

PART C

Chapter 1 Landscape Planning Concept and Design Themes

June 2013

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Chapter 1 Amendments – June 2013

Revision Register

Issue / Revision No	Reference Section	Description of Revision	Authorised by	Date
1	-	Initial Release of 2nd Edition of Manual	Steering Committee	Jun 2013

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Part C - Chapter 1

Landscape Planning Concepts and Design Themes

1.1 Introduction

The first part of this chapter discusses broad landscape planning concepts that must be applied in the development of landscape and urban design master plans. Urban forest and Greenway concepts create linkages between the transport corridor and the broader landscape.

The second part of this chapter discusses design themes that should be applied to segments of the road corridor at the master planning phase and into the detailed design phase. Landscape character themes establish the vegetative structure in terms of open and closed forest in the planning phase while specific themes establish the species selection and planting design approach to be developed in the detailed design phase. Landscape sequencing is a tool that assists in making the road legible to users through landscape treatments.

1.2 Urban Forest

The urban forest is more than just trees in urban area. The urban forest is the sum of all vegetation located within areas where people live and work (both on public and private land), which has ecological, economic, social and aesthetic benefits to the community. The urban forest is recognised for its importance in maintaining health, well-being and liveability of communities, its contribution to the environment and economic security. Maintaining existing and creating urban forests within transport infrastructure corridors can contribute to reducing heat island effects of walls and pavement.

The urban forest is recognised internationally as a valued intergenerational resource. It may effectively integrate the corridor and minimise the effects of environmental and community disturbances caused by transport infrastructure projects (Figure C1-1).



Figure C1-1: The urban forest should integrate with surrounding green space

The urban forest provides many values and performs a number of functions within the road landscape.

1.2.1 Value

Landscape master plans should explore and incorporate these Urban Forest values:

- Safety and traffic management: through its contribution to producing more positive and safer driver behaviour and increased user perception “*Green roads compared to roads with no greening can assist in mitigating daily stress levels of drivers and their attitude to other drivers*” (Roads and Traffic Authority of NSW ii), 2009:p14).;
- Community: providing recreational opportunities, contributing to better health, wellbeing and a higher quality of life (liveability) (Figure C1-2).
- Economic: improving tourism potential and business growth through local identity and character (Figure C1-3).
- Social: initiating ownership, awareness and education.
- Psychological: providing mental relief to the stresses of urbanisation.

1.2.2 Function

Landscape master plans should explore and incorporate aesthetic and environmental functions.

- Aesthetics: improving the image of the corridor by enhancing visual amenity, user experience and sense of place. This can be achieved by providing landmark features, highlighting views and vistas, and framing entrances to towns that enhance travel to destinations.
- Environment: mitigating the effects urbanisation through improving air, water, regulating the micro climate, and conserving biodiversity. Providing habitat through food and shelter for native fauna, including coverage for escape from potential predators.



Figure C1-2: Retained and enhanced Urban Forest adjacent to and within arterial road corridors



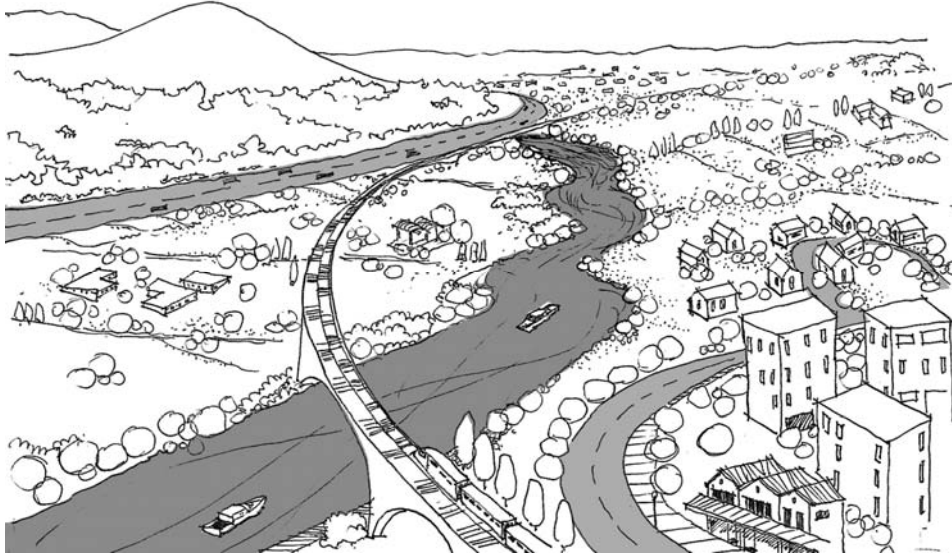
Figure C1-3: Urban Forests can create positive user experiences providing shade and public amenity

1.3 Greenways

Greenways are designed to provide connectivity (Figure C1-4). This is the ease at which movement occurs amongst habitats, communities and populations through the broader landscape. Greenways provide structured interconnected networks or corridors of green space. They are often more linear in form than Urban Forests, yet this is not a defined requirement.

