Roads
Little Rock, Arkansas

Arkansas HPR - Research
Bridge Numbering Project

Dear Mr. Courter:

Reference is made to your letter of January 8, 1963, approving the above research project, subject to five stipulations.

Conditions 1, 2, 4, and 5 are acceptable; however, we feel that reflectorization of the signs is justified because they will be useful to a wide group of motorists and the State Police during night hours. Deletion of reflectorization from the signs will substantially reduce the cost of manufacture as shown by the following figures:

	No. Bridges	Signs per Bridge	Unit Cost	Amount
1.	4,350	2	\$2.19	\$19,053
2.	4,350	2	1.40	<u>12,180</u>
			Saving	\$ 6,873

In regard to stipulation 3 which states the labor charge for installation is to be absorbed by the State, we refer to your letter of April 24, 1962, which approved the research project. Condition 4 states that "Assuming that the investigative phase justifies the installation of the signs, subsequent maintenance of such markers and the installation of additional markers would be the responsibility of the State Highway Department." In line with this statement, the Department has assumed that upon approval of the research work, the entire cost of manufacture and installation would be a reimbursable item in the 1963 HPR Work Program. The investigative report did not include the cost of installation because at that time we did not know whether the implementation of the project would be approved. The Maintenance Division of the Highway Department has now advised that the work can be done by the regular sign crews at a cost of \$1.25 per marker. This would include labor, equipment rental, and per diem for sustenance where such is allowed the sign crews. Based on this estimate, the installation phase of the work

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

Bureau of Public Roads

would be as follows:

4,350 x 2.50 = \$10,875.00.

In summary, the entire project cost would be \$13,058.00.

The Maintenance Division advises that by distributing the installation work over a period of 18 months and by using regular sign crews it would be possible to hold the cost of installation down to the figure quoted above.

Since from previous correspondence on this project, your office gave no indication that installation of the markers would be nonparticipating in Federal funds, and since installation will add an extra burden of cost to our sign program, we hereby request that both manufacture and installation of the markers be approved as participating items of the 1963 HFR Work Program.

Very truly yours,

F. R. Oliver, Director

J. R. Henderson, Engineer
Planning and Research

JRH:bw

cc: Mr. E. F. Nelson, Office Engineer
Mr. R. B. Winfrey, Maintenance Engineer
R. W. Parker

REGION SIX

ARKANSAS
LOUISIANA
OKLAHOMA
TEXAS

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
3128 Federal Office Building
Little Rock, Arkansas

January 8, 1963

IN REPLY REFER TO

Arkansas HPR - Research
Bridge Numbering Project

Mr. F. R. Oliver
Director of Highways
State Highway Department
Little Rock, Arkansas

Dear Mr. Oliver:

We have reviewed the report "Bridge Numbers - Field Reference Points" submitted with your letter of November 6, 1962. The report constitutes satisfactory completion of the investigation phase of the study.

Approval is now given for the fabrication and installation of the bridge signs as a participating item in the 1963 HPR work program subject to the following stipulations.

1. The bridge number signs will be 12 x 12 inches, non-reflectORIZED, black lettering on white background, and with a black border. There appears to be no justification for the reflectORIZATION of the signs since their purpose is mainly for use of personnel who will know the location of the signs.
- ✓ 2. The bridge number signs will be attached to existing flash-board posts at bridge ends of all bridges on the State Highway System (excluding the Interstate System).
- ✓ 3. The cost of installing the signs, which is a labor charge, will be absorbed by the section of the Highway Department which installs the signs as recommended in the report.
- ✓ 4. Subsequent maintenance of the signs and installation of additional bridge signs will be the responsibility of the State Highway Department.

2000

10/11/63

7

3. The fabrication and installation of additional reference markers to be placed in long gaps between bridges are not approved as a participating item in this research project. It is our opinion that the recommended spacing of the mileage markers is such that their usefulness for planning and research purposes would be slight.

Sincerely yours,

John W. Courter
Division Engineer

PTC
RECEIVED
1963
DIVISION ENGINEER

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

November 6, 1967

Mr. John W. Courter
Division Engineer
Bureau of Public Roads
Little Rock, Arkansas

re: BRIDGE NUMBERS

Dear Mr. Courter:

We are submitting, herewith, three copies of the report
BRIDGE NUMBERS - FIELD REFERENCE POINTS.

