REPORT ON UNIFORM MAP SYMBOLS

PART I - PROGRESS REPORT

PART II - FINAL REPORT

Submitted by the Subcommittee on Uniform
Map Symbols of the Committee
on Highway Planning
(Formerly Committee on Factual Surveys)

Approved and
authorized to be printed as a Report
by the Executive Committee at their
meeting on December 7, 1962 in
Bal Harbour (Miami Beach) Florida

Published by the
American Association of State Highway Officials
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Factual Surveys Committee
(Now Highway Planning Committee)

Subcommittee on
Uniform Map Symbols

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REPORT ON UNIFORM MAP SYMBOLS
PART I

I. SUMMARY

This is a progress report, submitted by the Subcommittee on Uniform Map Symbols in partial fulfillment of the assignment given it by the Chairman of the Factual Surveys Committee at the Annual Convention of the American Association of State Highway Officials in Boston during October 1959.

During the year 1960, the Planning Engineers of nearly every State were given a major responsibility for the task of compiling the 104(b)5 Study concerning the cost of completing the Interstate Highway System. With this main preoccupation in an enormously extensive, yet detailed, study there was not an adequate opportunity to devote sufficient effort to complete the assignment of the Subcommittee.

In furtherance of its study the Subcommittee prepared and circulated a questionnaire to the States, dealing with their practices in drafting and publishing their State highway maps. A specimen of the questionnaire and a summary of the responses are found as an appendix to this report.

One meeting of the Subcommittee was held during October 1960 at the offices of the State Highway Department at Santa Fe, New Mexico, all members of the Subcommittee attending. At this meeting the Subcommittee was greatly assisted by the advice and experience of Mr. Thomas Kennedy of the Division of Highway Planning, Bureau of Public Roads, Washington, D. C. In the Subcommittee's view the major problem concerning symbolization involved the representation of road symbols and attention was concentrated on this specific aspect of the assignment. Other symbols, such as those generally depicting other cultural features were decided to be both less vital and less controversial and as such were not given consideration at the meeting.

It is the recommendation of the Subcommittee that the current progress report, with its respresentations for road symbols, be circulated among all of the States, either by official action of the Executive Committee of AASHO, or less formally under the auspices of the Factual Surveys Committee, for the guidance of the future work of the Subcommittee on Uniform Map Symbols. The Subcommittee is convinced that if general acceptance can be obtained for the road symbols and concepts contained in this report, the remainder of the completion of its assignment will be relatively simple. If such general agreement on road symbols and concepts cannot be reached among the States, then the Subcommittee believes that it should be discharged from its assignment and a new Subcommittee constituted.

II. HISTORICAL BACKGROUND

In 1926 the American Association of State Highway Officials authorized the Executive Committee to adopt a suitable highway legend to be recommended for use by all of the State Highway Departments and Travel Map makers. The legend to show, in a uniform manner, the suitability for travel not only of the U.S. numbered routes but also of State routes.

The following action was taken as a result of that early recognition of the fact that a uniform legend would be needed to facilitate interstate and intercontinental travel.

RESOLUTION NO. 6

WHEREAS, the American Association of State Highway Officials is interested in and concerned with the safety and instrumental in the standardization of highway signs and markings and has endorsed and encouraged to a certain degree a practice of uniformity in all traffic facilities which would be of importance or concern to motorists; and

WHEREAS this practice of uniformity has greatly contributed to the safety and welfare of motorists in that confusion has been reduced to a minimum by ease in identification of standard signs and markings encountered in various States; and

WHEREAS, such uniformity in the techniques employed in reflecting symbols and nomenclature on highway travel maps issued for the information and guidance of motorists would also reduce confusion and contribute to the welfare of motorists; and

WHEREAS, the cartographic procedures and the variety of symbols used for indicating travel guidance and information on highway travel maps create confusion and frequently result in the inability of motorists to fully comprehend the information shown on highway travel maps:

NOW THEREFORE BE IT RESOLVED, that the Western Association of State Highway Officials by this resolution petitions the American Association of State Highway Officials through proper committees to conduct a study of the various official state highway travel maps and invite major cartographic firms to join the association in establishing and recommending a standard set of symbols and a uniform practice of cartography in producing state highway travel maps.

At the June 27, 1956 meeting of the AASHO Executive Committee in Kansas City, Missouri, President Rex M. Whitton, presented this resolution for consideration, and on the motion of Mr. Greer it was adopted. President Whitton instructed Executive Secretary Johnson to assign the uniform map symbols proposal to the Committee on Factual Surveys for study and reporting.

Study of the matter was undertaken by the Factual Surveys Committee at the AASHO convention held in Atlantic City, late in the fall of 1956. It was again a topic on the agenda of that Committee at the annual convention in Chicago during 1957. At the 1958 convention in San Francisco, the Chairman of the Factual Surveys Committee presented a list of symbols, asking that they be adopted by the Committee so that they could be offered to the Executive Committee of AASHO for final adoption by the States.

At the 1959 convention in Boston it appeared that the list of symbols adopted by the Committee at San Francisco in 1958 had not been sufficiently acceptable among the States and the Committee was asked to make a further study of the matter. Accordingly the Chairman of the Committee, Mr. Wm. E. Willey of Arizona, appointed a new Subcommittee on Uniform Map symbols with the responsibility of restudying the matter and submitting , report at the 1960 convention in Detroit. This paper is offered in partial fulfillment of that assignment.

III. THE PROBLEM

The Subcommittee recognized at the outset, that if uniformity in tourist maps is to be attained, the State highway departments would need to submerge their preoccupations with administrative and financial systems and begin to think in terms of functional highway systems as does the tourist. Under the necessity for communication in a common language it appeared more feasible for the highway administrator to speak in the idiom of the tourist, than to compel the tourist to learn the 50 dialects of speech which the various State highway departments use in discussing the complexities of their several road systems.

Such a term as the word "primary road", which may mean one thing to the tourist who is mainly concerned with reaching his desired destination, may have many other connotations to the highway administrator who is thinking in terms of legal authority and financial responsibility. The meaning of the term "primary road" may be quite different in adjoining States and have a bewildering variety of connotations in all of the 50 States.

