ROADSIDES

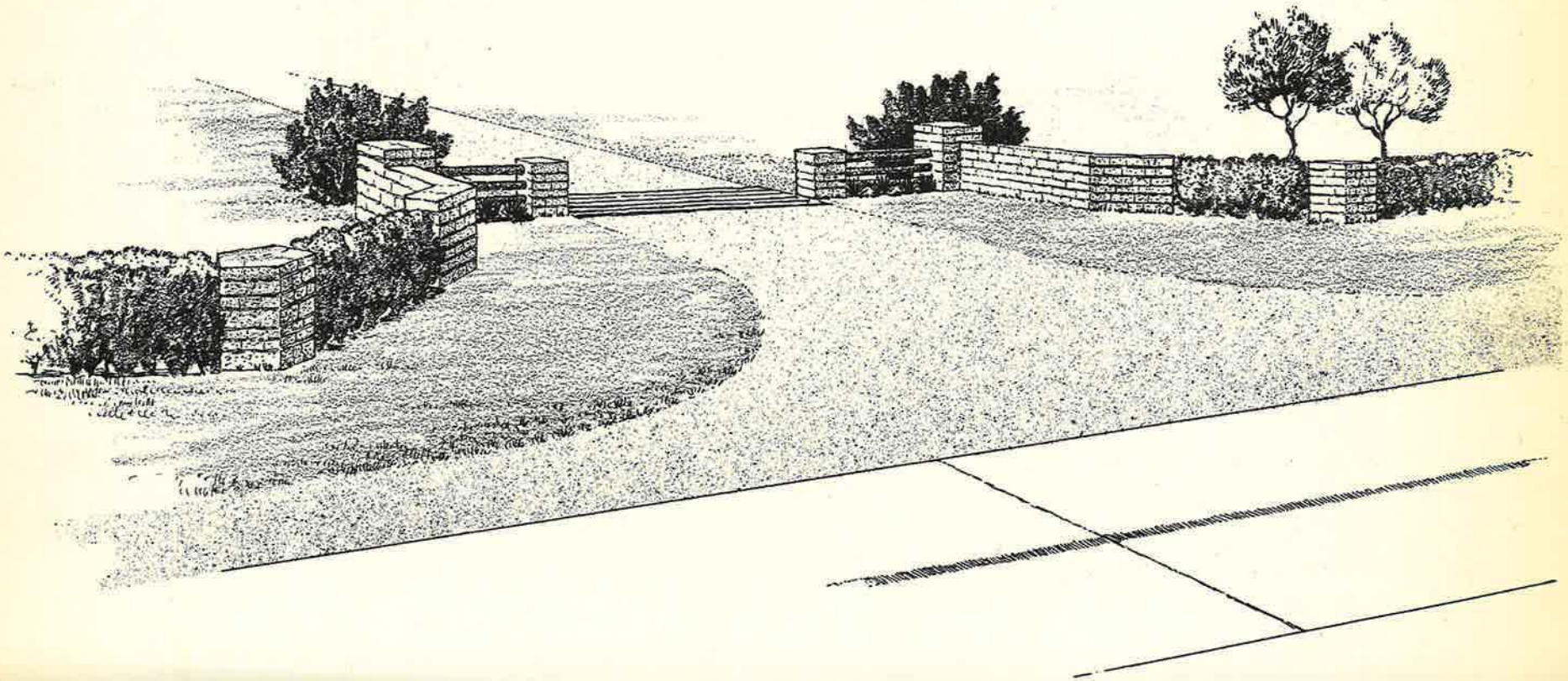
A RECORD OF PROGRESS

"The beauty of our roads and countrysides and the enjoyment of safe travel by millions over our vast network of improved highways throughout the years, is a vital resource of this democracy well worth preservation, development and defense. This long range plan is as important as the immediate role of the highway in national defense."

COMMITTEE ON ROADSIDE DEVELOPMENT OF THE
HIGHWAY RESEARCH BOARD

AMES, IOWA DECEMBER, 1940

VOLUME II



COMBINATION MASONRY AND HEDGE

R O A D S I D E S

A RECORD OF PROGRESS

VOLUME II

Prepared by

The Sub-Committee on Education and Public Relations of the Joint Committee on Roadside Development of the Highway Research Board, cooperating with the American Association of Highway Officials.

Published at Iowa State College, Ames, Iowa December, 1940

COMMITTEE ON ROADSIDE DEVELOPMENT

H. J. Neale, Chairman
Richmond, Virginia

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P. H. Elwood
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Springfield, Illinois

Jac Gubbels
Austin, Texas

Flavel Shurtleff
New York City

Foreword

This, the second "Roadsides, A Record of Progress", includes work submitted by twenty-three states. Fifteen new states are represented in this issue showing a definite increase in the response. (See map for details on states included.)

The contributions which are quoted herein are greatly appreciated by the Committee on Education and Public Relations, and show a definite forward trend in this great movement which you are all doing so much to advance. Again this year the work of assembling and editing was done by Mr. Wayne H. Wilson, Graduate Fellow in Landscape Architecture at Iowa State College.

While this publication is far from the syllabus or working manual we have suggested from time to time, we hope it will be of considerable inspirational as well as technical assistance to men working in this important field throughout the nation.

Though not listed in the contributions from the various state landscape architects, special mention should be made of the splendid treatment of "Landscape Design and Highway Development" appearing in Landscape Architecture for April and July 1940, the official organ of the American Society of Landscape Architects. In the earlier issue there is an outstanding contribution by Mr. A. R. Nichols, Consulting Landscape Architect to the Minnesota State Highway Department with supporting comments by Mr. Roy W. Crum, Director, Highway Research Board; Mr. S. Herbert Hare, Fellow, A. S. L. A.; Mr. Jac L. Gubbels of the Texas Highway Department; Miss Harlean James, Executive Secretary, American Planning and Civic Association; and Professor F. C. Lang, of the University of Minnesota. Throughout these comments and in Mr. Nichols' article, the basic and fundamental idea as noted by Mr. Crum, is that 'a balanced design is best produced before a road is built', and that 'beauty should be designed into the highway, not added superficially', as Mr. Hare states. It is gratifying to us that Mr. Crum quotes from the leading paragraph of the 1932 report of our Joint Committee. In the July issue of this same magazine it is encouraging to note Mr. F. L. Olmsted's comments on the Hitler highways, which evidently are more like railroads in their alignment and construction than the type of highway blended into the landscape which this committee and the landscape architectural profession have long advocated.

One afternoon session of the National Conference on Planning held in San Francisco July last, was devoted to Roadside and Architectural control. The undersigned served as chairman. Several important papers were presented. Copies of the full proceedings can be obtained

from the American Society of Planning Officials, 1313 East 60th Street, Chicago.

Last month an event of unusual interest to all concerned with tree planting problems was the Fifteenth Conference of Shade Tree Commissions held at New Brunswick, New Jersey.

Thus it is seen that planners, educators, and technicians in various fields are seriously studying the complicated problems of the roadside. Each year more state and district study conferences are held which are sure to improve the quality as well as the amount of work done. With better work will come a greater demand from those most concerned, the property owners and the highway users.

Few activities these days are free from "defense" relationships - certainly not our great highway system. But let us not forget the amenities or the long peace time program while we are planning means for defense transport facilities. Soldiers, equipment and materials should be quickly, safely and pleasantly transported from station to station and these young men should gain a true impression of the country through which they pass. Therefore, let us make of the emergency an opportunity for greater and perhaps more far reaching service by blending our highway and parkway system into the broad and varied panoramas of America.

-- P. H. Elwood, Chairman
Education & Public Relations

NATIONAL RESEARCH COUNCIL
HIGHWAY RESEARCH BOARD
Washington, D. C.

C
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P
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Address reply to:
Landscape Studio
Ames, Iowa
October 17, 1940

Attn: Landscape Engineer in Charge
of Roadside Development

Dear Sir:

The Committee on Education of the Highway Research Board is compiling another bulletin of information concerning the progress and activities in roadside development during the past year. To date we have received considerable information from the Highway Commissions of the following states: Connecticut, Idaho, Indiana, Nevada, Texas, Virginia, and Utah.

Much valuable information is included in the above material, but it is most inadequate for a representative showing of the work I know is being done in the various states. What we most desire is information on methods and techniques now employed as well as results of work accomplished.

Furthermore, we are anxious to obtain information concerning cooperation with educational institutions, garden, civic, commercial and women's clubs, and other organizations interested in the public education for support of this tremendously important, though rather recent activity of all the State Highway Commissions of the nation. We want your state and your commission well represented in this report.

Assembling of this material will be greatly facilitated by a prompt reply. We prefer some material now rather than more too late to be incorporated in our summary bulletin. All material should reach us not later than November 10th to be included in this publication.

I appreciate greatly your past cooperation and hope the forthcoming bulletin will be of some practical help, and perhaps encouragement, to you and your staff.

Very sincerely yours,

/s/ P. H. Elwood, Chairman
Education & Public Relations

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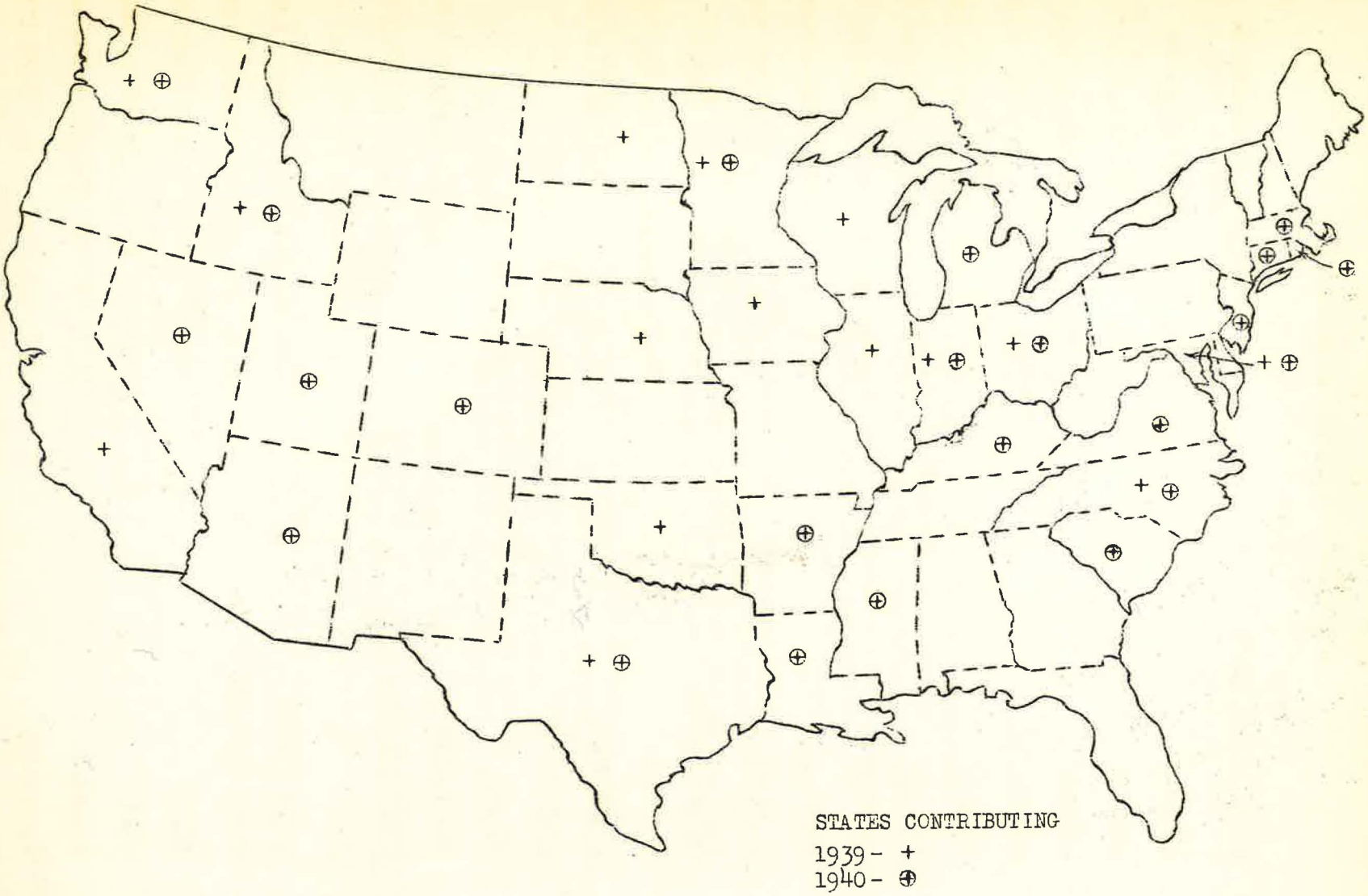
STATES CONTRIBUTING
1939 - +
1940 - ⊕

