

DO HIGHWAY RIGHTS-OF-WAY HAVE TO BE DULL?

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ABSTRACT

Highway rights-of-way in Alberta, and elsewhere, are dull because they consist of limited, non-native species mixes that are frequently mowed. These rights-of-way are therefore not much more exciting, or aesthetically pleasing, than a football field. This paper reviews the literature regarding methods of enhancing the aesthetics of highways, with particular emphasis on limiting mowing and use of specialty plantings. Limiting mowing may result in savings that could be used for other aesthetic works. Encouraging public involvement in beautifying sections of highway, particularly interchanges, would again help offset costs.

DISCLAIMER

Opinions are like noses, everybody's got one and no one has exactly the same one. This old saw is even true for those who decide what vegetation is planted along our roadsides (Duell 1987) and how or whether it should be maintained. The opinions in this paper are those of the author, and are supported where possible by the literature. They do not reflect the views or policies of the Land Reclamation Division or of Alberta Environment.

SCOPE

Webb (1982) found that there were 149,435 km of roads and highways in Alberta occupying 352,266 ha of land. These figures do not include urban roads or local, rural roads. In addition, 84 interchanges occupied another 755 ha. Egler and Foote (1975) estimated that combined rights-of-way (highways, railways, power and phone lines, and oil and gas pipelines) in the United States amounted to over 10 million hectares. They further noted that in 1970, the Interstate Highway System was "said to be gobbling up" 404,858 ha a year. Robinson (1971) indicated the Interstate Highway System consisted of 66,129 km of limited access roads while Koepp (1988) used a figure of 69,027 km. Michael and Kosten (1981) reported a figure of over 607,200 ha for the entire system. Koepp (1988) said that there are 6.26 million kilometres of roads in the United States of which 3.39 million kilometres are paved. Way (1973, quoted in Wathern and Gilbert 1978) stated that motorway verges in England exceed 5000 ha.

The width of rights-of-way depends on road type, location and design philosophy and can vary between 20 m and 600 m. Lombard North Planning Ltd. (1972) noted that a Class A highway (design speed 110 kph) required 45.7 m of right-of-way, while a National and Historic Parks Road Classification Arterial Rural Road (design speed 95 kph) required 36.6 m. On the other hand,

the proposed highway in Kananaskis they were studying had a planned 60.9 m right-of-way. These result in rights-of-way areas of 4.57 ha/km, 3.66 ha/km and 6.09 ha/km, respectively. Using figures from Webb (1982) above, mean Alberta right-of-way area is 2.36 ha/km, exclusive of interchanges. Two lane divided highways in Alberta, such as Highway 2 or Highway 16 generally have 100 m rights-of-way (Don Snider, Alberta Transportation, personal communication) which can be increased to 330 m if service roads are added (e.g. just south of Red Deer). These result in right-of-way areas of 10 ha/km, and up to 33 ha/km in some areas.

Voorhees and Cassel (1980) reported an average right-of-way width of 35 m for each side of a twinned Interstate Highway in North Dakota, or 7.0 ha/km. David and Warner (1981) estimated secondary "roadsides" in Illinois used approximately 0.9 ha/km (it appears from the article that this does not include the road surface areas itself). Schmitz (1983) provided the following data for the 18,360 km of Wisconsin highways: Interstates (107 m - 10.7 ha/km); 4 lane divided (91.4 m - 9.1 ha/km); 4 lane undivided (61 m - 6 ha/km); 2 lane principal arterial (30 m - 3.0 ha/km); 2 lane minor arterial (24.4 m - 2.4 ha/km); and 2 lane collector (20 m - 2.0 ha/km). Wells (1960) stated that complex interchanges on US expressways may require rights-of-way in excess of 450 m to 610 m for short distances. Way (quoted in Dunball 1979) used 3.2 ha/km as the average area of motorway verges, cutting and embankment slopes in England.