A good deal of the time of the Subcommittee was devoted to definitions of highway functional systems in such words as could be adopted among the five States represented at the conference table, and as appeared to be understandable among the other 45 highway departments not represented. These definitions are given in a latter section of the report and are most earnestly recommended for adoption even though a certain degree of independent judgment will

be required to accommodate them to the administrative and financing circumstances in many of the States.

Beyond this strategic issue of devising a common definition to apply to a common system of symbols, there are other minor obstacles to the attainment of uniform symbolization. None of these is an absolute or decisive barrier to uniformity but some will determine the extent to which conformance may be achieved with any nationwide standard.

a. Some States do their own map drafting, other States have the drafting done by commercial firms.
b. Some States print their maps in four colors, others use as many as eight colors.
c. There is visibly a great range in the delicacy of drafting and in the sophistication with which the techniques of color printing are employed among the State drafted maps.
d. Some States do the lithography within the State organization others have commercial lithographers do the work.
e. Some States are comparatively sparsely settled and have fewer space problems than others which are highly congested.
f. Some States are comparatively small in area, permitting them to use larger scales than other larger States which are restricted to practicable sheet sizes.
g. Some States desire to use the map as a vehicle to emphasize tourism, while others prefer to devote the map entirely

In addition to these variations it must be considered that uniform map symbolization can hardly be said to have been attained unless the oil company maps would conform to the same system. Oil Company maps, drafted by a few commercial mapping firms probably exceed the circulation of state-published maps by more than 10 times. Furthermore, by reason of their convenient distribution, free of charge at service stations, their use by tourists can be expected to be much more prevalent than the ratio of the number distributed would lead one to believe.

IV. THE OBJECTIVE

If the difficulties represented among the practice of 50 States and a number of commercial drafting firms are to be surmounted, and standardization of map symbols attained, it is necessary that the objectives of standardization be given most careful consideration.

1. STANDARDIZATION SHOULD BE A LONG TERM OBJECTIVE: It does not appear practicable to expect that once a standard symbolization is adopted, every existing base map should be destroyed and a new one drawn. Instead, standardization should be thought of as something to be achieved gradually in some respects as maps are revised annually, and totally whenever in the future, it becomes necessary to redraft the map base. Without standardiza-

tion as a long term objective, there will never be uniformity. With standardization as a long term objective, uniformity can be achieved in steps over a period of years.

As each State looks at its own base map it sees a drawing representing many man-months of effort and many thousands of dollars in cost These base maps have ordinarily had useful lives of upwards of 10 years. No one wishes to think of redrawing the base simply to achieve the abstract quality of uniformity. However, under ordinary circumstances, some few of the 50 States will be redrawing their bases this year, and some others next year. These States have a right to expect that some generally acceptable system of standard symbols should be available for their use. New systems of highways, new concepts of the quality of service coming with the emergence of the Interstate System, are leading many states to plan upon an early redrafting of their bases to reflect these new means in transportation. The Subcommittee is also aware of a similar desire among the commerical drafting firms to revise the oil company maps to show the development of a controlled access road network which is being sought by ever greater streams of tourist travel.

It appears, then, that the present and the immediate future, is a particularly advantageous time for the Amercan Association of State Highway Officials to promulgate a system of uniform map symbols to take a giant step forward toward achieving the ultimate goal of Nationwide standardization.

2. STANDARDIZATION WILL NEVER BE ABSOLUTE: There are a number of reasons why standardization will never be absolute in the sense that the rendering of symbols will be identical among all of the 50 States. Aside from the inevitable difference in drafting techniques, which will leave its recognizable hallmark of individuality on every map, the differences of density of cultural development and the physical geography of each State will operate to prevent the attainment of absolute standardization.

Therefore it must be conceded that, whatever array of symbols is adopted, each State will have to work toward their adoption as well as their cartographic skills, their cultural developments and their characteristic geographical features will permit.

V. CARTOGRAPHIC FIRMS

In line with the directions contained in the Resolution establishing the work of the Subcommittee, major cartographic firms were invited to join with the Subcommittee in the selection of uniform map symbols. While none of these firms attended the Subcommittee meeting, they did lend their technical advice through correspondence and otherwise assisted in the decisions which were reached.

The attitude of the cartographic firms toward uniform map symbols is somewhat mixed. In the very competitive business of

providing maps for oil companies and others, the map firms feel that a certain amount of freedom is desirable in order that they may offer a distinctive map to their clients, and sometimes the clients wishes must be observed in these respects. Furthermore the cartographic firms have the additional problem of working at many different scales since they often prepare road maps of entire regions - something which no single State highway department is obliged to do. All of these factors have a bearing on the extent to which the cartographic firms now feel able to conform with any uniform map symbolization scheme.

Nevertheless, if the AASHO does adopt a standard symbolization, it is evident that this step would be welcomed by the mapping companies and that their desire would be to comply with these standards to the extent that competitive circumstances, and scale problems will permit them to do so. The industry is well aware of of the studies being made by the Subcommittee and is anxious to be informed of the action taken by the Association respecting this report.

VI. MAP QUALITY

The art of map drafting, or cartography, in the hands of firms specializing in such work, has been brought to an exceedingly advanced state of development, utilizing techniques which are not ordinarily found in the drafting rooms associated with State highway departments. Delicacy of line is mainly achieved with the scribing or stickup process, and hand or stencil lettering has given way to stick-ups and type stampings. Photographic compliation and stage reproduction at enlarged or reduced scales are commonplace practice.

Extremely sophisticated uses of half tone screenings of basic ink colors and combinations of colors through overprinting have been found to increase the legibility and understandability of the best commercial maps. In addition to a complete familiarity with the resources of these processes, their use depends upon the employment of base materials of highest dimensional stability and the printing of maps on the finest quality paper stock. The quality of lithographic work must be held to closest tolerances of register.

Many of the State highway department drafting offices have not reached the same advanced state of cartographic excellence as have the commercial firms. In responding to the questionnaire of the Subcommittee (see Appendix, Question 3), 26 of 42 responding States reported that their maps were drafted by their own staffs. Of these 26 states, 19 states reported that the road symbols were drawn with ink although some of these also used other, more advanced methods. Of the same 26 States, only 8 reported using mylar or cronar map base material (recognized as the most dimensionally stable) while 6 States used linen, a notoriously unstable medium.

