



Manual of Aesthetic Design Practice



**BRITISH
COLUMBIA**

Ministry of Transportation

References

- AASHO, **A Guide for Highway Environment Design**, Washington, D.C., 1970.
- Alberta Transportation, **Alberta Roads, Environmental Design Guidelines**, prepared by TES Research and Consulting, Edmonton, Alberta, 1980.
- Appleyard, D., Lynch K., and Meyer, J.R., **The View From the Road**, Cambridge, Massachusetts, 1964.
- B.C. Land Commission, **Spallumcheen: The Visual Environment**, prepared by W.C. Yeomans, Burnaby, British Columbia, 1977.
- Coon, F.W., et al., **Practical Highway Aesthetics**, prepared for the American Society of Civil Engineers, Highway Division, New York, New York, 1977.
- Crowe, S., **The Landscape of Roads**, London, England, 1960.
- Dare, C.E. and Carstens, R.L., **Final Report, Cedar Rapids I-380: Freeway Noise, Multiple Land Use, and Aesthetics Study**, prepared for Engineering Research Institute, Iowa State University, Ames Iowa, 1973.
- Dunball, A.P., **Landscape Treatment of Trunk Roads and Motorways**, *Arboricultural Association Journal*, February 1972.
- English Tourist Board, **Signs of the Times 84**, London, England, 1984.
- English Tourist Board, **Tourism Signposting**, London, England, 1982.
- Hornbeck, P.L., **Highway Aesthetics - Functional Criteria for Planning and Design**, Cambridge, Massachusetts, 1968.
- Hough, M., **The Contributions of Landscape Architecture to Highway Design**, *Engineering Journal*, September, 1967.
- Ontario Ministry of Natural Resources, **Design Guidelines for Forest Management**, prepared by Hough, Stansbury and Associates Ltd., Toronto, Ontario.
- Province of British Columbia, **Freedom to Move: Overview of Provincial Transportation System, Vol. 1, 3, 12, 15**, Victoria, British Columbia, 1987.
- Province of British Columbia, Environment and Land Use Committee Secretariat, **Guidelines for Benefit-Cost Analysis**, Victoria, British Columbia, 1977.
- Province of British Columbia, Ministry of Environment, Resource Analysis Branch, **Proceedings: Visual Analysis Workshop, Parksville, British Columbia**, Victoria, British Columbia, 1977.
- Province of British Columbia, Ministry of Environment, **Visual Resource Assessment - A User Guide, Manual 2**, Victoria, British Columbia, 1983.
- Province of British Columbia, Ministry of Forests, **Biogeoclimatic Units of Central and Southern Vancouver Island**, Victoria, British Columbia, 1979.
- Province of British Columbia, Ministry of Forests, **Forest Landscape Handbook**, Victoria, British Columbia, 1981.
- Province of British Columbia, Ministry of Parks, **Preserving our living legacy: Parks Plan 90: Landscapes**, Victoria, British Columbia, 1990.
- Province of British Columbia, Ministry of Highways and Public Works, Design and Surveys Branch, **Highway Design Manual of Standards and Instructions**, Victoria, British Columbia, 1988.
- Province of British Columbia, Ministry of Transportation and Highways, Traffic Branch, **Manual of Standard Traffic Signs**, Victoria, British Columbia, 1988.
- Roads and Transportation Association of Canada, and Transport Canada, **Manual of Geometric Design Standards for Canadian Roads, 1986 Edition**, Ottawa, Ontario, 1986.
- Schiechl, H., **Bioengineering for Land Reclamation and Conservation**, sponsored by the Province of Alberta, Department of Environment, Edmonton, Alberta, 1980.
- Tunnard, C. and Pushkarev, B., **Man-Made America: Chaos or Control**, New Haven, Connecticut, 1963.
- U.S. Department of Agriculture, Forest Service, **National Forest Landscape Management, Vol. 2, Chp. 1, The Visual Management System**, Washington, D.C.
- U.S. Department of Agriculture, Forest Service, **National Forest Landscape Management, Vol. 2, Chp. 4, Roads**, Washington D.C.
- U.S. Department of Agriculture, Forest Service, **National Forest Landscape Management, Vol. 2, Chp. 5, Timber**, Washington, D.C.
- U.S. Department of Commerce, **A Proposed Program for Scenic Roads and Parkways**, Washington, D.C., 1966.
- U.S. Department of the Interior, National Park Service, **Plants, People, and Environmental Quality: A Study of Plants and Their Environmental Functions**, Prepared in collaboration with the American Society of Landscape Architects, Washington D.C., 1972.

