



MICHIGAN DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

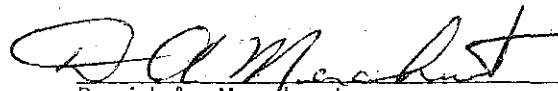
ENVIRONMENTAL ASSESSMENT FOR
REMOVAL OF HAZARDOUS ROADSIDE
TREES FROM HIGHWAY RIGHTS OF WAY

PREPARED BY
MICHIGAN DEPARTMENT OF TRANSPORTATION

IN COOPERATION WITH
FEDERAL HIGHWAY ADMINISTRATION
REGION 5

ENVIRONMENTAL ASSESSMENT FOR
REMOVAL OF HAZARDOUS ROADSIDE
TREES FROM HIGHWAY RIGHTS-OF-WAY

10/28/80
Date


David A. Merchant
Division Administrator
Federal Highway Administration

INTRODUCTION

This assessment provides an overview of the probable environmental impacts associated with the removal of hazardous trees on county roads and state trunklines, in Michigan. Both short- and long-term, as well as statewide and regional, impacts are discussed. Statewide and regional impacts of maintenance programs are also discussed. A number of alternatives to tree removal, offering on-roadway and off-roadway protection, are presented along with a procedure for determining the appropriate site-specific treatment.

This is a Generic Environmental Assessment: it documents environmental impacts based on information and step-by-step procedures outlined in Guidelines for Removing Hazardous Trees from Highway Rights-of-Way: A Management Manual (guidelines). The manual was prepared for use by state and local county road engineers to guide implementation of a roadside tree/vehicle accident risk reduction program.

Where specific rights-of-way situations are identified as part of the step-by-step manual process, alternative treatments to tree removal must be considered. These situations involve problems arising out of ownership, presence of endangered/threatened or rare species, tree species size, historic trees, danger of erosion/sedimentation and impact on wetlands or streams, and safety issues. Conditions under which alternatives to removal would be appropriate are identified. This includes trees existing within higher risk roadside areas that should not be considered for removal, and specific instances in which higher risk trees should not be cut, regardless of the location of the tree(s).

This assessment will be made available for review. For additional information, refer to the Assessment of: Guidelines For Removing Hazardous Trees From Highway Rights-of-Way, Asplundh, Nov. 1979.

If no comments or additional information is received which would require changes in this assessment, it will be adopted as a Finding of No Significant Impact in accordance with Federal-Aid Program Manual 7-7-2.

1. DESCRIPTION OF THE PROPOSED ACTION

This project proposes cutting or removal of hazardous trees along Michigan roadsides based on Guidelines For Removing Hazardous Trees From Highway Rights-of-Way: A Management Manual. Training and inspection programs will be necessary to facilitate proper implementation and adherence to these guidelines.

It is anticipated that Federal-aid funding for implementation of this program will be limited to a maximum of approximately \$500,000 dollars per year. Funding is offered through the 1978 Surface Transportation Assistance Act, hazard elimination program. Monies will be available for distribution to all Michigan counties on a priority need basis. In accordance with the guidelines, monies will be used to remove higher risk roadside trees first. This does not, however, preclude the possibility of removing trees along tangent (straight) road sections at some future date, should these sections warrant removal of higher risk trees.

Because of limited funding on a per year basis, the number of trees anticipated for removal by this action will probably be limited to less than 10,000 trees per year over the 5 year program. Realistically, it is anticipated that only trees on the outside of county and trunkline road curves will be effected. This would generally include trees out to the right-of-way edge on curved county and trunkline roads. This represents less than 1% of existing county and trunkline roadsides or less than 3/10 of 1% of all trees within 40 feet of the road edge of all road types in Michigan.

2. NEED FOR THE PROPOSED ACTION

2.1 The Injunction

This environmental assessment was a result of a roadside tree removal program undertaken, with federal funding, by the Michigan Department of Transportation, then the Michigan Department of State Highways and Transportation (MDSH&T). As a result of certain litigation initiated in federal court in Grand Rapids, MDSH&T had been enjoined from cutting live trees under the program until it had complied with federal and state environmental protection laws. That injunction was issued on June 4, 1976. It requires MDSH&T to determine if the program will have significant effects on the human environment. If so, MDSH&T must prepare an environmental impact statement (EIS). If not, MDSH&T must prepare a negative declaration (finding of no significant impact) explaining why there are no such effects.