The State highway departments should realize that collectively they are publishing some 17 million highway maps a year. If it is

calculated that these maps cost from 5 cents to 8 cents apiece for printing and paper stock costs alone (exclusive of drafting and editorial work on the map bases) it may be seen that an annual expenditure of between $850,000 and $1,360,000 is involved. This is big business and must be evaluated in terms of comparative quality with the products of the commercial drafting firms for oil company distribution.

With this substantial commitment in funds at stake, the Subcommittee believes that the system of map symbols to be recommended as the standard for use by all states should not be compromised by concessions to less than the best and latest drafting techniques, as well as the most closely controlled lithography and paper stock. In the recomendations for road symbols, contained in a later part of this report, the Subcommittee is fully aware that it will be nearly impossible for them to be drawn with a ruling pen and drafting ink. Scribing or stickup methods must be used. Other symbols can be printed only on good quality paper stock, because with inferior paper stock the lines would bleed together.

In adhering to these standards of quality the Subcommittee is convinced that the public will enjoy the same cartographic excellence in State maps as they have come to expect in oil company maps. To provide the public with an inferior quality in State-published maps will merely insure that they will not be used by the motorists for whom they are printed.

VII. ROAD BAND SYMBOLS

A. DEFINITIONS: One of the most taxing aspects of the Subcomittee's deliberations involved the finding, and defining, of descriptive terms which could be applied to the functional road systems shown on the highway maps of each of the States. It was immediately apparent that such terms as "State System", "Primary System", "Secondary System", "State Marked System" "Trunk System" and many others carried with them different connotations of meaning involving administrative or financial significances. The Subcommittee finally adopted the following three functional classifications of roads to be shown on the State maps.

1. PRINCIPAL THROUGH HIGHWAYS: This category includes all routes of the Interstate System. It also usually includes roads with U.S. marking and other State marked highways of equal importance to travel. It should be recognized, however that not all U.S. marked highways would be classified as PRINCIPAL THROUGH HIGHWAYS and the judgement of each individual State in this regard should be respected.

2. OTHER THROUGH HIGHWAYS: This category would include other State marked routes of primary importance to automotive

traffic, such as connections between major points of traffic generation. It is recognized that this is a relative classification which each State will be obliged to interpret for the benefit of tourists in its own area.

3. OTHER HIGHWAYS: This category includes all other highways of sufficient importance to be shown on the map, as determined by the State.

B. ROAD BAND REPRESENTATION: The Subcommittee in its discussions came to the conclusion that the system of road band symbols must convey certain specific types of information to the touring map user.

1. The symbol must permit the map user to follow a selected functional route with ease and continuity.

2. The symbol must permit the road user to learn the surface type of the route he is considering.

3. The symbol must indicate to the map user the quality of service he can expect on the route (i.e., is the route of 2-lane or multilane design; if multilane, is it divided or undivided; is access partially or completely controlled).

The road band symbols recommended by the Subcommittee are shown in Figure 1. As will be noted in Figure 1, distinctions are made between roads of different class and type, by color, by width, and by symbol configuration.

PRINCIPAL THROUGH HIGHWAYS will be shown in red (with the exception of Toll Highways). For these roads the symbol for a 2-lane highway will have a width-ratio of 1.00 while all multilane roads of this class will have a width-ratio of 1.50. No absolute recommendation on the printed width of a 2-lane roadband is offered by the Subcommittee but it is urged that all road bands be kept as narrow as possible to reduce congestion and to increase legibility. In devising these symbols, the Subcommittee was thinking in terms of a symbol for a 2-lane highway (width-ratio 1.00) as being about 1/40th inch in width, as printed. This width will be entirely practicable if the map base is drawn by either the scribing or stickup methods. It will not be practicable if the drafting is done by ruling pen.

As shown in Figure 1, a distinction is shown between several types of multilane highways to enable the tourist to select a routing which will offer him the highest quality in road service.

In this general discussion of PRINCIPAL THROUGH HIGHWAY symbols, no mention has been made of the surface type of these roads. This is because, in the opinion of the Subcommittee, all such roads will be paved and surface type representations would be superfluous.

OTHER THROUGH HIGHWAYS. Roads of this functional classification are to be shown in black (or dark blue). The appropriate surface type symbol should be used. As shown on Figure 1, the symbolization extends only through the design of multilane divided highways because, in the Subcommittee's opinion, if such roads were to be built to standards of partial or full control of access they would necessarily become PRINCIPAL THROUGH HIGHWAYS.

In the Subcommittee discussions the matter of the appropriate symbol of a 2-lane OTHER THROUGH HIGHWAY was quite prolonged stemming from differences in the concept of the function of this class of roads in States of different intensities of cultural development. The discussion was concluded with the Subcommittee's decision to provide for optional symbolization.

Two-lane OTHER THROUGH HIGHWAYS may be shown in black (or dark blue) with a width-ratio of 0.67 where in the State's opinion there appears to be a decisive difference in the functional service rendered by these roads and those classed as PRINCIPAL THROUGH HIGHWAYS. Where this difference, in the State's opinion, is not decisive, and where map congestion is not a limiting factor, the symbol may be shown in black with a width-ratio of 1.00. In offering this option, however, it was not the Subcommittee's intention that the two width-ratios should be used on the same map. In short, if a state decides to use either the 0.67 or the 1.00 width-ratio it should use the symbol consistently for all roads of the same functional class. To be inconsistent in this matter would introduce a fourth functional road class and tend to become confusing to the tourist.

OTHER HIGHWAYS. Roads of this class are generally not of interest to tourists except as a means of reaching a final destination not served by roads of a higher functional classification. Each State will need to determine for itself how many of these roads should be shown on the tourist map. Showing some roads of this class is very essential - showing too many can cause map congestion and confuse the indication of the main routes of travel used by most tourists.

In order to minimize map congestion the Subcommittee recommends that the symbolization of this class of roads be subordinated in two ways, by color and by road band width.

