

access to the area is made by other than the main highway.

9. Manner of mowing. All mowing must be done in a workmanlike manner and the area left in a neat condition upon completion of work.

10. When hay must be removed. All hay must be removed from the rights-of-way within 30 d after being processed; any hay not removed within the time limits or in the manner prescribed by this section may be removed by the division.

11. Access to work area. Methods of obtaining access to work area of highway right-of-way are (a) access to work area on Interstate and controlled access highways is limited to using gates provided in the right-of-way fence, and if no gate exists one may be installed by the permittee and becomes the property of the state; (b) under no condition will it be permissible to enter or leave the work area through use of the main highway; and (c) the division will not be responsible for providing access roads outside the right-of-way line.

12. Parking of haying equipment. When haying equipment is not in use it must be parked near the right-of-way line.

13. Liability of permittee. The following shall constitute the instances of liability of the permittee: (a) the permittee shall be held responsible for any damage to fences, signs, landscape planting, or other highway features resulting from his or her mowing and haying operations; (b) the permittee shall hold the division, its officers, or employees harmless from any claims or actions brought by any person against the division, its officers, or employees as a result of the negligence of the committee or his or her agents or employees.

Mowing in violation of these regulations is a misdemeanor, which, upon conviction, carries a maximum penalty of a \$500 fine or one year in jail or both.

Because of an extremely dry spring in 1976 the Department of Transportation did temporarily amend the starting date for mowing east of the Missouri River to June 15. In recent years private mowing complaints were minimal, in part because of the decision to issue

permits only to the abutting landowner.

The maintenance foreman and superintendents were kept busy issuing permits, keeping track of permitted sections, and observing mowing operations for violations. Some violations were observed, and enforcement is a definite problem. There is a decided reluctance to file violation warrants with law enforcement people.

Removal of the harvested crops has always been a problem, and, while these regulations and the permit appear to have helped this problem, it has by no means been eliminated.

Some of the benefits from our private mowing policy follow. Less mowing is necessary by our own maintenance forces. Much litter is removed from the rights-of-way, and this helps to keep drainage areas cleaned out. Public relations with those who live along the highway are also better, because they are not charged for the hay they get in our ditches.

In many cases noxious weeds are cut down before they go to seed, and sight distances are improved, which reduces safety hazards for the traveling public. Many people feel that the ditches look much better when they are mowed out.

Some of the disadvantages and problems include erosion started by spinning equipment wheels on the inslopes and backslopes. There is also a constant problem with getting the private harvesters to remove their hay from the rights-of-way within the specified time limit. Furthermore, some operators do a very poor job of mowing and leave an unsightly mess.

Maintenance personnel are harassed when spraying noxious weeds in the rights-of-way by people who want to mow the ditches. The ecology and conservation people do not want any mowing done in the rights-of-way and the bee keepers in some areas criticize mowing the flowered vegetation their bees feed on.

These are a few of the problems and advantages South Dakota has encountered in its rights-of-way mowing policies.

Publication of this paper sponsored by Committee on Roadside Maintenance.

Abridgment

Approaches to Roadside Management

Robert Berger, Washington State Highway Department
Irvin C. Floyd, Region 10, Federal Highway Administration, Portland, Oregon

The states in the Northwest maintain an acceptable roadside with an increasing inventory of work with fewer dollars and a smaller work force. The Washington State Highway Department, after identifying the problem many times, is developing a process that includes establishment of roadside management plans.

Roadside management is not a "buzz" word, but an accurate term identifying a team effort in roadside design, construction, and continuing maintenance. It is the process by which roadside development and maintenance are planned and accomplished in harmony with each other. Long-range goals are identified, and all activities are given priorities according to their importance in relation to the long-range goals or immediate needs or both, and their interactions.

The difference between this concept and normal procedure is interaction. In the past, each roadside activity was evaluated on its own merits and not always in relation to its impact on other activities.

Many times design and construction of the roadside create built-in maintenance problems. Construction people follow plans and specifications, and the maintenance crews wait in the wings until the contractor has finished. As soon as the contractor leaves the project, the maintenance crews take over, usually with the attitude that construction people did not mitigate the problem created by the design.

