Planting for Screening Headlight Glare And Traffic Guidance

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•THIS IS a supplemental report on "Planting for Screening Headlight Glare and Traffic Guidance" to record and show what progress has been made in the use of various species of plant materials for special problems. This record of information as of 1963, is to supplement information already published by the Highway Research Board (1, 2, 3). The committee is interested in the functional use of plant materials along roadsides for the purpose of making the highways safer to drive, more attractive and pleasant to travel, and less costly to maintain.

SOURCES OF INFORMATION

Twelve state highway departments (Connecticut, Illinois, Kansas, Maine, Maryland, Michigan, New Jersey, New York, North Carolina, Oregon, Pennsylvania and Virginia) have replied to requests for information concerning functional planting for screening headlight glare and traffic guidance. The replies furnished a considerable amount of new information and showed that these states are using plant material effectively in screening out headlight glare, framing traffic ramps by introducing vertical dimension with plant material, screening side distractions along service roads and arranging plantings to form a "hooding" effect at bridge abutments.

FUNCTIONAL PLANTING DESIGN

Maryland

Information from Maryland indicates that planting for screening headlight glare and traffic guidance is incorporated in almost every planting contract being designed. The report states that headlight glare has been reduced in some instances and eliminated in others.

Monotony in design has been relieved by using several varieties of shrubs in dense, straight row plantings. Skyline changes created by different types of plants including minor deciduous and evergreen trees have reduced driver tension.

New Jersey

On Rt. 34, informal groupings of Red Cedar have been used in combination with Rugosa Rose and Japanese Rose to relieve the monotony of the planting as well as to provide year around screening effect against glare. On wide medians some headlight glare plantings have been effective as snow fences during the winter months.

PLANTING COST

Connecticut

The State Highway Department's cost for planting deciduous shrubs is approximately \$1.85 per plant installed. For Red Cedars, used in the median to help relieve the monotony of hedge plantings, the average cost has been \$8.45 per plant (Fig. 1).

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Detroit Freeway-depressed cross-section Hedge arrangement Survived in spite of snow and salt Median-84 ft wide Informal grouping in 84 ft median VARIETIES OF PLANT MATERIAL USED FOR SCREENING HEADLIGHT GLARE AND TRAFFIC GUIDANCE Informal groupings in median Remarks depressed cross-section depressed cross-section Planted in 10 ft median Informal groups Informal groups 6.50, 9, 13-25 Unit Cost (\$) 45/mi 28 13.50 1.55(a) Major Trees-Deciduous (b) Major Trees-Coniferous (c) Minor Trees-Deciduous 28 86 18 t-12 42 (d) Shrub-Deciduous Spacing 10 ft 5 ft 8 ft 5 ft $3^{1/2}_{2-4}$ in. a, c $3^{1/2}_{2-4}$ in. a, c $1^{1/2}_{2-13/4}$ in. a, b 5-6 ft, 6-8 ft and 8-10 ftc 5-6 ft hgt^c 6-8 ft hgt^b 4-5 ft hgtc 6-8 ft hgtc 5-6 ft hgt 5-6 ft hgt 3¹/2-4 in.^a 4-5 ft hgt 1^{1/2-13/4} in.a, b 4-5 ft hgt 3-3¹/₂ ft^c Size 2-3 ftb Japanese Black Pine Japanese Black Pine Ketteri Juniper Austrian Pine Austrian Pine Austrian Pine Common Name Norway Maple Red Maple Gray Dogwood White Pine Scotch Pine Eastern Red Washington Thorn Washington Thorn. Washington Hackberry Pin Oak Pin Oak Crabapple Cedar Shadblow Thorn Pin Oak ŝ Juniperus virginiana Ketterí Juniperus virginiana Celtis occidentalis Quercus palustris Quercus palustris Malus, in variety Malus coronaria Charlotte Crataegus phae-Amelanchier cana-Botanical Name Quercus palustris Cornus racemosa Acer platinoides Pinus sylvestris Crataegus phae-nopyrum Pinus nigra Pinus nigra Pinus nigra Pinus strobus Pinus thunbergi **Pinus** thunbergi Crataegus phae-Compose outano Acer rubrum nopyrum nopyrum densis Mich. I-94 N.J. I-295 N.J. I-295 N.J. I-287 N.J. I-295 N.J. I-295 N J 129 N J H.A. Me. N.J. 129 N.J. US1 Highway State Kansas Mich. Conn. Mich. Conn. Mich. Conn. N.Y. Kan. Neb. Md. 1 22

