

REPORT OF SUBCOMMITTEE  
ON  
HIGHWAY TYPES AND ROADSIDE AREAS

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December 1937 Report: 2-Lane Highway Type

The first report of the Subcommittee, presented last year, was limited to "The Design of the Highway Cross Section" /1 on the primary two-lane rural highway for the 1930-1938 period of construction. The two-lane highway type represents about 95 per cent of State highway mileage in the United States. The trends indicated for this one major type of highway development bring out the fact that three distinct zones are now recognized: 1. roadbed; 2. roadside; and 3. adjacent lands.

The roadbed portion of the highway has had the attention of highway engineers for a long time. It is only during the organized improvement programs of the last five years, however, that the roadside portion of the highway right-of-way has had the benefit of engineering thought on a nation-wide basis. From this experience, highway thinking has expanded beyond the right-of-way to the adjacent lands. The 1937 report pointed out that there has been an ever-widening concept in the evolving pattern of highway design starting from the center line and spreading continually outward.

Safety, Appearance, and Maintenance

Five years of experience with roadside improvement demonstration projects have proved that in a properly conceived and designed highway, the roadbed and the roadside cannot be separated, but are really one common problem and therefore should be treated as a single unit of construction in sympathetic relationship with the adjacent lands.

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/1 - Pp. 255-268 of 17th Annual Proceedings, Highway Research Board.

Similarly, experience has demonstrated that highway safety, highway appearance, and highway maintenance, are not separate problems, but likewise are largely interrelated. Last year's report concluded that the application of landscape design principles to these fundamentally related problems will contribute much to the safety, good appearance and easy maintenance of highways, and the growing recognition of this fact is appreciably influencing current trends in associated highway practices.

The importance of the relationship of these three areas of highway development is further emphasized in the various subcommittee reports of the Joint Committee on Roadside Development, under "Erosion", "Educational and Public Relations", "Zoning", "Plant Ecology", and "Roadside Development Economics".

December 1938 Report:  
Multiple-Lane Highways and Roadside Areas

The progress report this year is divided into two main subjects for preliminary discussion: Multiple-Lane Highway Types and Roadside Areas. It deals primarily with the factual data resulting from the survey which has been made of all projects submitted to the U. S. Bureau of Public Roads since about 1930. In the 1939 report of this subcommittee, it is planned to conclude this tentative presentation of data with more complete and detailed information.

Under the sampling method reported last year, out of the total number of cross sections sampled during the inventory process, some 2,000 typical cross sections of projects submitted to the U. S. Bureau of Public Roads in the various highway programs of the past 7 or 8 years were selected for detailed analysis. These included all highway types; two lanes, three lanes, four or more lanes undivided, and four or more lanes divided.

Of this total of some 2,000 representative cross sections, about 1,300 covering the two-lane type of highway were reported in 1937. The present report covers the examination of the remaining approximately 700 cross sections, of which about 500 selected projects involving the construction of various types of multiple-lane highways by the several States during the 1930-1938 period have been analyzed in detail. For convenience, this preliminary report on multiple-type construction will be divided as follows:

1. Three-lane undivided highways
2. Four or more lanes, undivided
3. Four or more lanes, divided

These multi-lane cross sections have been analyzed State by State, and summarized in two-year periods for purposes of comparison in

the effort to determine possible trends in highway construction of the multiple-lane types in a similar manner to the previous report on the two-lane primary rural highway. Only the "roadbed" portion of the cross section will be dealt with to any large extent in this progress report, except incidental reference to right-of-way widths, etc. "The Roadside Details" presented in last year's report will apply equally well to the "roadside" portions of the present data. (See "The Design of the Highway Cross Section", pages 255-268 of the 17th Annual Proceedings of the Highway Research Board). In other words, except for the roadbed portion of the various highway types, the roadside principles developed in connection with the extensive construction of two-lane highway mileage will, in general, be applicable to all highway types.

### The Findings

Table 1 shows trends in the construction of multiple-lane projects in two ways:

a. According to the number of multiple-lane projects - based on the percentage distribution of the 2-year totals of types submitted to the U. S. Bureau of Public Roads since 1930.

b. According to the number of States - submitting multiple-lane highway projects of the undivided and divided types.

In Table II showing a summary of Table I it is indicated that:

1. The largest number of undivided projects of the 3-lane type (52) was submitted in the 1934 period and represented 45 per cent of the total (114) number of projects of this highway type received since 1930.

2. The largest number of undivided projects of the 4-lane type (125) was submitted in the 1936 period and represented 47 per cent of the total (269) number of projects of this highway type received since 1930.