ROADSIDES - A RECORD OF PROGRESS

State Contributing	Material Submitted By
ARKANSAS	W. W. Zass - Chief Engineer
ARIZONA	F. M. Guirey - Landscape Engineer
COLORADO	M. W. Pesman - Landscape Engineer
CONNECTICUT	John L. Wright - Director of Roadside Development
IDAHO	W. H. Marcellus - Roadside Improvement Engineer
INDIANA	H. J. Schnitzius - Landscape Super.
KENTUCKY	T. H. Cutler - State Highway Engr.
LOUISIANA	T. Slack - Roadside Development Engineer
MARYLAND	S. W. Baumiller - Roadside Development Department
MASSACHUSETTS	R. N. Coburn - Chief Engineer
MICHIGAN	Philip Troeger - Landscape Architect
MINNESOTA	H. E. Olson - Engineer of Roadside Development
MISSISSIPPI	Highway Department
NEVADA	Highway Department
NEW JERSEY	Robert S. Green - Landscape Engr.
NORTH CAROLINA	F. H. Brant - Landscape Engineer
OHIO	Dallas D. Dupre, Jr. - Land. Arch.
RHODE ISLAND	John Cirwein - Landscape Engineer
SOUTH CAROLINA	J. S. Williamson - State Highway Engineer
TEXAS	Jac L. Gubbels - Head, Roadside Development
UTAH	Grant R. Bowen - Landscape Engineer
VIRGINIA	H. J. Neale - Landscape Engineer
WASHINGTON	O. R. Dinsmore - Assistant Director of Highways

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Frontispiece and illustrations from Texas Highway Department
Bulletin No. 8
Submitted by Jac L. Gubbels, Head Roadside Development

ABSTRACTS FROM STATE REPORTS

Work Accomplished

ARKANSAS

In Arkansas, roadside development work consists of "flattening slopes and sodding or seeding, or a combination of both, and little planting of shrubbery is performed. This type of work is required only on our older projects, the construction performed during the past few years period being designed in accordance with the later principles of flatter slopes and shallow waterways."

ARIZONA

"The activities of the landscape division in Arizona have varied slightly from those of past years in the 1940 program, in that planting has been minimized. Several of our projects involve no planting whatsoever, but consist principally of the construction of erosion control measures and the flattening of cut slopes to permit natural revegetation.

"We are placing emphasis on the development of scenic overlooks this year, having about 12 in our program, and the development of several roadside parks which have proven very popular in Arizona.

"We have long realized the necessity for so planting that our maintenance costs will be minimized, because scarcity of natural water over most of the state makes the installation of any other than native materials prohibitive.

"We are just beginning the erection of a series of state-wide historical markers, which should in a period of 3 or 4 years cover nearly all of the major points of outstanding historical interest.

"Our Federal Aid program has been following a logical development that was instituted at the time the work was first begun. Fortunately, most of our new projects cover a good deal of landscape work in their scope, so that any further work found necessary is usually limited to the development of picnic areas, the trimming of occasional trees, and the installation of measures to control erosion that may not have been forseen at the time the initial construction took place."

COLORADO

"New departures in type of projects in the 'backbone state of the continent' have resulted from previous tentative but successful attempts on a limited scale.

"Most outstanding among these new departures is the recent treatment of the Glenwood Canyon highway. In a distance of nine miles a series of

roadside parks were created adjoining the highway, some in a peninsular riverbend, some hugging an almost perpendicular rock wall, others at the delta-like junction of a small creek with the river. At one particular very scenic spot where tourists are sorely tempted to stop to view the spectacular rapids, a narrow parking area was widened, protected from the steep riverbank by a stone parapet.

"Fountain Park and Rapids Area are provided with a drinking fountain fed by a natural spring from the mountainside. A large perpendicular jet of water lends additional interest in Fountain Park, to which Villa Lante gave the original inspiration.

"A successful innovation was the building of five-foot-wide lookout bays in the rubble wall protecting this park. They furnish the right opportunity for safe, scenic viewpoints.

"Fireplaces were built in the larger picnic areas, other utility features are left to the U. S. Forest Service. (The major portion of the project is in the White River National Forest.)

"Another significant project is found at Kenosha Pass, 10,000 feet above sea level, at a place where U. S. 285, after having wound through canyons and aspen groves, suddenly emerges upon a vast, flat area, South Park. The contrast is spectacular -- a roadside park here is a "natural".

"A remaining hump was graded down, traffic was guided into definite lanes and parking areas defined by means of native stone curbs and rustic carstops. The remaining area was planted to native pines, aspen, low juniper and other native material.

"The area is made more interesting by a historic marker carefully placed to catch the eye as one rounds the revealing curve."

IDAHO

Idaho reported the completion of two projects "consisting of seeding, flattening and rounding out slopes and flattening of fill slopes toward a smooth streamlined cross section". Successful solution of problems encountered on the projects such as the treatment of a wet cut fed by springs and the use of horizontal trenches six inches deep and six inches wide at three foot intervals on slopes. Trenches and untrenched areas were covered with topsoil. "In connection with one project a slope not actually within the new construction limits was roughly dressed up by machine methods merely to blend this old cut slope in with the new. Hand finishing of this slope and trenching was deleted, but topsoil was spread over this cut the same as the others. After the first years weathering and the grass seed had started to grow it was noticed that there were several places on the hand finished slopes where the topsoil had slipped, while on the slope finished by machine methods there was no evidence of any slipping. The entire project, however, has proven to be a real success. After the first year's growth the slopes and ditches are well sodded with a good growth of native grasses cutting

erosion to a minimum.

"The value of vegetated slopes and ditches has been brought into prominence in this locality also, with a trend toward smoothing up the entire right of way width to make it accessible to power mowers to cut weeds and to encourage growth of grass.

"Slopes in general are receiving more and more attention and the prevailing trend is toward a flat streamlined section in all future highway construction with special attention given to slopes in soils subject to damaging erosion. Another feature of the Roadside Improvement program which is making headway is the construction of turnouts for rest or scenic views and a more general consideration of the aesthetic values."

KENTUCKY

"We are planning a number of roadside picnic parks some where the area of the site is small with tables only, others where land is available, are equipped with grills, tables and sanitary toilets.

The following is a summary of Federal Aid Roadside Improvement Projects completed in 1939.

"Miles Constructed - 78.5
Total Cost - $81,753.72
Average Cost Per Mile - - - - - - - - - - - - - - - - - - - $ 1,041.45

		Cost	Average Unit Cost	Percent of Whole
Tops of slopes rounded	197,687 Lin.Ft.	$16,421.20	.083	20.05
Excavation	16,967 Cu.Yds.	11,860.30	.70	14.52
Grading	11,092 Sq.Yds.	895.09	.081	1.09
Top soil borrow	6,956 Cu.Yds.	6,406.50	.92	7.84
Sod	44,352 Sq.Yds.	10,680.24	.24	13.07
Honeysuckle vines	29,617	2,714.30	.092	3.32
Seed and fertilizer		12,612.48	----	15.43
Trees, shrubs & vines (Other than honeys.)		7,938.55	----	9.72
Other items		12,225.06	----	14.96

(The amount listed as "Other Items" includes paving, curb and gutter, riprap, moving and resetting fences, drain pipe, etc.)

Complete tabulation from which the above figures were obtained is on file in the Roadside Improvement file. Compiled January 4,1940.

LOUISIANA

"Louisiana's roadside development has included all phases of the work such as widening shoulders and front slopes, back-sloping, construction of better drainage facilities, surface dressing, sodding, preservation of native trees, planting and the construction of roadside parks. All work has been

done on a contract basis except our state projects calling for planting work only in which case they were done with maintenance crews with plant material being secured from the woods.

"At present we now have ten Federal projects, constructed with the 1 per cent Federal fund, which have been completed during the past six years and three more now under construction. Of this total six are located in the hill sections of Louisiana where erosion control is essential.

"In addition to the above a new statewide Works Progress Administration program has been inaugurated, a large part of which includes roadside development. During the past month nine of these projects have been started. They consist of widening shoulders, construction of better drainage, backsloping, sodding and the preservation of large, native trees."

MARYLAND

Maryland reports that at the end of this year - "we will have comprehensively landscaped 7.75 miles of dual highway with W.P.A. labor, and by contract, we will have completed 5.35 miles of dual highway."

MASSACHUSETTS

"Roadside development work in Massachusetts is divided as follows:

Design
New construction (general & roadside development)
Maintenance.

"The cooperation of the project engineers and the Roadside Development division make it possible to incorporate the fundamental landscape features in the design of the highway. It is at this stage that we can preserve our natural resources by the conservation of existing topsoil, vegetation, and location of wayside areas.

"The following features can be handled economically by the general contractor in the construction of the highway: the rounding of slopes, the handling of fill for foundation work on lookouts or waysides, the construction of tree wells to save existing trees, and the salvaging of peat and other material to be used later on roadside development projects.

"Roadside development projects are based on the 1% federal aid which is used for the projects designed by this division. These projects consist of tree, shrub, and ground cover planting. This work is done mostly by contract.

"The most can be obtained by the cooperation of the divisions of the highway department, in the construction and maintenance of our roadsides. The interest of these division heads has made it possible to complete the roadside work in an economical manner and increase the mileage of improved roadsides in this state."