		200	4			
Me.	Cornus alba	Siberian Dog-	2-3 ftv		1. 50	Makes excellent screen in summer and
	siberica	wood			~~~~	CONTRIDUTES COLOF IN WINTER
Conn.	LIEX glabra	Inkberry			8.00	
Md.	Ilex glabra	Inkberry		(7)		
Conn.	Ligustrum obtusi-	Regel's Privet			1.50	
Mich	I inclum regentanum	Docollo Deinet				
TIDITAT	folium regelianum	JANLA S TARAN				
Conn. and	Myrica pennsylvani-	Northern Bay-	$1^{1/2}-2$ ft and		3.50 and	
N.J.	C.A.	berry	$2-2^{1/2}$ ftc	20. E	4.50 (Conn.)	
Mich.	Rhamnus frangula	Buckthorn				
Md.	Rhamnus frangula	Columnar				
	columnaris	Rhamnus				Habit of growth-narrow
Conn.	Rhus aromatic	Fragrant Sumac	9 2 4+h		1.40 1 50	
- P.V.	Pose multiflore	Japanese Rose	2-0 TC-		75 ner 1 ft	
Conn.	Rosa rugosa	Rugosa Rose	$2-2^{1/2}$ ft and $2^{1/2-3}$ ftb	8	1.55 and	2
N.J.	Rosa rugosa	Rugosa Rose	$1^{1/2-2}$ ftb	5 ft	0.50	Informal mass planting
Mich.	Lonicera fragrantis-	Winter				
	sima	Honeysuckle				
Mich.	Lonicera tatarica	Tatarian Honevsuckle				
Kan.	Lonicera zabeli	Red Zabel	e S			
		Honeysuckle				
Conn. , N. J. Md.	Euonymus alatus compactus	Compact Euony- mus	1 ^{+/,2-} 2 ft ^c		Conn. 3.50	
Conn.	Viburnum dentatum	Arrowwood	$2-2^{1/2}$ ft and			
			$2^{1/2-3}$ ftb		1.48	
Me., Md. Mich.	Viburnum dentatum	Arrowwood			0	Arrowwood has grown well
Mich.	Viburnum lantana	Wayfaring Tree				
.Md.	Viburnum prunifol-	Blackhaw				
	I J. UIII		0.0 0		0000	
1P.1	viburnum prunuot-	Blacknaw	3-4 IC		9.00	
Kan.	Syringa rothonia- genis					
			(e) Shrubs	s-Evergree	sus	-0
Com.	Ilex glabra	Inkberry	2-2 ¹ /2 ft ^C		8.00	9
N.J.	Ilex glabra	Inkberry	15-18 in. ^c			
Me.	Pinus mugho				4.50	Survived in spite of snow and salt
Md.	Pyracantha, in variety					
N.J.	Pyracantha Lowboy	Lowboy	18-24 in. – Potted		7.50	

с_{В&В.}

^bB.R.

^aCaliber.



Figure 1. Connecticut Turnpike near Old Saybrooke. Median planting of mixed shrubs provides effective headlight screen.



Figure 2. I-80 showing planting of Rosa multiflora in 60-ft median in vicinity of Rockaway, N. J.

Illinois

The State Highway Department reports that the average cost of plant material varied from \$1.40 to \$2 per plant depending on the species used. The average cost per mi for median planting was approximately \$9,000.

Kansas and Maine

The State Highway Departments furnished no information as to cost of plant material for screening headlight glare and traffic guidance.

Michigan

On I-94, a depressed freeway in Detroit, the cost of planting 2.1 mi was \$90,000. Larger sized plant materials were used to obtain a more immediate mature planting effect. Large, $3\frac{1}{2}$ - to 4-in. caliber, balled shade trees were planted. Green Ash, Hackberry, Pin Oak and Norway Maple were used. Combined with these were lower growing plants such as Flowering Crabapple, Buckthorn, Crataegus in variety, spreading Cotoneaster, Regel's Privet, Tatarian Honeysuckle and Wayfaring Tree.

New Jersey

Shrubs consisting of Rosa rugosa, Rosa multiflora and Bayberry were planted on the Rt. 34 median in double rows with plants staggered 3 ft on centers (Fig. 2). Average cost for plant material was \$1.85 per unit. Length of project was 7.75 mi. Width of median was 20 ft with a 3-ft gravel shoulder on each side. Red Cedars 4 to 5 ft high were used at a few locations to provide immediate effective height for screening headlight glare. The plants cost \$10 each.

On Rt. 9 near Freehold, Bayberry and Rosa rugosa were used in median plantings. Average cost for plant material was \$0.65 per unit, project was 1.78 mi long, and median varied in width.

New York

On FAI 505 in Syracuse, at the 7th North Street Interchange with N. Y. State Thruway Interchange No. 36, planting was installed for the purpose of reducing noise and headlight glare control. The cost of the planting project was \$19,273. Here, a combination of deciduous and evergreen plant material was used in conjunction with an 8-ft woven wood picket fence. Background planting was $2^{1}/_{2}$ - to 3-ft B&B Norway Maples. Columnar Buckthorn 2 to 3 ft high, bare rooted, was planted behind the wooden fence and 5- to 6-ft high, balled, American Arborvitae was planted in front. Project was planted in spring and fall of 1962.