The extent of these right-of-ways may seem small especially in comparison to the broader "surrounding terrain" in which they are contained. However, as Egler and Foote (1975) pointed out, "in terms of highways and railroads, there is no land we see more often. For every mile we travel, we see (or should I say "can see"?) between one and two miles of right-of-way". Furthermore, Jones & Jones (1977) pointed out that the faster an observer travels the narrower his "cone of vision". At 64 km/h one sees a 37° cone, but at 96 km/h this is reduced to 20°. Thus, at the higher speeds of most modern highways, the right-of-way may dominate what occupies the driver's vision.

How many people travel our highways and form opinions about them? A sign just south of Edmonton indicated that 29,200 people pass the sign daily. In the U.S., Koepp (1988) reported that motor travel in 1987 amounted to 3.06 trillion kilometers in 181 million vehicles.

SAFETY

In the early years of highway design and maintenance aesthetics in most jurisdictions was, at best, an afterthought; safety was the key element. A wide right-of-way, covered in low growing (mowed) vegetation was thought to be best to provide long sight lines for greater driver awareness of approaching road changes and vehicles. It also provided an adequate "safety

recovery zone", that is an area large enough and safe enough (flat and free of obstructions) to get a vehicle under control should it go off the road.

However, recent information suggests that this is not only incorrect, but that the very concepts designed to produce safe conditions are producing unsafe ones. TES Research and Consulting, Inc. (1980 - hereafter cited as TES), in their report for Alberta Transportation "Alberta Roads - Environmental Design Guidelines" stated (p. 4-15):

"The required width of the safety recovery zone depends upon a larger number of factors that may not all be accounted for in current design standards.

The design speed of the road is obviously a factor not only in the physical sense of the inertia and probable trajectories of the vehicle, but also because of the psychological effect of speed on the motorist. As speed increases the driver's work load increases, and as the clearing width decreases the work load also increases. These two effects interact in some complex manner affecting the driver's behaviour. It could be hypothesized that the driver automatically balances work load and speed. The result may be that actual road safety is increased by the presence of trees or other objects at a physically unsafe distance from the road. This affect has been documented by German engineers in relation to low speed roads where it was found that road safety was increased by the presence of trees as close as 2 m to the road surface.

There appears to be little research of this phenomenon related to higher speed roads although there are instances of similar behaviour on North American roads. There is much more to safe road design than the removal of all large objects within the possible collision trajectories of errant vehicles. Psychological (perceived) and physical safety combined produce actual safety. No matter how good the road itself is, real dangers can be imposed by a roadside that is either too monotonous or too distracting."

Duell (1987) supported this latter statement: "Variation contributes to motorists' alertness and can signal changing highway conditions", as did Olgeirson (1974): "We know that it is a good idea to conserve as much variety as possible; variety is more comfortable esthetically and there is an ecological security in numbers." However, TES (1980) pointed out that constant, purposeless change (variety) can be visually confusing and just as monotonous as no change at all. TES (1980) further stated (p. 4 - 15):

"The character of the recovery zone vegetation can have a strong bearing on the required widths of clearing and buffer zone. It is often assumed that recovery zones must be turf covered; however, if safe sight distance is not affected, the plant materials could range up to small diameter trees. The shrub or sapling buffer zone also benefits safety in that it provides a deceleration zone in which the vehicle is slowed down rapidly but without danger of fatal impact. The necessary width of this buffer zone depends upon slope, predominant species and operating speed.

A series of crash tests in the early 1950's determined the depth of penetration of an automobile into mass planting of Japanese Rose. Only superficial damage to the vehicles and occupants resulted".

Robinson (1971) indicated that a 21.8 billion kilometer study in New Jersey on state highways recorded 414 fatal accidents, in which only 96 vehicles went "off the road"; of these, only 12 hit trees, while 26 hit utility poles. TES (1980) indicated that clumps of trees could be left within cleared rights-of-way. Storgaard and Associates (1979) in their report to Environment Canada "Environmental Code of Good Practice for Highways and Railways" recommended that "clearing for roads should be limited to the width required for road embankment, drainage requirements, and for safe distance". They also stated "As a general rule, the right-of-way should be kept clear of tall growing bushes and trees to maintain safe stopping and passing site distance. However, trees can be left where they do not conflict with these requirements. Shrubs, herbs and grasses help reduce erosion, add to the beauty of natural vegetation and return the right-of-way in some part to its function as wildlife habitat. The cleared right-of-way need be no wider than the 4 m swath cleared by a vegetative cutter except on curves and approaches to curves."