2.2 Defining The Problem

Trees that surround our highways, primary and secondary roads, and city streets have come under the scrutiny of safety-oriented programs in recent years. Although statistics show tree involvement in only 1.6 percent of all vehicle accidents, trees are involved in 12 percent of all accident fatalities. In Michigan, approximately half of the 10,067 tree/vehicle accidents in 1976 resulted in death or serious injury. One or more occupants in 163 vehicles died; one or more occupants in 4839 vehicles were injured; the remaining 5065 cases resulted in property damage only. A cumulative study of Michigan traffic fatalities from 1971 to 1976 revealed that despite significant

variance in the proportion of tree-related deaths from year-to-year, the absolute frequency of these deaths remained constant--even during the 1974 energy crisis when all other traffic fatalities substantially decreased.

Abundant research has been devoted to identifying, ranking, and tabulating the risk potential of many characteristics of tree/vehicle accidents.

Traffic-related research has drawn a profile of the driver most typically involved in run-off-road accidents: he's a young (20-25 years old), weekend driver, out during the early morning hours (2:00 - 4:00 am), driving faster than the posted speed limit. He may also be intoxicated and/or unfamiliar with the road.

Tree/vehicle accidents typically occur on winding rural roads--the vehicle leaves the pavement on the outside of a curve. The road type and various physical features of the road (lane and shoulder width, traffic volume and direction, presence of curves, etc), as well as the driver characteristics determine the probability of running off the road.

Accidents involving trees are mainly rural phenomena, occurring most frequently on county or township roads. Of the fatal accidents, 81.6 percent occurred on rural roads; 70.8 percent of the injury-producing, and 65.8 percent of the property damage-only accidents occurred in unincorporated areas.

Compared to the abundance of trees found along county roads, few trees are found along interstates and State trunkline highways traversing rural, suburban, and urban regions of the State. Consequently, these roadways have relatively few tree-involved accidents. With curves, however, the potential risk increases on highway sections. This risk is further compounded by darkness.

The typical tree/vehicle accident involves a larger tree within 30 feet of the road edge, located in a drainage ditch or at the bottom of a downward grade. The target tree and its immediate surroundings (size, density, distance from the road, the presence of other obstructions, etc.) determine the probability of the vehicle striking the tree.

3. ALTERNATIVES TO TREE REMOVAL

3.1 Summary of Impacts

Alternative treatments that can feasibly be used for county or trunkline curved roads are presented and discussed for practical use in Guidelines for Removing Hazardous Trees from Highway Rights-of-Way: A Management Manual (guidelines). For the discussion of impacts which follow, these alternative treatments include:

On-Roadway Protection

- Pavement Marking
- Delineators and Advance Warning Signs
- Speed Limit Restrictions
- Designation of Road as Scenic Drive (with speed restrictions)
- Super Elevation of Road Surface
- Shoulder Widening and Paving

Off-Roadway Protection

- Guardrails
- Regrading Ditch Sections
- Protective Berm Construction
- Slope Alterations
- Protective Plantings

Major Reconstruction Projects

- Road Relocation/Realignment
- Boulevard Construction

On a site-specific basis, the off-roadway area of possible environmental impact is limited for most alternative treatments ("Guidelines" Chapter 6). Natural factors which may be affected include soil-water relationships, vegetation, and drainage. Human factors of greatest significance are effects on adjacent land use, traffic flow, and aesthetic qualities. Generally, the extent of impact is proportional to the extent of soil disturbance. Most impacts are of short duration (during construction) and site-specific. Road relocation, boulevard construction, and shoulder-widening, however, may have significant impacts that require impact assessment. Since alternative treatments are conducted only where they are most cost-effective, and/or where tree removal cannot be performed because of special considerations (Chapter 5, guidelines). Regional and statewide impacts are limited and do not appear significant.

Impacts on cultural resources (archaeological) are judged as if the land-modifying activities associated with specific alternatives occur in an archaeological site area. Prior survey determines the presence or absence of archaeological sites. Lack of evidence of cultural material in the area indicates that there would be no impact on these locations.

3.2 Determining The Site-Specific Treatment

A variety of factors must be considered to determine the correct treatment (or non-treatment) for each site. Since most treatments are costly, the size of the statewide budget will exercise a controlling influence on the number and source of treatments that can be undertaken. Ideally, treatments are selected to yield the greatest reduction in expected fatalities, within the available budget. This result must be weighed against the amount of environmental (aesthetic and ecological) damage resulting from the treatment.

