

PART A

Chapter 3 Asset Management

June 2013

Copyright



<http://creativecommons.org/licenses/by/3.0/au/>

© State of Queensland (Department of Transport and Main Roads) 2013

Feedback: Please send your feedback regarding this document to: mr.techdocs@tmr.qld.gov.au

Chapter 3 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

Table of Contents

3.1	INTRODUCTION	A3-1
3.2	FUNDAMENTALS OF ASSET MANAGEMENT	A3-1
3.3	OPERATING CONTEXT: THE ROADS ALLIANCE AGREEMENT	A3-2
3.4	ROAD LANDSCAPE FRAMEWORK	A3-2
3.4.1	Road Landscape Framework Factors	A3-2
3.4.1.1	Road Type	A3-2
3.4.1.2	Contextual Setting	A3-5
3.4.1.3	Regional Landscape	A3-6
3.4.2	How to Use the Road Landscape Framework Matrix	A3-9
3.4.3	Application of Road Landscape Frameworks	A3-14
3.4.3.1	Transport & Roads Implementation Program	A3-14
3.4.3.2	Maintenance, Performance and Operations (MP&O) Program	A3-14
3.4.3.3	Transport and Road System Manager Framework	A3-15
3.4.3.4	Element Management Plans	A3-16
3.4.3.5	Maintenance Forward Planning	A3-16
3.5	DESIGNING AND CONSTRUCTING TO REGIONAL DIFFERENCES	A3-18
3.5.1	Arid Regions west of the Dividing Range	A3-18
3.5.2	Subtropical Regions east of the Dividing Range	A3-19
3.5.3	Wet Tropics of Far North Queensland	A3-19

Figures

Figure A3-1:	Consistency in planning, design and construction achieved at Tugun By-pass	A3-2
Figure A3-2:	Pacific Motorway at Tugun By-pass	A3-3
Figure A3-3:	Barkly Highway between Cloncurry and Mt Isa	A3-3
Figure A3-4:	Bucasia Road, Mackay	A3-4
Figure A3-5:	New England Highway, Yarraman, Toowoomba	A3-4
Figure A3-6:	Access controlled motorway in an urban context	A3-5
Figure A3-7:	Limited access highway in a rural context	A3-5
Figure A3-8:	Core landscape area- the Glasshouse Mountains	A3-6
Figure A3-9:	Landscape corridor- Mountains to Mangroves	A3-7
Figure A3-10:	Inter-urban break along Pacific Motorway at Pimpama	A3-7
Figure A3-11:	Theme used on screens reflects local culture and history of place	A3-8
Figure A3-12:	Effective urban design finishes and artwork creates a unique experience for users of integrated transport corridors	A3-14
Figure A3-13:	Overpass for pedestrians and cyclists safely links rail station to car park, bus stops and pathways, providing effective access and connectivity for users	A3-15
Figure A3-14:	Slashing/ mowing to grassed median and verge requires 8 to 10 maintenance interventions per annum	A3-17
Figure A3-15:	The maintenance interventions of planted median will progressively reduce to one intervention per annum	A3-18

Tables

Table A3-1:	Road landscape framework - urban context	A3-11
Table A3-2:	Road landscape framework - rural context	A3-13

Part A - Chapter 3

Asset Management

3.1 Introduction

“Asset management may be defined as a comprehensive and structured approach to the long term management of assets as tools for the efficient and effective delivery of community benefits. The emphasis is on the assets being a means to an end, not the end in themselves” (Austroads,1997:p4).

The key community benefit of road landscape is in the provision of public amenity. The need for this asset has been outlined in the Road Landscape Policy (Chapter 2 of Part A). The means by which this will be delivered is through Queensland Transport & Roads Implementation Program (QTRIP) projects and Maintenance, Performance and Operations (MP&O) activities.

The Department has adopted an asset management business model. This model includes the principles of risk management, quality management, fit for purpose, affordability and project management. These principles are relevant for application to all assets. Asset management is a reiterative approach to planning, design and construction and operational works.

This chapter discusses these principles and outlines the minimum service levels for road landscape assets in the state controlled road and transport network. It focuses on establishing Road Landscape Frameworks for corridor management. These frameworks will guide QTRIP projects and the MP&O's Element Management Plans in accomplishing the strategic design objectives of the road landscape policy.

3.2 Fundamentals of Asset Management

Fundamental to the concept of asset management is the:

- establishment of minimum standards in the form of levels of service;
- consistent planning, design, construction and maintenance to meet these levels of service (Figure A3-1);
- progressively upgrading sub-standard facilities to meet the levels of service;
- renewal of assets that have failed or reached the end of their life span; and
- undertaking routine maintenance to maximise the longevity of the asset.



Figure A3-1: Consistency in planning, design and construction achieved at Tugun By-pass

3.3 Operating Context: The Roads Alliance Agreement

The Department has entered into an agreement with the Local Government Association of Queensland to share responsibilities in the maintenance of state controlled roads. While primarily focusing on cost sharing arrangements between parties, it also defines the physical boundaries of each party's responsibility. An understanding of these boundaries and responsibilities is fundamental to ensuring that the design of the road landscape asset is maintained to the standard envisioned and is economically affordable.

3.4 Road Landscape Framework

Road Landscape Framework set out in this manual defines the minimum service levels that the Department seeks to attain. There are several factors upon which the frameworks are structured.

3.4.1 Road Landscape Framework Factors

Within the Framework four factors are defined as follows:

- Road Type
- Contextual Setting
- Regional Landscape
- Urban Design Approach

3.4.1.1 Road Type

Within these frameworks four road types are defined as follows:

- **Access Controlled Motorway:** a high speed (80-110 km/h), multi-lane dual carriageway (Figure A3-2) providing a through traffic function and grade separated interchanges with access controlled by on and off ramp access.