Although this study was started before the Highway Research
Committee was formed and was not done under their supervision, the
Committee reviewed and approved this report at the Committee
meeting October 19, 1967.

You will recall that the initial approval of this project
by the Bureau of Public Roads was qualified by the requirement
that the investigative phase be approved prior to installation
of the signs.

The enclosed report completes the investigative phase, and
we are now requesting that approval be given to install the signs
under our 1963 HRS program.

Very truly yours,

F. R. Oliver, Director

J. R. Henderson, Engineer
Planning and Research

encl.

WPN:mb

cc: Office Engineer

INTER OFFICE MEMORANDUM

Mulvan

DATE June 11, 1962

TO: Mr. Otha Hewitt, Supervisor of Traffic Services
 FROM: J. R. Henderson, Engineer of Planning and Research
 SUBJECT: Bridge Numbering Study -- HPS Project E-426

For use in the above study, we request that the sign shop make up four signs, on aluminum, similar to the sample signs.

We also request the following:

1. That the legend shown below be black numbers on a white background. The sign legend is:

270-13C
16.48
2. That the first sign should use "C" series lettering, two-inch size for the top line and three-inch size for the lower line.
3. That the second sign should use "D" series lettering, two-inch size for the top line and three-inch size for the lower line.
4. That these two signs be duplicated with black letters on a reflectorized white background.
5. That room be left for a border and separator line; but do not apply them.
6. That holes be punched, for mounting on posts, at top and bottom in center of each sign.

This may be charged to the Planning and Research Division, Project E-426.

WPN:bw
 cc: Mr. R. B. Winfrey

INTER OFFICE MEMORANDUM

DATE

Mr. Parker
May 31, 1962

TO: Mr. Ward Goodnan, Chief Engineer
FROM: J. R. Henderson, Engineer of Planning and Research
SUBJECT: Research Project No. 2 -- Field Reference Points

You are perhaps aware that the Bureau of Public Roads has approved a request for a research project entitled "A Proposal to Locate and Identify Field Reference Points on the State Highway System through the Numbering of State Highway Bridges." The cost of this work is estimated at \$22,000, including the installation of the approved bridge markers. This research work will be carried on in cooperation with the Maintenance Division. An outline of the work has been prepared, and we propose to assign Bill Nelson as Project Coordinator on this work effective June 1.

This project was presented to the Highway Research Committee last Thursday and accepted as Research Project No. 2. The work outline will be presented to Committee members and the project reviewed by the Committee both while in progress and upon completion of the work. The funds for this research work are included in the current HPS budget.

JRH:bw

cc: Mr. R. B. Winfrey
Mr. R. W. Parker

INTER OFFICE MEMORANDUM

DATE May 18, 1962

TO: Mr. Otis Hewitt, Supervisor of Traffic Services

FROM: J. R. Henderson, Engineer of Planning and Research

SUBJECT: Bridge Numbering Study - I-75 Project E-410

For use in the above study, we request that the sign shop make a case containing signs on white hardboard so we may be able to evaluate different sign designs for the bridge numbers.

We request the following:

1. That the legend shown below be executed in black on white hardboard. You can put them all on one large sheet of hardboard or on numbered strips. The sign legend is:

E-75 - 130
10.00

2. There are four for each of the following letter sizes:

- a. 1 inch - 'C'
- b. 2 inch - 'C'
- c. 3 inch - 'D'
- d. 4 inch - 'C'
- e. 5 inch - 'D'
- f. 6 inch - 'D'

This may be changed to the Planning and Research Division, Project E-410.

TH:ED

cc: Mr. J. R. Henderson

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

P. Oliver

May 15, 1962

Mr. Owen Payne, Jr., Director
Arkansas State Civil Defense
Conway, Arkansas

Dear Mr. Payne:

The Highway Department is studying the possibility of establishing a system of highway field reference points, or a method of locating on the ground specific points, that can be shown on maps of the State Highway System. We presently are contemplating numbering and signing each bridge, which would give us more than 4,300 reference points -- or one point for every 2.57 miles of highway.

It is likely that these reference points could be of great value in case of civil emergency, particularly since the Highway Department now has a statewide radio network. Thus, we would like to find out from you how Civil Defense could benefit from a bridge numbering system.