Costs of a specific treatment include not only those of implementation, but also future costs. These future costs involve periodic maintenance as well as repair or replacement if necessary. For example, guardrails often must be repaired after being struck by a vehicle; small trees must be cleared or trimmed as they become large enough to constitute a danger to passing vehicles; pavement marking may deteriorate after each year and require re-marking.

Environmental effects of a given treatment further complicate selection, both on a site-specific and a statewide basis. Like other costs, environmental effects have immediate impacts, typically of an aesthetic nature, and long-term impacts. For example, the environmental damage created by removing trees that serve as wind barriers may entail future impacts in the form of increased erosion. Environmental effects could well tip the balance in favor of a slightly more expensive treatment, that eliminates the need to remove trees.

Determining the precise cost of implementing a specific treatment requires an estimate of long-term maintenance and repair costs, the dollar value of all environmental effects, both short and long-term, the effectiveness of alternative treatments in reducing serious injuries or loss of life, and the allocation of available state resources. This is the ideal case, rather than reality. Presently, lack of knowledge about many of the costs involved in applying alternative treatments is accompanied by uncertainty about their relative effectiveness. What is required, however, is an integration of available knowledge into a general set of guidelines for selecting sites and treatments (See guidelines).

4. PROBABLE ENVIRONMENTAL IMPACTS OF TREE REMOVAL

4.1 Short-Term Impacts

All short-term impacts of tree removal are site-specific; that is, the nature and extent of the impacts are determined by the actual site of tree removal. The most serious short-term impact is a loss of aesthetic value. Measures to avoid removing unique trees and to control erosion have been considered and are outlined in the guidelines. Since disposal of slash (the vegetation that has been removed), is usually done concurrently with tree removal, the impact is of very short duration. Noise and air pollution associated with removal equipment--chain saws, trucks, etc.--are also limited.

4.2 Long-Term Impacts

The long-term impacts of tree removal are also site-specific and are associated with a loss of functional values of roadside trees. There are a wide variety of benefits trees and other forms of vegetation provide. These include micro-climate modification, engineering, architectural, aesthetic, and wildlife habitat uses.

In addition, trees have economic values surpassing the more traditionally recognized lumber/firewood values.

Removing trees results in loss of some of these values, wherever and whenever removal occurs. The nature and magnitude of the associated impacts depends on numerous, interrelated, site-specific variables. It is impossible to describe all of the specific situations in which roadside tree removal may have these effects; however, the more important values, impacts, and associated variables are discussed briefly in this section.

In most cases, the primary factor in determining the magnitude of the environmental impact of loss of tree functions is whether the trees to be removed are "barrier" trees. Barrier trees separate the road from potential impact areas, such as residences, open agricultural fields, water bodies, parks, sidewalks, and aesthetically pleasing scenes. Removal of non-barrier trees is much less significant, except in situations where the non-barrier trees themselves have exceptional value (e.g., as historical resources).

4.2.1 Climate Modification

The impact of removing roadside trees on climate varies widely depending on numerous site-specific variables. In general, however, the removal of single trees or small clumps of trees affects only extremely localized areas, primarily residential. No mitigation for loss of shading values of individual trees is practical. Removal of long rows or strips of trees can result in significant affects of the microclimate in some areas. For example, removal of a windbreak adjacent to a muck farm could cause significant wind erosion.

4.2.2 Glare and Reflection Control

Removing roadside trees can result in increased glare and reflection. In general, urban/suburban areas are more sensitive to such impacts than rural areas. However, east-west oriented rural roads in Michigan are also subject to glare from the morning and evening sun throughout the year, but particularly in the spring and fall. In most cases, removal of a single tree or small clumps of trees will have minimal impacts on glare and reflection.

4.2.3 Air Pollution Abatement

The removal of single, isolated trees or small clumps of trees along the roadside will have negligible effects on air quality. Removal of rows or strips of trees can have significant effects in some areas. In general, removal of trees along roadsides will have little impact in rural areas, except along gravel roads through open areas. Planting tall shrubs will help mitigate loss of air filtering values of trees in all areas.