3. The largest number of divided projects of the 4-lane type (64) was submitted in the 1936 period and represented 56 per cent of the total (114) number of projects of this highway type received since 1930.

Undivided Highway Types - (Per cent of two-year totals)

In 1932, multiple-lane highway construction of the undivided type represented 79 per cent of the total number of multiple-lane projects submitted for the period, with the majority of the construction (46 per cent) consisting of four lanes or more.

In 1934, there was a large increase in the 4-lane type of construction (from 46 per cent in 1932 to 56 per cent in 1934), although there was a downward trend (from 33 per cent in 1932 to 27 per cent in 1934) in 3-lane construction. Nevertheless, multiple-lane highway construction of the undivided type represented 83 per cent of the total number of multiple-lane projects submitted during the 1934 period, a slight increase over the 79 per cent for 1932.

In 1936, while the 4-lane undivided type of construction retained the same relative position (56 per cent) as in 1934, there was a large falling off in the submissions of 3-lane projects (from 27 per cent in 1934 to 16 per cent in 1936), with the result that multiple-lane construction of the undivided highway type began to drop (from 83 per cent in 1934 to 72 per cent in 1936) during the 1936 period.

Divided Highway Types -(Per cent of two-year totals)

In 1932, only about one-fifth (21 per cent) of the total number of multiple-lane projects submitted to the Bureau during the period were of the divided highway type.

In 1934, there was a slight reduction in the relative use of the divided highway type (from 21 per cent in 1932 to 17 per cent in 1934), although actually the number of projects was doubled (17 in 1932 and 33 in 1934).

In 1936, however, the divided highway type practically doubled in relative proportion of the total for the period (from 17 per cent in 1934 to 28 per cent in 1936). Also, the increase in number was again doubled as in the preceding period, (from 33 in 1934 to 64 in 1936). Thus, there is indicated a consistently steady increase in the adoption and use of the divided type in future periods whereas the undivided types have apparently reached the peak of usage and will tend to reduce in number in the future, particularly in the case of the 3-lane undivided highway type.

Assuming the above trends are indicative of the next two-year period of construction, the 1938-1940 highway programs will undoubtedly show a steady falling off in the submissions of 3-lane undivided types and a consistent increase in 4- or more lane projects of the divided highway type. It is probable the undivided highway type with 4- or more lanes may continue to represent about one-half of the multiple-lane highway projects, particularly in urban reconstruction areas, although a gradual reduction in the use of the undivided type in favor of the divided highway type is certainly indicated as the trend in highway construction of the multiple-lane type.

TABLE I

TABULATION SHOWING DISTRIBUTION BY STATES OF THE SELECTED NUMBER OF MULTIPLE LANE HIGHWAY PROJECTS SUBMITTED TO THE BUREAU OF PUBLIC ROADS SINCE 1930