- U.S. Department of Transportation, Federal Highway Administration, Bureau of Land Management, and Colorado Highways, **Colorado I-70 Scenic Lands: Preserving/Enhancing the Visibility from Interstate 70 of National Resource Lands in Colorado**, Washington D.C., 1975.
- U.S. Department of Transportation, Federal Highway Administration, **I-70: In A Mountain Environment, Vail Pass, Colorado**, prepared by Colorado Department of Highways, 1978.
- U.S. Department of Transportation, Federal Highway Administration, **Safety Rest Area: Operations and Maintenance**, prepared by Arizona Department of Transportation, Washington D.C., 1980.
- U.S. Department of Transportation, Federal Highway Administration, **Safety Rest Area: Planning, Location, and Design**, prepared by Minnesota Department of Transportation, Washington D.C., 1981.
- U.S. Department of Transportation, Federal Highway Administration, **Visual Values for the Highway User: An Engineer's Workbook**, prepared by Hornbeck, P. and Okerlund Jr., G., Washington, D.C., 1973.
- Yeomans, W.C., **Landscape Architecture and the Visual Resource**, sponsored by Environment and Land Use Committee Secretariat, Victoria, British Columbia, 1975.

List of Figures

Figure A-1	1	Figure C-5	13
Most highways in British Columbia are built through areas of spectacular scenery. Highways which do not respond to this aesthetic context are a lost opportunity.		Landscape typical of northern B.C.	
Figure A-2	1	Figure C-6	13
Highways should strive to contribute positively to this aesthetic quality of this province.		Landscape 'edges' can be dramatic. Note the two distinct landscape units in this photograph.	
Figure A-3	2	Figure C-7	14
This pragmatic solution to controlling stormwater runoff is aesthetically unacceptable.		Landscapes of British Columbia. B.C. Ministry of Parks (June 1990)	
Figure A-4	2	Figure C-8	15
This culvert outflow has been constructed to create an effective and well concealed transition between the pipe and stream.		Sample mapping of landscape units.	
Figure A-5	2	Figure C-9	15
In this example earthworks have been designed to minimize headlight glare and simulate adjacent topography.		Typical mapping of visible land use and cultural modifications.	
Figure A-6	2	Figure C-10	15
All areas within the highway right of way must be designed and maintained to create an attractive and orderly image. This area between a highway and frontage road looks unfinished and invites abuse through littering and off-road traffic.		Aerial view of rural location showing various land use impacts and cultural modifications.	
Figure A-7	2	Figure C-11	16
The treatment of roadsides, and medians should be simple and responsive to the character of the adjacent topography.		Sample mapping of water cover.	
Figure A-8	2	Figure C-12	16
In this example existing vegetation has been retained within the median reducing revegetation costs and maintaining visual continuity with the adjacent countryside.		Typical mapping of vegetation cover.	
Figure A-9	3	Figure C-13	16
This manual is written to respond to the broad range of conditions evident throughout B.C.		Mapping of slope class and landforms.	
Figure B-1	9	Figure C-14	17
Example of a rural Baseline Highway.		Typical 'attractor' landmark.	
Figure B-2	9	Figure C-15	17
Example of a Tourway in a rural setting		Typical 'detractor' landmark.	
Figure B-3	9	Figure C-16	18
Example of rural Parkway		Typical landmark map.	
Figure C-1	12	Figure C-17	19
An attractive view from the road.		A highway directly in front of this viewpoint would create a major visual impact.	
Figure C-2	12	Figure C-18	19
View toward the road.		Note how the cut slope on the distant slope is distracting.	
Figure C-3	12	Figure C-19	20
The mountains in B.C. present both a spectacular visual opportunity, and a construction challenge.		Typical attractive view from the road.	
Figure C-4	13	Figure C-20	20
Landscape typical of the Cariboo interior.		Designated viewpoints or pullouts can provide for pleasant and safe appreciation of a view offered by the road.	
		Figure C-21	23
		In this scene, the valley has a moderate VAC, but VAC is low in the surrounding foothills.	
		Figure C-22	23
		This subalpine lake and surroundings are low in VAC, primarily because of steep slopes and low vegetation regeneration.	
		Figure C-23	23
		The steeper the slope, the lower the VAC. Relative importance of VAC factors, (adapted from Blau, et al., 1979)	