4.2.4 Noise Abatement

In both urban and rural areas, removal of single trees or single rows of trees will have no significant effects on noise, except perhaps where a dense row of conifers shields a park, residence, or other "noise sensitive" area adjacent to a heavily traveled road. Mitigation by man-made barriers supplemented by plantings of vines and shrubs is possible and might be warranted in some situations. Planting of shrubs alone will not replace the attenuation of sound by wide bands of trees.

4.2.5 Soil Stabilization

The removal of roadside trees will result in significant long-term loss of soil stabilization values only if trees are removed in areas subject to mass wasting or where trees are needed for windbreaks to protect soils. Wind erosion is only important on sandy and organic soils in Michigan. Specific information on soils which may be susceptible to wind erosion can be obtained from the State Soil Conservation Office. Areas highly susceptible to mass wasting are primarily road cuts through hilly areas with slopes of 18% or more.

4.2.6 Interrelationships With Other Plants

Wherever roadside trees are removed, changes in lower vegetation will occur. These changes result in an environment of an earlier successional stage. These changes are negligible if a single isolated tree or small clump of trees are removed. If large clumps or long rows or strips of trees are removed, the diversity and interspersion of vegetation and its "edge" may be either increased or decreased. Edge refers to the structural juncture between several communities.

Dramatic changes in adjacent vegetation can occur if trees which serve as windbreaks are removed in sensitive areas such as dunes and wooded swamps. In dunes, removal of windbreaks can slow vegetational succession and perhaps cause blowouts. In wooded swamps, removal of clumps, rows, or strips of trees can result in subsequent windthrow (felling) of adjacent shallow-rooted trees, such as northern white cedar.

Removal of trees from roadsides can affect adjacent endangered and threatened plant species. While locations where unique species are known to exist or are identified as part of the guidelines process will be left undisturbed, it is possible that other locations may also have endangered or threatened plants.

4.2.7 Wildlife Habitat

Roadside trees are probably of special importance to Michigan wildlife only in open areas (e.g., agricultural lands) and urban areas where other trees are scarce. In such areas they can be important to squirrels and various tree-dwelling birds for food and shelter. In open areas, rows or strips of trees in large open areas can provide important travel corridors for ground-dwelling vertebrates including deer, rabbits, pheasants, and other game species. The latter function can also be served by shrubs.

Some roadside trees may be of significant importance to wildlife because of their size, species, or condition. Snags (dead trees) are especially beneficial to cavity-nesting birds (e.g., red-headed woodpeckers, starlings) and raptors which can perch on them without limbs and leaves to obscure the birds' vision. Important factors for evaluating the wildlife values of snags include hardness, height, diameter, and bark and limb condition. Preferences of wildlife vary by species; however, snags that appear to have overall highest wildlife value are soft or rotten, about 20 feet in height and 15 inches in diameter, and have no bark or limbs.

Long rows or strips of large, mast-producing trees (trees producing edible fruits and nuts), such as oaks, also may have special wildlife values by providing supplemental fall food in the form of acorns for squirrels, deer, and other wildlife.

There is some evidence that the presence or absence of trees along roads can influence the movement of wildlife, and this is therefore related to the frequency of road kills. Deer/car collisions are a significant public concern in Michigan for safety and economic, as well as for biological reasons. Deer/car collisions are a function of both traffic volume and speed, and habitat adjacent to the roads (e.g., winter deer yards).

With regard to the significance of highway-related mortality of small mammals, birds, and amphibians that have high reproductive potentials, there is no evidence that road kills of such animals are in any way significant when related to the total populations.

Removal of roadside trees will result in significant impacts on wildlife only in certain situations. Mitigation for loss of wildlife values of roadside trees is possible and probably warranted where large clumps or long rows or strips of trees are removed.

The three most practical mitigating measures are:

1. Planting shrubs to replace lost food sources and travel corridors.
2. Piling brush from the cut trees for shelter for small mammals and birds.
3. Constructing artificial nest boxes to replace loss of potential nesting sites in tree cavities.

To achieve maximum wildlife benefits, however, site-specific management plans based on an analysis of existing resources and limiting factors for various types of wildlife are essential.

Removal of large numbers of trees in forested areas will usually increase edge areas (areas separating forested and open habitats). Development of edge habitat and the increase of edge species mitigates that loss of forest habitat and decline in forest species. Edges increase the diversity of nesting and foraging sites for songbirds.