MICHIGAN

Michigan reports that in addition to the development of roadside parks and "the more concentrated type of development on boulevarded sections of trunk lines within metropolitan areas, they have a program of general roadside planting projects in such portions of the state that are lacking in natural plant life; in extensive snow barrier planting to replace picket fence snow barriers; in erosion control planting and in special planting designed to aid in traffic control.

"Very successful results have been obtained on dune control planting. The increasing development of shoreline highways has brought this phase of landscape activity into greater importance.

"It should be noted here that sodding ditches, back and fill slopes, has been very general in road construction in this state. Experimental planting of shrubs and vines in lieu of sodding is being carried out on certain road projects. Money for this construction comes from road construction funds."

MINNESOTA

"Minnesota has stressed one of the most important phases of Roadside Development in the past year -- namely, the providing of ground cover on all areas disturbed by grading operations.

"This includes the placing of 831,100 square yards of sod on slopes and ditches for erosion control; the seeding of 4,451 acres to alfalfa and brome grass mixture; 469 acres to Kentucky blue grass and 2,625 acres to winter rye. The total acreage of seeding for the year amounts to 5,214 acres and represents a ground cover on 397.8 miles of new construction.

"Through the cooperation of the various relief agencies such as the Work Projects Administration, the National Youth Administration, and the C.C.C. the following work has been completed or is under construction:

"The landscaping of the approaches to twenty-two (22) cities or towns; the landscaping of six (6) bridge approaches; the landscaping of nine (9) roadside parking areas; the construction of four (4) stone masonry concourses or overlooks; the construction of one (1) natural spring development; the construction and perpetuation of thirteen (13) historic markers; the construction and landscaping of eighteen (18) State line entrance markers; and the flattening of slopes, seeding, sodding and planting on 87.3 miles of old trunk highway construction.

"Most of our concentrated projects lying within the corporate limits of a municipality are maintained by the city or town and a resolution agreeing to such maintenance is requested before any project within the municipality is started. We have, however, two (2) projects consisting of natural spring development and roadside parking areas which are being maintained by the local Lions Club and this procedure has been very satisfactory as a part time caretaker is hired by the Club to keep the project in good condition.

"We also have a roadside parking area and historic marker project that is being maintained by the local Chamber of Commerce which has also hired a part time caretaker."

NEW JERSEY

Federal Aid Projects (By Contracts)

1. Route #35, Bypass, Woodbridge to Perth Amboy. Contract $33,120.00

2. Route #25, Relocation Cranbury - Hightstown. Contract $9,900.00

3. Route #35, South Amboy - Thomas A. Edison Memorial Contract $13,997.00 Bridge Approach

State Highway Projects (Landscape Division)

1. Route #40, John Davison Rockefeller Memorial Highway. In operation through Burlington County.

2. Route #40, Northern end of John Davison Rockefeller Memorial Highway. 6.7 acres along 1300' of highway at Belmar.

3. Route #35, Asbury Park Traffic Circle and adjacent areas along 1500' of highway.

4. Route #38, Moorestown Roadside Improvement along 2300' of highway.

5. Route #25 and Route #S-26, Milltown Traffic Circle and adjacent areas.

6. Route #4, Chestnut Neck Battle Monument along 1100' of highway south of New Gretna.

7. Routes #1, #4 and #6, Fort Lee Bridge Plaza - Shade Tree Planting.

8. General slope planting (erosion control), Honeysuckle, Bittersweet, Virginia Creeper, Native Sods, and Cedar, Pine Oaks and Dogwood on cuts and fills throughout the State.

State Highway Maintenance

1. Complete maintenance throughout growing season of over 1,000 acres of lawn area and over 100 acres of trees and shrubs along some 1,700 miles of State Highways.

2. Tree trimming performed by one permanent crew throughout the

year and by seven crews during the winter months.

3. Salvage of all suitable plant materials on new alignments.

4. Collecting of plant materials donated from privately owned acreage.

Preliminary Surveys

1. Roadside improvement acreage.

2. Roadside picnic areas.

3. State-wide shade tree plantings.

OHIO

Ohio submits the following Roadside Park Report:

Parks prior to 1939	115
Completed during 1939	82
Constructed during 1940	
A-Force Account	14
B-N. Y. A.	48
C-W. P. A.	15
D-Others	3
Total A, B, C and D	80
Total Roadside Parks (in full use)	277
Single Roadside Table & Refuse Can (1st year inaugurated)	325
Number of easements for 1941 Park construction	48
Number of Park sites contemplated for 1941	102
Number of Roadside Tables contemplated for 1941	526
Average area per Park	2.043

"Roadside Improvement is the main classification or angle of highway landscape work and by this is meant the wide and extensive program of replacing or "re-creating" the natural beauty that once existed along our highways before the fast automobiles and trucks necessitated the reconstruction of the highways by widening, straightening, and the strengthening of the pavements. This entails wider right-of-way, heavy cuts through the hills and the filling of the valleys. Unfortunate as is the destruction of the native trees, shrubs, vines and grasses, it becomes necessary, if the highways are to be made safe for traffic. It then becomes necessary to heal these 'construction scars' by replacing the destroyed natural beauty.

"As nearly as possible nature is copied, and the same general type of vegetation as formerly grew along the roadsides is re-planted. As a result, once more there is greenery, once more there is shade, and once more there

is covering over the earth pleasing to the eye, and protective against erosion.

"During the past two years over 750 miles of this type of work has been carried out to a fine completion. This compares highly favorable with the total of 472 miles which were completed in the six years previous to this extensive program.

"A second phase of the Roadside Development program, and one which is becoming increasingly more popular and pleasing to the general public is the construction by the Department of Highways of the Roadside Parks.

"There are now almost 300 of these, located at opportune points along the State highways. The greater percentage of these have been constructed during the past two years.

"These Parks each have certified drinking water, shelters, ovens, tables and sanitary toilet facilities. Fire wood is supplied, daily maintenance is given, and the popularity of these rest and picnic areas is attested by the number of people who use them. Registrations are received from every State in the Union, and from all over the World.

"These Parks are constructed in the main by National Youth Administration boys, supervised by Department of Highway foremen. W.P.A. labor is also used to advantage. The State buys none of the sites, depending entirely upon generous property donors. In this way the Department of Highways is furnishing Roadside Parks to the people of Ohio at an average cost of less than $2000.00 each, with more facilities, as compared with Parks in neighboring States which are paying from $4000 to $6000 for similar recreational areas.

"In addition to the Parks, and to augment them, 1940 saw the inauguration of the placing of Roadside Tables (with refuse cans) over the State. 325 tables were put out this year, and the instant approval given to them will justify a larger number for 1941."

RHODE ISLAND

"Rhode Island is doing a great deal of landscaping on its highways for the purpose of erosion control and to restore the natural beauty of the country side.

"Our rotaries and dividing islands are particularly well kept, which make for pleasant riding on the highways. Our slopes are mowed twice a year and are very particular to preserve all native growth on them. We use Sickle-bar mowers and tractors with Sickle-bar attachments with hydraulic lifts. We pay very much attention to our shade trees on the highways and constantly planting new ones, as we feel that trees are essential to the beauty of a highway and gives the motorist a pleasant and restful ride.

"Our state is considered a vacation state to a great extent, therefore,

we maintain many picnic groves on our roadsides, some very large and continuously adding to them, as they are very popular with the motorists. Realizing the popularity of these groves we have increased the fireplace and table facilities to accommodate more people. We have installed sanitary facilities and furnished water supply for drinking and cooking purposes. These wells are officially tested for purity before use. These groves are constantly cared for and supplied with fire wood."

UTAH

"We have also set up a project which is nearing completion, wherein all slopes were completely warped according to the enclosed graph. The project installed was at the entrance to Zions National Park. Its finish is quite notable in that the aspect of the roadsides, insofar as round forms are concerned, is a very natural one. This is especially true on side hill sections. The cut side has the appearance of a natural termination of the ridge, very much as if the roadway were developed on an existing bench. The slopes were mulched and seed soiled.

"Since grading was completed, there has been some very severe rain storms, cloudbursts in proportion; but there has been very limited shoestring erosion on the slopes.

"As a result of the seed-soiling process, natural pioneer types of vegetation are quickly establishing themselves. The most noticeable ones at present are the annuals.

"The project was also set up for the seeding of two native shrubs (evergreen oak and desert almond). The oak has germinated and supplied a good stand. It remains to be seen if these growths will survive our hot dry summers. Native growths of shrubs of this character, however, are in dry situations; so that we expect fairly good results.

WASHINGTON

"The work of landscaping the roadsides west of the Cascades is manifold, although largely a program of conservation.

"The view of many magnificent mountain peaks and ranges, or glimpses of Puget Sound along the highways, are further enhanced by the "thinning out" of too dense an undergrowth, and the careful cutting back of desirable existing trees and shrubs. In many scenic areas logging or slashing activity has removed most of the existing native plant material. In these areas native trees and shrubs can be replanted to provide a natural setting for the existing scenery. Likewise, dead snags are left standing on logged-off lands adjacent to the roadsides. By removing these unsightly spires, a new skyline of second growth fir appears.

"Constructing the modern super-highway through rolling, wooded country with the resulting cuts and fills calls for a special treatment.

"Cut areas present an unnatural appearance which we endeavor to correct by some form of slope treatment, followed by planting, mulching and seeding. By flattening slopes to an angle of rest relative to the contours in the adjacent landscape, we attain the assemblance of an undisturbed roadside area. This method is practical only on low cuts. Where high cuts are encountered, flattening would be prohibitive from the standpoint of cost. It has been found that the sloping of the upper one-third portion of these high slopes results in a very pleasing contour.

"Disturbed areas along roadsides, whether flat ground, cuts, or fills, require the re-establishment of trees, shrubs, or ground covers. Selection of plant material suitable for these areas was originally confined to collected native material. While every care was exercised in replanting these trees and shrubs, the results in many instances were very discouraging.

"In the search for material hardy enough to survive adverse conditions, our attention was constantly drawn to the excellent growth of the Native Broom. We have found many Brooms which have none of the objectionable habits and all of the desirable qualities of Native Broom. These Brooms come as creeping ground cover types, low, shrubby types and high bushy types for screen planting. In addition to the Brooms, we have used Native Maples, Dogwood, Azaleas, Rhododendrons, Snowberry, Mockorange, Ivy, Wild Currant, Trembling Poplar, Oregon Ash, Kinnickinnick and others. Types of plants are placed in areas on roadsides which more nearly conform to their natural environment.

"This material once established serves a two-fold purpose; first, in beautifying the highway and second, in preventing costly and unsightly erosion. The difficult problem of establishing plant growth on the sterile subsoil has been surmounted by digging generous soil pockets and backfilling with good top soils with the addition of natural peat, where available, or the use of farmyard or commercial fertilizers. This method of planting would leave a spotted effect were it not for the seeding and mulching of the intervening areas."

Public Relations - Education

ARKANSAS

"The Department does not number a landscape engineer among its personnel and our work is generally planned and carried to completion through our Maintenance and Construction Departments, the first named with state forces and the latter through the contract method.