Figure C-24	26
Experience 1: curvilinear alignment, varying vegetation setbacks, rounded slopes	
Figure C-25	26
Experience 2: split median, split grade, median vegetation.	
Figure C-26	26
Experience 3: one way curvilinear alignment.	
Figure C-27	26
Experience 4: tangent, focus on landmark.	
Figure C-28	26
Experience 5: viewpoint/information area.	
Figure C-29	26
Experience 6: curvilinear alignment, more open countryside.	
Figure D-1	32
Align vertical and horizontal curves with co-incident midpoints.	
Figure D-2	32
Where vertical and horizontal curves do not coincide the vertical curves should lead.	
Figure D-3	32
Arc and spiral highway design.	
Figure D-4	32
Consider separate alignments for divided highways	
Figure D-5	33
Align tangents with land use and vegetation grid.	
Figure D-6	33
Tangents should focus on natural or man-made landmarks.	
Figure D-7	33
Ideal angle and distance from landmark.	
Figure D-8	33
Skirt the edge of clearings and sensitive areas.	
Figure D-9	34
Align roadway at the margin between scree slopes and vertical rock face.	
Figure D-10	34
Terraced cut slopes allow for subsequent revegetation.	
Figure D-11	34
Respond to vegetation patterns while traversing hillsides.	
Figure D-12	34
Align road through natural gullies or created breaks to follow natural terracing or linear rock strata.	
Figure D-13	35
The view to adjacent water bodies can substantially enhance the driving experience.	
Figure D-14	35
Views from the roadway can be accommodated without impacting the shoreline.	
Figure D-15	35
Where roadway alignments do impact on waterbodies aesthetics of shoreline treatment should be given a high priority.	

Figure D-16	36
Do not encroach on water bodies closer than 7.5 metres. This roadway would be better with a vegetated buffer between it and the river.	
Figure D-17	36
In this example care has been taken to preserve the vegetated edge adjacent to the lake.	
Figure D-18	36
Roadway alignment should not require clearing which overwhelms the natural dimensions of waterbodies.	
Figure D-19	36
Bridges should become an extension of the curvilinear alignment of adjacent roadways.	
Figure D-20	37
Align road through natural gullies or created breaks.	
Figure D-21	37
Angle the vertical approach into the valley at a minimum of 3 degrees, to show a perceivable response to the valley.	
Figure D-22	37
Angle the horizontal approach into the valley at a minimum of 3 degrees, to expose views away from the road to the valley length and walls.	
Figure D-23	37
Bridges should be designed as part of the horizontal and vertical alignment of the adjacent road. This straight bridge interrupts an otherwise graceful curvilinear alignment.	
Figure D-24	38
Focus on landmarks such as mountains, predominant hills, landmark trees, forests, shelterbelts, and/or landmark buildings.	
Figure D-25	38
Cross the edges of landscape units as this highway does passing from a forested area in the foreground, to an open grassland, and back into the forest in the distance.	
Figure D-26	38
Alternate between a sense of enclosure and long distance views (eg. forest vs. agricultural clearings, or tree groupings within a predominantly open landscape.	
Figure D-27	38
A varied median width can be used to enhance the driver's interest and attentiveness.	
Figure D-28	39
Alignment should change in response to significant visual features	
Figure D-29	39
Limit the view of the road ahead within the area of effective vision to no more than three changes in alignment.	
Figure D-30	39
Avoid short vertical curves which may obscure the view to oncoming traffic.	
Figure D-31	39
In this photograph signs have been erected to warn motorists of restricted visibility as a result of a short vertical curvature.	