4.2.8 Hydrologic Effects

Rights-of-way for highways can expose a sufficient length of a stream to cause detrimental changes in the stream's temperatures. This would be most likely to occur where a road ran parallel to a stream and trees were removed all along its southern bank.

Prior to removal of any trees near coldwater streams, the County Engineer must contact the Michigan Department of Natural Resources for a field assessment of possible effects. No trees are to be removed if increases in water temperature are likely to occur. It is very unlikely that such potential impacts will occur during roadside tree removal. Based on fatal tree accident analysis, a very low percentage of all generic roadside environments studied included water and wetlands.

4.2.9 Monetary Values

The economic values of roadside trees, particularly in urban/suburban areas, are becoming more widely recognized. These dollar values have been based primarily on investments in each tree by the cities, and may not reflect an attempt to place dollar values on the amenity values of urban trees (e.g., attractiveness, etc.).

Values of individual roadside trees for saw timber and firewood are easier to estimate. But since trees cut under this program would not likely be used for such purposes, these values are not relevant.

In addition to their values for saw lumber and firewood, trees can enhance property values by as much as 20%, with average increases of 5 to 10%. Dense cover arrangements enhance property values more than scattered trees on residential lots. In Michigan, real estate value of trees varies widely from county to county. Values are highest in the major population centers.

Procedures for claiming income tax deductions for loss of ornamental trees include: replacement costs, decreases in appraised property value, and other values as possible bases for calculating related tax deductions for collecting insurance payments.

In cases involving condemnation or civil suits and where aesthetic values of trees are of paramount importance, use of The Guide for Establishing Values of Trees in Michigan (Council of Tree and Landscape Appraisers, 1979) is suggested.

The removal of roadside trees results in the loss of monetary values of trees wherever they are cut. Possibly the most practical way to dispose of lumber or firewood is by sale, because of the small number of trees cut in a single area and the high transportation costs involved.

4.2.10 Aesthetic Values

Roadside trees are very important to local and regional landscape scenery because they are viewed regularly by large numbers of people. The removal of roadside trees would affect roadside and landscape scenery wherever trees are cut. Straight clearing edges resulting from tree removal are potential focal points to travelers because they sharply contrast with adjacent natural vegetation in color, texture, and form. Freshly cut stumps visible to passing motorists or adjacent viewers may also draw attention to locations where trees have been removed, accentuating an artificial change in the natural character of the roadside. On the other hand, many roadside trees suffer from road salting, air pollution, ponding (owing to the roadbed's interference with crossdrainage), or physical damage. Removal of such trees usually benefits roadside scenery. Tree removal can also allow views of lakes, streams, and other attractive scenes.

Most roadside trees in Michigan, however, are aesthetically pleasing. Many compliment other scenery. In most areas, the most important factor influencing the aesthetic impact of tree removal is the effect on landscape diversity. Removal of trees in open areas is generally detrimental; tree removal in heavily forested areas is often beneficial, for it creates habitat for shrubs, showy wildflowers, and grasses. Removal of trees at specific locations, such as the outside of curves, may provide the traveler with a sequence of enclosures and openings that add variety to the driving experience, particularly in forested areas.

Significant losses of aesthetic value occur if visually pleasing trees that screen unsightly areas, such as junkyards, landfills, and industrial sites, are removed. Removal of trees from the medians of divided highways significantly reduce aesthetic appeal by allowing views of other traffic.

Some mitigation for loss of aesthetic value of trees is practical and warranted in some areas. (See guidelines)

4.2.11 Cultural Resources

Impact on cultural resources is of two types: 1) direct, where land modifying activities associated with tree removal actually alter or destroy an archaeological or historical site, or portions of such a site so as to render it useless to investigation, research, access, or view; and 2) indirect, where tree removal would affect the integrity or the aesthetic value of a particular historical property.

Impact of tree removal in itself is minimal if trees are removed at ground level. Most impact occurs because of presence of heavy equipment. Heavy machinery can compact and disturb the surface of sites so as to seriously alter their nature. Impact also occurs due to associated activities such as grubbing and hoeing or the dragging of logs over the surface of the site. An indirect impact on cultural resource structures or remains is likely when trees are removed near the site area.

4.3 Statewide and Regional Impacts of Tree Removal

Since tree removal is dependent upon site-specific conditions, a set distance for removal cannot be established and applied on a regional or statewide basis. Survey data can be used, however, to estimate the number of trees on a statewide basis that might be affected by a tree removal program.