Landscape master plans should provide links to Greenways and continuity of habitat networks by linking existing nodal points along or within Greenways (Figure C1-5). State and local government planning schemes identify landscape corridors which may form the basis of greenways integration with the road landscape. Greenways are crucial to uniting fragmented landscapes into one connected piece.

Vegetated corridors which cross roads need to be designed in accordance with the Department's *Fauna Sensitive Road Design Manual*, to accommodate the needs of wildlife. Connectivity can be



maintained through specific fauna movement devices, such as tunnels, underpasses and land bridges; designed to ensure the safe passage of animals across roads.

Figure C1-4: Greenways can be applied to achieve regional open space networks and connectivity

Source: Adapted from Cawood Hellmund, P & Somers Smith, D, (2006) – p9



Figure C1-5: Greenways implemented as part of pedestrian and cyclist routes

1.4 Design Themes

The landscape master planning phase should consider developing landscape character themes that establish the vegetative structure in terms of open and closed forest in the planning phase while specific themes establish the species selection and planting design approach to be developed in the detailed design phase.

While these themes are being considered, maintenance minimisation requirements shall override purely aesthetic design. Planting designs that require pruning and/or extensive weed management or large extents of grassland that require reoccurring maintenance are not value for money investments and should not be utilised. Landscape designs should be self sustaining after the initial construction contract with maintenance intervention progressively diminishing.

1.4.1 Landscape Character Themes

The broad themes of an open forest landscape versus a closed forest landscape contribute to enhancing the user experience. These themes should be the basis for any landscape design and be implemented appropriately according to the adjacent and/or surrounding context and landscape character. Changing the amount of enclosure versus openness in certain locations along a corridor also contributes to enhanced user perception. The differences between the two themes are:

1.4.1.1 Closed Forest

A **Closed forest** landscape:

- eliminates high frequency reoccurring maintenance;
- contributes to the urban forest of the local community;
- contributes to environmental enhancements of water quality and soil management;
- creates or maintains spatial enclosure; and
- channels views to focus areas and /or features.

Examples of where applying a closed forest (Figure C1-6) may be suitable are:

- urbanised areas to reduce heat island effect, managed infrastructures impact of local communities;
- to frame distant views of natural landscape features and landforms, such as mountains;
- areas which provide no opportunities to maximise quality views to the surrounding landscape;
- when passing through or adjoining an existing forest, to provide an effective buffer between the two and minimise edge effects; and
- to screen undesirable views (for example; industrial areas).



Figure C1-6: An example of a closed forest

A closed forest comprises dominantly shrub and tree planting (outside clear zone). Planting density (plants per square metre) should provide a visual screen or buffer. Understorey planting may also be used in addition for initial stabilisation, weed growth suppression and erosion control. This maximises the chances of successful establishment and lower maintenance in the long term. Species should be selected which have a denser, foliage to the ground habit.

1.4.1.2 Open Forest

An **Open forest** landscape:

- reduces high frequency reoccurring maintenance; and
- creates or maintains permeability to immediate and distant views.

Examples of where applying an open forest (Figure C1-7) may be suitable are:

- to maintain immediate filtered views and views to beyond the corridor;
- where there is an opportunity for users to experience views across open grasslands; and
- continue existing open forest character, where adjoining the corridor (for example; in rural landscape areas).



Figure C1-7: An example of an open forest

An open forest comprises small/medium shrubs and trees (outside clear zone). Trees are planted at low density (1 tree per 10-20 square metres) yet provide a shade canopy to assist with weed suppression. Tree species should be selected which have a more open habit to maintain an open character.

The planting design within open and closed forest areas should reflect both the species composition and structure of adjacent vegetation. Actual species selection will depend on the local ecological context, and may vary in response within the themed areas, according to changes in ecology. Species should be based on the relevant naturally occurring plant communities at a particular location. It should be noted that not all local species in adjoining areas will grow on fill embankments and may need to be sourced from wider areas to suit the road formation. Planting densities will also change throughout depending on the adjoining and/or surrounding habitats and communities present.