Subordination by color is recommended to be achieved by a screen value of black (producing a grey tone) or by a screen value of blue (producing a light blue). Secondary colors are not recommended because of registration problems. It is acknowledged that blue is usually associated with water features on a map, but in the opinion of the Subcommittee, the road symbols are sufficiently distinctive from water symbols so that no confusion will occur.

Subordination by road band width is recommended to be achieved by the use of a width-ratio on 0.67 for these roads. The committee recognizes the difficulty of representing road type symbols within this road band width unless the drafting is done by scribing or stickup processes.

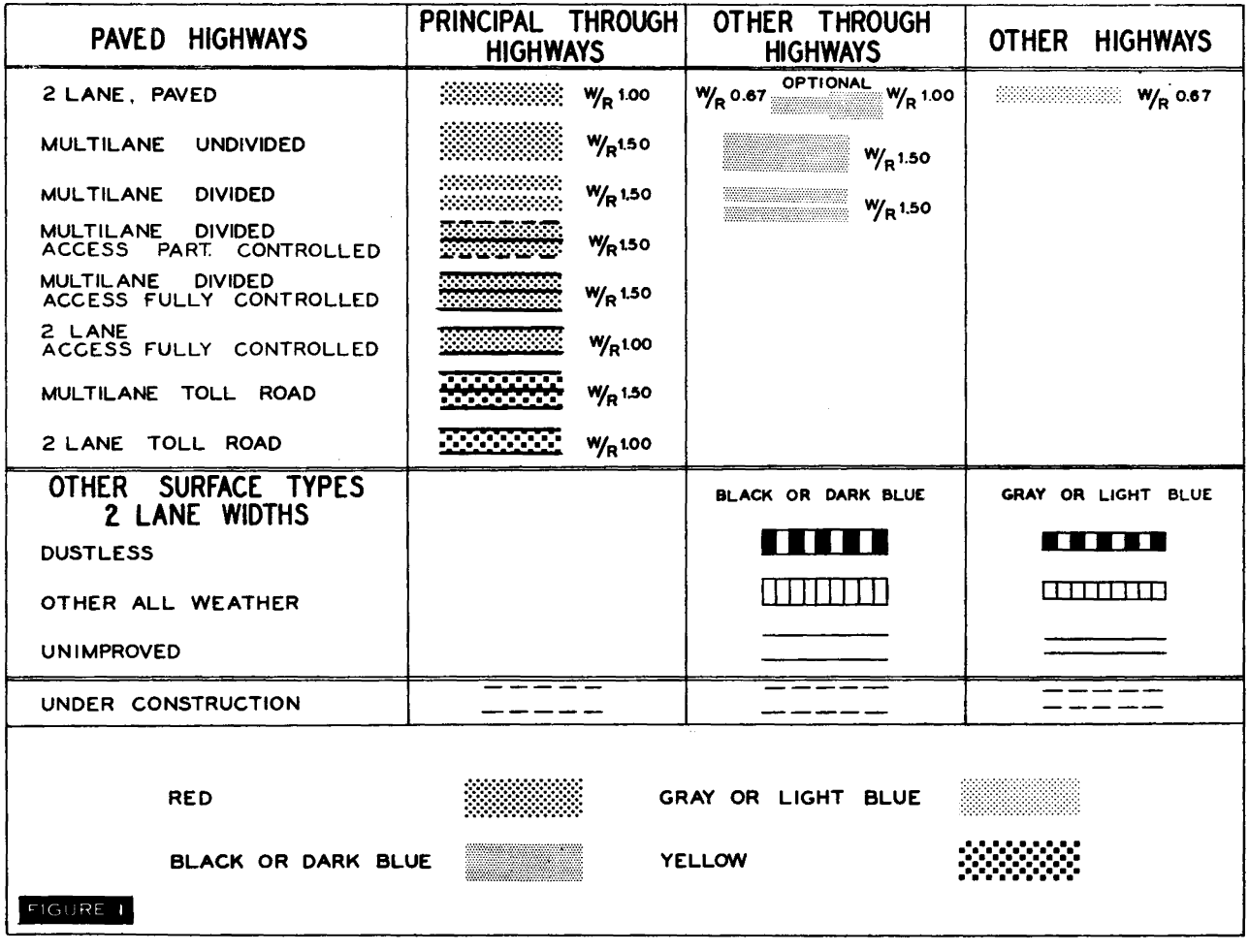

PAVED HIGHWAYS
PRINCIPAL THROUGH HIGHWAYS
OTHER THROUGH HIGHWAYS
OTHER HIGHWAYS
2 LANE, PAVED
W/R 1.00
W/R 0.67
OPTIONAL
W/R 1.00
W/R 0.67
MULTILANE UNDIVIDED
W/R 1.50
W/R 1.50
MULTILANE DIVIDED
W/R 1.50
W/R 1.50
MULTILANE DIVIDED ACCESS PART. CONTROLLED
W/R 1.50
MULTILANE DIVIDED ACCESS FULLY CONTROLLED
W/R 1.50
2 LANE ACCESS FULLY CONTROLLED
W/R 1.00
MULTILANE TOLL ROAD
W/R 1.50
2 LANE TOLL ROAD
W/R 1.00
OTHER SURFACE TYPES 2 LANE WIDTHS
BLACK OR DARK BLUE
GRAY OR LIGHT BLUE
DUSTLESS
OTHER ALL WEATHER
UNIMPROVED
UNDER CONSTRUCTION
RED
GRAY OR LIGHT BLUE
BLACK OR DARK BLUE
YELLOW

FIGURE 1

Multilane undivided highways are shown as a solid road band having a width-ratio of 1.50.

Multilane divided highways are shown with a narrow white centerline, the road-band having an overall width-ratio of 1.50. It would have been more satisfying to the Subcommittee to have recommended a black centerline for this symbol to be consistent with the configuration of the symbolization of routes with control of access, but recognition was given to the difficulty of keeping a black centerline registered in the middle of an uncased roadband. Care must be taken with this symbol to avoid two undesirable extremes.

a. The white centerline should not be so narrow that bleeding will fill it.

b. The white centerline should not be so wide that the red marginal bands will be diminished to a point where they appear to be casings.