"Considerable interest is shown by various Garden, Civic and Women's Clubs and other similar organizations toward attractive looking rights of way. This movement is gaining volume and is quite a matter of comment throughout the State."

ARIZONA

"We have had excellent cooperation from some of the Chambers of Commerce, both in maintaining plantings set along the streets of some of our towns, and in the securing of materials for a series of memorial shrines, which are now being constructed along the old Camino de los Padres, the forerunner of the Camino Real so famous in California. The Camino de los Padres runs from Nogales on the Mexican Border to Yuma on the Colorado River where it traverses Southern California, tying in with the Camino Real in San Diego.

"The Chambers of Commerce in the various counties through which this route passes are raising funds for the purchase of materials to construct these shrines, each of which is dedicated to one of the Spanish Padres, who in the past four hundred years has traversed this route. Art work, in the form of a stone statuette representative of the Order of the Priest is being executed by the Federal Works Art Project. Construction of the masonry for the shrine is handled through the National Youth Administration which furnishes the labor. Our Department provides supervision, a light truck and fuel for its operation. The State Federation of Garden Clubs has been very cooperative in furnishing us with various kinds of seed, small trees, and in assisting us to secure planting easements from private owners.

"While work of this kind is now carried on on a relatively small scale, I believe it to be most valuable from a public relations standpoint, and certainly well worth the slight cost that our Department has to put up as its contribution to the work.

"I trust that our State Highway Commission will give increasing recognition to this activity, and provide us with some small funds with which to carry it on rather than continuing a situation in which we have to beg, borrow, or steal, whatever we can acquire, though I don't suppose this situation is much different from that in many of the other States."

COLORADO

"To our satisfaction we are finding an increasing interest among highway engineers. Many have given valuable suggestions on erosion control, seeding, drainage, and landscape structures.

"Maintenance forces are cooperative but 'need to be shown'. In many cases the older projects have meant increased cost, specialized maintenance, interference with past routine. Such items are not relished by a maintenance head anxious to reduce costs.

"Interestingly enough, we find it difficult to reduce irrigation and intense maintenance once the local patrolman has become engrossed in a new project. Plant material in Colorado must be carefully established for a number of years, then gradually left to shift for itself without special care.

"Our best channel of public education is through the Colorado Federation of Garden Clubs, and local clubs of a civic nature. I give illustrated lectures in various towns over the State, radio talks in Denver, and write articles mostly for the State Garden Quarterly.

"An annual conference of Highway Engineers at the Colorado State University reaches Colorado and part of Wyoming. Proceedings are published.

"We need improved techniques, both on getting the plans out and on reducing the labor of final surveys on cross-sections, grading quantities and similar operations. Other states seem to have the same problem of keeping engineering costs down, especially on the smaller projects."

INDIANA

The following paragraphs from the program and institute program of the Indiana Roadside Council are indicative of the cooperative efforts being carried out in Indiana:

1. Objective

This organization will work in cooperation with the State Highway Commission departments in suggestions for the beautification or removal of obstructions from the State right-of-way on State Highways, and with the County Commissioners for improvement of county roads and roadsides.

2. Plan

The first plan of work is to find the facts about our roads - a process of education. We can do this through tours along the roads and make reports of suggested places for improvement such as, rest area, suitable place for parksite, or placing a Kiosk, with historical interest, the preservation of fine view, or natural water supply as springs, and report findings to proper authorities.

3. Education

Another process of education is to arrange District meetings in each Highway District and hear from the State officials in the State Highway Department, or County Commissioners facts about making of our highways, traffic control and plans to beautify the roadsides. Discussion should follow and members of the Council feel free to ask questions about their work of road officials. The background of suggested improvements must be based on accurate knowledge of existing conditions and of legislative

limits on work of the Highway Department.

4. Cooperation

This organization can assist the Highway Department in keeping the right-of-way free of all signs except those ordered or approved by the State Traffic Director, by calling the nearest Highway Office and reporting signs being placed. Read the new law about signs along the highway right-of-way or in towns along streets that are really State Highways.

5. Preservation

Conservation - Trees, shrubs and other natural beauty along our highways must be preserved. This organization can give their support to this movement, through educational programs over the Radio, the Press and the Screen, in an understanding of the aesthetic and commercial value of roadside attractiveness. Planting to control soil erosion and to conserve the landscape.

6. Safety on the Highway

The factors of highway accidents are: The Highway, the Car, the Driver and the Pedestrian. Know your state laws governing traffic regulations and such laws as needed in roadside development, Education to protect yourself. Engineering to make safe driving easy and enforcement to control the reckless driver and careless pedestrian.

KENTUCKY

"The Highway Department cooperates with the Garden Clubs and Civic organizations where opportunity ariaes.

"We have made plantings on the roadside in a number of instances at their instigation. In one instance the Junior Board of Trade of Louisville planted one mile of Dogwood and Elms on the Louisville-Cincinnati Road near Louisville, at their cost but under the supervision of the Highway Department.

"The Experiment Station maintained by the Federal Government and the Kentucky University at Lexington make tests of soil and seeds for us."

LOUISIANA

"Landscape contractors are not usually equipped with the type of machinery to do the earthwork of some roadside contracts. General road contractors are without the training and experience for the horticultural side of the work. Planting work is a seasonal operation. It is believed that better results could be obtained, where planting work is involved in a contract, if there were two separate contracts - one for the earthwork and possibly the sodding and another for all work in the horticultural field.

"Cooperation has been given to garden, civic and other clubs throughout the state with the idea of interesting the public in this line of work. In several localities these clubs have assisted not only in creating favorable public sentiment but have also helped by supplying funds for actual work,

particularly planting."

MARYLAND

"This year we have made great strides in incorporating in the maintenance department the idea of using landscape principles such as using plant materials, that is sod, vines, plants of all kinds, in repairing their erosive troubles. We are cooperating with all civic and other organizations in their interests in beautifying the highways."

MASSACHUSETTS

"Many garden clubs and other organizations have taken a great deal of interest in the roadsides of this state. Many times during the year various talks are prepared for these groups in order that they may become familiar with the work of the department. The Massachusetts State College sponsors a week's course each winter on roadside development problems and the highway department has ten men attend each year. Many times during the year local newspaper articles appear covering various types of roadside work including photographs. Field trips are planned by some of the organizations and they view some of the roadside projects. The Horticultural Society has given its cooperation through its various divisions by mentioning the work the highway department is doing to improve the highway."

MICHIGAN

"It has never been a particularly difficult matter in this State to get popular support on measures that have to do with the improvement of roadsides throughout Michigan. Public demand has exceeded the effort that the department has been able to give to roadside improvement.

"The coordination affected by the Department with the public is through the medium of (1) releases to the newspapers, (2) showing of motion pictures, (3) special exhibits at conventions, fairs, etc., (4) addresses before Women's Clubs and businessmen's organizations, and (5) radio talks in which highway landscape development is given its proportionate place on the program."

MINNESOTA

"Many garden clubs have cooperated with the State in the construction and maintenance of roadside parking areas and the State Federation of Women's Clubs has a standing committee on Roadside Beautification and this Committee is very helpful in disseminating information to the public as to Roadside Development activities throughout the State. This organization is actively sponsoring the "Suggested Act for Roadside Development and Control" which is being advocated by the American Automobile Association.

"The entire roadside development program throughout the State has been well received by the public as is evidenced by the large number of requests that we receive for additional projects. By making judicial use of the available relief labor, we are obtaining an actual accomplishment value of

one dollar for each thirty cents expended."

NEW JERSEY

"Institution and Outside Organization Cooperation -

1. New Jersey Agricultural College - Soil analysis, fertilizing, and seeding.

2. Municipalities - Plantings in cooperation with several towns along State Highways.

3. Garden Clubs, etc. - Assistance given and plantings carried out where practical."

NORTH CAROLINA

"In order to better direct the interest of civic organizations toward more practical roadside planting, emphasis is being placed upon the development of 'feature points' which include reserved areas at highway intersections, historical markers, grade separations, and safety turnouts at points of special scenic interest. The cost of developing such feature points is usually more in keeping with the pocketbooks of civic organizations than is the cost of the more extensive planting projects so frequently proposed by such organizations."

OHIO

"This highway landscape program was carried on in several ways or by several methods. Whatever the method, proper plans are prepared, all subject to the approval of the Director of Highways and his Chief Engineer. Full cooperation of the Director and his engineer assistants is necessary to the full accomplishment of the landscape phases of highway construction, and the record is proof of the interest and enthusiasm which was given and which is essential to receive from these men, if the work is to succeed.

"Much of the Roadside Improvement is performed by contract, on competitive bidding. A great deal is carried on by relief labor forces, such as W.P.A. and N.Y.A. The maintenance forces of the Department do some of the work, where this method seems most economical and expedient.

"The entire program, while beautifying the highways, furnishes needed labor to many classes or types of workmen, both skilled and unskilled; and it furnishes needed business to the firms which supply the plants, seeds and other materials required. The general prosperity of the State of Ohio is thereby increased.

"A special function of the Department of Highways for 1940, to be continued from year to year, was the setting aside, with the enthusiastic approval of the Governor of Ohio, of Armistice Day as a Fall Arbor Day, when the Department forces, in cooperation with the many interested organizations, will restore, replant and rededicate the many Memorial Tree Plantings which are

located over the State, and which during past years have been sorely neglected.

"For some years the need of permitting the landscape architect to have a more direct supervision over the maintenance of the roadsides and of the drainage problems has been felt, and this has been accomplished in recent months. In cooperation with the Engineers, it is believed now that the perfect maintenance method is established.

"Representatives from the landscape personnel are made available (at no cost to the organization) for illustrated and informative lectures in which is described or outlined the purposes of the landscape program, the method of operating, the results obtained, and the benefits to the citizens of Ohio.

"One of the aims of this phase of the Department is to acquaint the tax payer, in a direct and honest manner, with just what is being done, and why."

SOUTH CAROLINA

"This Department has a policy of cooperating with civic organizations in beautifying certain sections of highways in South Carolina. In this we issue permits for these organizations to plant shrubbery, flowers, etc., on the Department's right-of-way and the Department assumes the maintenance of such shrubbery or flowers. There are in this State several sections of roads which have been beautified in this way.

"In addition to this, various agencies and organizations in the State desire to erect or assist in the erection of historical markers along state highways. The Department cooperates where the erection of such markers is sponsored by reputable agencies or organizations and the historical facts set forth on the markers are subscribed to by reliable authority. In such cases the agency furnishes the marker and the Department erects same, and in addition constructs a parkway of sufficient width to provide parking space for persons stopping to view the marker."

TEXAS

"The Landscape Division directs the roadside development program of the Texas Highway Department. Its policy has been to act in an advisory capacity to the Construction and Maintenance Divisions which are responsible for the execution of roadside development work. Under such a plan, the entire personnel of the Highway Department is conscious of the roadside development program, and has some part to play in the working out of the program. A trained man is located in each of the 25 Districts, and it is his duty to assist the construction engineers and maintenance forces in any way possible in regard to roadside development matters.

"Plans for Federal Aid landscape projects are prepared in the field by resident engineers who work in cooperation with the Landscape Division. After contracts for the projects are let, the resident engineers supervise the execution of the work.