1.4.2 Specific Themes

If a landscape master plan has been developed, it should indicate the specific themes to be implemented in the detailed design phase. Where no master plan exists, the planting design should be developed based upon the road project setting (Figure C1-8).

ROAD PROJECTS AND SETTINGS

	Roads Through Wetlands	Roads Through Bushland / Rainforest Corridors	Main Roads in Dense Urban Areas	Roads in Rural Areas	Avenues and Parkways	Roads in Country Townships	Roads Crossing Major Waterways	Roads with Scenic Outlook	Roads Through Industrial Areas
INDIGENOUS	Preferred Application	Preferred Application	Not Preferred	Preferred Application	Suitable Application	Not Preferred	Preferred Application	Preferred Application	Not Preferred
NATIVE INFORMAL	Preferred Application	Preferred Application	Suitable Application	Suitable Application	Preferred Application	Preferred Application	Suitable Application	Preferred Application	Suitable Application
NATIVE FORMAL	Not Preferred	Not Preferred	Preferred Application	Not Preferred	Preferred Application	Preferred Application	Not Preferred	Suitable Application	Preferred Application
EXOTIC	Not Preferred	Not Preferred	Suitable Application	Not Preferred	Suitable Application	Suitable Application	Not Preferred	Not Preferred	Suitable Application
RIPARIAN	Preferred Application	Preferred Application	Suitable Application	Suitable Application	Not Preferred	Not Preferred	Preferred Application	Not Preferred	Not Preferred
GRASSLAND	Suitable Application	Not Preferred	Not Preferred	Preferred Application	Not Preferred	Not Preferred	Suitable Application	Preferred Application	Not Preferred
FEATURE	Not Preferred	Not Preferred	Preferred Application	Not Preferred	Preferred Application	Preferred Application	Not Preferred	Not Preferred	Not Preferred

KEY

Preferred Application
 Suitable Application
 Not Preferred

Figure C1-8: Guide to applying specific themes

1.4.2.1 Indigenous

The Indigenous theme can be used to maximise integration with endemic vegetation adjoining or located near the corridor (Figure C1-9). Endemic species are prevalent in or peculiar to a particular locality or region or Regional Ecosystem and may be used as the basis of the planting palette to assist in reconnecting fragmented landscapes or corridors, and to reinforce the ecological integrity and diversity of an area. This design theme typically adopts informal planting configurations to reflect and replicate the natural structure of the landscape. It should be encouraged for use in areas of significant remnant native vegetation and areas designated as conservation corridors. It may also be used in revegetation programs to ensure effective regeneration.

It should be noted that some endemic species will not be suited to growing conditions of an unnatural landform such as a road formation. Some require specific soils, hydrology or more shade than available or are short-lived. A common mistake is to utilise species from the regional ecosystem without considering the severely altered soil profile properties and growing conditions of the road formation.

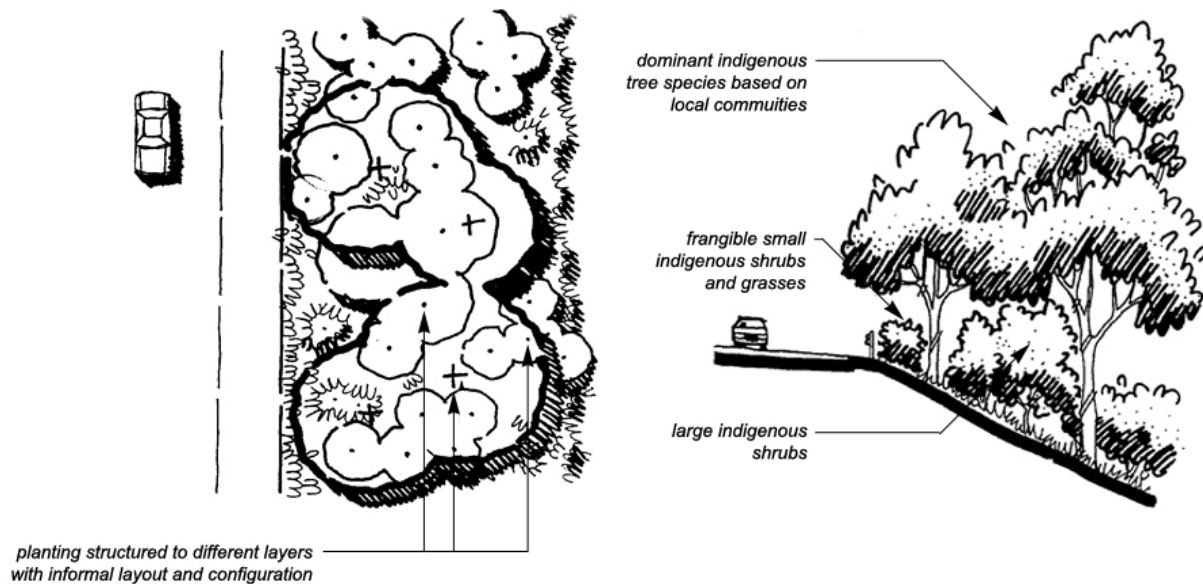


Figure C1-9: Indigenous theme

Source: Adapted from TRACT (1997)