Multilane divided, access partially controlled. This is an Optional symbol which many States may wish to use. Prior to the adoption of Interstate highway-standards some States constructed highways where access was partially controlled (no commercial frontages with direct access to the through traffic lanes, main intersecting roads grade-separated). In other States, full control of access is being attained in stages. Such highways, in the opinion of many persons, give service closely approaching that of fully controlled access roads, and it was the judgment of the Subcommittee than an indication of this condition should be given to tourists. The use of this symbol and the selection of roads of which it would appropriately apply is left to the judgment of each of the individual States. The symbol consists of a black broken casing and black continuous centerline with a red color fill. The overall width-ratio of the entire symbol is 1.50.

Multilane-divided, access fully controlled. This symbol will be used for Interstate highways and other free highways constructed to equivalent standards. The symbol consists of three continuous black lines (two casing lines and a centerline) with a red color fill. The overall width-ratio for this symbol is 1.50.

Two-lane, access fully controlled. Some parts of the Interstate system are presently planned for development to only a 2-lane design. Other Interstate highways will achieve multilane development only in stages. A 2-lane fully access control symbol is provided for these situations consisting of two casing lines in black with a red color fill. The overall width-ratio is this symbol is 1.00.

Toll roads. Toll roads are usually multilane and always fully access controlled. The Subcommittee believes that the tourist should be put on positive notice that these highways differ from free roads. It is therefore recommended that toll roads be identified by a color fill of yellow (instead of red) but that otherwise the symbol for toll roads should be the same as that used for multilane (or 2-lane) fully access controlled highways.

SURFACE TYPES. The Subcommittee recommends that indications of surface type be limited to four general classes; paved, dustless, other all weather, and unimproved. The symbols for these those shown on Figure 1.

Each State will be obliged to classify the roads falling in these classifications and the Subcommittee does not believe an extended discussion is warranted, especially for the paved and dustless categories. The term "all-weather" should be understood to be qualified by the fact that for short periods in heavy snow storms or during periods of severe breakup these roads may be temporarily obstructed. The term "unimproved" should be thought of in the sense that a tourist uses it as meaning unsurfaced irrespective of the fact that the roadway may have been improved by grading and some drainage.

Primitive roads, without grading, drainage, or surface will seldom be shown on a tourist map and only then when no other access is provided into an undeveloped area. Where primitive roads are indicated, a warning note should be shown on the map conveying appropriate information for the stranger in that area.

VIII. ACCESS POINTS

With the development of the Interstate System with its feature of full control of access, the necessity for the appropriate indication of access points has become much more widespread. Three general conditions where a fully access controlled highway intersects another road were recognized by the Subcommittee; a full interchange may occur with all direction turning movements provided for, a partial interchange may occur with movements provided in only some quadrants, all access may be denied. Figure 2 shows the recommendations of the Subcommittee for the indication of the situation at intersections with full access controlled highways.

In general, it is desirable to give as much detail as possible on the map to minimize the confusion to a tourist encountering the intersection for the first time. Where scale permits (up to about 1" - 5 miles) on urban enlargements and on maps of the smaller States it is desirable to show a representational configuration of the ramps of the interchange. Where this is not possible, the conventional symbol of a square at the intersection (as shown on Figure 2) should be shown to represent a full interchange. For partial interchanges the square symbol is modified by eliminating those quadrants in which interchange facilities are denied.

Where interchange between a full access controlled highway and a crossing road is denied this should be shown by interrupting the symbol of the minor road as on Figure 2. It is not recommended that any symbol distinction be made between the cases where the minor road crosses over or under the freeway, the single important

fact to the motorist is that no interchange movement is possible.

The committee does not believe that it is necessary to give an indication that access is permitted on roads not shown as full access controlled. Only in those unusual cases where cross road access is denied need be show for highways of this type.

IX. TRAFFIC ROUTE MARKERS

The Subcommittee's recommendations for traffic route markers are also shown on Figure 2. The symbol for the Interstate route marker is shown as a negative type using white numerals on a black (or dark blue) background. For business routes white numerals are used on a green background. There are two reasons for recommending this negative type symbol.

a. By reason of its dark background it appears most prominently on the map.

b. Since the red horizontal band (on the route marker used on the highway) is eliminated to give greater space for showing the route number, the negative treatment aids in distinguishing this shield from the shield used to indicate U.S. route markings.

Other route markings are unchanged from those previously adopted by long usage for indicating U.S., State and Secondary numbering systems.

X. CONCLUSION

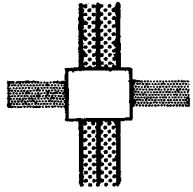
In concluding this progress report, the Subcommittee again wishes to express its regrets that it has not been able to deal with the entire field of map symbols. The Subcommittee does feel, however, that the area of road symbols, covered in this report, is the most controversial aspect of the entire subject. If agreement can be reached respecting these, it does not appear that there is any substantial obstacle to the completion of its assignment.

ROUTE MARKERS

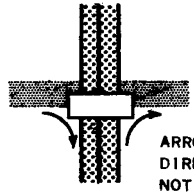
INTERSTATE MARKER		BLACK OR DARK BLUE BACKGROUND
INTERSTATE MARKER (BUSINESS LOOP OR SPUR)		GREEN BACKGROUND
U.S. NUMBERED MARKER		RED
STATE ROUTE MARKER		
OTHER ROUTE MARKER		

ACCESS POINTS

FULL TRAFFIC INTERCHANGE



PARTIAL TRAFFIC INTERCHANGE



ARROWS INDICATE DIRECTION OF TRAFFIC. NOT TO APPEAR ON MAP

ACCESS DENIED

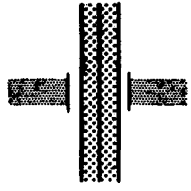


FIGURE 2

REPORT ON UNIFORM MAP SYMBOLS PART II

GENERAL

This is the final report, submitted by the Subcommittee on Uniform Map Symbols, in fulfillment of the assignment given it by the Chairman of the AASHO Committee on Factual Surveys (now named committee on Highway Planning) at the Annual Meeting of the American Association of State Highway Officials in Boston Massachusetts in October 1959.

At the Annual Meeting of AASHO in Detroit, Michigan on November 29, 1960, the Subcommittee submitted a progress report covering a system of uniform symbols for representing highway features on State tourist maps. The recommendations of the Subcommittee were adopted by the full Committee and the progress report was recommended to the AASHO Executive Committee for adoption.