"Sectional meetings with the trained men have been held at intervals to discuss current problems. In addition, the Districts are furnished with booklets and other literature pertaining to this work from time to time.

"Since every person in the Highway Department has some part of roadside development to perform, it gives each of them an opportunity to meet people in their sections outside of their usual acquaintance with a few county commissioners and dealers. In fact, these men are sought after by the citizens in the various communities to aid them with improvement programs in their respective communities. Each year, the various Districts put on a wild flower show for the public. The Maintenance Superintendent has the maintenance forces gather the flowers from the fields. Engineers and others assist in the preparation of the exhibit, and representatives of the Highway Department are present at all times to meet the public. These exhibits not only help to establish public relationship but also help to make the highway employees roadside development conscious.

"Public relationship has further been extended by the forming of a Citizens Organization for Highway Beautification. The State Highway Commission appointed a State Chairman to organize citizens who were interested in roadside development. The State Chairman appointed a district chairman in each Highway District, the district chairman in turn appointed a chairman in each County, and the county chairman appointed a chairman in each community. Their duties were to encourage the improvement of filling stations, refreshment stands, homes adjacent to the highways, yards adjacent to the city streets which the highways traverse, and to make the town and rural people conscious of appearance and cleanliness, the unattractiveness of junk yards, dumping grounds, and all such aspects which aid in furthering the beauty and enjoyment of our highways. An illustrated booklet entitled "Improvement of Properties Adjacent to the Highways" has been prepared to assist the highway personnel and members of the Citizens Organization who contact the property owners and request their cooperation. This is real public relationship and makes every citizen a partner in our work.

"During the past year, the Landscape Division has written to numerous companies, and requested them to cooperate in our roadside development program by refraining from advertising with small signs and large billboards. These companies have replied that they are not in favor of advertising along the highways and will cooperate if their competitors can be persuaded to refrain from such advertising. This is one phase of the work that requires the cooperation of each State Highway Department in the nation. Only through our combined efforts can advertising be prohibited or controlled along the highways.

"Some representative of the Highway Department makes it a point to meet with each organization when a meeting is announced for the planning of some civic or rural development. Cooperation with these bodies has been helpful in establishing public relationship and securing better planned developments.

"In Texas thirteen Courtesy Stations have been located on important highways entering the State. Courteous attendants offer road information and

assistance to the tourists. They help the tourists select the best route to their destinations, and give them information about points of interest along the way. This has proven to be very successful for our files are full of letters from tourists all over the nation who have written to express their appreciation of the courteous and helpful services rendered.

"A colorful wildflower motion picture has been prepared, and is in great demand by schools and civic organizations. This has stimulated interest in flowers along the roadsides. Various organizations help in this program by collecting wildflower seeds and donating them to the Highway Department.

"This report has been confined to Education and Public Relations for roadside development. We consider public relationship essential to a successful roadside development program."

VIRGINIA

"During the past year the Landscape Division of the Virginia Department of Highways prepared a Roadside Development Model for display at various garden club and civic organization functions. This consists of a model of a typical highway. The bed of the model is 4½ feet wide and 20 feet long, which at one end starts with two roads meeting at the intersection of a main road. The first four feet shows in relief, eroding cut slopes and ditches, fences falling over the edge of the cuts, public utility poles, trash dumps, promiscuous snipe signs, "sign infested" filling stations and buildings, and in general other features that show lack of cooperation.

"On the panel board, which is directly in back of the model, standing 8 feet high, are photographs under the caption "Outdoor Advertising" showing conditions "before" and "after" signs have been removed from approaches to cities, towns, etc. The next section is captioned "Waysides", showing photographs of the different Waysides in the State, and on the relief model a typical bridge with naturalistic planting, a Wayside along the edge of a stream with shelters, etc. The third or center panel portrays general conditions, and here the road widens from the two-lane to the three-lane. The cut slopes are well rounded with fences located along the slope to show what can be accomplished by cooperation with the property owners in allowing grading operations to extend back of the right-of-way line. The fourth panel is captioned "Erosion and Drainage Control" and shows "before" and "after" photographs of these features, while the relief model shows the value of extending the drainage areas back to the right-of-way line and swaling the ditches. The cut slopes which could not be treated with grass are featured with ground cover plantings. The fifth panel under the caption of "Structures" shows the treatment of bridges, etc., while on the model it shows the proper approaches to school houses, churches, stores, etc., and the treatment of a circle.

"The theme of the entire model is - "The Roadsides Belong to Everybody - Everybody should take a personal pride in the Roadsides". This model has received very popular approval in the different places it has been displayed, and many have stated that the presentation of the subject with the third dimension visible, shows the need of cooperation much clearer to them than from descriptions or photographs.

"The Associated Clubs of Virginia for Roadside Development, composed of all the leading women's organizations in the state and representing over 40,000 women, has been very influential during the past year in securing valuable amendments to the Outdoor Advertising Act. For example, the excepted zones around filling stations and business places have been reduced from 500 ft. to 350 ft. The pasting and gluing of advertisements on buildings or other places other than on outdoor advertising structures is prohibited. All signs, whether in excepted zones or where permits have been issued, must be kept in a good general condition and in a reasonably good state of repair, or they can be ordered removed. The fees are as follows: (1) 50¢ if such area does not exceed fifty square feet; (2) $2.00 if such area exceeds fifty square feet but does not exceed four hundred square feet; (3) $3.00 if such area exceeds four hundred square feet but does not exceed six hundred square feet; and (4) an additional one dollar for each two hundred square feet of such area in excess of six hundred square feet. Outdoor advertisers are prohibited from using the name of any county, city, town, village or historic place or shrine without obtaining the written consent of the corporate authorities or owners of such places.

"This year the Associated Clubs' main objective will be a study of the Zoning Enabling Act, and every endeavor is going to be made to get as many counties to promote zoning or roadside control as possible. One of the slogans adopted is that "Zoning is in reality an Insurance Policy" in perpetuating their endeavors to obtain more pleasing roadsides."

WASHINGTON

"Regarding public relations, this department has attended twenty meetings so far in 1940 where articles were read, or talks on specific items of interest in roadside improvement were made, as for example, on our state flower, the rhododendron, its history and development, transplanting from the native state, and cultivation. Discussions on other native trees, shrubs and ground covers indigenous to the region where the meeting is held have been held in the same manner. At these meetings we have shown a two-reel colored motion picture depicting scenes along our highways of native flowering trees and shrubs, scenic viewpoints, snow scenes in the mountain passes, and roadside improvement. The request for these programs by Garden Club and Civic Planning Councils has been steadily increasing, which is a good indication of the growing interest in roadside improvement."

Construction Techniques

COLORADO

"Selection of Projects - On the basis of past experience we are guided by the following considerations:

1. Right-of-way not to be less than 100 feet.
2. Location of highway to be well established.
3. Additional right-of-way to be acquired by County Commissioners of region to be benefited.
4. Special maintenance to be assured by adjoining town if the project is of the town entrance type.
5. Project to be on main traveled highway to be of major benefit.
6. Types considered (preference given to combination type):
   a. At town entrance (soft pedal!)
   b. Erosion control (easily eroded soil, ill-considered drainage, wash-out areas), unstable backslopes.
   c. Scenic highways or scenic stretches on main highway.
   d. Roadside well adapted to seeding.
   e. Roadside well adapted to occasional shade trees in treeless regions.
   f. Mountain passes or mountain thoroughfares needing stopping-off (roadside) areas.
   g. Possible spots for live snowfences.
7. Attempt to get the most value at the least expense.
8. Type area to be significant for similar locations.
9. Attempt to distribute projects in different parts of the state.
10. Preference given to highways of most up-to-date design.

"Interesting Odds and Ends - Deer stripped all newly planted native junipers last winter, leaving established ones immediately adjoining them alone. The trees (4 to 5 ft. in size) were left in and most of them formed new growth during summer. Now we are waiting to see what the deer will do this winter.

"Cattle used newly planted lodgepole pines as scratching poles. Contractor has built tepees around them made of aspen poles and decorated with barbed wire. It works but whets the curiosity of visiting tourists.

"A new method of erosion control on steep mountainsides may be found in a new device we have developed and which we call "seed pockets". Gravel and rocky ground is removed to a depth and width of twelve to fourteen inches and replaced by topsoil, in the top six inches of which is incorporated a mixture of native grass seed and ground cover. Results this first summer have been eminently satisfactory, and the patches of growth are beginning to spread."

CONNECTICUT

"Progress in Slope Erosion Control - While most of the topsoil from various parts of Connecticut has the one common characteristic - that of being slightly acid - subsoil conditions vary tremendously. In this comparatively small state, the strata beneath the surface varies from sand to clay, with underlying ledge varying from sandstone or shale to granite in different sections. The terrain varies from flat or rolling to mountainous. The underground water table is seldom the same in two different locations.

"Slope erosion control, whether it is against wind erosion or water erosion, may be rendered successful when a proper vegetative growth can be secured on the slope. However, the matter of vegetative growth necessarily comes last. Our experience has taught us that no new vegetation can be successfully made to stay on a slope until the slope will by itself, through proper grading, and drainage where necessary, lie in repose.

"We feel that we have conquered the first prerequisite to slope erosion control - more satisfactory cross-sections.

"Many experiments have been carried on by us with regard to the second prerequisite - proper drainage where necessary. Where surface water is the cause of disturbance, the solution is far simpler than in the case of underground water which causes sloughing. Here, each case offers a different problem, and no common rule will apply to the multitude of conditions which present themselves. Our worst sloughing may generally be said to occur where the subsoil is of clay or a combination of clay with other material, but it is always the water present in this soil which does the damage. It is imperative to ascertain the height of the water table and to intercept and properly direct this surplus underground water. This we have done, using either French or rubble drains which discharge into natural water courses outside the cuts.

"With regard to the establishment of vegetative growth on slopes, we are trying various mulching, ground cover, fertilizing, and seeding experiments. We are making a thorough study of ecological conditions with the ultimate aim of encouraging volunteer growth on our slopes by preparation of proper seed beds. Where it is possible to procure a mulch, with all its thriving vegetative life, in the form of seeds, roots, growing plants, and microflora

directly adjoining the slope to be treated, we are afforded a simple means of extending down the slope the conditions which existed before it was disturbed. We have recently tried mulching partly eroded slopes where topsoil has long since washed away or where none existed. We have tried various types of materials as a mulch. To some of these areas we are applying fertilizer and seed experiments - seeds not only of grasses and herbaceous material, but also of such native shrubs as tend to colonize themselves readily. While we know that the roots of sumac, sweetfern, etc., will "take" without the application of topsoil when planted with any good mulch which will hold sufficient moisture to prevent drying out, we would like to have these free-colonizing materials "come in" without the trouble and attendant expense of planting."