1.4.2.2 Native Informal

The native informal theme may also be used to reinforce or replicate the existing setting (Figure C1-10 and Figure C1-11). It may use either endemic or native species, arranged informally/ naturalistic or in a semi-natural way. This theme is similar to the Indigenous theme yet may incorporate more commonly available native species. Species should be long-lived and predominantly with dense foliage full to the ground habit. This will assist in eliminating reoccurring maintenance.

The native informal theme often borrows the species and configurations from the local setting. While plants may not be indigenous to a local area they should be found within the general region and exhibit success in roadside planting. This theme may be further enhanced with understorey species including native grasses, shrubs and small trees.

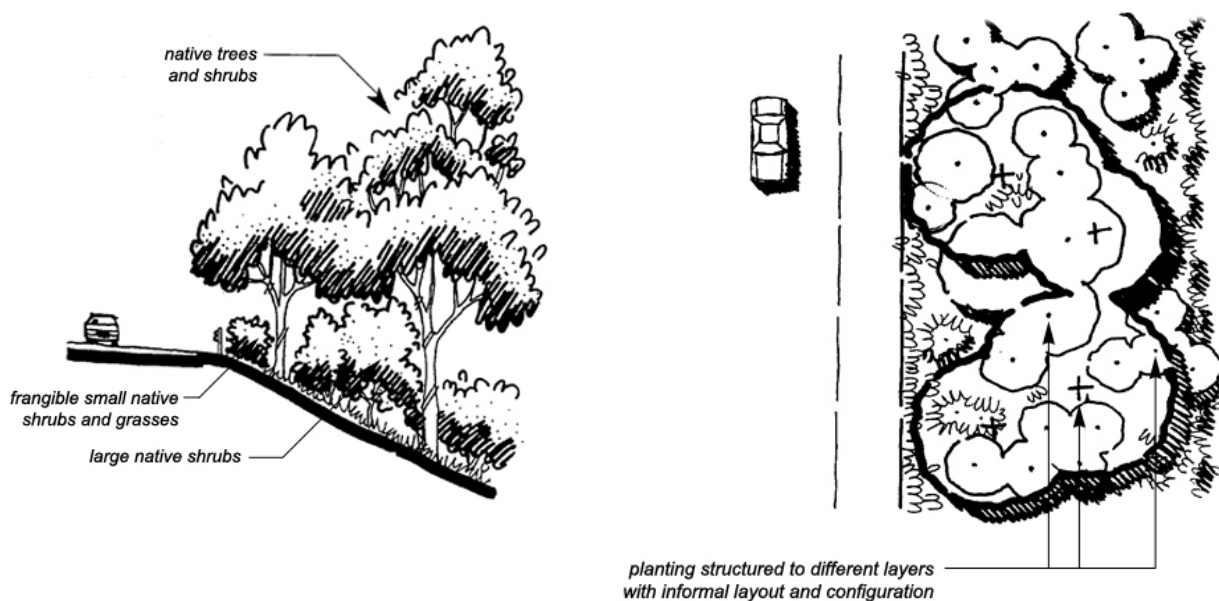


Figure C1-10: Native informal theme

Source: Adapted from TRACT (1997)



Figure C1-11: An example of a native informal median planting

1.4.2.3 Native Formal

The native formal theme uses either endemic plant species or native species (Figure C1-12). The planting configurations are formal/ structured in nature and may consist of a range of arrangements including formal avenues, geometric patterns or linear bands of trees, shrubs and groundcovers. Species should be long-lived and predominantly with dense foliage full to the ground habit. This will assist in minimising reoccurring maintenance.