Thus we see from the above that rights-of-way need not necessarily be the wide, even-width, grass-only types seen on many highways.

A RIGHT-OF-WAY PHILOSOPHY

Increasingly, the philosophy of highway design, revegetation and maintenance is shifting towards a recognition of aesthetics. The following two statements from the literature express this philosophy as it should be applied in Alberta.

"Transportation of people and goods is not an end in itself, but a means to achieving other ends. Traditionally, highways have played a major role in fulfilling a variety of objectives and have contributed extensively to regional development and society's economic well-being. However, the highway engineer is often accused of locating, designing and operating highways with only transportation in mind, in the process disregarding

conservation values and human community integrity. The resulting road is often perceived to damage, or conflict unnecessarily with, natural and historic landmarks, wildlife habitat, potential recreation areas and the aesthetic quality of the landscapes through which it passes.

This set of guidelines identifies methods for the harmonious integration of roadways with the natural landscapes and dynamic ecosystems found in Alberta. Its fundamental objectives are to outline basic principles and approaches that can be used to minimize adverse environmental impacts, promote environmental protection and enhance opportunities for environmental appreciation." (from the foreward in TES 1980).

Lombard North Planning Ltd. (1972) reported that the Terms of Reference for their study of the proposed Kananaskis Forestry Trunk Road corridor called for recommendations on "guidelines for development of a scenic route way including consideration of variable width right-of-way, selective clearing, view of the highway, revegetation, etc." among others.

The federal government in the United States passed the Highway Beautification Act in 1965. Its first objective was "to promote the safety, convenience and enjoyment of travel on, and protection of the public investment in, those State highways which are part of the National System of Interstate and Defense Highways or the Federal-aid system of primary and secondary highways, and to provide for the restoration, preservation, and enhancement of scenic beauty within, adjacent to, or within eyeshot of such highways" (Sutte and Cunningham 1968, p. 57).

However, I found Michigan's approach to be the most advanced:

"Michigan's highway transportation system is viewed as being the front door to the State's scenic, recreational, and cultural resources. The visual quality of the system is important in projecting a positive image of the state, enhancing the overall motoring and recreational experience, and perhaps influencing decisions as to length of stay and whether to return - both important to Michigan's economy. Michigan Department of Transportation management is showing a growing interest in, and willingness to provide, adequate funding for esthetic considerations at both the design/development and the management/maintenance levels" (Sauders 1987).

Blaesing and Oellette (1981) further defined the Michigan approach:

"The final method for protecting the vegetation in road ROWS is the establishment of safe but sane maintenance provisions. We take a very protective approach to vegetation trimming and removal, only removing what is

necessary to provide a high degree of safety at intersections, on curves and hills, around signs and guardrails, and certain potential roadside obstacles. Plus we have state legislation which allows residents to petition for Natural Beauty Road designation on certain roads which has the effect of prohibiting excessive maintenance practices in the ROW. In total, we are very fortunate to have so many procedural methods within the Road Commission to review, control, and monitor activities within road ROWs which could prove detrimental or destructive to roadside vegetation".

The remainder of this paper describes two mechanisms that can be employed to enhance the aesthetic quality of rights-of-way following construction. For more information on what can be done to increase highway right-of-way aesthetics during the planning and construction phases, the reader is referred to Gray and Leiser (1982), Jones & Jones (1977), Leslie and Hornberger (1976), Robinson (1971), Schiechl (1980), TES (1980), and others. The RECLAIM bibliography (Sims and Powter 1982) lists over 170 entries under the keyword "Roads".

MOWING

Highway rights-of-way are mowed for safety, weed control, and aesthetics. They are also mowed to reduce snow drifting, fire hazard and garbage trapping, and to discourage wildlife browsing. On the other hand reduction or elimination of mowing: allows invasion and establishment of native species, including woody plants; allows tall stands of mature grasses and legumes to develop, which are aesthetically pleasing (Stainton, 1987), especially on windy days; improves wildlife habitat; and, most importantly, reduces maintenance costs considerably.