UNDIVIDED HIGHWAYS								DIVIDED HIGHWAYS				
3 Lanes				4 Lanes or more				4 Lanes or more				
1932	1934	1936	Total	1932	1934	1936	Total	STATE	1932	1934	1936	Total
--	1	--	1	--	3	1	4	Alabama	--	--	1	1
--	2	1	3	--	2	--	2	Arizona	--	--	--	--
1	2	1	4	--	--	1	1	Arkansas	--	--	--	--
2	5	--	7	2	2	5	9	California	--	1	7	8
--	3	1	4	--	4	--	4	Colorado	1	--	--	1
--	1	--	1	1	2	1	4	Connecticut	--	1	1	2
--	--	1	1	--	1	1	2	Delaware	2	6	--	8
1	1	--	2	2	4	2	8	Florida	--	2	2	4
--	--	--	--	--	2	1	3	Georgia	1	2	1	4
--	--	2	2	--	3	2	5	Idaho	--	--	--	--
--	--	--	--	1	4	6	11	Illinois	1	--	3	4
--	1	--	1	1	4	8	13	Indiana	--	--	4	4
--	--	--	--	--	--	2	2	Iowa	--	--	--	--
1	1	--	2	--	3	4	7	Kansas	--	--	--	--
--	--	--	--	1	8	1	10	Kentucky	--	2	1	3
--	--	1	1	--	7	--	7	Louisiana	--	--	3	3
1	2	1	4	--	3	2	5	Maine	--	--	1	1
--	--	--	--	3	2	2	7	Maryland	--	1	3	4
1	3	1	5	4	5	4	13	Massachusetts	2	6	2	10
--	--	--	--	6	5	3	14	Michigan	1	3	1	5
--	1	1	2	--	3	4	7	Minnesota	--	1	3	4
--	--	--	--	--	1	2	3	Mississippi	--	--	--	--
1	4	1	6	1	6	2	9	Missouri	--	1	--	1
--	--	2	2	--	--	3	3	Montana	--	--	--	--
3	1	--	4	1	2	4	7	Nebraska	1	--	--	1
--	1	2	3	--	3	3	6	Nevada	--	--	--	--
1	1	1	3	--	--	--	--	New Hampshire	--	--	--	--
2	1	--	3	2	1	2	5	New Jersey	4	4	6	14
--	1	--	1	--	1	--	1	New Mexico	--	--	--	--
4	1	1	6	--	1	4	5	New York	2	--	5	7
1	2	2	5	--	1	--	1	North Carolina	--	--	1	1
--	2	3	5	--	1	--	1	North Dakota	--	--	--	--
3	1	--	4	2	3	6	11	Ohio	1	--	3	4
--	2	--	2	--	1	2	3	Oklahoma	--	--	--	--
--	1	1	2	--	--	2	2	Oregon	--	--	1	1
1	2	2	5	--	3	6	9	Pennsylvania	--	--	3	3
--	--	--	--	3	2	8	13	Rhode Island	--	1	2	3
--	--	--	--	--	5	3	8	South Carolina	--	--	1	1
--	--	--	--	--	1	1	2	South Dakota	--	--	--	--
--	--	1	1	--	2	6	8	Tennessee	--	--	1	1
1	--	2	3	1	3	2	6	Texas	--	--	--	--
--	--	1	1	--	--	5	5	Utah	--	--	--	--
--	--	1	1	--	--	1	1	Vermont	--	--	--	--
1	1	3	5	--	--	4	4	Virginia	--	1	4	5
1	2	1	4	2	3	6	11	Washington	1	--	1	2
--	--	2	2	--	--	--	--	West Virginia	--	--	--	--
--	2	--	2	3	1	1	5	Wisconsin	--	1	3	4
--	4	--	4	--	--	2	2	Wyoming	--	--	--	--
26	52	36	114	36	108	125	269	TOTAL NUMBER	17	33	64	114
17	29	25	(38)	17	38	41	(46)	NO. STATES	11	15	26	(30)

Type of Project	Low Type Surface	High Type Surface	Ratio
383 Undivided Highways	103	280	3 to 1
114 Divided Highways	19	95	5 to 1
497 Total number of projects, with surfacings predominately of the high type.			

## TABLE II

## SUMMARY OF TABLE I

- - -

- A -

SHOWING DISTRIBUTION OF VARIOUS TYPES OF MULTIPLE LANE HIGHWAY PROJECTS  
SUBMITTED TO THE BUREAU OF PUBLIC ROADS SINCE 1930 BY 2-YEAR PERIODS

2-YEAR PERIOD	NUMBER OF PROJECTS			BOTH TYPES Total number for period
	UNDIVIDED 3-Lanes	4-Lanes or more	DIVIDED 4-Lanes or more	
1932	26	36	17	79
1934	52*	108	33	193
1936	36	125*	64*	225*
Total No. (By types)	114	269	114	497

- B -

SHOWING PERCENTAGE DISTRIBUTION OF TYPES OF MULTIPLE-LANE HIGHWAY PROJECTS  
SUBMITTED TO THE BUREAU OF PUBLIC ROADS SINCE 1930 BY 2-YEAR PERIODS

2-YEAR PERIOD	PERCENT OF TYPE TOTAL			
	UNDIVIDED 3-Lanes	4-Lanes or more	DIVIDED 4-Lanes or more	BOTH TYPES Total percent for period
1932	23	13	15	16
1934	45*	40	29	39
1936	32	47*	56*	45*
TOTAL	100%	100%	100%	100%

- C -

SHOWING PERCENTAGE DISTRIBUTION OF TYPES OF MULTIPLE-LANE HIGHWAY PROJECTS  
SUBMITTED TO THE BUREAU OF PUBLIC ROADS SINCE 1930 BY 2-YEAR PERIODS

2-YEAR PERIOD	PERCENT OF YEARLY TOTAL			
	UNDIVIDED 3-Lanes	4-Lanes or more	DIVIDED 4-Lanes or more	BOTH TYPES Total for period
1932	33*	46	21	100
1934	27	56*	17	100
1936	16	56	28*	100
TOTAL	23	54*	23	100
	(77%)		(23%)	(100%)

Note: Figures with an asterisk indicate largest number or percent by type or period.