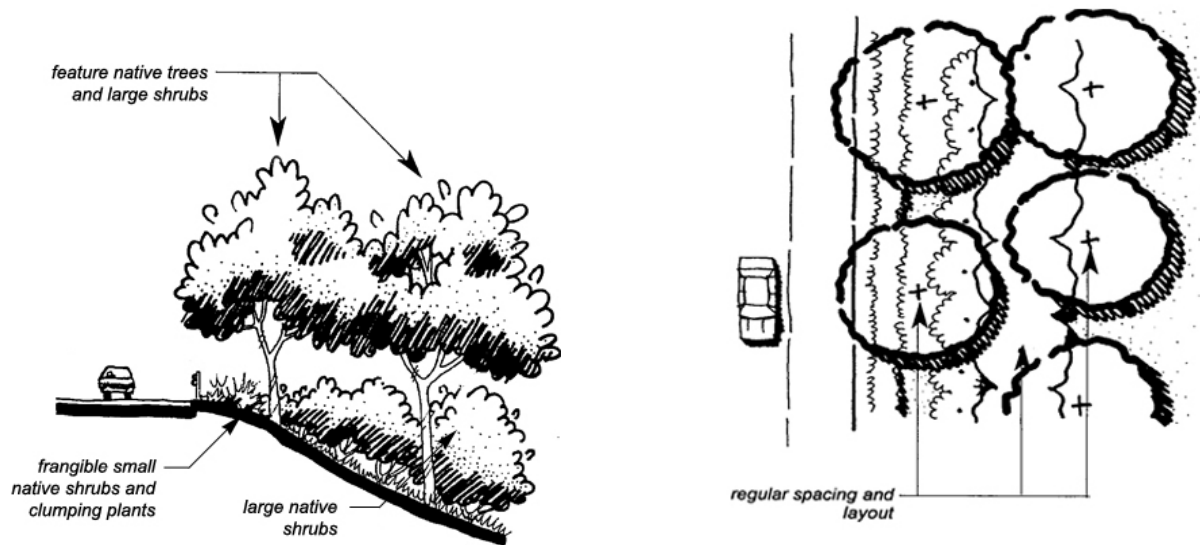


Figure C1-12: Native formal theme

Source: Adapted from TRACT (1997)

1.4.2.4 Riparian

The riparian theme involves the use of species naturally associated with water systems, such as river or creek systems. This theme may be used to promote awareness of watercourses and crossings. The choice and distribution of species should reflect the original planting and ecological integrity of the creek or river system (Figure C1-13).

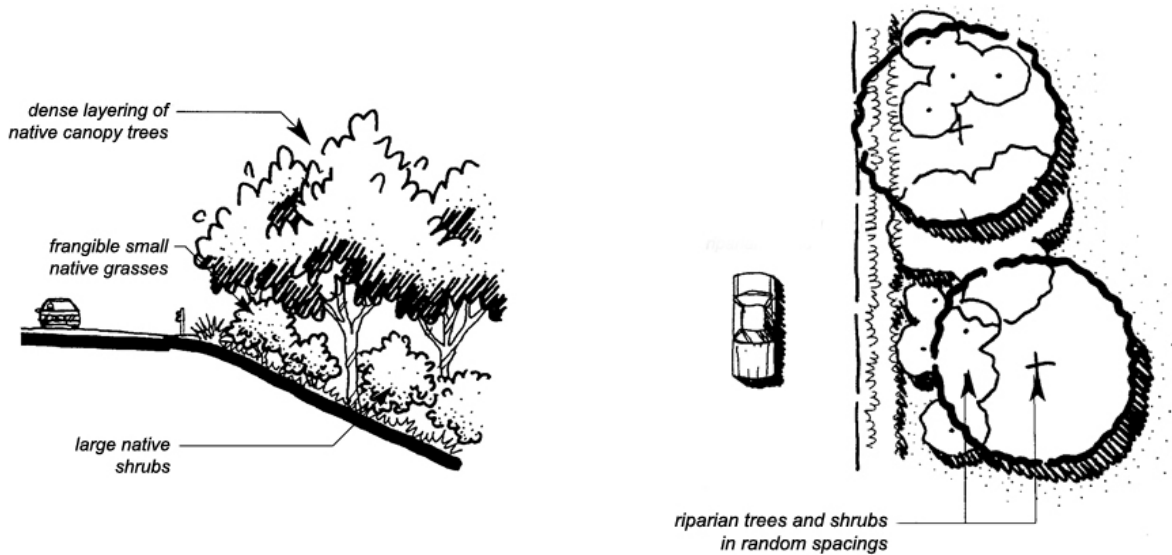


Figure C1-13: Riparian theme

Source: Adapted from TRACT (1997)

1.4.2.5 Feature

The feature theme is generally used in addition to any of the aforementioned themes to highlight a particular area or areas within the corridor. It may be used to identify an individual feature, define a key focal element within the landscape or announce an entire area or precinct. It is particularly useful for areas such as interchanges, junctions and other prominent locations (Figure C1-14).