Virginia

The Department of Highways reports that planting for headlight glare control has been practiced for a number of years. Generally, Rosa multiflora (Japanese Rose) has been used for this purpose (Fig. 3). The average cost has been \$0.75 per lineal ft of planting.



Figure 3. Rosa multiflora planted in 1952 on Virginia Rt. 350, Fairfax Co. Median is 24 ft wide. The Japanese Rose has grown 8 ft high providing a complete screen against headlight glare.

PLANTING PROBLEMS AND MAINTENANCE DIFFICULTIES

Illinois

On I-55, planting results have been poor as judged after two years of careful observation. These results have prompted a more cautious approach with new median plantings. At present, it is believed that proper plant selections are the key to successful median plantings and also that the use of large amounts of salt for snow and ice control has contributed somewhat to poor success with median planting.

Maine

Difficulty has been experienced in planting narrow medians due to the need for snow storage space. Cornus alba siberica planted in 1959 on an Interstate project has produced a rapid, thick, uniform growth. It affords an excellent headlight-glare screen during the summer months. It is less effective in winter, but the esthetic contribution of its red stems to the landscape scene is decidedly worthwhile.

The State has found that Forsythia, Snowberry and Ibolium Privet grow fairly well but tend to damage and break easily. Rodents cause some damage to crabapples and privet during the winter months.

On wide medians, yellow-stem Weeping Willow, with an under-planting of Siberian Dogwood, has produced a very colorful planting combination. Maine has eliminated Willow blight and canker by spraying with fungicide at planting time. A second spray is applied two weeks later. With this practice, the willow disease problems have been almost eliminated.

Maryland

The State Roads Commission reports that for several years it was thought that Rose multiflora was the best plant to use for headlight-glare screen planting. This opinion has changed because Rosa multiflora has to be trimmed at least once a year and sprayed regularly for control of the Japanese Beetle.

The State is using compact and slow-growing plants such as Euonymus alatus compactus, Lonicera fragrantissima, Viburnum dentatum, dilatatum, and prunifolium, Rhamnus frangula columnaris and Crataegus phaenopyrum. Some of the evergreen plants are Pyracantha, Ilex glabra, and Pinus thunbergi, 8 ft on centers, where space will permit.

New York

The Department of Public Works reports that in 1958 a hedge of Crataegus phaenopyrum 6 to 8 ft high was planted in a 10-ft turf median having mountable curbs. About 800 plants were planted on 5-ft centers. In October 1963, 67 plants had been damaged by traffic, 27 were missing entirely, and 40 had regrown to about 3 to 4 ft high. Traffic volume was reported as relatively light.

In 1959, a hedge of Regel's Privet 3 to 4 ft was planted in a 9-ft turf median having mountable curbs. One thousand four hundred fifty plants were planted on 4-ft centers. At the end of the year, 450 plants had been destroyed by traffic. In October 1963, only a few plants remained and they were only 2 to 3 ft high. Traffic volume is heavy on this highway.

North Carolina

The State has found that on highways where the medians are narrow and depressed a single row of shrubs planted for screening headlight glare has a disappointing effect. When plants are located too close to the edge of the pavement, considerable damage results from cars swerving into the median.

Rosa multiflora has given the best results at a low initial cost, as well as requiring less maintenance. This rose may be pruned roughly and it is the only shrub of its type that will self-heal after traffic damage.



23

Figure 4. Functional planting on highway slopes. Ground cover reduces maintenance, and pines and crabapples outline curve and screen objectionable old buildings from main roadway (Portland, Ore.).



Figure 5. Planting of Oregon Holly in median to eliminate headlight glare. Slopes covered with low-growing ground cover of Bearberry which helps to reduce amount of roadside mowing.



Figure 6. Typical planting of an evergreen ground cover, Bearberry, on interchange slopes too steep to mow mechanically. Native shrubs in median support existing trees, reduce headlight glare and prevent unauthorized crossings (I-5 south of Salem).



Figure 7. Median planting to delineate curve on I-5 and eliminate headlight glare. Native shrubs added to trees saved during construction.

Oregon

The State Highway Department has made much use of ground cover on slopes and medians to eliminate the need for mowing. Hybrid Bearberry, English Ivy, Hypericum, Sala, and Hall's Honeysuckle have been used. Oregon Holly, Dwarf Scotch Broom, and Japanese Rose have been used effectively in medians for headlight-glare screening and traffic guidance.

CONCLUSION

1. Reports from the various states indicate that much effective functional planting is being done for screening headlight glare, traffic guidance and noise abatement on highways.

2. Much experience and knowledge has been gained since the progress report of three years ago.

3. Planting in narrow medians creates many maintenance problems. These should be carefully considered by the designer to determine if the intended benefits justify the cost.

4. Screen planting for headlight glare and traffic guidance can never replace or be as effective as the acquisition of sufficient right-of-way for properly designed individual roadways separated by a wide median.

5. The cost of planting and maintaining narrow medians is much more expensive through the years than the acquisition of additional land for a wide median.

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