TABLE III

## MULTIPLE-LANE DIVIDED HIGHWAYS

Figures indicate number projects  
 Figures in parentheses - percent of total

- - -

Trend in Widths of Median Strips (Classified Widths)

<u>Width Classification</u>	1932	1934	1936	---	Total
1' - 3'	0 (0)	1 (3)	2 (3)	---	3 (3)
<u>4' - 6'</u>	4 (31)	5 (14)	16 (24)	---	25 (22)
7' - 11'	2 (15)	4 (11)	4 (6)	---	10 (9)
12' - 19'	2 (15)	8 (23)	10 (15)	---	20 (18)
<u>20' - 39'</u>	3 (24)	14 (40)	23 (35)	---	40 (35)
40' or over	2 (15)	3 (9)	11 (17)	---	16 (13)
<u>TOTALS (No. &amp; %)</u>	13 (100)	35 (100)	66 (100)	---	114 (100)

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Trend in Types of Median Strips (Flush or Raised)

<u>Flush Type</u>					
Crowned Center-	4 (29)	8 (23)	22 (34)	---	34 (30)
Depressed Center-	1 (7)	3 (9)	8 (12)	---	12 (10)
<u>Subtotal (Flush type)</u>	5 (36)	11 (32)	30 (46)	---	46 (40)
<u>Raised Type</u>					
Urban Curb	4 (28)	12 (34)	10 (15)	---	26 (23)
Rural Curb	5 (36)	12 (34)	25 (39)	---	42 (37)
<u>Subtotal (Raised Type)</u>	9 (64)	24 (68)	35 (54)	---	68 (60)
<u>TOTAL (All types)</u> (No. & %)	14 (100)	35 (100)	65 (100)	---	114 (100)

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Trend in Surface Treatment of Median Strip Areas

Ground Cover	14 (93%)	28 (90%)	54 (79%)	---	96 (84%)
Hard Surfacing	1 (7)	3 (10)	14 (21)	---	18 (16)
<u>TOTAL (No. Projects)</u>	15 (100%)	31 (100%)	68 (100%)	---	114 (100%)

TABLE III - "A"

## MULTIPLE-LANE DIVIDED HIGHWAYS

- - -

Trend in Widths of Shoulders on Projects Submitted  
to the Bureau of Public Roads since 1930

Width in Ft.	1932	1934	1936	Total
0' - Outer Curbs				
Urban Type	5 (31%)	11 (33%)	10 (13%)	26 ( )
Rural Type	2 (12%)	2 (5%)	7 (9%)	11 ( )
Subtotal	7 (43%)	13 (38%)	17 (22%)	37 (29%)
2'	0	0	1 (1%)	1
4'	0	4	4	8
6'	1	3	9	13
Subtotal (7'-)	1 (6%)	7 (21%)	14 (18%)	22 (17%)
8'	2	2	14	18
10'	6	11	22	39
12'	0	1	10	11 (Trend)
Subtotal (7'+)	8 (51%)	14 (41%)	46 (60%)	68 (54%)
TOTAL (All Widths) (No. Projects)	16	34	77	127 (100%)

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## Trend in Widths of Graded Roadbed in Feet

Approx. Width in Ft.	1932	1934	1936	Total
50' )	0	4	6	10
60' )	3 <u>5</u> (42%)	2 <u>10</u> (45%)	10 <u>26</u> (49%)	15 <u>41</u> (47%)
70' )	2	4	10	16
80' )	4	5	11	20
90' )	1 <u>5</u> (42%)	3 <u>10</u> (46%)	4 <u>22</u> (41%)	8 <u>37</u> (42%)
100' )	0	2	7	9
120' )	1	2	2	5
150' )	1 <u>2</u> (16%)	0 <u>2</u> (9%)	3 <u>5</u> (10%)	4 <u>9</u> (11%)
TOTAL (No. & Percent)	12 (100)	22 (100)	53 (100)	87 (100)

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## Widths of Right of Way in Feet

80' R.O.W.	1	-	5	-	2	-----	8
100'	1	-	6	-	17	-----	24
120' R.O.W.	0	-	4	-	5	-----	9
140'	1	-	2	-	5	-----	8
160' R.O.W.	0	-	0	-	0	-----	0
180'	0	-	0	-	0	-----	0
200' R.O.W.	2	-	1	-	2	-----	5
TOTALS (No.)	5	-	18	-	31	-----	54



TABLE IV

## MULTIPLE-LANE UNDIVIDED HIGHWAYS

Submitted to the Bureau of Public Roads  
(Tabulation showing representative cross-section  
for each State since 1930)

- - -

Trend in Number and Width of Traffic Lanes

<u>No. Lanes</u>	<u>Width in Ft.</u>	<u>No. of States</u>				
		<u>1932</u>	-	<u>1934</u>	-	<u>1936</u>
3		12	-	18	-	16
	9'	-		1		2
	10'	12**		16**		9**
	11'	-		1		4 (Trend)
	12'	-		-		1 ( " )
4		*** 14	-	*** 35	-	*** 50
	9'	1		5		-
	10'	13***		29***		44***
	11'	-		1		5 (Trend)
	12'	-		-		1 ( " )
6		1	-	1	-	8
	9'	1		-		1
	10'	-		-		5*
	11'	-		-		1 (Trend)
	12'	-		1		1 ( " )

NOTE- \*\*\* Figures marked by three asterisks indicate the most used width for the respective period (2-years) shown.