The AASHO Executive Committee, meeting in Louisville, Kentucky, adopted the recommended system of highway symbols on June 28, 1961 and the member States were notified of this action by the Executive Secretary's letter of July 24, 1961.

In submitting its progress report to the Committee, in November 1960, the Subcommittee recognized that its assignment had only been partially fullfilled since only highway symbols were included in its recommendation. As the Subcommittee understood its assignment, map symbols for other cultural nonhighway symbols still needed to be considered.

SUBCOMMITTEE ACTIVITIES

To proceed with its study of nonhighway symbols a review was first made of the practices among the State highway departments and the major cartographic firms. This review resulted in achieving a poster type display which was photographed in color film and sent to each member of the Subcommittee for review and comments during June 1961.

When each of the members of the Subcommittee had had an opportunity to comment on the color films the poster displays were revised accordingly and presented for discussion at the AASHO meeting of the full Committee in Denver in October 1961.

As a result of this discussion by the parent committee, the poster display was again revised and a four color lithographic reproduction was made which was sent to each of the State highway departments for their further review and extended comments.

CONCLUSIONS

Following this rather extensive series of consultations with the member States of the problem of establishing a uniform system

of nonhighway symbols for use on tourist maps, the Subcommittee has reached several conclusions on this matter.

(1) The issue of uniformity in symbols for non-highway features is less important than for highway symbols.
(2) The use of symbols for nonhighway features varies widely among the States depending largely upon their geographic, climatic, economic, and recreational interests and emphases. National parks and national forests may be quite important in some States but not in others. Indian Reservations may or may not be significant features. In some States, ski areas may need deliniation while in others a similar emphasis may be wanted for boating facilities.
(3) It does not appear that major tourist confusion would occur through lack of uniformity in nonhighway symbols.

RECOMMENDATIONS

As a result of its conclusions the Subcommittee made certain recommendations to the parent committee, and following their adoption, the recommendations were then passed on to the Executive Committee of AASHO.

(1) That the symbols for nonhighway features shown on the attached color plate be adopted as the "suggested" system of symbolization for tourist maps.
(2) That the individual States be expected to retain a considerable amount of latitude in the actual deliniation of nonhighway features, particularly recreational features, which are of special significance to them.
(3) That it be understood that there is, in the intent of the American Association of State highway Officials, a distinction between the "recommended" system of symbols for highway features, adopted June 28, 1961. and the "suggested" system of symbols for nonhighway symbols proposed in this final report.

The color plate, which is a part of this report, shows the suggested nonhighway symbols, and should not be understood to be limiting on the value or the exact tint of color which may be used. When a symbol is shown in green, for instance, the cartographer must use his judgment as to whether this shall be shown on his map as a dark green, or as a half-tone light green, or whether it should be a yellowish or a bluish green.

APPENDIX A
QUESTIONNAIRE

AASHO FACTUAL SURVEYS COMMITTEE
SUBCOMMITTEE ON UNIFORM MAP SYMBOLS
OFFICIAL STATE HIGHWAY MAP QUESTIONNAIRE

STATE_____

I. GENERAL

1. How frequently is your map published. Annually _____? Less frequently (explain) _____? More frequently (explain) _____?
2. How many copies are printed each time _____?
3. Is the drafting done by your own draftsmen _____ or by a commercial map drafting firm _____? Which _____?

3a. If drafting is done by State, indicate process used.
(1) For road symbols; ink _____, scribing _____, stickup _____, other _____.
(2) For other symbols; ink _____, scribing _____, stickup _____, other _____.
(3) For lettering; ink _____, stickup _____, other _____.

3b. If drafting is done by State, indicate base material used; linen _____, cardboard _____, metal _____, glass _____, vinyl _____, mylar or cronar _____, other _____.

4. Is the lithography done by a State printing office _____ or by a commercial lithographer _____?
5. As to the map itself, disregarding the printing of color photos or other non-cartographic material, how many colors of ink are used.

2 colors _____		Black _____	Yellow _____
3 colors _____		Red _____	Orange _____
4 colors _____		Blue _____	Other _____
5 colors _____		Green _____	

5a. Do you use half tone values of the basic ink colors to achieve various tints or combinations, such as a light blue and a dark blue from one blue ink; or as green from a combination of yellow and blue inks.
No half tones are used _____.
Use half tones for varying values of color _____.
Use half tones for combination of colors _____.
Give tints and colors achieved in this way.
_____
_____
_____

II. BASIC HIGHWAY MAP
(Does not include urban enlargements)

1. What is the approximate scale of the map.
As drafted 1" = _____ miles
As printed 1" = _____ miles.
2. What is the width of the road bands on the printed map?
(Show to 3 decimals of an inch such as 1/60" = 0.017")
2-lane primary road 0._____".
multilane primary road 0._____".
2-lane secondary road 0._____".
3. Do your road bands for primary highways give any indication of access control? divided multilane by open band _____? by contrasting color center-line _____?
Do you use casings in contrasting colors _____?
4. Do you differentiate between surface types on primary roads _____, or on secondary roads _____?
5. Do you differentiate by color between US marked routes and State marked routes _____, or do you differentiate by color between better and poorer primary routes irrespective of route marking _____?
6. Do you indicate highway grade separations on:
multilane primary roads _____
2-lane primary roads _____
all roads _____
7. Do you distinguish between separations having no traffic interchange, those with only partial interchange, and those with full traffic interchange _____?
8. When was your present map base drafted (disregarding annual revisions) _____?
9. How frequently do you completely redraft the base (disregarding annual revisions) _____?

III. URBAN ENLARGEMENTS

1. Do you have a rule as to when to show an urban enlargement _____? Does this rule depend upon population of the city _____? If so, what is the population used to determine this _____? Do you use any other basis for this decision? _____
_____
2. Are the urban enlargements all drawn to the same scale _____? If so, give approximate scale 1" = _____ miles. If not, what is the range of scales used: 1" = _____ miles to 1" = _____ miles.

IV. OPINION QUESTIONS

The Subcommittee is asking these opinion questions to get some guidance in the problem of suggesting uniform map symbols. No one will be committed by their answers to these questions.