Would you please complete the attached questionnaire and return it to us as soon as possible. Please feel free to make any comments you may desire as the questionnaire will be considered only as a source of information and will be combined with similar questionnaires completed by other agencies.

Thank you for your cooperation.

Very truly yours,

F. R. Oliver, Director

J. R. Henderson, Engineer
Planning and Research

RWP:bw
att.

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

Mr. Parker

May 2, 1962

Mr. John W. Courter
Division Engineer
Bureau of Public Roads
Little Rock, Arkansas

re: Arkansas HPS Research,
Field Reference Points - E426

Dear Mr. Courter:

This will acknowledge your letter of April 24, 1962, approving the subject project as an item in the current HPS program, subject to the conditions outlined in your letter. This is to advise that work has started on this project with the preparation of a detailed procedural outline, an informational copy of which will be submitted at an early date. This research work has been assigned a P&R job number of E426 as a means of identifying and collecting costs.

Very truly yours,

F. R. Oliver, Director

J. R. Henderson, Engineer
Planning and Research

JRH:bw

cc: Office Engineer

R. W. Parker

INTER OFFICE MEMORANDUM

DATE **May 18, 1962**

Parker

TO: **Mr. Otha Hewitt, Supervisor of Traffic Services**

FROM: **J. R. Henderson, Engineer of Planning and Research**

SUBJECT: **Bridge Numbering Study - NPS Project E-426**

For use in the above study, we request that the sign shop make up some tentative signs on white cardboard so we may be able to evaluate different sign designs for the bridge numbers.

We request the following:

1. That the legend shown below be screened in black on white cardboard. You can put them all on one large sheet of cardboard or on cardboard strips. The sign legend is:

270 - 13C
16.48

2. Make one set for each of the following letter sizes:

- a. 1 inch - "C"
- b. 2 inch - "C"
- c. 2 inch - "P"
- d. 3 inch - "C"
- e. 3 inch - "P"
- f. 4 inch - "P"

This may be charged to the Planning and Research Division, Project E-426.

RWP:mb

cc: Mr. Winfrey

HIGHWAY RESEARCH BOARD

Parker

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL
DIVISION OF ENGINEERING AND INDUSTRIAL RESEARCH

2101 Constitution Avenue

Washington 25, D. C.

EXecutive 3-8100

April 10, 1962

Mr. J. R. Henderson, Engineer
Planning and Research
State of Arkansas Highway Department
Highway Building
Little Rock, Arkansas

Dear Mr. Henderson:

Your letter of April 2, to Mr. Burggraf inquiring about the identification of bridges as field reference points has been referred to me for reply.

I understand that the Oklahoma Department of Highways has had some experience with this but I am not aware of any others. I would assume that you could use the method of establishing control points as a pattern for identification of bridges. As you know, control points are used in road life and other aspects of road study. Although bridges seldom delimit sections of roads, yet I can see their value for use in accident analysis and various localized analyses of road and road user.

Yours very truly,

M. Earl Campbell

M. Earl Campbell
Acting Assistant Director

MEC/mt

[Faint circular stamp with a signature inside]

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

Parker

April 2, 1962

Mr. Fred Burggraf
Director
Highway Research Board
2101 Constitution Avenue
Washington 25, D.C.

Dear Mr. Burggraf:

The Arkansas State Highway Department is making a study of the possibility of establishing field reference points on the State Highway System by numbering and identifying bridges in accordance with our route, section, log-mile system.

Part of our investigation involves study of other highway agencies' efforts in this area. In line with this, we would appreciate receiving any information the Highway Research Board may have on:

1. The use of highway field reference points.
2. The methods used to establish the points.
3. The methods used to identify and locate the points.

We would appreciate a reply as soon as possible since the preliminary stages of this study are already underway.

Very truly yours,

F. R. Oliver, Director

J. R. Henderson, Engineer
Planning and Research

RWP:bw

ARKANSAS STATE HIGHWAY DEPARTMENT
LITTLE ROCK, ARKANSAS

COPY

Parker

March 28, 1962

Mr. John W. Courter
Division Engineer
Bureau of Public Roads
Little Rock, Arkansas

Dear Mr. Courter:

Attached, is a copy of a research proposal entitled "A Proposal to Locate and Identify Field Reference Points on the State Highway System Through the Numbering of State Highway Bridges".