Early maintenance schemes in many jurisdictions involved repeated mowing of the entire right-of-way. However, this has changed with time as Stainton (1987) pointed out in the following "history" of mowing policy in Illinois:

"Roadside management policy along state maintained highways in Illinois during the 1950s and 1960s was to mow the entire right-of-way. The roadside was considered an extension of the motorist's front yard, and was maintained as such. A typical rural roadside during this era was mowed four to five times a year. In urban areas, six to ten mowings per year were common. Acres mowed exceeded 500,000 annually. Mowing costs surpassed \$5 million in 1968.

Reduced funds and manpower in 1969 gave birth to the Illinois Department of Transportation's (IDOT) first limited mowing policy. As part of this program, two-lane primary highways were generally mowed to ditch line in rural areas and to the right-of-way in urban areas and in front of residences. Interstate highways were mowed to the ditch line or followed selective or "architectural" mowing lines established by the district landscape architects.

Mowing frequency was reduced to three mowings per year. Annual acres mowed steadily decreased to 330,000 acres in 1973.

The 1974 nationwide energy crisis - along with additional maintenance budget cuts - created a need for further mowing reductions. As a result, the mowing guidelines along interstates were reduced to an 8-ft swath beyond the shoulder break and on ramps at rural interchanges. Highway medians less than 80 ft wide were mowed. Primary highways were generally mowed to the ditch line.

From 1974 through 1983, statewide mowed acres decreased to less than 200,000 mowed acres annually, but then began rising: 1984, 260,000 acres; 1985, 240,000 acres; and 1986, about 250,000 acres. An increase in undesirable weeds and woody vegetation along roadsides and public requests for more mowing were responsible".

Schmitz (1983) indicated a similar trend in Wisconsin:

"The roadside mowing has been reduced in stages over a period of years starting in 1957-58 when there was concern about the wide right-of-way on the proposed interstate system and how these areas would be maintained.

In the 1960's mowing of steep cut and fill slopes was discontinued, also that of some wider right-of-ways. More emphasis was placed on preserving and permitting the re-establishment of natural vegetation, trees, shrubs and ground covers.

In the 1970's the areas to be mowed were further reduced basically to the area between the roadway or shoulder and the ditchline except for some highways with a narrow right-of-way. The number of mowings was limited to one shoulder cut in early summer and mowing to the ditch line in late summer.

In 1980 the number of mowings was reduced to only one mowing to the ditch line and one shoulder cut on all medians, in midsummer. Some additional mowing was permitted in highly urbanized areas. According to the present policies mowing is limited to the area between the traveled roadway and ditch except for some highways with narrow rights-of-way where the unmowed strip would be less than 3.6 m, and to narrow median areas. The remaining unmowed areas are maintained in grasses and herbaceous plants, with shrubs and trees located at some distance from the roadway depending on the adjacent land uses and vegetative cover."

Doll (1988) provided a similar account of Wisconsin's program, and indicated the reduced mowing "keeps the roads safe while cutting the cost by leaving an unmowed area away from the road."

Hottenstein (1963, quoted in Leslie and Hornberger 1976) provided a summary of the anti-mowing philosophy:

"How can the pampered and perhaps uncontrolled equivalents of golf course greens on many acres of roadside turf be justified? Why some engineers and administrators cling to the idea that slope areas and fence-line areas must be mowed frequently and as closely as the turf areas adjacent to the roadways has always been a mystery. Mowing to achieve a lawn or fairway appearance from fence-line to fence-line through rural and forested countryside belongs in the luxury category, and besides, it cannot be justified aesthetically. Strangely, such practices evoke favorable comments for the reason that they create a neat appearance. Such high-class, city-park type mowing is not within the capacity of the maintenance engineer's budget. Even from an appearance standpoint such practices cannot be justified. Many of the roadside areas within the right-of-way should be managed to achieve a natural effect, thus making them an integral part of the adjoining countryside. The picture of mile after mile of neatly maintained turf areas resembling lawns and fairways is neither distinctive nor indicative of the character of the natural environment of the State or locality the motorist views."