1. If you were to redraw your map base in the near future, how would you improve your map?
a. Reduce congestion with narrower road bands _____?
b. Reduce congestion by showing fewer secondary roads _____?
c. Reduce congestion otherwise _____
_____
d. Adopt new road symbols to show interstate system better _____?
e. Adopt new road symbols to give clearer indication of degree of access control _____?
f. Provide for use of more modern drafting techniques _____?
g. Use more dimensionally stable base material for better color registration _____?
h. Use more colors than previously _____?
i. Make more effective use of half tones with present colors _____?
2. Do you recommend abandoning State publication of road maps and depend upon commercial maps to do the job _____?
3. Are you satisfied with present map and have no intention of making drastic changes for many years to come _____?

APPENDIX D
SUMMARY OF RESPONSES TO QUESTIONNAIRE

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS
FACTUAL SURVEYS COMMITTEE
SUBCOMMITTEE ON UNIFORM MAP SYMBOLS

In connection with the preliminary studies being made by the Subcommittee on Uniform Map Symbols, a questionnaire was sent to each of the 50 states inquiring as to some of the practices involved in the publication of the official state highway map. By October 5, 42 states had responded to this questionnaire and the report which follows is a summary of these replies.

I. GENERAL

1. HOW FREQUENTLY IS YOUR MAP PUBLISHED?

Of the 42 states responding, 34 reported an annual publication of the official highway map, six states reported less frequent publication, and two states, Arkansas and Colorado, reported a more frequent publication. The practice of publishing an annual series of maps apparently prevails.

2. HOW MANY COPIES ARE PRINTED EACH TIME?

The number of copies in each printing varied from a high of 900,000 in a single printing in Colorado and Illinois to a low of 20,000 in Vermont. Of the 42 states reporting, six printed 600,000 or more, 14 printed 400,000 or more, ten 200,000 or more and 11 less than 200,000 with Rhode Island not reporting. The average number of maps printed per state was 330,000. It is of interest to note that the total number of maps published by the states annually will approach 17 million if the response of the 41 states is indicative of the practice of the remaining 9.

3. IS THE DRAFTING DONE BY YOUR OWN DRAFTSMEN?

Twenty-six of the states reported that they did the drafting of their official highway map with their own forces, while 16 reported that the drafting was done by a commercial map drafting firm.

3a. IF DRAFTING IS DONE BY STATE, INDICATE PROCESS USED.

Of the 26 states which reported that the map drafting was done with their own staff, 19 reported that the road symbols were drawn with ink, four reported the use of scribing techniques, and 10 used the stickup process. It is evident from this number that some states used more than one process and we find that Colorado, Delaware, Ohio, and Washington used both ink and stickup while Texas reported using both scribing and stickup and Maryland ink and scribing for indicating road symbols. The use of stickup symbols was more prevalent in the case of other cultural features, 15 states reporting its use, 12 states reported the indication of cultural features in ink and three used the scribing method. For lettering on the maps, 19 states used the stickup method, while in seven states lettering was done in ink, including Maine which reported using both ink and stickup methods. Wisconsin was the only state which reported using type stamping.

3b. IF DRAFTING IS DONE BY STATE, INDICATE BASE MATERIAL USED.

As to base material, six states reported using cardboard or mounted paper, eight states used mylar or cronar, and six states used linen for base material. Glass, vinyl, and dinobase were each reported as used by one state, while a metal base is used by three states.

4. IS THE LITHOGRAPHY DONE BY A STATE PRINTING OFFICE OR BY A COMMERCIAL LITHOGRAPHER?

Of the 42 states which reported, 40 responded to the effect that their maps were printed by a commercial lithographer and two states, Kansas and Oregon, reported that the lithography was done by a state agency.

5. AS TO THE MAP ITSELF, DISREGARDING THE PRINTING OF COLOR PHOTOS OR OTHER NON-CARTOGRAPHIC MATERIAL, HOW MANY COLORS OF INK ARE USED?

The numbers of colors of ink used on the state maps are as follows: none reported using two colors, one reported using three colors, 23 reported using four colors, 14 reported using five colors, three reported using six colors, and one, Maryland, reported the use of eight colors of ink.

5a. DO YOU USE HALF TONE VALUES OF THE BASIC INK COLORS TO ACHIEVE VARIOUS TINTS OR COMBINATIONS, SUCH AS A LIGHT BLUE AND A DARK BLUE FROM ONE BLUE INK; OR AS GREEN FROM A COMBINATION OF YELLOW AND BLUE INKS.

In the use of half tone screens, five states gave a negative response. The remaining 37 states reported using half tones for varying the value of the basic inks and only 27 states of the 37 using half tones reported that combination colors were obtained through the screen process.

II. BASIC HIGHWAY MAP
(Does not include urban enlargements)

1. WHAT IS THE APPROXIMATE SCALE OF THE MAP?

As may be expected, the scale of the printed map varied widely among the reporting states. Alaska, Arizona, Idaho, Montana, New Mexico, Oregon, Texas and Utah reported using scales of 1" = 20 miles or greater. At the other end of the range, 12 states used scales of 1" = 10 miles or less. These are Connecticut, Delaware, Maine, Maryland, Massachusetts, Mississippi, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, and Vermont. The middle range of from 1" = 12 miles to 1" = 15 miles was preferred by 15 of the 42 reporting states.

2. WHAT IS THE WIDTH OF THE ROAD BANDS ON THE PRINTED MAP?

The width of road bands reported by the various states for two-lane primary highways showed a considerable spread in practice. Following is a frequency distribution of the widths reported for this feature.

1/50" (0.020) or less - seven states
1/33" (0.030) to 1/50" (0.020) - 15 states
1/25" (0.040) to 1/33" (0.030) - 15 states
More than 1/25" (0.040) - five states

Multilane primary highways were shown at a somewhat greater width than two-lane primary highways except in the case of Arkansas, Idaho, Indiana, Kansas, Maine, Michigan, Minnesota, Nevada, Rhode Island, South Carolina, Utah, Vermont, Virginia, Wisconsin, and Wyoming, where there is no differentiation in road band width.