Figure D-32	40
Avoid a sequence of grade changes which may appear as a roller coaster.	
Figure D-33	40
Vertical (sag) curve should approximate horizontal curve length.	
Figure D-34	40
Vertical curve length should approximate length of effective vision.	
Figure D-35	40
Provide a visual screen between frontage roads and highways.	
Figure D-36	40
Align roads to avoid clearings at the ends of tangents.	
Figure D-37	41
Indicates minimum stopping sight distances at various design speeds. (Taken from RTAC)	
Figure D-38	41
The grassed safety recovery area at the edge of this roadway is provided to allow vehicles to make emergency stops. Typically these areas will not have slopes exceeding 5:1.	
Figure D-39	41
Shrubs used for median planting can provide an additional measure of crash protection.	
Figure D-40	42
For divided highways avoid convergent alignments where headlights will shine into the path of oncoming traffic.	
Figure D-41	42
In this photograph, vegetation within the median minimizes the impact of headlights from oncoming traffic.	
Figure D-42	42
A raised berm between opposing directions of traffic will also limit the impact of headlight glare.	
Figure D-43	43
The 'Area of Effective Vision' is expressed diagrammatically indicating a diminishing visual impact with increasing distance and greater angles away from the direction of travel.	
Figure D-44	43
The area of effective vision will become longer and more directional with increased design speeds.	
Figure D-45	43
When viewed from distances up to 5 km., where utility corridors cut through forest, screen the groundplane of the cleared right of way with vegetation and earthworks.	
Figure D-46	43
Make revegetation of the utility corridor where it intersects the road a priority.	
Figure D-47	44
Viewed from a distance of up to 5 km., where corridors cut through forests, screen the groundplane of the cleared right of way.	
Figure D-48	44
In treed areas, viewed from distances up to 1.5 km., screen the powerline support structure.	

Figure D-49	44
Do not align the road to focus on a powerline corridor at the end of a tangent.	
Figure D-50	44
Intersect the powerline with the road at the perpendicular or at an angle no less than 30 degrees.	
Figure D-51	44
In hilly or mountainous terrain, route the highway so that, from a distance of 0-1.5 km., the powerline, where it intersects the road, will not appear above the horizon line (eg. descending into a local low point with middleground backdrop).	
Figure D-52	45
Where cut has occurred within 3 years and when viewed from a distance of 5-8 km, avoid alignments which focus the road on dominant lines of the cut.	
Figure D-53	45
When viewed from within 1.5 km., screen the area of the cut in its entirety.	
Figure D-54	45
Additional space is required to construct an adequate visual screen which could have concealed this timber cut.	
Figure D-55	45
Set aside a 20 m wide visual screen within the right of way, exclusive of future road widening and clearing requirements, OR require a 20 m wide perpetually forested screen within the adjacent allocated timber license area.	
Figure D-56	46
Align tangents away from those commercial uses which are unsightly. For business operations immediately adjacent to the road, provide room for a minimum 20 m wide vegetative buffer. Buffer may take the form of an earthwork berm if appropriate to local terrain.	
Figure D-57	46
Buffers of native vegetation should be minimum 20m width in rural areas.	
Figure D-58	46
Alignment does not allow sufficient room to screen these commercial billboards on private property. More signs are being erected in cleared areas to the right of the photograph. There is not sufficient right-of-way to establish a buffer zone.	
Figure D-59	47
Some planting has been undertaken to screen this hydro installation. A more continuous planted buffer would have been more successful.	
Figure D-60	47
Where highways are aligned on upper slopes recognize the opportunity to create spectacular viewpoints.	
Figure D-61	47
Skirt open spaces which provide views (eg. agricultural or forest clearings or open spaces associated with water such as rivers, streams, oceans, lakes, reservoirs, marshes, bogs).	
Figure D-62	47
Expose views for a minimum of 0.5 seconds for fleeting views, 5.0 seconds for panoramic views.	