Wells (1960) stated that "where the highway is passing through lands not in cultivation, there may be little excuse for mowing. The application of this principle can be a considerable economy. In hilly country it may eliminate mowing many cut and fill slopes, and on wide rights-of-way it permits an attractive combination of mowed and unmowed areas".

In Alberta, roadsides are mowed one to three times per year; in the latter case, the pattern is one shoulder cut, one cut of the full right-of-way, and one final shoulder cut in late summer (Don Snider, personal communication). A reduction in mowing would not likely be considered except in special circumstances. For instance, orchids have been found along the right-of-way of highway 2A between Olds and Bowden and a recommendation for a revised mowing program has been made.

Figures for mowing costs in Alberta were not available, however the 1986/87 Annual Report for Alberta Transportation (1987) listed a maintenance budget for primary highways of \$70,464,918. This budget includes campground maintenance, snowplowing, guard rail and sign installation, and seeding as well as mowing.

Schmitz (1983) reported a one year cost of \$3 million (US) for mowing and weed control on Wisconsin's 18,360 km of highways. It is important to note, however, that Wisconsin mows less than one third of the right-of-way width.

Another benefit of reduced mowing is an improvement in wildlife habitat. Indeed, Wilkins and Schmidly (1981) stated that "In the near future, roadsides could constitute virtually

the only major habitat available for wildlife in many parts of the United States." Highways may also serve as corridors linking isolated populations (Jackson 1976).

This "benefit" has generated considerable controversy, however, since some feel it may encourage larger animals (especially ungulates) to the roadside, thus creating a potential hazard for both the animals and motorists. For example, the Canadian Parks Service has had to go to considerable lengths and expense to keep elk, mule deer, and other animals off the Trans Canada Highway through Banff National Park (Scott-Brown, 1985).

Kent (1981) noted that 970 wildlife deaths occurred on the Trans Canada Highway in Banff National Park from 1964 to 1978, and that an estimated 2,000,000 birds and mammals are killed annually on roads in Canada. However, he concluded that vegetation management to control or reduce wildlife - vehicle collisions would only be effective on a limited scale and would likely have to be combined with fencing.

A ranger at Miquelon Lake Provincial Park told me that they currently mow most of the park roads because earlier attempts to allow natural invasion resulted in collisions with animals. On the other hand, Machan (1981) and Zimmerman (1981) reported fewer road kills in shrub areas along four-lane highways in Indiana than in grassed areas, even though more animals were present in the shrub areas. David and Warner (1981) reported no more pheasant strikes in specially seeded, delayed mowing sites than in mowed sites in Illinois. Michael et al (1976) pointed out that programs to attract birds, rather than ungulates, will be more acceptable because of the reduced hazard posed by birds.

Several authors have reported improved wildlife habitat with reduced mowing: Oetting and Cassel (1971) and Voorhees and Cassel (1980) - secure nesting cover for waterfowl along North Dakota's I 94; Wilkins and Schmidly (1981) - unmowed rights-of-way along three Texas highways supported greater rodent densities and diversities; and David and Warner (1981) - increased densities of pheasants, and use by a variety of songbirds in areas, specially seeded and subjected to a late mowing treatment when compared to untreated areas.

Mowing recommendations for wildlife habitat improvement arising from these studies include:

- (1) Ditch bottoms, secondary slopes, and back slopes should remain unmowed and inslope mowing for reduced snow hazard should be minimal;
- (2) Interchange triangles should remain unmowed except to the toe of the inslope or less;
- (3) Mowing of inslopes should be delayed until well after the peak of waterfowl nesting - at least until July 20.