The concept of roadside management involves a team effort by engineers, landscape architects, and members of other disciplines who identify long-range goals and in-

corporate them into the design, construction, and maintenance of the roadside. Each of the disciplines recognizes the team goal and subsequently makes the necessary trade-offs that are an inherent part of any team effort. It is important that they recognize that the concept of roadside management applies not only to roadside improvements, but also to those roadsides that have never had an improvement project.

By using aerial photos illustrating existing field conditions as base sheets, all roadside management plans must provide at least the following information: goals and objectives; key plant materials; views to be preserved or screened; vegetation to be protected, supplemented, controlled, eradicated, or selectively thinned; general horticultural requirements (e.g. fertilizing, pest control); irrigation needs (including programming of irrigation controllers); mowing limits and frequency; roadside drainage (design and maintenance); priority of each activity; manpower requirements (annually and monthly and skill levels); equipment needs; and estimate of costs.

A roadside management plan is of great benefit as a communications tool connecting top management with the employee on the job. Too often we overlook the need to provide the employee with a communications device to interpret what is desired. The plan can also be used as a basis for the supervisor in preparing his next year's program needs that will be passed up through channels

to be incorporated in the overall annual maintenance program. Once the plan is approved, the supervisor has a document to follow. At the same time, performance in the field can be evaluated by higher management.

The plan also illustrates what will not be done and acts as a basis for lower expenditures on equipment, materials, work hours, improved product quality and as a common reference for all levels of decisions.

We believe that the management approach to roadside design, construction, and maintenance is the responsible approach to making our highways aesthetically pleasing elements of the environment through which they pass. After the development of a roadside management plan, continuing maintenance should fall below previous expenditure levels, and benefits should increase.

A roadside management plan will ensure that a right-of-way will serve its highest and best use, whether this be habitat for upland game birds or landscape planting throughout a city. The goals and objectives of roadside design, construction, and maintenance can be accomplished at the lowest organizational level, if it is accomplished as a part of the plan.

Publication of this paper sponsored by Committee on Roadside Maintenance.

Abridgment

Economics of Roadside Mowing

B. E. Cox, Lincolnshire County Council, England

Expenditures for highway maintenance in the United Kingdom are being severely cut at the present time. The policy of the central government is to reduce 1975-76 expenditures by 20 to 25 percent by 1980.

As a result of this policy, the highway authorities have had to examine their maintenance standards, even though many engineers maintain that current standards are already inadequate and for some functions have not achieved the recommended target standards laid down as national criteria in the Marshall Report (1). Some of these standards for greenery cutting follow.

THE MARSHALL REPORT

The object of grass, tree, and hedge cutting is to prevent obstruction of sight lines at bends and traffic signs, to inhibit the growth of injurious and other weeds, to maintain a tidy appearance, and, in the case of trees adjoining roads, to prevent them from becoming a danger to road users.

Suggested Standards for Grass Cutting

Rural Roads

On the first 2 m (6 ft) of verges and on central reserves of motorways and trunk roads, grass should be kept below 15 cm (6 in) and elsewhere on the roadside below 30 cm (12 in).

For other roads, the minimum suggested is one cut width of one pass of the mower per year plus additional cuts as necessary to maintain visibility at bends. On

more important roads and on roads with well-used footways, more frequent and wider cuts (including up to the full width every second year) may be considered necessary. Steep banks starting from the edge of the carriageway should be cut more frequently to avoid reducing its effective width or obstructing pedestrians.

Urban Roads

On motorways and trunk roads in urban areas, all grass should be kept down to 7.5 cm (3 in). On other roads, however, for highway purposes the same standards as for rural roads should apply.

Suggested Standards for Hedge Trimming

Where it is the responsibility of the highway authority, hedge trimming once a year should be sufficient on rural roads; it is needed more frequently in urban areas. Where there is a special requirement, for example to preserve visibility at bends or across central reserves, cutting should be done as required. (In the United Kingdom, highway boundary hedges are normally the responsibility of the adjoining landowner.)

Chemical Sprays

It may be necessary to use chemical sprays to eliminate weeds and control growth around posts carrying signs, along guardrails, on the edges of curbs, and on footways. They may also be used to control the growth of grass on the strip adjoining the edge of the carriageway