We request that this be included as a participating project in our 1962 NPS Program as NPS 1(20)E-426.

Very truly yours,

F. R. Oliver, Director

J. R. Henderson, Engineer
Planning and Research

RWF:mb

cc: Mr. Winfrey, Maintenance Engineer
Office Engineer

INTER OFFICE MEMORANDUM


DATE February 26, 1962

TO: Mr. J. R. Henderson, Engineer of Planning and Research
FROM: R. W. Parker, Head of Research Section *RWP*
SUBJECT: Research Project - Bridge Numbering System

At present the more than 4,400 bridges (structures longer than 20 feet) on the State Highway System are not numbered in a systematic way. This makes it difficult to locate and identify specific bridges. A logical system of numbering bridges would be useful in many ways, for example:

1. The Bridge Design Division needs to locate and identify bridges both before and after the bridge plans are developed.
2. The Maintenance Division can use a bridge numbering system in both routine highway maintenance as well as bridge maintenance activities.
3. The Planning and Research Division needs a numbering system to keep records on bridges as part of the road inventory work, as a means of accurately locating traffic accidents, and to reference traffic counts, speed checks, etc.
4. All Divisions of the Highway Department could use properly numbered bridges as reference points in the performance of their routine operations.
5. The State Police, and other outside agencies could beneficially use a bridge numbering system as a means of locating specific points on the highways.
6. The general public could similarly use such a numbering system.

Research into this project would be needed to answer several questions so that a usable and economical numbering could be developed. The more apparent questions are:

1. What criteria would be used to determine the most logical numbering system?
 2. Would all bridges, structures longer than 20 ft., be numbered by one system or would sub-systems be necessary?
 3. What information would the numbering system, itself, include?
 4. How would these numbers be placed on the bridge?
- 

INTER OFFICE MEMORANDUM

DATE February 26, 1962

TO:

FROM:

SUBJECT: (2)

The research project could include an investigation of the major uses of a numbering system, the information to be included in the number (meaning of the number), the location of the number on the various types of bridge structures, and the method of placing the number on the bridge.

This would be a short term, inexpensive, project.

I recommend that a proposal be prepared for this project and submitted to the Bureau for approval.

RWP:mb

HRC - 2

B-File

BRIDGE NUMBERS
ON ARKANSAS HIGHWAYS

Small signs, 12"x12", have been placed on all bridges 20 feet or more in length which are a part of the State Highway System, with the exception of those on Interstate Highways. These signs are used by the Highway Department and the State Police. Other organizations and individuals can use these signs once they become familiar with the legend.

To understand these signs and to use them effectively, it is necessary to know something about the State Highway System. Every road which is a part of the System has a highway number. These numbers are shown on signs along each route. They are recognized by the general public and are used rather extensively by those who are less familiar with the locality.

A further breakdown of these routes into sections has been made to facilitate inventorying, maintenance, and reporting information. These are known within the Department as maintenance sections. They are of various lengths and are numbered from west to east or from south to north, with a few exceptions. Thus, any location on the System is designated by two numbers -- route and section. The termini of these sections are usually at county lines and major highway intersections.

In addition to this, each section has been measured to the nearest one-hundredeth of a mile. The process of measuring each section is referred to as "logging" the road, and the measurement at any point is the "log-mile". The mileages of separate sections are used for inventorying the highway system and for computing mileages between points for maps.

At the time a road is logged, all important features are measured also; i.e., highway intersections, railroad crossings, city limits, bridges, etc. From these logs, the bridge locations can be determined.

With this brief review of the way the bridges are logged, the signs can now be explained. The numbers on the tops of the signs show the route and section numbers. These may be either U.S. Highway or State Highway route numbers. They will correspond to the informational route signs along the highway.

If the person observing the bridge signs is traveling in the same direction the highway was logged, there will be a plus (+) symbol in the center of the sign. If the direction of travel is opposite to the logged direction, nothing will be shown in the center of the sign.

The number on the bottom half of the sign indicates the log-mile, or mileage from the beginning of the section. Upon close inspection, a decimal point is evident in this number. This number, like the route and section number, is the same at each end of the structure.