- (4) Maximum length of time an area should remain unmowed is 3 years.
 - (5) Set up a rotational mowing system for an area, such that each year 1/3 of the area is mowed. Also, mow only one side of divided highways each year.
 - (6) Mow any given section of road only once per year.
 - (7) Cut invading woody vegetation on a 10 year rotational basis, by cutting one mile stretches each year so that only 10% of the right-of-way is cut each year.
 - (8) Mow only after young rodents, rabbits and ground-nesting birds have left their nests and after plants have produced seeds.
- (1), (2), (3) - Oetting and Cassel (1971)
 - (4), (5) - Voorhees and Cassel (1980)
 - (4), (6), (8) - Wilkins and Schmidly (1981)
 - (7) - Michael et al (1976)
 - (8) - Dusablon (1988)

Given the increasing costs of mowing, the general acceptance by the public of unmowed (but not unkept) rights-of-way (Drake and Kirchner 1987), and the potential for improved wildlife habitat, it is no wonder some agencies have decided that "mowing practices are no longer cost justified" (Ross 1981).

SPECIALTY PLANTINGS

Highway rights-of-way are generally seeded to grass/legume mixes which may, or may not, be adapted to the site. Duell (1987) noted that "too often administrators in departments of transportation want one mix to serve throughout the state". In Alberta, three seed mixes are used (Don Snider, personal communication):

- (1) North: 40% creeping red fescue, 40% alsike clover, and 20% timothy;
- (2) South: 40% creeping red fescue, 20% timothy, 17% alsike clover, 9% brome grass, 9% crested wheatgrass and 5% alfalfa, and;
- (3) Kananaskis: 35% creeping red fescue, 30% Kentucky bluegrass, 20% Canada bluegrass, 10% white clover, and 5% crested wheatgrass.

Planting of alternative vegetation types, particularly native species, wildflowers, and shrubs is an option that is receiving considerable support in the United States. Luken (1988) and Wells (1960) stressed that the management goals for the area must be taken into account before planting so that appropriate species may be selected. Possible management goals include: reduction of traffic noise in urban areas (Harris and

Cohn 1985); erosion control; community recovery; aesthetics; recreation potential; and, improved wildlife habitat. Luken stated that "restored natural communities are more aesthetically pleasing to most people than are monocultures of introduced species".

Various plantings have been used to increase wildlife habitat. Machan (1981) tested plantings of 15 shrub and two pine species in Indiana and found an increase in use and production of songbirds and rabbits (no mowing was performed within the planted areas). Bellis et al (1971 - cited in Michael and Kosten 1981) found that deer in Pennsylvania favored crownvetch areas in winter, grass areas in spring, and clover areas in summer and fall. Ferris (1974 - cited in Michael and Kosten 1981) found that small mammals were more common in sericea lespedeza areas, followed by crown vetch and then fescue. Hawk abundance paralleled the small mammal populations.

Hodgins (1988), in an editorial in *Wildflower*, stated that an increasing number of road departments are capitalizing on the fact that there are many species of native wildflowers that prefer road habitats. They are finding the encouragement of herbaceous wildflowers to be less expensive and less labor intensive than traditional programs of herbicide spraying, multiple mowing, or planting exotic species. He stated that "Road authorities NOT involved in wildflower restoration are quickly becoming as obsolete as DDT". Examples of the increased use of wildflowers and woody plants follows.

Alberta Transportation undertook an experimental wildflower seeding program along Highway 22X (Don Snider, personal communication). Snider said that tree and shrub plantings in the rights-of-way were unlikely to be approved except in special circumstances (e.g. to reduce glare from oncoming vehicles). He noted, however, that plantings on interchanges were more likely to be approved, and indicated that plantings in Ontario have helped reduce drifting of snow at interchanges.

Dusablon (1988) described an extensive program by the Vermont Agency of Transportation to plant wildflowers along Interstate Highway 89. He reported that costs for revegetating 1.6 ha were approximately \$7,000 (US), but that costs were expected to be lower in the future as they improved their implementation methods and started to collect their own seeds.

Stainton (1987) reported on a program by the Illinois Department of Transportation to use the state's native grasses and forbs for roadsides. A total of 3.2 ha was seeded in 1980 and 12.6 ha in 1981. Seeding rates were 23.3 kg/ha prairie grasses, and 2.2 kg/ha forbs with a cover crop of 27.8 kg/ha perennial rye, 55.6 kg/ha seed oats, and 1.1 kg/ha of annual flowers. In another trial, a 37 km (121 ha) stretch of Interstate Highway 55 was overseeded with prairie grasses and forbs. In 1983, a Prairie Seeding Specification was added to the Department's standard specifications for Highway Construction Book. He reported that the Department has been very satisfied with the results of the native vegetation planting projects.