3. DO YOUR ROAD BANDS FOR PRIMARY HIGHWAYS GIVE ANY INDICATION OF ACCESS CONTROL?

Twenty states reported showing highways with access control either by classifying them as interstate, tollways, or highways with access control. Nine states did this by means of open bands, and eleven with a color fill. Two states, Iowa and Florida, make use of a centerline within a casing.

4. DO YOU DIFFERENTIATE BETWEEN SURFACE TYPES ON PRIMARY ROADS OR ON SECONDARY ROADS?

Of the 42 states responding, 14 states reported that the road symbols did not indicate surface type for primary highways. Eleven states reported that they did not show the surface type for secondary highways.

5. DO YOU DIFFERENTIATE BY COLOR BETWEEN U.S. MARKED ROUTES AND STATE MARKED ROUTES, OR DO YOU DIFFERENTIATE BY COLOR BETWEEN BETTER AND POORER PRIMARY ROUTES IRRESPECTIVE OF ROUTE MARKING?

In the past there has been considerable debate as to whether U.S. marked

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS

Factual Surveys Committee - Subcommittee on Uniform Map Symbols

RECOMMENDED HIGHWAY SYMBOLS

PRINCIPAL THROUGH HIGHWAYS

Width-Ratio	
1.00	2 LANE, PAVED
1.50	MULTILANE UNDIVIDED
1.50	MULTILANE DIVIDED
1.50	MULTILANE DIVIDED, ACCESS PARTIALLY CONTROLLED
1.50	MULTILANE DIVIDED, ACCESS FULLY CONTROLLED
1.00	2 LANE, ACCESS FULLY CONTROLLED
1.50	MULTILANE TOLL ROAD
1.00	2 LANE TOLL ROAD
1.50 or 1.00	UNDER CONSTRUCTION

OTHER THROUGH HIGHWAYS

(Print in Black or Dark Blue)

Width-Ratio	
1.00 or 0.67	2 LANE, PAVED
1.50	MULTILANE UNDIVIDED
1.50	MULTILANE DIVIDED
1.00 or 0.67	DUSTLESS
1.00 or 0.67	OTHER ALL WEATHER
1.00 or 0.67	UNIMPROVED
1.00 or 0.67	UNDER CONSTRUCTION

OTHER HIGHWAYS

(Print in Gray or Light Blue)

Width-Ratio	
0.67	2 LANE, PAVED
0.67	DUSTLESS
0.67	OTHER ALL WEATHER
0.67	UNIMPROVED
0.67	UNDER CONSTRUCTION

ACCESS POINTS

- FULL TRAFFIC INTERCHANGE
- PARTIAL TRAFFIC INTERCHANGE
- ACCESS DENIED

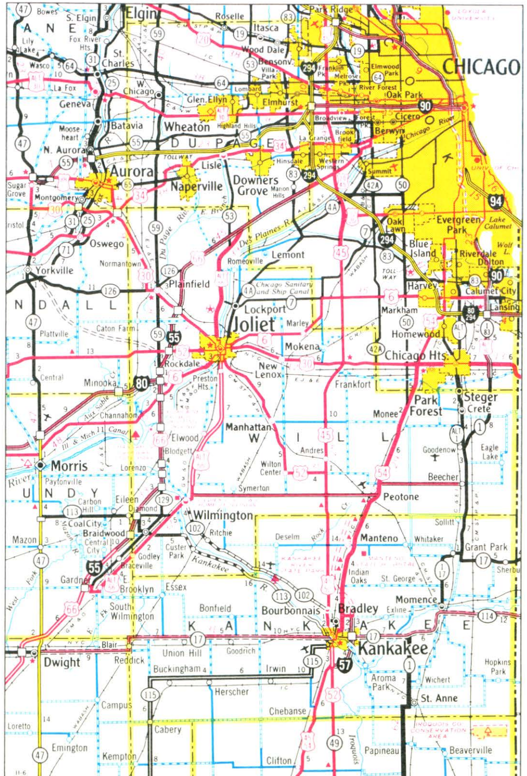
ROUTE MARKERS

- 80 INTERSTATE MARKER
- 80 INTERSTATE MARKER (Business Loop or Spur)
- 42 U.S. NUMBERED MARKER
- 25 STATE ROUTE MARKER
- 68 OTHER ROUTE MARKER

EXAMPLE OF RECOMMENDED HIGHWAY SYMBOLS IN A CONGESTED AREA

Scale 1" = 12 1/2 Miles Width-Ratio 1.00 = 1/40 th Inch

(Disregard symbols for all other cultural features)



BASE MAP COPYRIGHT 1961 BY STATE OF ILLINOIS

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS

FACTUAL SURVEYS COMMITTEE - SUBCOMMITTEE ON UNIFORM MAP SYMBOLS

NON-HIGHWAY SYMBOLS

NATIONAL PARKS OR MEMORIALS
STATE PARKS OR MEMORIALS
CAMPSITES
GAME PRESERVES
FISH HATCHERIES
RANGER STATIONS
RESERVATIONS INDIAN
OTHER
POINTS OF INTEREST
ROADSIDE PARKS
FIRST-AID STATIONS
PUBLIC BOAT ACCESS
SKI AREAS
COLLEGES AND UNIVERSITIES
STATE INSTITUTIONS
NATIONAL FOREST
DAMS

MUNICIPALITIES
UNDER 1,000
GROUP 1
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 6
POPULATION OPTIONAL
100,000 AND OVER
COUNTY SEAT
STATE CAPITOL

TIME ZONE BOUNDARY
NATIONAL BOUNDARY
STATE BOUNDARY
COUNTY BOUNDARY
OTHER BOUNDARY
CONTINENTAL DIVIDE

RAILROAD
AIRPORTS COMMERCIAL
MILITARY
OTHER
LOCAL MILEAGE
CONSOLIDATED MILEAGE
TOLL BRIDGE
FREE BRIDGE
TOLL FERRY
FREE FERRY
HIGHWAY POLICE
HIGHWAY DISTRICT OFFICE

MOUNTAINS
PASSES
ELEVATIONS
EL 6,110
PORTS OF ENTRY
SPRINGS OR WELLS
LIGHTHOUSES
HISTORICAL MARKERS
HISTORIC TRAILS OR ROADS