Figure D-63	48
Retain natural elements which provide a break from the view for a minimum of 0.5 seconds, at irregular intervals (5 minutes apart). maximum).	
Figure D-64	48
Align road along forest edges. Forested conditions require alignment to respond to changes in vegetation type and density.	
Figure D-65	48
Align roads parallel to hedgerows and make tangents focus on significant landmark trees.	
Figure D-66	48
This maple retained within the median contributes to the overall quality of the highway and to the driver's experience.	
Figure D-67	49
Expose road surface to direct sunlight from east and south directions by alignments skirting clearings, providing for feathering of vegetation on south and east, and decreasing amount of cut zones.	
Figure D-68	49
Where aesthetics warrant vegetation close to the pavement, review early morning sun angles to minimize icing. Adjust alignment and/or vegetation to reduce problems as identified.	
Figure D-69	50
In this photograph an ecologically well resolved culvert outflow needs additional care to create an aesthetically satisfactory solution.	
Figure D-70	50
Roadway alignment should recognize and skirt sensitive habitat areas.	
Figure D-71	51
Alignment should follow property boundaries where possible. Small, isolated parcels should be purchased for right of way.	
Figure D-72	51
Borrow pits can be integrated into earthwork design within the right of way.	
Figure E-1	54
Where clearing access routes cannot be contained within the right of way, separate the route from the highway by a 20 m buffer.	
Figure E-2	55
During felling operations be careful not to disturb fragile areas.	
Figure E-3	56
Initially, clear only the lines required for control line and cross section survey.	
Figure E-4	56
Refine alignment to avoid special topography or features revealed during control line survey, prior to mass site clearing.	
Figure E-5	56
Inspect the outer 10% of the proposed clearing to find landscape features which might be saved by minor readjustment to proposed grading.	

Figure E-6	57
Prior to clearing the outer 10%, assess visual screen and noise abatement requirements.*	
Figure E-7	57
Assess dead, dying and wind susceptible plantings, removing only those which pose a threat to the area within paving edge, future above ground utility lines, sight lines and sight triangles.**	
Figure E-8	57
Finished clearing should respect objectives for visual, and environmental factors, in addition to engineering requirements.	
Figure E-9	58
Vegetation closer to the highway can help slow down traffic where the design speed is reduced.	
Figure E-10	58
Retain vegetation whose mature height will not exceed 600mm above the finished elevation of the highway.	
Figure E-11	58
Selective clearing should be guided by highway safety requirements and aesthetic considerations.	
Figure E-12	59
Clear lower limbs of overhanging trees to 5m clear height.	
Figure E-13	59
Native vegetation retained within the median can help reduce the impact on oncoming headlights.	
Figure E-14	60
Note how utility lines are concealed by Arbutus trees retained at the roadway edge.	
Figure E-15	60
Retain vegetation along the shores of waterbodies.	
Figure E-16	61
Vary the edge of the clearing line to create an undulating forest edge. Avoid a forest edge which has a regular undulating pattern. Keep undulations random, and similar to adjacent natural conditions.	
Figure E-17	61
Retain undisturbed root zone as required to protect trees to remain from potential wind throw hazard.	
Figure E-18	61
Tree clumps provide variety within forest clearings.	
Figure E-19	61
Clearing should emulate the natural forest edge transition from grasses to shrubs to pioneer trees to mature forest.	
Figure E-20	62
Clear sufficient length and at an angle to expose the view at the design speed.	
Figure E-21	62
Limbing trees can offer filtered views.	
Figure E-22	62
In long clearings, consider retaining specimens or clumps to break up the view.	
Figure E-23	63
Minimize views to timber cuts uphill from the road.	

Figure E-24	63
Techniques for screening downhill timber cuts can be quite different than for uphill cuts.	
Figure E-25	63
Careful selective clearing and leave areas can screen fill banks and retaining walls.	
Figure E-26	65
In most roadways within roadside facilities, native vegetation should be allowed to meet the pavement edge.	
Figure E-27	65
Native vegetation higher than 300 mm should be removed within a 5m radius of entrances to buildings or other structures.	
Figure E-28	65
Where picnic tables are located in the woods, allow a minimum of 1 m between table pads and trees. In this example one of these tables should have been located further away from the existing trees.	
Figure F-1	68
Remove landforms as required for safe sight distance.	
Figure F-2	68
Borrow areas within the right of way can be shaped to resemble naturally occurring topography.	
Figure F-3	68
This substantial fill disposal site is largely concealed from the highway because of the vegetation left at the roadway edge.	
Figure F-4	69
Borrow pits and access routes to pits can be screened by vegetation. Locate borrow pit and access road to leave effective vegetation buffer.	
Figure F-5	69
This permanent quarry site would have been better located further from the roadway edge and concealed from view by a vegetated buffer.	
Figure F-6	69
This retention pond located within the right of way could have been designed to create a more naturalistic shape.	
Figure F-7	70
Stockpile topsoil within the limits of cleared areas in well drained areas.	
Figure F-8	70
Topsoil samples should be collected from the site and tested to determine nutrient content, texture, and structure.	
Figure F-9	70
Topsoil should be retained for areas of high visibility, which are most likely to be revegetated with trees or shrubs, such as interchanges.	
Figure F-10	71
At natural drainage channels, blend the slope to create 'lay-backs'.	
Figure F-11	71
Typical feathering of the ends of a slope.	
Figure F-12	71
Typical rounding at top and bottom of slope.	