Saunders (1987) reported that Michigan's roadside planting program dates back to 1909 when the state legislature granted authority to township boards to plant trees along public highways in the interest of public welfare. From 1919 until 1965, roadside trees and shrubs were planted along two lane highways by state maintenance forces. In 1965, the Federal Highway Beautification Act shifted the planting program from secondary roads to the Interstate and primary roads. From 1965 to 1986, \$18 million (US) was spent on highway plantings. The Roadside Development Section of the Michigan Department of Transportation is also administering a statewide program to re-establish wildflower plantings along the freeway system.

Crownvetch has received considerable interest in the eastern United States and Ontario, especially on slopes. Ross (1981) stated that more than 24,000 ha of rights-of-way in Pennsylvania are planted with crownvetch. The long-lived cover (in excess of 80% after 10 years) provided by the species is extremely important when projecting future budgets and developing roadside vegetation management programs.

Ontario undertook an extensive crownvetch planting program, coupled with a no-mowing policy on steep slopes where erosion control was desired. Some of the plantings were done on slopes of bridge embankments and the dark green color of the crownvetch provides an aesthetically pleasing contrast to the paler grass/legume mix normally used. Cundiff (1988) reported that the Ontario Ministry of Transportation and Communications "wants to know if it would be worthwhile to plant wildflowers along the province's highways". He also noted that similar projects were successfully undertaken in the 1970's in Texas, Kansas and Ohio.

PUBLIC ACCEPTANCE

Public acceptance of reduced mowing practices and specialty plantings has generally been high, especially for the plantings. Dusablon (1988) indicated that Vermont's wildflower program has been a public relations success and that further work is planned. David and Warner (1981) reported that farmers began requesting to be part of a planting/reduced mowing "Roadsides for Wildlife" program in Illinois once it was demonstrated to increase pheasant populations.

Robinson (1971) noted that in the early 1930's many trees, shrubs and ground covers were planted in the United States and that "there was lively competition between cities to make their entrances attractive". Stainton (1987) in Illinois and Saunders (1987) in Michigan reported a great deal of interest and cooperation from local garden clubs in their wildflower planting programs. So while planting programs may seem to be an expensive option for transportation authorities to improve aesthetics, it may be possible to enlist the aid of local public groups to provide stock and planting labor. The only requirement from the transportation authority would be a careful mowing program that would not interfere with the plantings (or, preferably, an elimination of mowing).

Schmitz (1983), however, provided a cautionary note about generalizing the level of acceptance:

"Roadsides have been called the front yard of the nation and are viewed as such by highway users and those living next to the highway. People were accustomed to seeing mowed roadsides so there was some public criticism to unmowed weedy appearing roadsides. However with the increase in concerns for the environment and native vegetation, and in energy conservation fuel saved by not mowing, public reaction has become more favorable. There continues to be criticism of unmowed areas in semi-urban and urban areas. While some people prefer mowed roadsides, others feel that any mowing at all is too much."

CONCLUSION

Highway rights-of-way need not be an extension of our front yards - to be mowed and fertilized and herbicided in perpetuity. Aside from the obvious cost-savings in reducing or eliminating mowing, the resulting vegetation will be more aesthetically pleasing as it will blend into the surrounding landscape in the case of non-agricultural areas, or provide a striking contrast to the landscape of agricultural lands.

There should be consideration given to setting up demonstration areas along major Alberta highways to test the feasibility of developing more "natural" or aesthetic rights-of-way. These demonstration areas could test:

- (1) limited mowing (once every three years) on full right-of-way;
- (2) changing the current pattern for three mowings to two shoulder cuts, then in the fall a full right-of-way cut;
- (3) no mowing on cut and fill slopes;
- (4) use of native grasses and forbs;
- (5) use of trees and shrubs.

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held September 22-23, 1988
Kananaskis Village, Alberta

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**Held September 22 and 23, 1988
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C.B. Powter, compiler

1989

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