

ROADSIDE DEVELOPMENT -- ASSETS AND LIABILITIES

By

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INTRODUCTION

The unparalleled demands for funds for the defense of democracy will retard only temporarily the spectacular progress of Roadside Development. During this apparently necessary lull in roadside activity, it is well to take off a trial balance of its assets and liabilities. Just what has this new approach to road construction added to our highway network in measurable values; and where lie the hidden dangers which might offset these gains?

ASSETS

Interest, Education, and Public Relations

Seldom does any roadside improvement performed for one purpose fail to show multiple values:--an erosion-control project will also increase the safety of the roadside and prove of scenic interest. The latter directs our attention to one of the real assets of a complete roadside development program--its public relations value. The motorist notices first the vistas along a route; its other factors are impressed upon him more slowly. Combining cut and fill slopes, drainage ditches, roadway and roadside with one another to eliminate rough edges, moulds the highway naturally into the surrounding topography and is pleasing to the eye of the motorist.(17)¹ Interesting highway vistas attract tourists, whose money adds much to state income.(8) Roadside turnouts and parks can be educational, through the marking of even the local varieties of trees with their common and botanical names (as varieties of cactus are on Arizona roadsides) (2) Plates showing elevation above sea-level, and historical markers;--all of these appeal to the tourist and to the local taxpayer as well. The increasing installations of picnic tables, approved water supplies, and sanitary facilities

1. Numbers in parenthesis refer to list of references at end.

in roadside parks are greatly appreciated where the service station is too far away to fill the bill.

Safer Roadsides

Despite the natural urge of the Landscape Architect to 'spare those trees', he has contributed greatly to roadside safety by the judicious removal of trees and telephone poles on the shoulders (18), and saving trees on backslopes by proper protection. Careful planting of local shrubs, such as yucca and ocatilla in west Texas, (3) has proved an asset in calling attention to sections of guard rail, culverts, and to set off warning or direction signs. Vines planted in pockets in rock cuts reduce the hazard of falling rocks.(13) The flat front and back slopes and minimum depth of ditch prevent cars forced off the road at high speeds from being wrecked. Safety on the roadsides is a very definite asset.

A Safer Traveled Way

Anything that can be done to increase the safety of the traveled way is a tremendous asset--we have all shuddered at the appalling increase in highway accidents. Roadside Development has contributed in manifold ways to highway safety. The flat, rounded shoulder, a product of the roadside development engineer, is as important as the paved highway when a car breaks down. If the vehicle must remain in a traffic lane, it is a potential hazard; on the shoulder both it and traffic are protected. Plantings which outline curves stand out by day and night, and increase the safety of the highway. Slight changes in alignment suggested by the roadside development engineer can contribute much to the safety of the highway. For example, shifting the road from a valley to a ridge may increase the scenic interest and at the same time carry it above flood waters.(11) The widening of highway rights-of-way at bridges, on high fills, in deep cuts and at curves, by creating an impression of greater spaciousness and providing better vision, decreases the mental hazard, thus reducing the nervous fatigue of the driver and increasing the safety of the highway.(11) The elimination of apparent bottlenecks, such as vegetation close to the highway, has a very marked effect on driver habits. Any obstacle close to the edge of the traveled way tends to make drivers operate

their vehicles closer to the center of the highway, thus increasing potential head-on collisions. Traffic studies have shown that wide shoulders inevitably draw traffic toward the outer edge of the road, encouraging full use of the highway and thus promoting safety. Screen planting at traffic circles stops glare and reduces accidents, and the same is true of medial strips when the planting is low.

