

DEPARTMENT OF DESIGN

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TWENTY YEARS OF ROADSIDE DEVELOPMENT

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Many years ago there was a statement made that "we pay for our highways whether we have them or not." The highway engineer and the economist have proven that statement many times. And now upon careful analysis, it appears that we pay for roadside development whether we have it or not.

In the early days roadside development meant simply roadside beautification and it was difficult to get engineers interested because they felt that this was an expenditure that could well be confined to extending the roadway itself. Careful analysis has shown that roadside development is functional with highway safety and highway maintenance . . . two items that at the present time are giving much trouble to highway engineers and have become two of the great problems in connection with highway work. Roadside development properly carried out not only means lower cost maintenance and safer highways, but presents to the user of the highway a more pleasing environment and serves for public relations between the highway builder and the general public.

Recently, for several years, our highway maintenance expenditures exceeded our investments in construction, and it is only since many millions of dollars were added to our construction program that this condition has been corrected. One of the main tasks for the highway engineer is to so organize his highway system that the maintenance cost will be at a minimum. Otherwise we would migrate to a maintenance program endeavoring to maintain for the travelling public roads that in many instances are obsolete and that have not been properly constructed to meet the demand of the great amount of traffic that is bound to come upon our highways in the near future. If the money is spent for maintenance, then this same amount of money is denied the construction and re-construction program.

In the early days there were many road-

sides so constructed that they required continuous and annual maintenance in order to keep the roads in shape to take care of the traffic. The proper development of roadsides would, with a small amount of one-time construction cost make it possible to reduce the annual maintenance to a minimum.

Another important point that is so closely allied with roadside development is that of safety. Properly constructed shoulders, well turfed slopes and the removal of hazards are all matters that with proper roadside development can be carried on with minimum of expense and will contribute greatly to the safety of the highway. The result of this program is a pleasing and beautiful roadway and roadside where the traffic can properly be handled expeditiously and safely.

Twenty years ago roadside improvement was just beginning in an orderly way. Most of the State highway departments were less than enthusiastic about what appeared to be a process of planting a tree here and there. Certainly it was said this "beautification" could have no effect on traffic safety or service at all. It could not possibly move highway costs any way but up!

Today, in 1951, we find some twenty-odd states organized to carry on their roadside development work not as an afterthought, but as a part of regular highway design and construction. This is because it has been found that roadside development, as a part of complete highway development, definitely increases traffic safety and service potentialities and reduces maintenance costs. Furthermore we have found that every well considered roadside development resource that increases safety and decreases cost of maintenance also improves highway appearance. All this is a way of saying that sound development of the highway right-of-way more than pays for itself.

Step by step over the last many years we

have learned a number of things about the relationships between sound roadside development and good modern highway design, construction and maintenance.

In 1930, roadside improvement was done separately—sometimes years after the highway pavement was constructed. Today, as we have learned, sound roadside development begins with highway location and design. When a road has been well located with the alignment and grading adjusted to fit the topography and critical conditions we have accomplished many things to show that roadside development is an integral and functional part of our highway system.

Care in adjustment of location can reduce the depths of cuts and fills. It also reduces the amount of erosion control work which adds so much to our annual maintenance costs.

In the early years of our program many of our highways had a railroad type of cross section with typical V-type ditches and 1:1 or 1½:1 cut and fill slopes. Our 1950 highways have broad drainage ways with side slopes flattened to 3:1 or 4:1 where permitted by topography. The flatter slopes have reduced the number of places where guard rail is used. This new cross-section has made it possible for the grading to be done with motor-operated blade dozer and carrier equipment. With flatter slopes the latest types of heavy excavation equipment can operate most effectively. This equipment cannot be used on side slopes steeper than about 2:1.

With flatter slopes snow can be removed with fast-moving equipment and mowing the roadside can be done by machine at a much faster rate and much lower cost.