Figure F-13	72
Avoid the appearance of unnatural steepness on short slope lengths.	
Figure F-14	72
These naturally occurring laybacks can be reproduced during earthworks design and construction.	
Figure F-15	72
Grade around rock or rock outcrops so as to maintain a natural appearance.	
Figure F-16	73
Typical 'bell-mouth' swale and related feathering.	
Figure F-17	73
Design earthworks to avoid damage to trees and vegetation to be retained.	
Figure F-18	73
Avoid fill over the roots of trees to be retained as has been done in this photo.	
Figure F-19	74
Example of blasted rock face which simulates a natural rock outcrop.	
Figure F-20	74
Example of a smooth wall blasted rock face incorporating benches for stability.	
Figure F-21	75
Avoid excessive depth of ditches.	
Figure F-22	75
Make ditch side slopes as flat as practical, and relate to adjacent terrain.	
Figure F-23	75
Ditch alignments need not be parallel with the edge of pavement. Ditches should respond to adjacent terrain.	
Figure F-24	75
Consider perforated drains rather than ditches to drain granular sub-base, where longitudinal slope is adequate.	
Figure F-25	76
Blend created ponds or created retention basins to simulate naturally occurring depressions.	
Figure F-26	76
Minimize the visual impact of ditches and steepness of slopes in medians.	
Figure F-27	76
Typical culvert end with concrete flare. See Figure A-4 for alternate example.	
Figure F-28	77
Construct berms with a varying height, length and alignment to avoid visual monotony.	
Figure F-29	78
Blend the ends of the avalanche barrier into adjacent terrain.	
Figure F-30	78
Feather the toe and warp side slopes on the lee side of the barrier.	
Figure F-31	79
Elevation of typical retaining structure.	

Figure F-32	79
Section through typical retaining structure.	
Figure F-33	80
Create a terrace at bridge spring point.	
Figure F-34	80
Emphasize design speed changes with earthworks.	
Figure F-35	81
Align ditches at roadside facilities to be the least visible, usually at the site perimeter.	
Figure F-36	81
Earthwork techniques can emphasize roadway speed limits and reduce pedestrian/vehicle conflicts.	
Figure G-1	84
Once rough grades have been established topsoil will be spread to depths required to ensure adequate plant growth.	
Figure G-2	85
Vegetation within the area of sight triangles should be kept less than 300 mm height above the level of pavement. Refer to the Ministry of Transportation and Highways Landscape Policy.	
Figure G-3	86
Where attractive views exist, limit the height of foreground vegetation.	
Figure G-4	86
Note that revegetation undertaken within the darkly shaded areas of this 'Area of Effective Vision' diagram will be more effective in screening and framing views.	
Figure G-5	87
Revegetate to screen at convergence of alignments and between highway and frontage roads which parallel within 20m.	
Figure G-6	87
Revegetate the open ends of tangents.	
Figure G-7	88
Screen the view to utility corridors when viewed from a distance of within 5km.	
Figure G-8	88
Alignments which expose timber cuts within 5km of the roadway will negatively impact the aesthetic quality of the driving experience.	
Figure G-9	89
Typical screen between roadway and unsightly adjacent land use.	
Figure G-10	89
For unsightly land uses, provide a 20m minimum planted buffer.	
Figure G-11	89
For normal commercial business screen parking areas and yard operations.	
Figure G-12	89
Where screening of businesses cannot be accomplished, consider providing of alternate visual focus.	