Bridge number signs are simple and easily used once the principal and method of determination are understood. A different reference method will be used along all Interstate Routes in the State when they are completed.

HRC-2 Bridge Numbering Project
Progress Report
June 15, 1964

The Traffic Services Division has continued installation of the bridge numbering signs as rapidly as their work load permits. During the month of April 1,144 signs were installed. Part of these were in the northeast part of the state. Some were in the southwest and a few were installed in the central part.

In May 444 signs were installed. These signs were all in District No. 10. As of June 1 a total of 5,059 signs had been installed. This is approximately 52.3% of the total number of signs.

Bob Kessinger

Bob Kessinger
Project Coordinator

HRC 2 - Bridge Numbering
Progress Report
April 8, 1964

During the month of February the sign crew installed 1,173 signs. In March the number installed was 616. This makes a total of 3,471 signs installed. To date approximately 35.9 percent of the total (9,678) signs have been installed.

The odd sign shown installed in February was used on the Arkansas side of the Greenville Bridge.



Bob Kessinger
Project Coordinator

HRC 2 - Bridge Numbering Project
Progress Report
February 10, 1964

During December only 28 signs were installed. In January, 672 signs were installed in 31 different counties. A total of 1,682 signs have been installed as of February 1, 1964. This is approximately 17.4 percent of the total number (9,678) of signs required.

Bob Kessinger

Bob Kessinger
Project Coordinator

HRC 2 BRIDGE NUMBERS
PROJECT COORDINATOR'S REPORT

December 6, 1963

No report was made for October. The report from the sign shop shows that 52 signs were installed during the month of October.

In November 120 signs were installed in ten counties. The total number of signs in place December 1, 1963 was 982. This is approximately 10.2 percent of the total number to be installed.

The addition of the 800-odd miles of roads to the highway system increased the number of bridges to be signed to 4,839 (Sept. 1, 1963). However, this number will continue to change as new bridges are built and old bridges are, in many cases, removed or are replaced by culverts and R. C. pipe.

by *Bob G. Kessinger*
Bob G. Kessinger

PRELIMINARY RESEARCH PROPOSAL FORM

Prepared by: R. W. Parker, P&R Div. Date 2-27-62

Title: "A Study of Bridge Numbering Systems"

Suggested by: _____

Project Statement: At present, the more than 4400 bridges (structures longer than 20 feet) on the State Highway System are not numbered. It is difficult to locate and identify specific bridges. A logical system of numbering would be useful to the Highway Department, the State Police, and the general public.

Scope (Area of Study): This project would investigate methods used by other highway agencies to number bridges and would gather and analyze data to lead to the development of logical numbering criteria, the structures to be numbered, information to be included in the system, and how these numbers would be placed on the bridges.

Methods: Previous research on this subject would be studied. The major users of the numbers would be polled as to their needs, and types of bridge designs would be studied in the office and field. Trials of the most likely systems and methods of placing the numbers would be field tested.

Objectives (how results are to be used): Recommendations would be made to the Highway Department concerning a system of bridge number and a method of placing the numbers on the bridges. This would result in positive identification of individual structures and allow it to be used as a field reference point as well as aiding in the keeping of records pertaining to it.

Estimated Cost \$500 ~~Number of persons: 1 full & 1 part~~

Date of Initiation as soon as feasible Time Required 2^{calendar} months

Agencies to conduct study: P & R Division of the Highway Department

Urgency of project: No special priority is requested.

Action taken by Research Council:

ARKANSAS STATE HIGHWAY DEPARTMENT

A PROPOSAL TO LOCATE AND IDENTIFY FIELD REFERENCE POINTS ON THE STATE HIGHWAY SYSTEM THROUGH THE NUMBERING OF STATE HIGHWAY BRIDGES

I. Introduction:

One of the primary purposes of conducting the Highway Planning Survey Program, which is administered by the Planning and Research Division, is to provide an up-to-date inventory of all highway facilities in the State. A major elements of the road inventory program is the method used to locate and indentify individual segments of the road network so that records pertaining to these individual segments can be properly kept. Since the beginning of the HPS Program, a route, section, log-mile system has been used to identify specific segments of or points on the statewide road network. These segments or points are shown on "route and section" maps prepared for the several individual roadway systems making up the statewide road network.