IDAHO

"An outstanding feature of the Preston Project was the proposed treatment of a wet cut fed by springs which had in the past caused considerable maintenance cost due to sloughing. The treatment of this area was to tap the main spring flow with perforated pipe and to concentrate the flow into an enclosed concrete catch basin and to pipe the water down the cut slope across the road to a turnout area to feed a drinking fountain. The waste water spills into an open ditch which in turn irrigates a group of shade trees around the turnout. This drinking fountain, needless to say has proven very popular with both tourists and local residents. It was also planned to plant a mass of native shrubs on this cut slope to help control the erosion and sloughing. The confining of the spring water has taken care of this trouble, however, the shrubs planted on this slope, although not necessary from an erosion control standpoint, add to the appearance of the slope and tends to hide the scar of this cut slope. The cost of this treatment was only a fractional part of the money spent removing slough material and besides eliminating this maintenance cost has proven to be an asset to the highway."

INDIANA

"A Practical Collecting Nursery - When the roadside planting first started in Indiana, all materials were purchased from commercial growers. Some of the material not available in the nurseries was specified as "nursery collected".

"Some of this latter stock was of extremely poor quality and had had such severe treatment before it reached us that we tried out some collection of our own in the spring of 1935. As the project engineers started locating the sumac, grey and red osier dogwood, elders and the other more common shrubs, it became apparent that there was a wealth of collectable material in some sections of the state.

"Native flowering trees - red bud, dogwood, shad blow and crataegus, were not available in large quantities in the nurseries, and we soon found that in certain sections in the state we could collect excellent stock which would live and grow as well as, or better than, the purchased stock, at very little cost.

"This stock was usually growing in open fields which had been abandoned during the past twenty years, was well branched and adapted to sun and wind. It occurred in large colonies in some areas where a collecting crew could collect an entire season's need for the state in a few days.

"The first collection was done on the projects themselves, but some of these were at the other end of the state from the needed material. The problem was that of getting the material collected, delivered and properly accounted for.

"A plan was evolved to keep the costs charged correctly along the following lines: - a fictitious project was set up without funds in itself, payrolls and expenses were met out of a general fund and all the material needed by all the projects was determined. A temporary collecting nursery was established in a locality where the greater part of the needed material was available. Material was "heeled in" here as fast as collected.

"When the stock was ready for any particular project, they were notified and sent trucks for the needed material. Each project was charged its proportionate share of the final collecting cost and when the last of the material was delivered and billed, the cost of the fictitious project was met by these billings against the regular projects. The crew was disbanded and the next season the same procedure took care of that season's collections.

"The needs of the projects determined the location of the collecting nursery each season, and, generally speaking, the sub marginal lands in the south central portion of the state were the best collecting areas. The foreman and one or two key men were usually available the next season, but the general labor was taken from the unemployed list in the locality and taught the mechanics of digging the different varieties of material.

"Collectable material in the locality of projects was collected by the project itself so that the material shown in the list was only that which could not be collected within reasonable distance from a regular project.

"This procedure has been followed for five seasons and the following quantities have been collected:

Shade Trees	-	1½ to 3"	-	909
Flowering Trees	-	4 to 6'	-	2,933
Shrubs	-	3 to 5'	-	77,587
Vines	-	6" sq.rods	-	4,625

"Keeping in mind the fact that we do not have any original material cost, the fact we know we are handling the material with proper care, that the material is native and acclimated to both soil and climate - all these factors have combined to make this a worth while part of our activities.

"The by-products of this procedure have been a heightened public interest in our native material and the fact that a considerable number of laborers in several localities have learned the mechanics of proper plant handling."

MARYLAND

"In connection with new plantings, results have shown that vine plantings on backslopes have not proved as successful as was anticipated. Again, they have not been as economical for erosion control as sod and have been more expensive to maintain.

"There can be no standard set of methods for all projects applicable to the detailed work. Due to varying conditions detailed work on projects differ and require different methods. Sodding is an example. The use of check slabs of sod in ditches has proved valueless as a permanent erosion control on some of our projects due to the loose types of soils. In such localities full slab-sod lining is now used in the ditches or in some cases stone ditch lining has proved very effective. Again, saving, stock-piling and the redistribution of topsoil has not been the practice on our roadside contracts. There has not been sufficient good soil on our projects to warrant it. Slab sodding steep backslopes has been practiced during the recent past with excellent results. In this way new topsoil and sod are brought in at the same time. Strip sod placed in rows 12 inches apart on front slopes with the broadcast application of approximately 400 pounds of commercial fertilizer to the acre has also proved effective. Seeding of highways has not been practiced. Experiments have been made along this line and it is believed that seeding may be used in some localities to an advantage."

MINNESOTA

"The alfalfa-brome grass mixture is used throughout the agricultural sections of the state and the abutting farmer is permitted to crop same thereby keeping the roadside in a neat and presentable condition at no maintenance cost to the state. Kentucky blue grass is seeded in the metropolitan areas and the timbered sections. Winter rye was used in fall seeding as a temporary ground cover for erosion control on all projects which were completed after August 15, which is our deadline for alfalfa seeding, and these areas will be reseeded to the permanent ground cover of the alfalfa and brome grass mixture this coming spring. With this type of seed mixture, the alfalfa eventually dies out and the brome becomes the permanent grass."

NORTH CAROLINA

"Continued success has been attained in the use of mulch as a soil erosion control measure without the use of topsoil, seed, or fertilizer. A considerable percentage of all roadside cuttings throughout the state are now used by maintenance engineers as mulch on their roadside slopes. This is, of course, a slow method of obtaining vegetative cover; but as it is very inexpensive and very simple, it has proven its worth in many cases where more expensive treatment is not justified.

"In mountainous sections of the state, a method of mulching developed by the Appalachian Forest Experiment Station, Asheville, North Carolina, has been used with considerable success on Federal Aid and W.P.A. roadside improvement work. This method used on steep cut slopes that cannot be flattened employs the use of wooden pegs driven into the slope for the purpose of

holding mulch in place, and in some cases poles or pieces of brush are also used to retain mulch on the bank (this low cost treatment is explained in detail in the Appalachain Forest Experiment Station Technical Note No. 38).

"The use of Sudan Grass as a temporary cover crop during hot summer months has been proven very satisfactory on roadside improvement projects, and is now being used extensively on construction projects as well as by maintenance forces.

"The method of establishing honeysuckle ground cover in trenches on steep slopes has been simplified. Originally topsoil was placed in trenches and individual honeysuckle plants then planted in the topsoil.

"It has been found to be much cheaper and apparently just as satisfactory to mow off the tops of a patch of honeysuckle, and then use the topsoil containing a very large number of honeysuckle roots to fill the trenches."

OHIO

"One of our best developments has been the 'E-305 Seeding'. This type of seeding and mulching is now performed on all construction projects which are not to have comprehensive landscaping done on them. We have been doing this type of work for 1½ years in a large way, and for 3 years, all together.

"We permit the contractor to seed and mulch whenever he gets ready for it, regardless of the season. This eliminates all the disadvantages (and complaints of a general contractor) of holding a large construction job over until a planting season, the tieing up of considerable funds, etc.

"We experimented with this first, on Emergency Relief and W.P.A. projects, and now our results are 85% effective. Over a full year of average weather, this will go to 90 and 95%.

SUPPLEMENTAL SPECIFICATION NO. E-305 (Revised 2/15/40)
(Seeding and Protecting Roadway Areas)

"E-305.01 Description. This item shall consist of the furnishing and placing of all seed and straw on such areas as are shown on the plans or as directed by the engineer in accordance with this specification.

"E-305.02 Materials. All seeds and straw for protection and all other materials and equipment used shall be as outlined under the "Construction and Material Specifications", State of Ohio, Department of Highways.

"E-305.03 Construction Methods. As soon as the areas to be seeded and protected are placed and satisfactorily shaped the following mixture of seeds shall be sown over the areas, other than the shoulders, at the rate of three (3) pounds per one thousand (1000) square feet: 20% Kentucky Blue Grass; 20% Perennial Rye Grass; 30% Yellow Sweet Clover; 30% Hairy Vetch. Shoulders shall have the Yellow Sweet Clover eliminated and the Kentucky Blue Grass increased to 50%.

"The seed shall be raked in to a depth of one-quarter inch. If the areas to be seeded are so compacted that this raking-in cannot be well done, such areas shall be previously loosened by raking or other means, to allow for it. As soon as seeding is completed a straw mulch two inches thick shall be placed over all seeded areas and kept in place during the life of the contract.

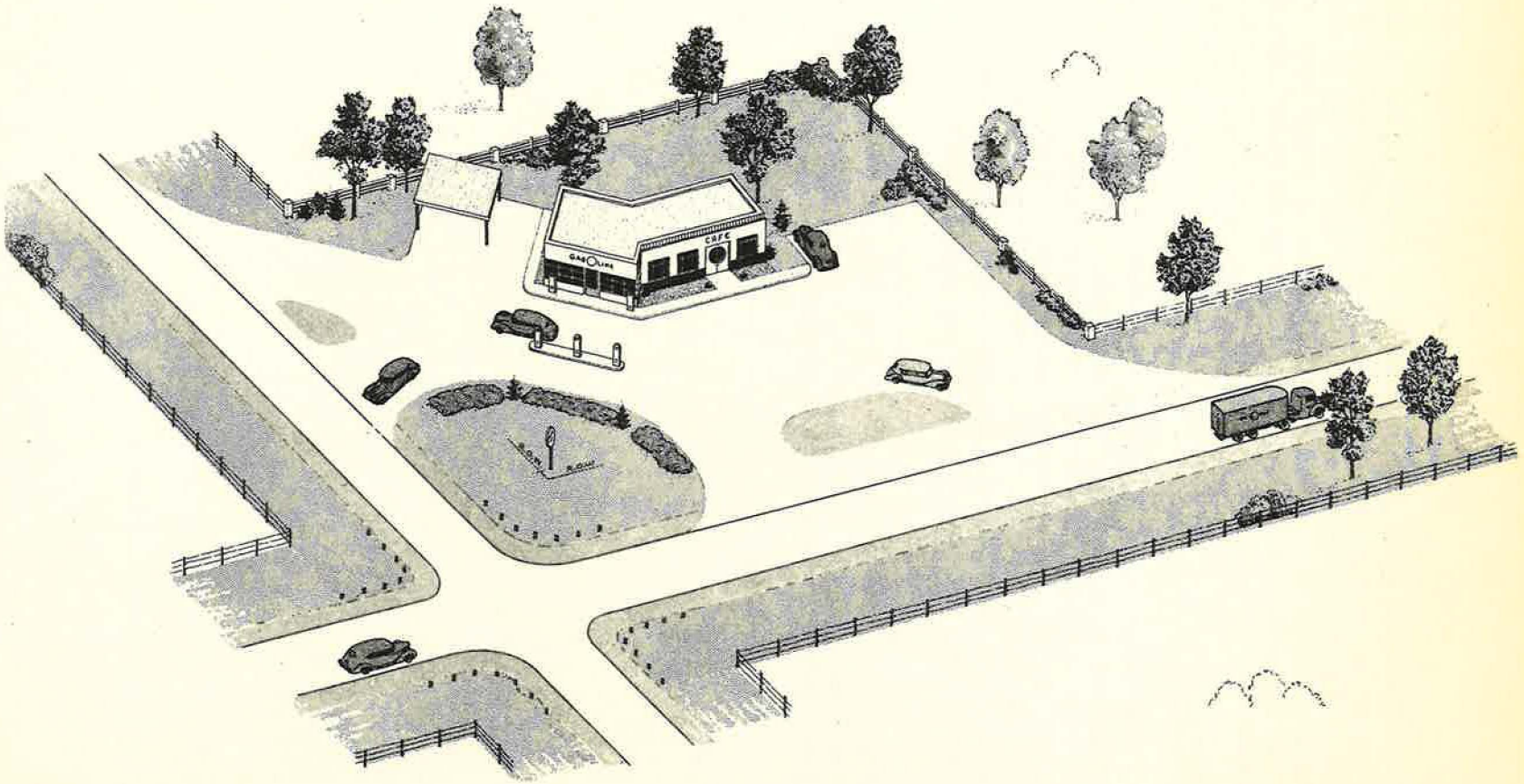
WASHINGTON

"Mulches which have been successfully tried are: the application of straw held in place by light wire ties; covering the slope to a depth of 1/2 inch with alder sawdust; (the decaying of this material with its beneficial results was quickened by an application of ammonia sulphate and commercial fertilizer at the rate of 2/3 tons per acre); green alder and willow brush (this material was applied to high gravel cuts subject to wind erosion; a nurse crop of oats establishes a quick ground cover on flattened areas.