Signature tree species relative to the surrounding landscape setting may also be included to define the area and reflect the local character. These will generally be specified as container or ex-ground plant stock to provide immediate impact. Plant species are generally selected which will promote a visual statement and variety in form, texture or colour.

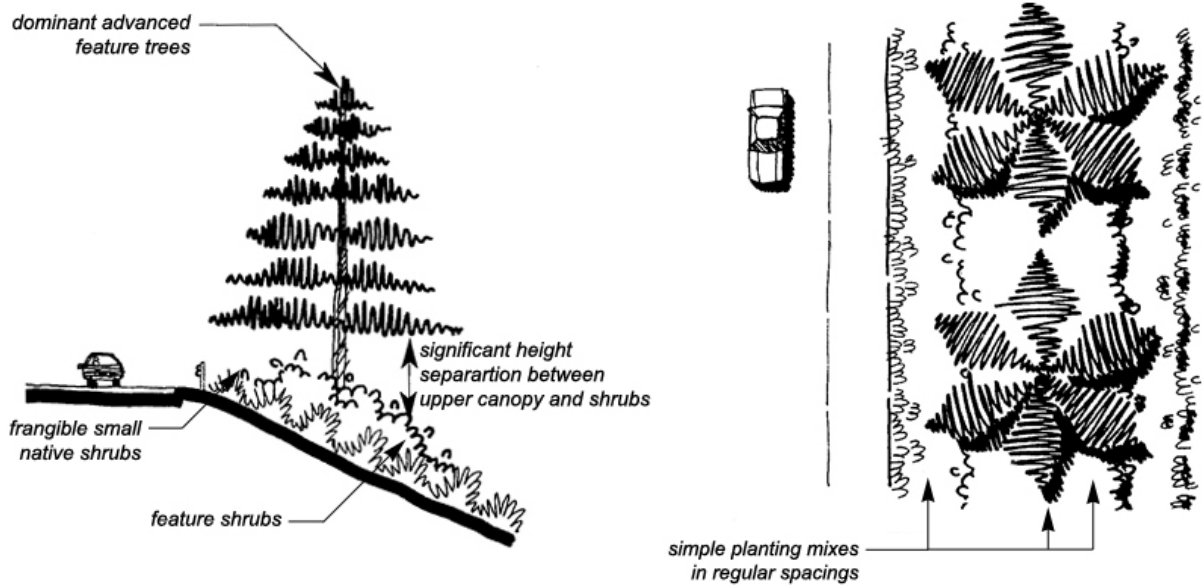


Figure C1-14: Feature theme

Source: Adapted from TRACT (1997)

1.4.2.6 Grassland

The exotic grassland theme is most commonly used where the corridor adjoins existing pasturelands (Figure C1-15). This is the most common revegetation method in rural areas. While the pasturelands have been developed to support livestock, the exotic grasses used are very prolific seed sources and when not grazed can obtain heights above the maintenance intervention level. It is important to select appropriate species to minimise the likelihood of maintenance intervention levels being triggered. Mowing these grasslands for sight distance and visibility is the single most expensive reoccurring maintenance task on a state-wide basis.

The native grasslands theme is a expensive and highest maintenance theme. This is primarily due to competition from weeds and pasture grasses that may occur in the surrounding area. As seed from many native grass species are very expensive and the ongoing maintenance requirements to maintain the treatment are high, the theme is not recommended. Native grasses are also highly susceptible to the effects of herbicides, which limits weed removal to hand methods.