4.3.1 The Impact of Risk On Removal

Curved county roads carry the highest risk of tree/vehicle accidents and require priority treatment. Only an estimated 52,000 trees exist within 20 feet of curved county roads (Asplundh assessment, Nov. 1979). There are an estimated 4,963,000 trees along county and trunkline roads (within 40 feet of the road edge) that can be considered in the upper 50% of the risk of vehicle/tree accidents. If all 52,000 trees on curves were cut, that would amount to about 1% of the higher risk trees. It would represent less than 1/2 of 1% of all trees within 20 feet of the edge of all county roads (curved and straight) and less than 3/10 of 1% of all trees within 40 feet of the road edge of all road types.

Based on the total number of trees affected, removing the trees involved in 50% of the higher risk tree/vehicle accident sites would not have a high cumulative statewide environmental impact. Because the higher risk sites occur at outside curves and these road segments account for less than 1% of the roads by mileage, the impact of removing affected trees on the environment in Michigan would be negligible and dispersed within the landscape.

4.3.2 Distribution of Trees

Removal of trees along higher risk road sections will not occur equally throughout the entire State. The tree-vehicle accident problem occurs with much greater frequency in the lower half of the Lower Peninsula on all types of roads--interstate, trunkline, county, and city roads.

A greater proportion of higher risk tree/vehicle accidents (relative to the extent of the total land in the State) will occur in the counties nearer the major metropolitan areas; these counties will most likely receive priority treatment. Regional impact would be greater in these areas than in the rest of the State. It must be remembered, however, that alternative treatments to tree removal would be considered, thus reducing the overall number of trees that will be removed under this program. Tree removal will only occur on rural county and trunkline roads, not city streets.

4.3.3 Sensitivity of Roadside Environments

Trees add considerable aesthetic value which defines and enhances all landscapes, urban or rural. The cumulative visual impacts of removing trees is dependent on the perceived aesthetic quality of a roadside environment.

With appropriate mitigation, tree removal in areas with exceptional views may be minimized. Use of appropriate mitigation where the number of potential viewers increases (particularly in the lower half of the Lower Peninsula) helps minimize aesthetic impacts. (See Chapter 7 of guidelines). These types of mitigation are particularly useful and necessary in areas where tourists or landscapes associated with high scenic values and concerned viewers are important. Significant cumulative aesthetic impacts may otherwise exist, especially where landmarks or high traffic volumes (exposure to larger numbers of viewers) exist.

Because the number of trees per mile to be removed in urban/suburban areas is small (removal is not broadly applied to city streets; see page 2-4 of the guidelines), statewide and regional impacts on climate, noise, and air pollution are minimal. The most important statewide and regional impacts of the proposed tree removal project are associated with wildlife habitats and aesthetic value.

Since most county road rights-of-way extend only about 21 feet from the edge of the road, confining tree removal and maintenance to the right-of-way significantly reduces impact on aesthetic value and wildlife. Limiting tree removal along the outside of rural county and trunkline curved roads, reduces the number of "barrier" trees to be removed by an even greater percentage.

Since tree removal, for legal and economic reasons, is likely to be confined to the right-of-way, the proposed program will have minimal statewide and regional impact on aesthetic value and wildlife for trunkline and county curve roads. A proposed statewide program may have significant positive statewide and regional impact on snow removal efforts by reducing drifting and icing of roads, and providing areas to pile snow. These benefits are of particular importance in the Upper Peninsula and northern areas of the Lower Peninsula.

4.4 Statewide and Regional Impacts of Maintenance

When trees are removed, the area thus cleared may need to be maintained by mowing. Virtually all of Michigan's roadsides are maintained by regular mowing. Where trees have been removed, mowing may result in the long-term loss of the functional values of roadside trees. Because the area from which trees would be clear-cut are likely to be relatively small, the increase in mowing is not likely to be great.

4.4.1 Mowing

Vegetation and Wildlife - Mowing reduces the diversity of both vegetation and wildlife. Mowing does not kill woody vegetation quickly; however, repeated mowing favors fast-growing grasses and certain forbs.

Refraining from mowing during the nesting season is undoubtedly the best mitigation for direct losses of wildlife. However, some reduction in bird loss can be achieved by mounting flushing devices (a bar in front of the mower which will flush birds before blades cut the grass).