Maintenance Savings

In applying the principles of Roadside Development to all maintenance operations, you do not merely repair damage, you find the cause and cure it for all time. (1) Sodding and seeding eliminate much of the annual maintenance expense of filling washouts and cleaning drains and ditches. (4) In Massachusetts, maintenance of a long through cut cost \$2,000 a year before drainage and sodding. Now maintenance for the entire cut amounts to only \$150 per year. (16) In Texas, where the winds of the plains moved 7,000 cubic yards of soil on U. S. 83 in four months by eroding cuts and filling ditches, the backslopes were flattened by a grader working the soil downwards to fill eroded spots and using the extra material to widen fills. The slopes were mulched with rye and wheat straw, seeded with a selected mixture, all turned over to bury the seed and hold the mulch, sprinkled from a tank truck; and then the early growth of weeds from the mulch and reed grass stabilized the slope permanently. (21)

A well-considered improvement of location or alignment can reduce roadside maintenance costs to the everlasting satisfaction of the highway commission and the taxpayer, if you tell him about it. (11) A 1-mile hill on U. S. 81 south of Columbus, Nebraska, cost the Maintenance Division \$2,000 in 18 months in erosion repairs. The contractor who repaired the damage used sod in different varieties 4 inches thick, and stopped Nature's destruction. (24)

Roadside Development has proved an asset of inestimable value in maintenance through the creation of the streamlined cross-section, which mows easily with machines, is safe for the motor vehicle out of control, and in the snow belt has shown itself self-cleaning. The planting of trees and shrubs at proper locations on roadsides, to form an attractive grouping and natural snow fence,

also has proved an asset in preventing drifting on the traveled way.(13)

Mowing costs have been reduced by the flatter slopes and wide center strips, because faster machine mowing has replaced the snail-paced hand mowing. The passing of guard rails, due to these safer slopes, has also lessened the need for the hand scythe.(13) Minnesota made a saving in mowing costs by seeding her roadsides with grass that farmers can feed to livestock--alfalfa was planted because the farmers were willing to mow the roadsides for the grass.(10)

Two more assets can be recorded for Roadside Development under the head of maintenance; one is man-created, the other a gift of Nature. Planting of trees which cast their shadows across the highway relieves the glare of the summer sun and also protects the pavement from extremes of temperature, and conserves the moisture which binds stabilized road bases.(7) Nature's gift is the volunteer growth of trees and shrubs which appears within a year or two after the resloping and seeding of banks and the rounding of the tops. This asset is a very real economy, as Nature saves your doing the planting and it is very much more natural--naturally!(9)

Constant Addition to Knowledge

One of the assets which is growing with compound interest is the increasing thought being given to roadside development problems by engineers, landscape architects, and contractors. Nominations for the Annual Roadside Development Awards of *CONTRACTORS AND ENGINEERS MONTHLY* have brought to our attention dozens of new ideas contributed by contractors to insure the permanence of projects; and each year the Committee on Roadside Development of the Highway Research Board, and the similar committee of the American Association of State Highway Officials, have reported the results of field studies of new mulching methods and of plant ecology.

A new method of holding sod on a 2 to 1 clay slope with 1 x 4 boards comes to mind as a contribution from a contractor; (23) and the desire to use thicker sod or larger sprigs than specified, (25) to insure the immediate stabilization of the work without the need of re-sodding washouts or re-sprigging bare places, is an

excellent example of additions to knowledge and improvement in practice. The story of the contractor's mistake which led Ohio to harrowing seeded areas instead of hand-raking them, is well-known to you. (5) Sometimes even mistakes prove to be assets!

The development of special equipment and hand tools by contractors deserves special mention for reducing the unit costs of roadside development projects and making possible more uniform, more reliable results.

Savings In Design and Construction

Roadbuilding is too great an industry to countenance hand-to-mouth, short-term economies. Today, more than ever before, road men are thinking along the lines of 'fence-to-fence' highways rather than the paved way. Roadside improvement is nothing more than a better class of construction and better maintenance procedure. (1) The thought which roadside development engineers have given to the problems of highway design has reduced construction costs and made the future development of the highway possible, when required, without the expenditure of vast sums for new rights-of-way and corrective measures in drainage. (1) Experimental work with rounded cross-sections immediately demonstrated that the dressing of these slopes could be done quicker and at lower unit cost with draglines, scrapers and blades than by hand work. (19) Economy of construction is then added to economy in maintenance as an asset.