\*\* Figures marked by two asterisks indicate the second most used width during the respective periods shown.

\* Figures marked by one asterisk indicate the third most used width during the respective periods shown.

Trends are suggested thus - (Trend) - and indicate the 11' width of lane coming into use and the 12' more and more considered as the future traffic lane width.

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## MULTIPLE-LANE DIVIDED HIGHWAYS

Trend in Width of Traffic Lanes Used on Projects  
Submitted to the Bureau of Public Roads since 1930

		<u>Number of Projects and Percent of Totals</u>							
4 or more Lanes	9'	-	3 (14%)	-	4 (13%)	-	1 (1%)	----	8 (6%)
	10'	-	14 (67)	-	17 (57)	-	45 (57)	----	76 (58)***
	11'	-	2 (10)	-	7 (23)	-	25 (32)	----	34 (26)**
	12'	-	2 (9)	-	2 (7)	-	8 (10)	----	12 (10)*

Above data indicate 10' lanes are now in widest use, but that there is a definite trend toward a wider use of the 11' width and also the 12' width appears to be given more and more consideration.

TABLE IV - "A"

## MULTIPLE-LANE UNDIVIDED HIGHWAYS

Submitted to the Bureau of Public Roads  
since 1930

## Trend in Types of Curbs Used (Representative of States)

No. of Lanes	Curb Type	1932 No. of States	-	1934	-	1936 No. of States
3		<u>12</u>	-	<u>18</u>	-	<u>16</u>
	None Used	12 ***	-	11 *	-	9
	Rural Type	-	-	5	-	5
	Urban Type	-	-	2	-	2
4		<u>14</u>	-	<u>35</u>	-	<u>50</u>
	None	10 **	-	12 **	-	23 ***
	Rural	3 *	-	16 ***	-	18 **
	Urban	1	-	7	-	9 * (Trend)(?)
6		<u>1</u>	-	<u>1</u>	-	<u>8</u>
	None	-	-	-	-	1
	Rural	1	-	1	-	3
	Urban	-	-	-	-	4 (Trend)

Note: Three asterisks indicate figures most used, (by States)  
Two asterisks indicate second most used, and  
One asterisk indicates third most used type by States  
for the respective period (two-years) shown.

The above data indicate that on the three-lane undivided highway few States used any curb type but when it was used the rural or lip curb was most largely used. The high vertical face city curb seldom.

On the 4- or more lane undivided highway type, the majority did not employ a curb of any type, although when a curb was used, the rural type appears to have been used by about twice the number of States utilizing the high vertical face type of city curb (urban).

The trend toward the urban type in the 1936 period may be due to the submission of projects in cities or urban areas where a city type of curb would be indicated for a slow speed or controlled traffic zone.

## Multiple Lane Highway Types -- Trends based on number of States

Similar trends are evident also from analysis of the number of States submitting multiple-lane types of highway projects to the U. S. Bureau of Public Roads since 1930.

There is indicated a definite tendency toward a reduction in the 3-lane undivided highway type with fewer States using such construction in the future.

The divided highway type with 4 or more lanes is gaining wider recognition. An increase in the number of States that will adopt it for use in the near future is strongly indicated.

The 4-lane or more undivided highway type will probably remain in use but it is indicated that it will gradually be replaced by the divided highway type, which in all probability will tend to become the dominant type of multiple-lane highway construction.

### SUMMARY

1. In the sectional layout of multiple-lane highways, three distinct zones or divisions of the entire right-of-way are now recognized: roadbed, roadside, and adjacent lands.
2. The importance of the relationship of these three areas of highway development is further emphasized in the various subcommittee reports of the Joint Committee on Roadside Development. (Erosion, Ecology, Zoning, Public Relations, and Economics).
3. There has been an over-widening concept in the evolving patterns of highway design, starting from the center-line and spreading continually outward. This constant expansion of the graded roadbed has tended to squeeze down the remaining portion of the existing right-of-way or roadside, emphasizing the necessity for obtaining greater widths of right-of-way. Many of our right-of-ways are not sufficient to construct divided highways and have sufficient roadside space available for roadside development. A right-of-way should be of sufficient width at the outset to include a fairly wide neutral ground and have side space for development work, particularly proper backsloping. At the present time the roadbed is widened at the expense of the roadside. More attention to wider right-of-way acquisitions will overcome this sacrifice to the efficiency and safety of highways.
4. Roadbed and roadside cannot be separated because they are basically one common problem to be treated as a single unit of construction in sympathetic relationship with the adjacent lands. (Border control).