Aesthetic - The aesthetic impact of establishing a treeless roadside depends on numerous site-specific factors.

Mowing often reduces the aesthetic value of roadside wildflowers. On the other hand, surveys indicated that rural landowners may be concerned about weedy, shabby-looking roadsides.

In urban/suburban areas where well kept grassy areas compliment adjacent lawns and parks, mowing of roadsides can have positive aesthetic impact.

Agriculture - In general, mowing of roadsides in agricultural areas has a positive impact. Unmowed roadsides serve as a seed source for many species of undesirable weeds. Since mowing tends to reduce the number of weed species, weed control in agricultural fields adjacent to mowed roadsides is often simpler and less expensive than along unmowed roadsides.

Mowing of roadsides is also an important source of hay in many rural areas of Michigan. Indeed, much of the mowing of roadsides in some rural counties is performed by farmers. If seeded with alfalfa and other desirable plants, roadside hay production per acre can approach that of other agricultural land.

Creation of Fire Breaks - Where the potential for fire and subsequent damage to valuable resources is high, road rights-of-way can have considerable value as fire breaks. The paved portions of county roads are sometimes insufficient to block the spread of wildfire if the rights-of-way are lined with woody fuel.

Herbaceous (especially short grass) plants on rights-of-way are generally more effective from a fire control point of view than other types of rights-of-way vegetation. Woody rights-of-way with dense "second growth" make particularly poor fire breaks.

4.4.2 Maintenance Alternatives to Mowing

There are two kinds of vegetation management techniques for right-of-way maintenance: broadcast (non-selective) and selective. The most commonly-used broadcast techniques are mowing (already discussed) and mechanical cutting or spraying of herbicides. Cutting and application of herbicides can also be done on a selective basis, with desirable shrubs and, perhaps, small trees retained.

The effects of mowing and other non-selective cutting depend on numerous site-related variables. The impacts of the maintenance alternatives also vary greatly from site to site. However, some general conclusions can be drawn to compare techniques to mowing.

Herbicide Application - Selective use of herbicides usually has greater beneficial impact on wildlife and long-term aesthetic value than either broadcast spraying or non-selective mechanical clearing (including mowing). However, use of herbicides along Michigan roads will result in some short-term loss of aesthetic value. Applications usually are made during the growing season and will cause browning of the treated plant.

"Browning" of rights-of-way vegetation has been a source of numerous citizen complaints to utility companies that use herbicides for transmission line maintenance. Widespread use of herbicides, particularly broadcast spraying, for road right-of-way maintenance would undoubtedly result in more citizen complaints about loss of aesthetic value than would mowing.

Selective Cutting - By favoring low growing shrubs selective cutting retains valuable wildlife habitat and creates a low growing plant community that requires very little maintenance.

Perhaps the biggest drawback to widespread use of selective cutting for road right-of-way maintenance is the cost associated with training of personnel. To obtain maximum wildlife and aesthetic benefits, minimize costs, and avoid extensive future right-of-way maintenance, selective cutting should be carefully planned and based on detailed inventories of existing vegetation and other features. Such initial training costs would also be involved in selective use of herbicides.

5. EARLY COORDINATION EFFORTS

As part of the early coordination effort, consulting services were contracted to Asplundh Environmental Services, with statistical and legal support by the University of Michigan Highway Safety Research Institute. This work resulted in: 1) "Guidelines for Removing Hazardous Trees From Highway Rights-of-Way: A Management Manual" (guidelines) and, 2) an environmental assessment of that tree removal program (guidelines) in Michigan. As part of this research and coordination, review of the Guidelines was obtained from selected governmental and public interest groups who would be effected or had specific interest in the project. These included: Michigan United Conservation Clubs (MUCC); Oakland County Road Commission; Washtenaw County Road Commission; and the Michigan Department of Natural Resources, Forest Management Region III Headquarters. This early review was intended to solicit public comment during development of the manual and, in particular, review of a manual by prospective users to increase the usefulness of the final product.

Comment was requested in two areas:

1. The appropriateness of the suggested alternatives to deal with the hazardous tree problem and,
2. Address the sufficiency, and practicability of the manual, and document for effectively implementing an agreed upon policy.

Comments and suggestions were incorporated into the manual, along with those of the project review committee representing the Michigan Department of Transportation and the Federal Highway Administration.