Highway planning today requires the aid of the roadside development engineer in the best selection of routes, as rights-of-way are becoming more and more expensive. In a few years the location of a highway will be as fixed by adjacent land usage and values as the railroad is today, and little or no change will be possible to improve alignment or the beauty of the roadside or to increase the traffic capacity or safety of the highway. (11)

Your roadsides may be made permanent, although the highway itself is bound to be worn out by traffic. Therefore, conserve your permanent asset. The construction expense of roadside planting is insurance against erosion; it is not an additional expense, as its cost is returned many times in the economy of maintenance. (11)

Good highway appearance and all the other assets and values we have mentioned must be built into new highways through the cooperation of the entire highway organization, including the roadside-development-minded Landscape Architect or Engineer, right from the first thought given to location and design.(13) In construction, the mass production of rounded slopes by machines has eliminated the need for the old railroad cross-section even on secondary roads.(19) I found this summer that many counties are rebuilding their roads as rapidly as possible, to take advantage of the economies of the streamlined cross-section.

To meet his responsibilities in highway construction, the Landscape Architect must be conversant with all the problems of the highway engineer and be able to visualize the completed highway before the first tree is cut or the first yard of dirt is moved. He must share with the construction engineer the responsibility of providing for the comfort and safety of the motoring public; and he alone is responsible for delivering the highway to its users in its most becoming garb, with the greatest ultimate economy, using the ever-present forces of Nature as his aides.(11)

MILITARY VALUE

An asset of Roadside Development which we had not taken into consideration even two or three years ago has now been brought forcibly to our attention. The wide, flat shoulders of the properly-designed modern highway today provide havens of refuge for civilian vehicles when Army convoys overtake them, at the same time avoiding complete traffic snarls of military and civilian traffic which prevent either convoy or commercial truck from reaching its goal. In a real emergency, this is a very serious problem, as many people in France learned to their sorrow. The streamlined cross-section permits military convoys to park off the traveled way during rest periods, so that normal traffic may have free use of the highway; and, finally, the disabled Army or civilian vehicle may seek the shelter of the shoulder for repairs.

LIABILITIES

The assets, the choice fruits of Roadside Development, have crowded upon us in the past few minutes; but we must not forget that we have liabilities, errors, unfortunate tendencies which,

unless curbed, may slacken the pace at which we can produce assets, and we may even lose some of their manifold benefits.

Indiscriminate Planting

We have mentioned how helpful the proper planting of trees and shrubs can be on our highways, but it can be carried too far. Trees and shrubs planted on roadsides seldom reduce maintenance cost, but rather add to them due to the greater amount of hand-mowing required and to the care of the trees and shrubs themselves. (4) The planting of high-growing shrubs and failure to prune them back may mask a dangerous corner or intersection, (26) may even cause the death of innocent children playing hide-and-seek on a boulevard strip in a built-up section.

Driving through one of the group of 23 states which I have covered rather thoroughly this year, I noted well-graded grassy slopes of varying degrees of flatness, giving a constantly-changing vista even on a mile-long tangent. The rounded tops of these slopes were open gates through which Nature had entered, seeding the slopes with wild shrubs and trees, producing a graceful, natural planting pleasing to the eye. The restfulness of this harmonious landscape was suddenly disturbed by carefully-planted lines of pines at mid-slope and on others some variety of deciduous trees. Why was it done? It ruined a man-made creation in tune with Nature. It set up a needless liability. Inquiry brought out that an ambitious local District Forester had taken this means of improving on the work of the State Roadside Development Engineer. Don't let your trees and shrubs become liabilities.