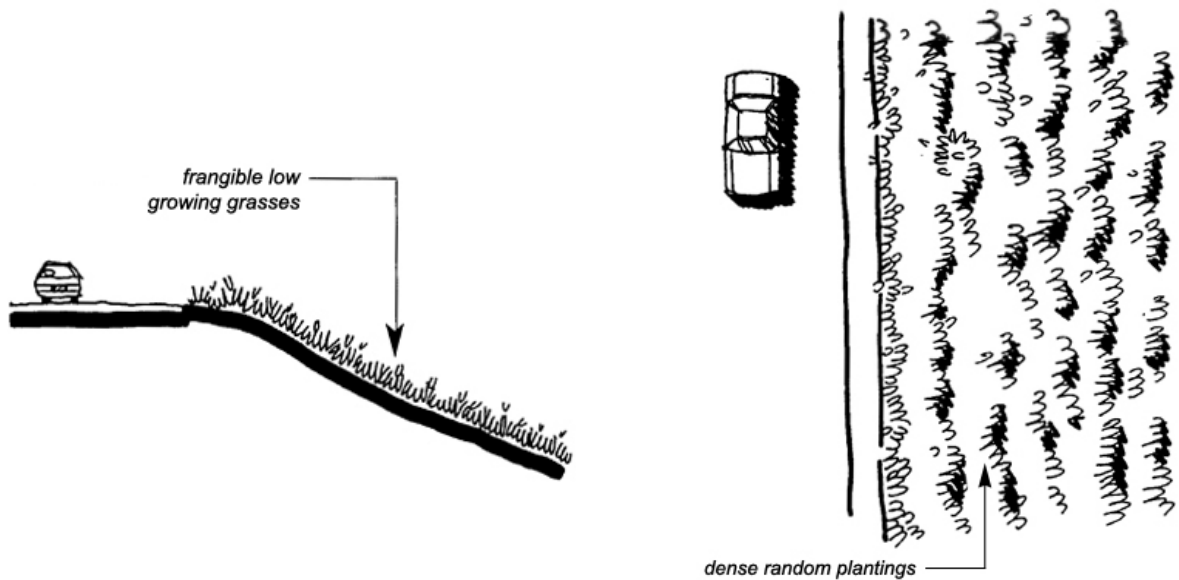


Figure C1-15: Grassland theme

Source: Adapted from TRACT (1997)

1.4.2.7 Exotic

The exotic theme is generally not advocated for use within corridors. Exotic plant species; that is, those of foreign origin or character, introduced from abroad, and not native to Australia, should only be used in instances where indigenous or native species will not meet the design intent for particular areas. Species selected should be non invasive, or carry a threat of becoming a weed in a particular situation over time.

The use of the exotic theme predominantly adopts a formal planting configuration in response to the design intent. Formal layouts may include the use of feature plant species arranged alongside the roadside or in medians, in bands or blocks and be layered vertically with different species. Plant species may also be selected for colour and textural qualities (Figure C1-16).

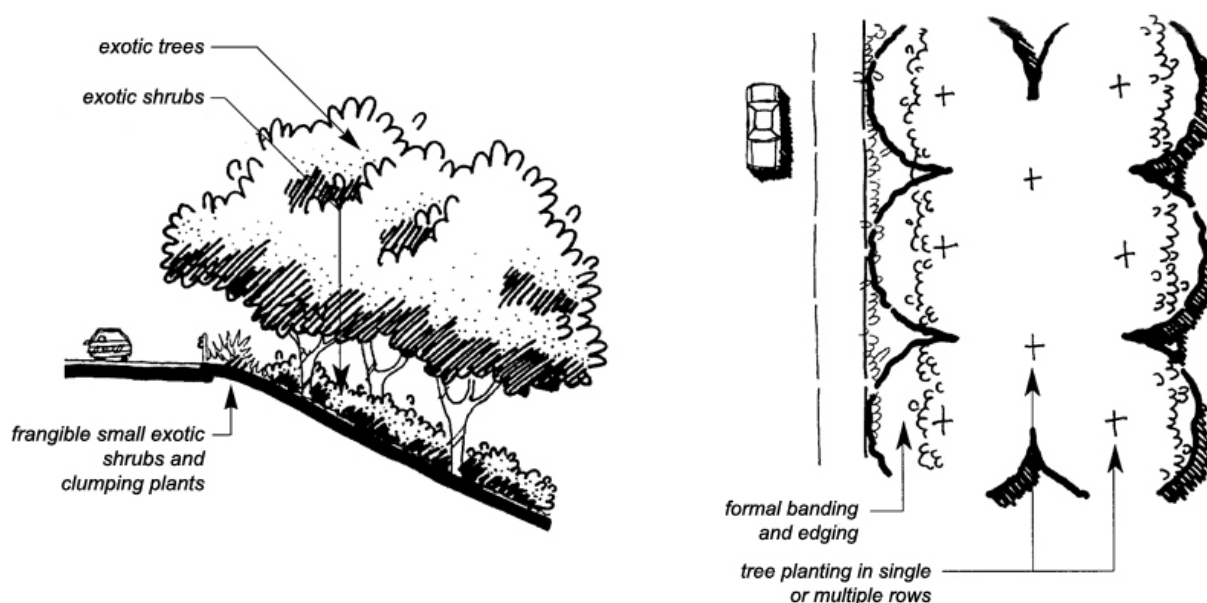


Figure C1-16: Exotic theme

Source: Adapted from TRACT (1997)

1.5 Landscape Sequencing

Creating landscape sequences within corridors improves the safety and visual experience for users. Landscape sequencing improves user perception through changes in visual cues. It can also effectively promote distinctive character precincts through which a corridor passes.