Figure G-13	90
Typical planting at the base of bridge and overpass support structures.	
Figure G-14	90
Provide shrub planting between median traffic barriers.	
Figure G-15	90
Provide for revegetation at the base and/or top of retaining structures.	
Figure G-16	90
Provide planting within traffic islands and interchange loops.	
Figure G-17	91
Revegetation developed in conjunction with adjacent landholders should provide a buffer between the highway and adjacent commercial or residential interests.	
Figure G-18	92
Revegetation should consider and respond to the character of existing vegetation.	
Figure G-19	92
The crown vetch used as groundcover in this photograph blends with the surrounding context.	
Figure G-20	92
Undulate the forest edge.	
Figure G-21	93
Fragment the forest edge.	
Figure G-22	93
Feather the forest edge.	
Figure G-23	93
Revegetation should create a transition from grasses through to mature trees.	
Figure G-24	94
A dense groundcover can reduce erosion and assist in the stabilization of cut and fill slopes.	
Figure G-25	94
For large areas seed mixtures can be applied by hydroseeders.	
Figure G-26	95
In this situation grasses have not established. Deep rooting perennials are needed for this application.	
Figure G-27	95
Additional slope stability is provided by using aggressively rooting plants and layering in plant material.	
Figure G-28	96
In areas where snow drifting caused by high winds is an issue trees should be set back from the edge of pavement.	
Figure G-29	97
Vegetation can supplement other forms of noise abatement.	
Figure G-30	97
Where roadways pass close by residential areas revegetation should provide a screen against headlight glare.	
Figure G-31	98
Note setback distances from trees in this rural situation.	

Figure G-32	98
Note setback distances from trees in this urban situation.	
Figure H-1	101
Note good fit of retaining structure into its setting, and skilful use of drystone wall, seeded wildflower and trees.	
Figure H-2	101
Select materials which may be indicative of the region in which the structure is placed.	
Figure H-3	102
Consider retaining walls where fills exceed 80% of the height of adjacent vegetation.	
Figure H-4	102
The wall in the background allows the vegetation downslope to be retained. The foreground shows the impact without the wall.	
Figure H-5	102
Bridging streams whenever possible is preferable to installing culverts. Bridges maintain the continuity of the watercourse and help to minimize the impact of highway construction on natural systems.	
Figure H-6	103
The impact of this bridge was reduced by splitting the structure and allowing more light below.	
Figure H-7	104
Curvilinear forms are softer and more in context with rural landscapes.	
Figure H-8	104
Suspension bridges can have a dramatic and positive landscape impact.	
Figure H-9	105
This large bridge structure is designed with a muted colour so that it blends with the hillside in the background.	
Figure H-10	105
This retaining wall has not taken into consideration the characteristics of the surrounding landscape and the strong white colour has a dramatically negative impact.	
Figure H-11	106
A well designed culvert headwall - appropriate to a highly visible parkway site.	
Figure H-12	106
This retaining structure is well textured with linear planting strips and vegetation. This scale of detail is appropriate when viewed at highway speeds.	
Figure H-13	106
Stone veneer in process. This would be appropriate on a Parkway project, or area of close public inspection.	
Figure H-14	106
This lock-block with stone finish would be appropriate for a tourway project.	
Figure H-15	107
A good example of repetition of form and texture.	
Figure H-16	107
This bridge structure will have the dominant vertical form of the piers repeated.	

Figure H-17	108
The balustrade of this bridge has repeating accents. These aesthetic features can be adapted to the safety requirements of modern bridges.	
Figure H-18	109
Parallel structures should be designed as matching sets, even if constructed in different phases.	
Figure H-19	109
Bridge handrails are the most visible part of the bridge structure and should receive special design attention.	
Figure H-20	110
Example of a rural bridge slope finished to allow ease of maintenance.	
Figure H-21	110
Example of a more urban bridge abutment.	
Figure H-22	110
Provide pullouts or other recreation amenities associated with beautiful structures.	
Figure H-23	112
When possible, locate retaining walls downslope from the highway, to reduce visual impacts from the highway.	
Figure H-24	112
Viewed from the road this retaining structure is completely hidden.	
Figure H-25	112
An example of a retaining structure using locally available materials.	
Figure H-26	114
The provision of a wide and varied median could have avoided the requirement for a continuous traffic barrier.	
Figure H-27	114
Avoid the use of paint on concrete traffic barriers	
Figure H-28	114
Locate traffic barriers to minimize their visual predominance.	
Figure H-29	115
Consider installation of "see-through" forms of traffic barrier where views below the highway are frequent.	
Figure H-30	116
Bicycle routes can be developed as an integral part of the highway.	
Figure H-31	116
Bicycle routes can be constructed as separate alignments where the conditions and level of use warrant.	
Figure H-32	116
The dimensions of a cyclist.	
Figure H-33	117
With the Shared Roadway alignment motorists and bicyclists share the same lanes.	
Figure H-34	117
A smooth paved shoulder along rural highways can be signed as a bicycle route.	
Figure H-35	117
Bike lanes have preferential use for cyclists.	