5. Highway safety, appearance, and maintenance likewise cannot be separated because they are also largely interrelated problems to be treated as balanced parts of a complete highway development. The application of landscape design principles to all of these fundamentally related factors of design is appreciably influencing current trends in associated highway practices. The practical aspects of the landscape design may be recognized and utilized by the design engineer, the traffic engineer, the right-of-way engineer, the construction engineer, and all other construction and maintenance technicians involved in the total highway program. There is an aesthetic factor in the design that cannot be accomplished or justified entirely upon rule of thumb or strictly mathematical arguments. Varying backslopes to restore natural rounded topography, pleasing curvature of alignment to avoid monotony where a continued tangent might be perfectly practical are instances of the importance of landscape design in its purely aesthetic consideration as a necessary complement to the engineering design. The two go together -- the aesthetic angle and the engineering angle both contribute to an ideal solution for satisfactory public service not accomplished by either alone.

6. Five hundred selected multiple-lane highway projects submitted to the U. S. Bureau of Roads since 1930 have been analyzed and the following indicated trends are noted in guiding the evolution of the future divided highway type into a more complete development of the whole right-of-way as a unit in relation to its surroundings.

(a) The undivided highway type have apparently reached the peak of usage with a tendency to reduced construction in the future, particularly in the case of the three-lane undivided type.

The 4 or more lane undivided type may remain in use subject to gradual replacement by the divided highway type, which through increasing adoption and wider use will probably become the dominant type of multiple-lane construction.

(b) Two general types of median strips are developing:

Narrow raised type --- 4 to 6 ft. wide, with curb edgings and hard surface treatment (Possibly due to right-of-way limitations).

Wide flush type --- 20 to 39 ft. wide, often with rural (low, sloping face) type of curb, and in some cases with curb edges omitted. Surface area protected with ground cover treatment. Many 12 to 19 ft. and some 40 ft. and wider are also used. As the median strip is widened, the necessity for curb edge tends to reduce. The flush type with depressed center is also growing in use.

(c) The 11 ft. traffic lane is gaining in use over the existing 10 ft. width. The 12 ft. traffic lane is also becoming recognized and the trend is definitely in that direction.

(d) 10 ft. is the most common shoulder width, with 8 ft. the next most used width. A definite trend since 1936 toward the wider 12 ft. shoulder section is now observed.

(e) Widths of graded roadbed have steadily increased from about 50 ft. in 1932, to 72 ft. in 1934, 85 ft. in 1936, 97 ft. in 1938, and 108 to 112 ft. appears to be gaining consideration for the 1940's.

(f) Widths of right-of-way have increased from about 80 ft. in 1932 to 100 ft. in 1934 and 120 ft. in 1936, pointing toward 150 to 160 ft. in 1938, and 200 to 300 ft. in the 1940's.

(g) The divided highway of the 1940's may be pictured as having a median strip 40 ft. or more in width, with a flush depressed center, between two 24-ft. one-way surfacings with 12 ft. shoulders, all placed on a wide right-of-way with roadside borders (right-of-way 200 ft. or more).

Extreme simplicity in the treatment of the wide median strip is indicated.

Ample roadside space for easy slopes and opportunity for natural landscape treatment in the outer borders is indicated.

Divided-highways should not have utility poles located in the median strip because unsightly and out of place there. On a wide right-of-way, it is advantageous to locate the poles along the highway borders.

In island widths of less than 25 ft. or 30 ft., ground cover treatment, unbroken by planting, gives a more dignified and unified appearance than would result if scattered planting were introduced.

The wider islands permit more latitude in the planting arrangement, but even here simplicity and group effect should be accomplished rather than a scattered unrelated arrangement which tends to divide rather than unite the total cross section.

The practical aspects of design considering safety and utility are inseparably linked with a design that will consider aesthetics as an essential part of the highway program.

A balanced design is the most economical from the long-range point of view. The foundation of a well-balanced design is an adequate width of right-of-way, with roadbed, roadside, and adjacent lands all united in proper relation.