Wide safe shoulders and broad rounded drainage ways are now used on our highways. Shoulders of selected stabilized soil, with turf cover, are now being constructed. They are safer and require less maintenance. Snow plows, mowing equipment and blade graders can be operated readily across streamlined shoulders and gutters.

Cuts and fills flattened to 3:1 or 4:1 where topography permits, also advances traffic safety. Vehicles forced off the traveled way in an emergency can stop safely even if forced off the shoulder. Furthermore the flatter slopes lower the cost and improve the effectiveness of erosion control. In northern States, like the Dakotas, for example, 4:1 and 5:1 back slopes have proved their value in the control

of snow drifting. On 3:1 and flatter slopes mulching and seeding immediately following rough grading is now being done with mulch-blower and seed and fertilizer spray equipment. Already this equipment has reduced average erosion control costs nearly 50 percent.

Today mowing is done by motored-equipment working at speeds of three to five miles per hour. Because of improved cross sections that permit use of the equipment effectively, mowing costs from one-tenth to one-fifth the cost of the same work in 1930. The older cross sections required hand mowing. In practically every case the new cross section coupled with proper roadside development permits the use of machines instead of costly hand maintenance.

Sound roadside development provides essential driver service and rest area facilities. Under 1950 traffic conditions serious interference with traffic results on heavily traveled roads unless safety-turnouts and rest-area facilities are provided for stopping and parking.

Bus turnouts are needed on highways entering all large cities and in the vicinity of school zones. Footwalks and related pedestrian facilities may also be needed.

Safety turnouts are necessary to avoid parking on road shoulders and the travelled way.

The stopping of tourists on scenic highways may require selected turnout area development to avoid interference with through traffic.

On long routes between population centers through undeveloped open country roadsides, a number of States provide rest areas with parking, water supply, outdoor cooking, and comfort facilities. Commercial truck travelers and tourists alike use these areas in increasing numbers.

A wide variety of gas stations, restaurants, motels, drive-in theaters, and other forms of private development are a growing problem on highways carrying heavy traffic. Each entrance driveway and off-road parking space is a potential traffic hazard. Road intersections need to be kept open and adequate sight distance must be maintained. Building setback controls and roadside access and zoning measures are being worked out in some States. Drainage-ways may require redesigning because of surface water from new road and border developments.

As woodlands are cleared and replaced by

plowed lands, or crop lands replaced by residential development, highway drainage systems have to take care of increased volumes of surface water. Resulting problems of channel and drainage-way protection are essentially road-side development problems.

Sound roadside development requires planting of trees and shrubs as one of its final steps. It will be noted that planting has not yet been mentioned in connection with roadside development. Planting is however necessary as a final stage of complete highway development. Planting is done, however, only for specific problems connected with erosion control, traffic guidance, and traffic safety and appearance. Slopes too steep to be mowed by power-operated equipment are, for example, best planted with running vines or other wood material that require no mowing. Road intersections, outside of curves, the approaches to bridges, and the whole surrounding area of major grade separation may require planting of high-headed shade trees for purposes of traffic guidance and safety.

In outlining much too briefly some of the advantages of sound roadside development, we have been essentially stating one simple fact. Safe economical highway development and sound roadside development are words for

the same thing. Unless the roadsides are safe, maintainable at low cost, and pleasing to the eye, no highway can be said to be properly constructed. The best pavement in the world may be structurally strong but unsafe for traffic use and overcostly to maintain unless combined with a soundly developed roadside.

Much progress in roadside development has been made since the beginning of our highway construction program in this country because in the early days all efforts were placed upon the roadway without regard to the roadside. But as pointed out, roadside development is in fact an integral part of highway construction and as traffic increases this phase of highway work must be given ever increasing attention.

There are many indications that through the savings made in maintenance and the increased safety on the highway, the entire roadside development may be carried on in such a way that in the long run it pays for itself. At the same time this roadside development does much in furthering better relations between highway departments and the people of the respective states. Good highway appearance is an adjunct of correct highway building that may be obtained as a by-product of well designed and well engineered highways.