Figure H-36	117
Bike paths with separate alignment are preferable in Tourway and Parkway situations.	
Figure H-37	118
Minimize the use of paint on curbs, or develop higher maintenance standards to minimize peeling, cracking condition.	
Figure H-38	118
Decorative paving should be installed in traffic islands and medians where space is insufficient to allow planting.	
Figure H-39	120
Wood post and agricultural style woven wire are appropriate for wildlife fencing. Note that fencing is routed through the trees in some cases.	
Figure H-40	121
Consolidate several signs onto a single support structure. Signs and sign lighting enclosures should be of equal length to create a clean silhouette.	
Figure H-41	121
Avoid locating signs where they obstruct views.	
Figure I-1	126
Typical Class A Safety Rest Area Schematic Plan. Note: Each Rest Area plan must respond to the local site.	
Figure I-2	126
Class A Safety Rest Area.	
Figure I-3	127
Typical Class B Safety Rest Area Schematic Plan. Note: Each Rest Area plan must respond to the local site.	
Figure I-4	127
Class B Safety Rest Area.	
Figure I-5	128
Typical Class C Safety Rest Area Schematic Plan. Note: Each Rest Area plan must respond to the local site.	
Figure I-6	128
Class C Safety Rest Area	
Figure I-7	129
Typical Pullout Schematic Plan. Note: Each pullout plan must respond to the local site.	
Figure I-8	129
Typical Pullout.	
Figure I-9	137
Include provision for handicapped access and enjoyment in rest areas. Note the extended table top and slab at this table.	
Figure I-10	137
Good relationship between parking and picnic area - convenient, but with some separation.	
Figure I-11	137
A custom designed building for a rest area.	
Figure I-12	138
Create curbed islands and curvilinear entrance roads.	
Figure I-13	138
Avoid excessively large parking areas for car parking.	

Figure I-14	139
Provide interpretive display and photo opportunity.	
Figure I-15	139
Marsh outlook. Note deck to control access to marsh.	
Figure I-16	139
A scenic overlook without adequate protection for pedestrians.	
Figure I-17	139
A scenic overlook with reasonable pedestrian protection. Note innovative combination of post barriers and signage	
Figure I-18	139
Interpretive signage grouped at the end of a short secondary path.	
Figure I-19	140
Primary path to building and site features.	
Figure I-20	140
Secondary path located away from major circulation area.	
Figure I-21	140
Tertiary path. Note closeness to nature in this path.	
Figure I-22	140
Tertiary path. Emphasis in tertiary path design should be on exposing the natural attributes of the site.	
Figure J-1	147
In this example utility poles have been located away from the highway to preserve a particularly important view adjacent to a tourist facility.	
Figure J-2	147
In this example utility poles have been located on the outside of a curve within the area of effective vision.	
Figure J-3	147
This situation is much better where utility poles are not within the area of effective vision.	
Figure J-4	148
Locate poles and standards on curve and/or tangent to side of road away from significant views.	
Figure J-5	148
Locate poles and standards to the inside curve, where views are equal.	
Figure J-6	148
When views along tangents are equal, locate standards and poles to the side opposite the approaching curve's predominant view.	
Figure J-7	149
Consider attaching utility lines to cliff faces.	
Figure J-8	149
Locate lines behind a vegetative screen where lines must follow topography.	
Figure J-9	150
Lighting for signage should match the length, scale and colour of the sign.	
Figure J-10	151
Illuminating this water cascade and bridge structure will create an interesting night driving experience.	