"All areas to be mulched are first seeded. The rate of seeding is about 30 pounds per acre. Types of seed used on flat semi-moist areas, Kentucky Blue Grass, Canada Blue Grass, Native Bent and White Clover; on steeper areas where drainage is more complete, hardy Rye grasses and Fescues."

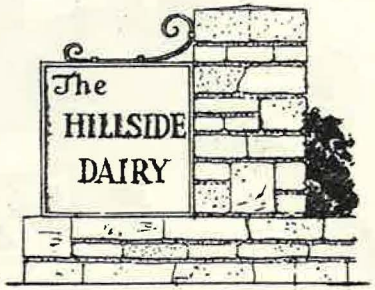
COMBINATION OF ROADSIDE ESTABLISHMENTS IN URBAN AREA

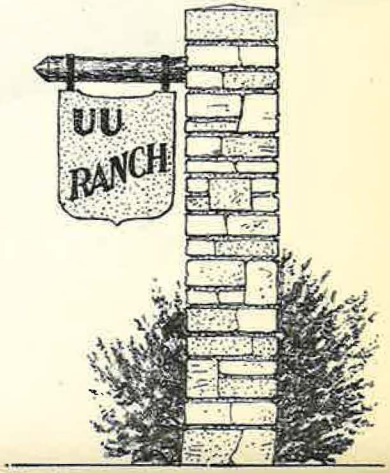
Adequate parking area and drives with good visibility. Note the neatness of the grounds and the absence of unnecessary advertising signs.



SUGGESTED TYPES OF SIGNS FOR USE WITH ENTRANCES

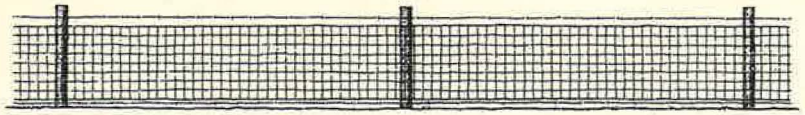
Note: Entrance signs to be placed on private property – not on highway right-of-way.



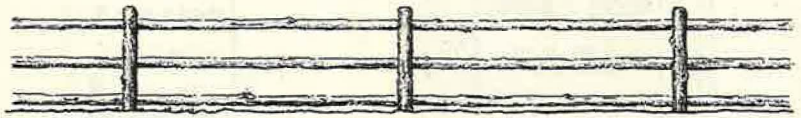


SUGGESTED TYPES OF FENCES FOR USE WITH ENTRANCES

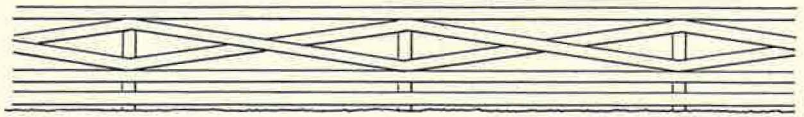
Note: It is suggested that all heavy type fences be constructed not more than 4' in height to assure clear vision at entrances.



WIRE NETTING

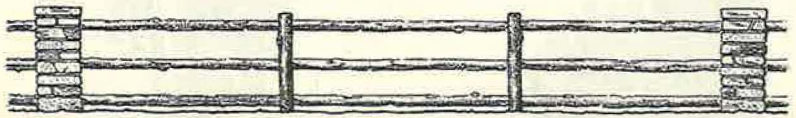


POST-AND-RAIL

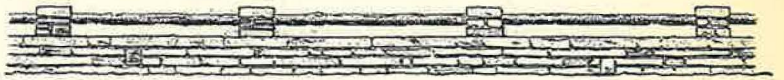


KENTUCKY BOARD FENCE

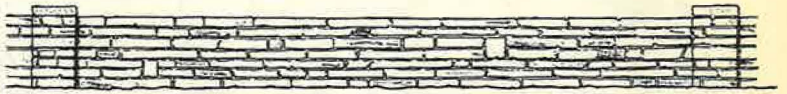
CEDAR PICKET FENCE



MASONRY POST AND CEDAR RAIL



MASONRY AND CEDAR RAIL



MASONRY WALL WITH POSTS

LOW MASONRY WALL

MASONRY POSTS AND HEDGE

CLIPPED HEDGE

NATURAL HEDGE

Publications Submitted

BOOKS

1. "TREE CLEARANCE FOR OVERHEAD LINES" by G. D. Blair, Chief Forester, Consumers Power Company, Jackson, Michigan.

Published by: Electrical Publications Inc., 360 N. Michigan Avenue, Chicago, Illinois.

In regard to his book the author states; "As forester for a large public utility company, I have long realized there was a definite need for a clear discussion on tree practices as they apply to routine problems encountered by engineers, landscape architects, foresters, linemen, tree workers, and other employees of the many public utilities which build and maintain overhead lines on public thoroughfares. The problems encountered exceed those of tree surgery and frequently encompass laws, regulations, economics, engineering, design, safety practices and public relations. Likewise, street and highway officials, park commissioners and others in whom responsibilitity for the appearance and safety of our streets, highways and parks is vested need a working appreciation of the public utility problems in meeting regulations and ordinances. "Tree Clearance for Overhead Lines" is my conception of a working handbook for all concerned with the various functions relating to a common viewpoint, that of accomplishing tree preservation, public thoroughfare beautification, and safety by practical methods."

BULLETINS, REPORTS, ETC.

1. Roadside Development - Highway Research Board -
   Part I - Reports at the Nineteenth Annual Meeting
   Part II - Final Report - Subcommittee on Erosion.

2. The Information Exchange - Texas Highway Department
   Issue No. 88 - June 1940.

In this bulletin an article entitled, "Channelization of Motor Traffic" by Guy Kelsey has been reprinted from the December Proceedings of the American Society of Civil Engineers together with a discussion of Mr. Kelsey's article by Julian Montgomery, State Highway Engineer of Texas.

3. Discussions on Roadside Development - Texas Highway Department.

The booklet contains 25 papers presented at Roadside Development meetings regarding the problems and techniques of Roadside Development work in the various districts in Texas.

4. "Suggestions for Roadside Development" - Improvement of properties adjacent to highways - Texas Highway Department Landscape Division. No. 8, July 15, 1940.

In this booklet a series of "birds eye view" perspective sketches show

suggested layouts for service stations, roadside establishments, community center and tourist court treatment in rural and urban areas together with drawings of entrances to private properties adjacent to highways.

Concerning this work the Texas Highway Department states the following: "The developments of roadside establishments adjacent to highways have gone through a period of trial and error. Through practical observations it has been found that the successful establishments are those which have incorporated a part or all of the following features in their developments:

(1. A setback of 50' from the property line for permanent structures. A 30' setback for structures where the service areas are in the rear.

(2. Spaciousness and a feeling of spaciousness for convenience.

(3. Uninterrupted circulation for automobiles.

(4. Easily accessible from the highway with the least obstruction to the flow of traffic.

(5. Spacious driveways and sufficient parking areas.

(6. Good architectural appearance, neatness and cleanliness, with a minimum of advertising.

(7. Location on level land.

Good business is of benefit to the Texas Highway Department as well as to the private individual. The Texas Highway Department is at all times ready to cooperate with private owners through offering suggestions to reduce hazards which hamper business and safety as well."

5. Report on Roadside Development - Utah and Idaho, District No. 12. The discussions presented at the Coordinator District Meeting of District No. 12 held August 12-13, 1940 are printed in this report.

The personnel interested in erosion control, representatives connected with the U. S. Forest Service and the Soil Conservation Service as well as the landscape personnel of the two Stateswere represented at the meeting.

Grant R. Bowen acted as general chairman, and Mr. Ezra C. Knowlton, Chief Engineer of the Utah State Road Commission formally opened the meeting with a discussion of the scope of roadside improvement work.

Major headings of the subjects discussed are listed as: Highway types and Roadside Areas, Plant Ecology, Slope Erosion and Zoning and Building Lines.

6. Nevada Highways and Parks - published Bi-monthly by the Nevada Department of Highways.

Excellent photographs and interesting material concerning the attractions and opportunities offered the Tourist in Nevada.

7. Virginia Highway Bulletin - Issued monthly by the Virginia Department of Highways - "to furnish a common medium for the dissemination of departmental news and information of mutual interest and educational value to its employees."

8. Better Roadsides - Publication No. 41 Connecticut Forest and Park Association.

The roadside committee of the association has undertaken the work of campaigning for the replanting of shade trees since the hurricane of 1938. The pamphlet suggests methods, general principles, trees to plant, planting suggestions, and tree care. The Connecticut Shade Tree Law is included.

Such a publication is a good example of a means of suggesting what may be done "through knowledge and concerted effort" and provides a good means of increasing public education and interest.

EXCERPTS FROM NEWS ITEMS, MAGAZINE CLIPPINGS, CIRCULARS, ETC.

1. News item - Ohio Department of Highways -

"The Ohio Department of Highways, at the explicit request of Governor John W. Bricker, is waging a state-wide battle to conserve the trees along the 8,000 miles of state roads.

"Conservation of all the State's resources was one of the aims of Governor Bricker when he was inducted into office, and the highway department set about, under his direction, to put an end to the destruction of trees where new construction was planned.

"This phase of the work of the highway department is under the direction of Dallas D. Dupre, Jr., landscape architect, and trained personnel is used in transplanting, in pruning and in providing protecting stone walls, aeration courses of gravel, or mounding the soil about the roots of trees.

"Many trees which would be destroyed in the ordinary course of events due to highway construction, are thus saved, and only those trees which would interfere with actual construction, the free flow of traffic, or with sight distances and the visibility of moving traffic or pedestrians, are actually removed.

"Many valuable trees of medium size, which could not otherwise be preserved, are moved from their original locations to new places near the right-of-way, where they are again planted.

"During the course of work on a highway project where there are trees to be saved, the landscape division keeps an eye constantly on operations, so that trees will not be injured when left standing.