At the present time, the roadway segment or point location and identification system is only shown on these maps, and no route, section, log-mile reference points have been transferred to the field. This lack of ground reference points has hampered the road inventory program, because all inventory data come from field observations which have to be assigned to specific roadway routes and sections without knowing the exact, on-the-ground limits of the route segments. This has resulted in inaccurate data collecting and reporting and in difficulties in the keeping of accurate official records.

Proper field location of roadway segments could be accomplished by either marking the section boundaries and erecting intrasectional mile-posts or by locating fixed points within the section by their distance (log-mile) from the section terminus. The first method would necessitate the erection of a great many signs and mile-posts and would be very costly and difficult to properly maintain. However, the second system would utilize existing highway bridges as fixed points located and identified by the route, section, log-mile system, with a substantial saving in sign installation and maintenance costs.

There are now 4,349 bridges on the Primary and Secondary State Highway System, or an average of one bridge every 2.57 miles, that could serve as known field reference points.

In addition to directly benefiting the Road Inventory part of the HPS Program, the establishment of known locations on the State Highway System through the identification of highway bridges by their route-section and log-mile could be used by Highway Department personnel, in performance of many routine duties, by the general public, as a way of locating known points on the highways, and by the Arkansas State Police in accident reporting and law enforcement functions. And most importantly, the identification and location of field reference points on the State Highway System, when used in conjunction with the Highway Department-Civil Defense radio network, would be of great public benefit during time of emergency.

In consideration of these benefits, it is proposed that the Planning and Research Division of the Arkansas State Highway Department undertake a study to determine the best method of placing route, section, and log-mile identification numbers on all bridges (structures 20 feet or more in length) on the State Highway System. The study would include investigation and determination of:

- A. The size, style, and color of the digits comprising the number.
- B. The methods to be used to affix the numbers to the bridge structure.
- C. The most desirable location on the various types of bridge structures where the numbers are to be attached.
- D. A suggested plan of operation for installing the identification number on all bridge structures.
- E. The cost of installing and maintaining a bridge number system.

This scope of the project would also include the actual installation on the bridges of the adopted method of identifying specific bridges in the field.

II. Methods of Study:

The first step in the study would be to investigate in depth the possible uses of a bridge numbering system by submitting questionnaires to Highway Department and State Police personnel who would use the number to determine the requirements they would place on a bridge number system.

The second step would be to examine the efforts of other state highway departments in bridge numbering, by questionnaire and by library study of published reports. Information would be collected to reveal methods of placing the numbers on the bridges and the design of the bridge number signs.

The third step would be to analyze the collected data to establish criteria governing the usage of the number and the design of the sign.

The fourth step would be to design several different styles and sizes of signs in accordance with the above criteria, to select the most desirable.

The fifth step would be to investigate the several different types of bridge superstructures to determine methods to be used to affix the bridge numbers to the structure.

The sixth step would be to actually place the most feasible sign types on several different types of bridge superstructures to field test the sign design and the methods of placing the number on the bridge.

The seventh, and final, step would be to initiate a program of affixing the bridge numbers on all highway bridges on the State Highway System.

III. Published Reports:

A final report would be prepared, setting out the study procedures, data, analysis, conclusions, and recommendations. This report would present conclusions pertaining to the most desirable sign design and the most feasible method of attaching the recommended sign to the bridge structure. Sufficient detail would be shown to enable the sign shop to fabricate the signs and the maintenance personnel to install the sign on the bridges.

IV. Project Personnel:

It is proposed that the investigative phases of this research project be conducted by personnel now assigned to the Planning and Research Division of the Highway Department. The fabricating of the bridge number signs and the attaching of the signs to the structure would be performed by personnel now assigned to the Maintenance Division of the Highway Department.

V. Time and Cost Estimates:

It is estimated that the investigative phase of the project would take two calendar months; and the installation phase eight calendar months, for a total project time of ten calendar months.

It is further estimated that the total project cost would be as follows:

Investigative Phase	=	\$2,000
Installation Phase	=	20,000
Total Project Cost	=	\$22,000

VI. Source of Funds:

This project would be part of the State's HPS program; thus, financial support would come from both State Highway Department and Bureau of Public Roads funds as follows:

State Funds	=	\$ 6,167
Federal Funds	=	15,833
Total	=	\$22,000