A successful landscape sequence will contain the following:

- breaks in vegetation;
- alternation of closed forest themed landscapes with open forest themed landscapes, at appropriate locations;
- avoidance of over stimulation and visual confusion; yet with enough variety to maintain user interest (preventing driver boredom);
- consistent treatments along the road cross section; for example, batter and embankment slopes, street furniture and so on; and
- use of appropriate visual cues to establish location along a journey.

In terms of landscape and revegetation treatments, sequences are generally created at particular areas through applying changes in rhythm, intensification and form.

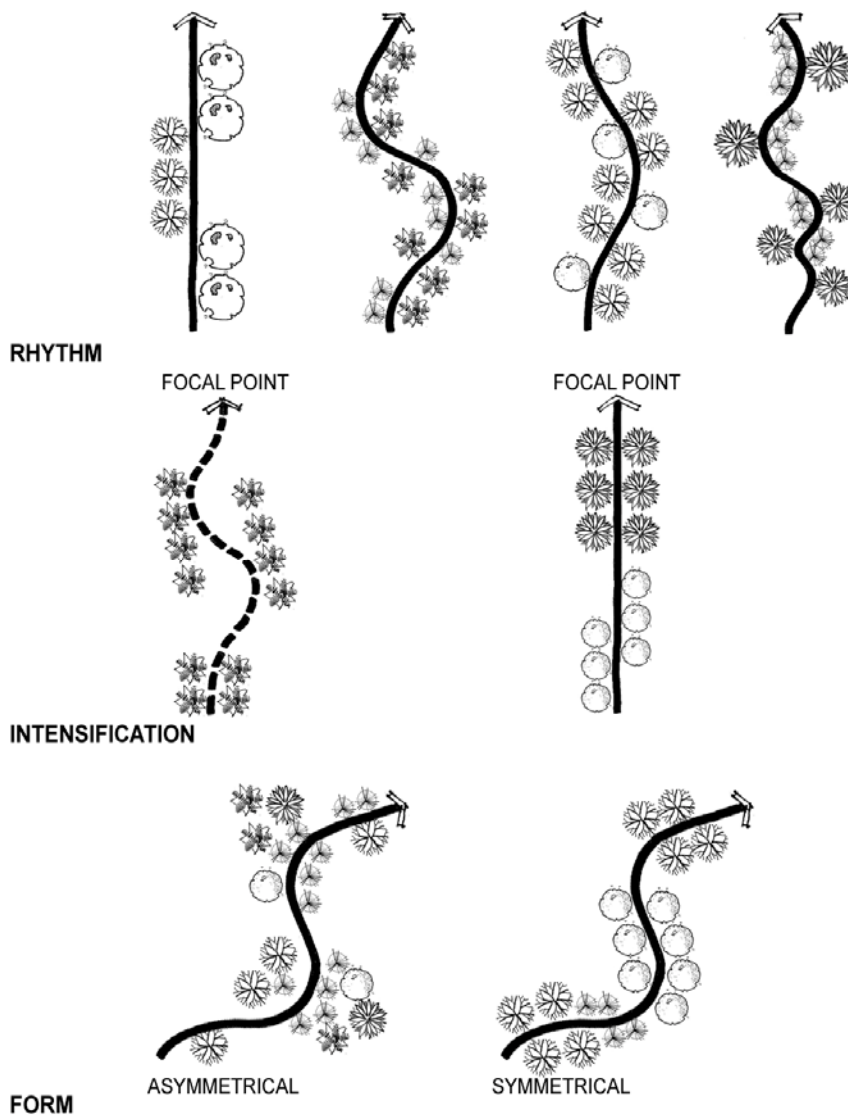


Figure C1-17: Ways of creating sequences with landscape treatments

Source: Adapted from Department of Transport and Works – Northern Territory (1988), p18

Sequences can also be developed by implementing changes in visual cues relative to urban design components. These changes can be permanent or temporary, natural or constructed. Potential visual cues useful to developing sequences are:

- form (and associated shape, size, height, colour, materials, texture, tactility and so on);
- scale;
- pattern;
- light and shade (and resultant light levels, light quality, temporal changes in light); and
- arrangement of spaces and associated perceived density.

Aspects to consider when constructing a sequence of images (Figure C1-18) within the road landscape are:

- functional aspects; for example the types of users and effects on their perception;
- surrounding landscape setting;
- landscape context and existing character; and
- configuration and location of design components, and their impacts on visual experience.



Figure C1-18: Layering of shrubs transitions to tree species while colour leads to focal point of exit sign