"Trees left standing on these projects are carefully pruned and protected under rigid specifications, these specifications meeting all the standards of good arboriculture practice. The pruning is done with the idea in mind of making healthier trees, the removal of dangerous and diseased branches, and to improve traffic sight distances.

"On the older roads the highway department's maintenance division takes over and with the aid of experienced and well equipped tree pruners, the landscape architects carry on a state-wide program of tree care which includes root protection, drainage, fertilization, pruning, spraying and banding for insects.

"Special drawings have been prepared by the chief architect's office for aiding in the proper pruning and the care of trees.

"Personnel of the highway department is trying constantly to educate these elements by example, by personal contacts and by lectures or in schools of instruction, on conservation of trees as a heritage which money cannot buy."

2. U. S. D. A. - Forest Service - Annual Report Appalachian Forest Experiment Station, Asheville, North Carolina.

"Practical Methods of Soil Stabilization on Roadbanks -

"The roadbank erosion problem is an aesthetic as well as an economic one. The unattractiveness of the bare soil exposures extending mile after mile along the roads has been the cause of much unfavorable comment by motorists. Fishermen and those needing clear water for domestic and commercial purposes have complained that streams were muddied by soil washing from road cuts and fills. Road engineers find that sloughing of material from raw banks increases maintenance costs.

"While some moist and fertile roadbanks have reseeded naturally and promptly, this is not the case with most of the large cut banks and some fills, and it is not a simple task to get vegetation established on them. Many of them are raw, dry, infertile, and exceedingly poor seedbeds for plants of any description. Alternate freezing and thawing make the soil unstable and uproot plants that have started. The soil loosened by frost action is easily washed off the bank by rains. A number of different methods of stabilizing the soil by planting have been tried, but most of them are too expensive to be applied economically to the many hundreds of miles of roads that need bank fixation.

"The Station's experiments in roadbank fixation have led to the conclusion that the simplest, cheapest, and only sure method is first to reduce mechanical action to a minimum by rounding off the tops of the slopes, reducing the steepness as much as possible and minimizing frost heaving; and second, to provide an adequate seedbed, including soil fertility, moisture, and a supply of seed of the native vegetation, by applying a mulch of weeds, straw, grass, etc., to the raw slopes. If properly done, Nature, in nearly

every instance, will do the rest. The local briars and weeds that seed in will blend the roadsides into the natural landscape and at the same time provide the needed soil stabilization.

"The two general methods developed by the Station are: (1) staked weed mulches, for use in open country and wherever weeds can be obtained readily; and (2) staked brush and litter mulches, to be used in heavily forested areas where weeds are not available. The first named method is generally the easier of application, but both have proved feasible on extensive projects and have given satisfactory stabilization. The purpose of the staking is to keep the mulch from slipping down the bank or from being blown by the wind. Several hundred miles of road have been successfully treated, and the Station has issued a circular containing full instructions for applying the method."

3. "The Utilitarian Value of Roadside Development - by Edward Eckert-Forester, Michigan State Highway Department. -

"I wish to state that Michigan is fortunate in having highway officials who are roadside minded, and I believe that this interest can best be maintained by emphasizing the service or utility objectives of our work, which I repeat are:

1. Contribution to Highway Safety.
2. Intelligent management of roadside trees and vegetation.
3. Providing roadside services for motorists.
4. Performing work which will reduce maintenance costs.
5. Development of our roadsides so that the plantings will serve a utilitarian purpose."

4. "Roadside Development Engineers Meeting in Gulfport" - from Mississippi Highways, August, 1940. -

"The District Committee on Roadside Development of the American Association of State Highway Officials and Highway Research Board met in Gulfport August 12 and 13. The district includes the states of Alabama, Florida, Georgia, Mississippi and Tennessee.

Representatives attending the meeting were S. W. Harbin of Alabama, O. T. Ray and Harry Tindley of Georgia, John R. Slade of Florida, Robert Goodpasture and Clyde Jones of Tennessee, D. Collins, Emmett Kind, J. F. Fonville and F. J. Russell of Mississippi, H. C. Headley, W. B. King, H. W. Patrick and F. A. Davis representing the Federal Public Roads Administration.

"Among the subjects discussed at the meeting were: 'The complete use of maintenance of the entire right-of-way'; 'Erosion'; 'Ground Preparation'; 'Steep Slopes'; 'Mulching'; and 'Legislation for Zoning'."

5. "A Study of Native Plant Associations Adaptable to Highway Planting" by Charles W. Barr, Michigan State College - as reviewed by the Landscape Architect, Public Roads Administration, September 1940. -

"The author selects for his study the native plant associations found along the fence lines of fields adjacent to State highways within a 15-mile radius of Lansing, Michigan. Eleven typical fence row areas were surveyed and individual plants and groups of plants were located from an established base line running parallel to each section of fence row. Charts were made up showing the measured spread of crowns of trees and the foliage areas of massed groups and colonies of shrubs, and the data for the report were recorded from a reading of the charts.

"In some cases brush cutting and clearing on the selected area may have destroyed the value of such areas for study. Stress is laid on whether selected areas in the open are dominated by shrubs and vines or by trees. As might be expected, except for the areas where brush had been cleared out by the landowner, or where sprout tree growth was common, shrubs and vines were dominant growth forms on the edges of open fields.

"The author notes for the eleven areas - (1) That trees dominate the plant associations in wooded areas except for 5 areas where no answer is given; (2) That in all but four cases the selected associations appear to be developing toward a tree type of dominant climax growth; (3) That in every case tree groups vary in size and spacing.

"It is noted that no grasses are mentioned in the summary. Because the grasses may be the most important single type of vegetation on many roadsides, this may be a serious omission in this case, from an ecological point of view. It is understood, however, that the report is mainly interested in 'planting design considerations' only - grasses not being considered, of course, as plant materials.

"The following points are emphasized in the Conclusion of the report:

"1. The source or starting point of a linear association (a fence row) is important in shaping its character. 'If it projects outward from a woodlot there is a noticeable decline in the number of shrubs'. This observation may be true for this particular locality. It might not be true for a Rhododendron or Laurel area in the Appalachian Mountains, for example, where these shrubs tend to grow to best advantage under the shade of higher growing trees.

"2. The author brings out the point that 'the younger the (plant) association the more important the shrub types become'. As compared to tree types, again this observation is of local value only. For example, in portions of the Piedmont region scrub pine, sassafras and similar trees tend to take over fence row areas to the exclusion of shrub types of growth. The statement that 'The artificial plantings can vary in the quantity of shrubs used, and still harmonize with the surrounding farm land' is of rather negative value. As a matter of fact, the best informal roadside planting tends to restrict the number of kinds of materials used to a very few of the most distinctive, typical, and dominant types of trees and shrubs as typically found on dry, shady, sunny or other characteristic sites.

"Some species tend to grow in groups - some as scattered specimen -

aspen, hawthorn, sassafras, etc., are typical group forming species. Hickories, black walnut, sugar maple and oaks tend to grow as individuals.

"In general, it is believed that trees with light wind blown seed, or very abundant heavy seed spread by birds, will tend to form thickets in fence rows. Trees with heavy seed (acorns, nuts) or with seed of low viaibility in the open (maples, ash, etc.) will tend to be scattered specimens in fence rows.

"Recommendations for Future Highway Planting - Natural ecological succession and natural plant arrangement should be the guide for roadside planting.

"All natural planting must be informal in character. Shade tree planting should be accompanied by natural associations of low-headed trees, shrubs and ground covers. Formal group or row planting produces fatigue in the motorist and is not pleasing in appearance. Trees informally arranged should be of varying size for best results.

"Fatigue is reduced to a minimum on roads with borders of natural vegetation. A varied natural appearing planting will also reduce fatigue.

"Continuous planting of mixed native trees over 500 feet or more of roadside, interspersed with long stretches of completed roadside, should be the goal of roadside planting.

"The author believes that of the three classes of plants, high trees, low trees and shrubs, the value of the shrub class has been under-estimated.

"The shrub class of plant material is most difficult to use, and cannot be adapted to many roadside conditions, where trees, grass and low ground covers are useful by comparison on almost all roadside areas.

"High-headed trees, if fronted down by low trees and shrubs, produce an effect of depth not possible with trees alone. The author suggests roadside planting featuring large groups of low-headed bushy trees rather than scattered individual shade trees, Suggests that first type of planting will reduce future costs of maintenance of planting. He suggests that a larger number of short-lived fast-growing trees be planted on roadsides.

"The suggestions here regarding low-headed trees are at variance with much of the experience of the states up to the present time. Nothing, for example, would indicate that a dense group planting of small low growing trees would cost much less per tree for cultivation and maintenance than the same number of scattered small individual planted shade trees. After two or three years the group planting would shade the ground, etc., but by that time both types of trees should be well established and require little, if any, maintenance."

6. National Roadside Council -

I. "Will California Outsmart Florida?" - by Mrs. W. L. Lawton,

Chairman, National Roadside Council.

Mrs. Lawton states in conclusion: "A central state committee with representative men and women from all state groups should be formed to study the subject, to recommend measures to be submitted to the legislature, and to organize the state in support of those measures. Such groups exist now in some fifteen states. Why not in Florida?

"Roadside control is no easy task. It cannot be accomplished in one year or in two. But on one thing all will agree -- what California has accomplished, Florida can do."

II. "Florida Behind the Billboards" - by Mrs. W. L. Lawton - Nature Magazine for May 1940. Mrs. Lawton makes a plea for a Roadside Bill for Florida.

"Little can be accomplished until the state groups most concerned unite to form a central committee whose job it will be to study conditions, determine the best law for Florida, and organize and educate the state. Education is paramount. The citizens of Florida will not support any bill until they realize present conditions in their own state and know what solutions have proved possible in other states. Fifteen states now have such a state committee, but in Florida some well-meaning chairman in some women's federation, utterly ignorant of the scope of the problem, prepares a billboard bill. Some legislator presents another. No one organizes the state to back either bill and failure is inevitable.

"Foremost among the groups that must support roadside control, if it is to be achieved, are those whose profits depend upon an increase of travel. Contradictory as it seems, these very groups are today responsible for much of the abuse of Florida roadsides. Hotels, resorts, highway associations and chambers of commerce are using innumerable signs and billboards, regardless of their devastating effect on the beauty of Florida's highways. Yet it is a matter of common knowledge that attractive highways are today a potent factor in increasing travel."

III. "Retroactive Zoning for Billboard Control" - Excerpts -

"A great drawback in billboard control through zoning has been that the zoning regulations did not affect billboards already in existence. As a rule zoning is not sought until some glaring damage has shown its necessity, and then when enacted, the zoning prevents further damage but does nothing to mitigate the damage already done.

"This need not be true so far as damage caused by billboards is concerned. Arlington County, Virginia, has demonstrated that zoning can be made retroactive against billboards. The Arlington County ordinance permits billboards in only three zones, General Business, Light Industrial and Heavy Industrial, and all non-conforming boards are required to move out within 90 days. This provision is enforced. (Marin County, California has similar provision but has not enforced it.)"