Exotics versus Natural Ground Cover

Luther Burbank and Judge Logan improved on Nature when they gave us new plants from old; but the Landscape Architect in roadside work should refrain from the glamorous, exotic or formal. The ship of state done in Coleuses seen in our public gardens has no place in the rural roadside, nor its counterpart in whitewashed stones held securely in pattern by a cement mortar. Cooperate with

Nature, do not caricature her efforts, do not be too formal. Steer clear of the liabilities of the artificial in Roadside Development; be natural in your approach, and thus insure natural results. Use natural ground cover, the local grasses; don't import a growth foreign to the area--it probably won't last anyway.

Over-Emphasis of Roadside Parks

We know full well the value of the turn-out, the small wayside rest and the lookout, as assets to our roadsides; but the enthusiasm of the roadside development engineer has taken wings and carried him into the midst of a covey of 5-, 10- and 20-acre parks. These delight the traveler and the taxpayer, as long as the latter does not realize what they are costing him in reduced maintenance money available to care for the highway over which he must drive to reach the attractive, restful parks. Inquiry has shown that these parks cost a minimum of \$1,000 a year for the services of the one or two men who clean, mow, empty trash cans, maintain the parking area, etc., and they usually have a light truck for their work. Too rapid multiplication of these parks, to permit more and more of the public to have them close at hand, will prove a very great drain on highway funds and do nothing at all to reduce maintenance costs on the roadside, but rather will increase them.

Our largest state, the great Lone Star empire of Texas, had over 500 free roadside parks of 1 to 3 acres each on its 20,461 miles of state highways in 1937, or one park for each 41 miles. This remarkable recreation service to the taxpayers is commendable, but don't let the glamour of large parks seduce you lest there come a day when the axe of the taxpayer will fall and the highway department recreational parks and bird sanctuaries will be cut off from the highway maintenance funds needed for their upkeep.

Maintenance funds have not increased greatly to care for such park developments; in fact, most maintenance engineers are 'grousing' because they are not receiving an increase in funds commensurate with the increased highway mileage they must maintain. The total of state highway maintenance funds is less by \$3,000,000 this year than in 1939.

1939	\$212,850,000
1940	207,698,409
1941	209,643,138

We are all greatly concerned over the diversion of state gas tax money from highway purposes to politically expedient projects. Let us not over-emphasize roadside parks to such a degree that we may be accused of diverting state highway funds from maintenance of the traveled way to a phase of roadside improvement which does not contribute to highway economy.

Danger in the Medial Strip

We have exhibited the liability incurred in over-planting the boulevard or medial strip, the construction of which has done so much to increase the traffic capacity of the nominal 4-lane highway. A further liability in these strips lies buried beneath the surface. The wider the medial strip, the greater the volume of water that will percolate into the ground. We have seen cases where this water has caused weakening of the subgrade at the edge of the pavement, resulting in serious damage to the pavement itself. Deep gravel drains between the pavement edge and the fertile medial strip will overcome this potential liability.

THE TRIAL BALANCE

It is time to examine our trial balance and see where we stand. Are we in good condition? Do our assets outweigh our liabilities? You will say, 'Yes,' at once, because you are directly interested in the field of Roadside Development -- and I agree with you.

No program of Roadside Development can be considered entirely successful, however, until it includes the elimination, or restrictive control, of highway advertising signs. These silent salesmen for all the needs of man from A to Z--ambulances to zinnias--have perhaps been the cause of as many calls for ambulances and flowers as any other distraction competing with the highway for the driver's attention. Control has been effected through zoning, as in the coastal counties of Georgia, by licensing as in Virginia, and through right-of-way contracts on new locations as in Mississippi. Promote control in the manner best suited to your local conditions, but get control!

Watch your liabilities closely, do not let them grow and get out of hand, and conserve your tremendous assets. Then we shall have efficient and safe arteries of transportation with roadsides that attract but do not distract the motorist; and may they soon return to their role of Pathways of Peace.

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