APPENDIX

Roadside (Waysides) Areas: "Safety Turnouts"

In July, 1938, there was distributed to each member of the committee an outline on 'safety turnout' areas, with the request that each member summarize his own observations covering the locality or region with which he is most familiar. A questionnaire form on waysides was also attached. A digest of the replies is given below:

1. What is a wayside?

As defined in the New Standard Dictionary - the side of the way; the border or edge of the road or highway as apparently intended to convey by the succeeding questions: A special recreational area not directly required for the use of the traveled way.

A wayside is any special turnout or stopping area set aside for the temporary use and convenience of the traveling public with particular reference to safety and with facilities for which it is intended.

A wayside is an area within the right-of-way, yet off the roadway, onto which vehicles may be driven for purposes of repair or of parking and which the occupants may use as a vantage point for views or for historic sites; for picnicking, overnight camping; or as access to a stream or other body of water used for fishing, bathing or boating.

A wayside as relating to a highway is that area adjoining the traveled road that is available and adapted to provide rest and enjoyment to the traveling public.

2. Why do we need it?

Taken as first defined, for right-of-way for the traveled road.

Waysides are needed principally for service rather than for recreation, with the view of getting the "stopping" public into a designated area and off the highways.

We need waysides to increase highway safety and to provide additional recreation areas where they are most needed -- along the highways.

Its need is essential to a fulfillment of the purpose of intermittent rest, together with an appreciation of natural advantages and use of comfort facilities where they may be incorporated.

3. What types and kinds are there?

Grading, Vision, Sidewalk, Parking, Parks and Public Utilities.

The type of wayside most necessary in the Gulf States at present is the simple roadside park including the necessary camping conveniences, as tables, ovens, toilet, and drinking water.

Wayside areas include such types as picnic areas, lookouts, concourses, historical markers, spring developments, trailer camps and small parks.

- a - Turnouts -- for repair and parking.
- b - Scenic overlooks -- provide parking space from which the view may be enjoyed.
- c - Historic sites -- provide parking space and a marker.
- d - Picnic areas -- provide parking area and space for picnicking.
- e - Overnight camping areas -- provide parking area for car (and trailer) and space for camping.
- f - Waterside areas -- next to a stream or other body of water (fresh or salt). Provide parking space and access to the water which may be used for fishing, bathing or boating.

4. What size of area? (Give range or limits)

For highways 100 to 200 ft.; vision on side-roads, triangular  
Urban 200 by 200 ft., county road urban 300 by 150 ft.  
Two trunkline rural routes 300 by 300 ft.  
County road rural 300 by 200 ft.  
Railroads urban 150 by 300 ft.  
Railroads rural 300 by 600 ft.  
Roadside parks, approximately two acres.

The average size of roadside parks should be about one acre and should be so arranged that complete drive-ins can be made.

Size of wayside area: Anywhere from one quarter acre to two acres.

The size of the area could well be determined by the character of the development of the wayside and range in size from an incidental turnout space up to a park not larger than can be properly maintained by the highway department or other authorized State agency.

5. How located? Distribution of waysides with reference to traffic and other similar park areas not under control of the State highway department -

Parks located at approximately one-half day driving distance at locations holding maximum natural advantages.

Waysides should be constructed on the main highways where the most traffic occurs and between and away from towns and cities which already offer facilities in many respects similar to those which waysides offer.

They are located wherever opportunity for suitable development exists along our highways. It would be desirable to locate them relatively close together; near and on main traveled routes serving densely populated districts, provided there were suitable locations and land values were not too high.

They should be located with reference to scenic and topographical advantages, coupled with a consideration of the need of the public not merely for "getting there" but for stopping at designated places in their quest for rest, beauty and enjoyment. It is felt that mileage is not the chief measuring unit in distribution, but that feasible utilization of the wayside should govern their frequency.

6. How should maintenance be handled?

Direct maintenance by the highway maintenance division.

Maintenance should be handled by the regular maintenance department with the cooperation of the landscape department, and with the particular view of keeping the site clean, neat and attractive.

Maintenance is handled by the regular maintenance division of the department under the supervision of the division of roadside development. Where maintenance calling for special skill is required, the division of roadside development handles this.

Maintenance in many cases may be assumed by the nearby affected community, or in some cases by the department of State parks. However, with the natural growth and demand that will result from wayside areas, it will become more and more a function of highway operation and will thus necessitate a specific maintenance program under the State highway department.

7. What facilities are furnished? What do the areas offer the public?

Turnouts clear of trafficway, parking facilities, drinking water, chemical toilets, picnic tables, outdoor fireplaces, and natural or developed landscape setting.

Facilities should include tables, oven, toilet and pure drinking water. Such areas offer the public sufficient and useful accommodations with the added protection of an inclosed or "off the highway" area.



Facilities furnished: In some cases tables and benches for picnicking have been provided, and in all cases receptacles for holding rubbish.

Facilities offered: Overlooks, historic monument sites and small strategic scenic turnouts are all temporary stopping places usually not requiring comfort facilities. However, when these overlap in scale with the picnic areas and small park development, provision should be made for water supply and proper sanitary conveniences, if the maintenance factor is definitely established.

8. What is public reaction? Favorable or unfavorable? What is engineers' reaction?

1. Very favorable and popularly accepted
2. Same

1. The public seems favorable
2. The engineers' reactions are also favorable

1. Favorable
2. Same

1. Public reaction to the wayside development program is most favorable as enlarging the usefulness and enjoyment of the highway's function.

2. The engineer will approve such a coordination of effort if it broadens the scope of highway construction in a comprehensive way, contributes to safety, and avoids "fussy decorative application".

9. Has development of areas helped "Safety"?

(Any record of accidents? If so, why did they occur?)

Yes, in that they have come into such general use as a place to stop for a few moments for those on long drives as well as those who use the facilities for picnic and recreation. It is logical to assume that a driver will benefit by a few moments respite gained at one of these locations.

No reason why such areas should not help safety.

Development of these areas has helped safety by providing a place for parking off the traveled way. As far as our records go there have been no accidents.

Turnouts, overlooks, setbacks for historical markers and roadside parking areas very definitely contribute to safety by facilitating the stopping and parking of cars off the traveled pavement or shoulders adjacent.

10. Have any difficulties in maintenance developed? Have any difficulties in administration of the area developed?

(If any troubles have been observed, describe and explain briefly) ----

There should be no difficulties in maintaining waysides. It would be far less expensive and far less troublesome to maintain a wayside park or any other small area than to maintain only a few miles of roadside development on which trees are planted.

No special difficulties in maintenance or administration have developed.

Maintenance and administration are at present the pressing problems confronting a wayside development program. The program fills a recognized public need and as such must involve a financial program of maintenance and administration or the entire purpose fails. The building of this financial program needs the guidance and support of all interested in the broadening of the State highway's service to the public.

11. Based on your observation of such areas, what suggestions would you note for application in future development of waysides?

Using the interpretation given the term as defined in question No. 1, the regulation and control over the use of abutting property is a basic need. Long extended aprons for the use of commercial establishments; individual entrance drives for the closely grouped homes that require access to the trafficway have created a very serious hazard for users of highways. This condition seriously detracts from the orderly appearance of the highway as well as affecting safety.

Some waysides may be overdone to the extent that they cannot be properly maintained, which has produced an uncared-for appearance. Small, simple waysides of a useful nature are preferable to those of a larger scale. Highways should not take upon themselves larger park sites which tend more to recreation than usefulness. These latter should be handled by the park boards or commissions in the respective States.

Suggestions for future development:

1. Each area numbered and named. Each area shown on State highway map by number, and listed and described by number.

2. A distinctive and attractive sign for each area and a sign on the highway 1/4 mile on either side calling attention to the area. These signs need not be all alike, in fact they should be adapted to the locality, but the information should be standard and legible for fast moving traffic.

3. Provide ample parking space and safe and easy access from and to the highway, but keep vehicles to the space assigned them by barriers of naturalized native material free from maintenance. This would help preserve and protect any existing vegetation responsible for the attractiveness of the site.

4. Use only native plant material harmonious with the site.

5. In acquiring right-of-way for new highways take extra widths where necessary to secure desirable waysides.

6. In all man-made yet basic facilities, such as picnic tables, spring outlets, fireplaces, etc., use only native materials blended and in scale with the site.

In the future development of waysides, a careful analysis should be made of the natural advantages existing to suggest the possibility of a wayside and of the probable appreciation and use by the public. The wayside should fulfill some definite need, thus becoming an integral part of the highway. Unless this definite need exists and a definite impression is conveyed to the public, the wayside should be omitted from the program.

12. What facilities would you omit? What extra facilities would you include?

1. None
2. Probably certain playground equipment

The necessary facilities explained in No. 7 are the facilities most desirable.

Extra facilities to be included:

Water supply -- natural or artificial spring outlet where possible.

Sanitary facilities -- located so as not to pollute any surface or ground waters and so that offensive odors will not get into used areas. Flush toilets in intensively used areas.

Fireplaces in picnic and camping areas.

Shelters with fireplaces in more intensively used areas in case of showers.

Seats and benches in shade and placed so as to command views.

Incinerators (of native material).

Signs and markers pointing out spots and facts of scenic, geological, botanical, wild life, archeological and historic interest.

Bathhouses in exceptional instances.