Figure A3-2: Pacific Motorway at Tugun By-pass

- **Limited Access Highways:** a high speed (80-110 km/h) single or multi lane dual carriageway (Figure A3-3) providing a through traffic function, with limited access by at grade intersections.



Figure A3-3: Barkly Highway between Cloncurry and Mt Isa

- **Divided Arterial Roads:** a 60-80 km/h multilane dual carriageway (Figure A3-4) providing a connecting function, with access by at grade intersections, roundabouts and driveways.



Figure A3-4: Bucasia Road, Mackay

- **Undivided Arterial Roads:** a 60-80 km/h single lane dual carriageway (Figure A3-5) providing a connecting function, with access by at grade intersections and driveways.

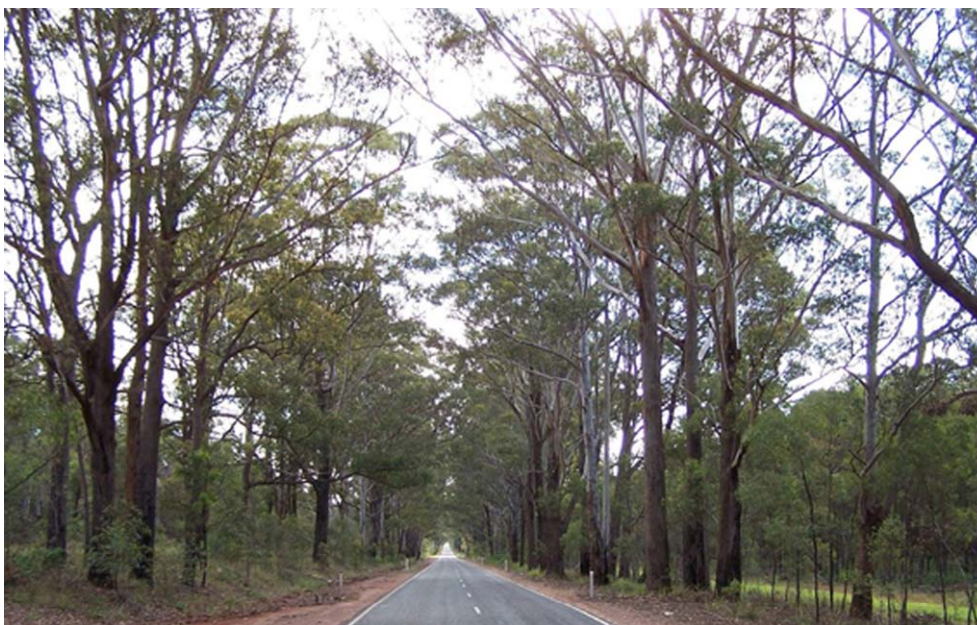


Figure A3-5: New England Highway, Yarraman, Toowoomba

3.4.1.2 Contextual Setting

Within these frameworks, there are two contextual settings defined as:

- **Urban:** (Figure A3-6) the full extent of urban footprint or the future urban land use planning for cities, regional centres and towns as defined in the State Government's Regional Plans.



Figure A3-6: Access controlled motorway in an urban context

- **Rural:** (Figure A3-7) all other land uses outside the urban foot print or future urban land use including agricultural land, national parks and state forests.



Figure A3-7: Limited access highway in a rural context

3.4.1.3 Regional Landscape

Within these frameworks, there are three types of regional landscapes:

- **Core landscape areas** are “*areas of highest confluence of multiple regional landscape values and ecosystem services*” (South East Queensland Regional Plan 2009-31, p.58). Examples of core landscapes in the greater Brisbane area include the D’Aguilar Range, and the Glasshouse Mountains (Figure A3-8).



Figure A3-8: Core landscape area- the Glasshouse Mountains

- **Landscape corridors** are “*lineal areas with current or potential high confluence of landscape values and ecosystem services that have the capacity to improve connectivity between core landscape areas, people, places, infrastructure and ecosystems*” (South East Queensland Regional Plan 2009-31, p58). Examples of landscape corridors include the Karawatha-Greenbank-Flinders peak corridor linking Brisbane, Logan, Ipswich and the Scenic Rim as well as the Mountains to Mangroves (Figure A3-9) corridor linking the D’Aguilar Range to Moreton Bay.



Figure A3-9: Landscape corridor- Mountains to Mangroves

- **Inter-urban breaks** are “*areas separating major urban development areas*” (South East Queensland Regional Plan 2009-31, p58). Examples include Moreton Bay- Sunshine Coast and Pimpama- Jacobs Well (Figure A3-10) inter-urban break.



Figure A3-10: Inter-urban break along Pacific Motorway at Pimpama

3.4.1.4 Urban Design Approaches

Within these frameworks, there are six urban design approaches:

- **Regional Statement/ Treatments** are purpose built signs and/or sculptures that reference aspects of the regional urban landscape. This treatment marks a significant junction in or gateway into a region. Use of this treatment is restricted to high speed motorways and should be in scale with the speed at which it is viewed.
- **Landmark Statements/ Treatments** are purpose built signs and/or sculptures that reference aspects of the local urban context. This treatment marks a significant junction or threshold into a local urban environment.
- **Town Entry Statements/ Treatments** are purpose built signs and/or sculptures that reference aspects of the local urban environment which make the location unique. These treatments/statements mark the commencement of a sequence of features leading into a town centre or Main Street Streetscape.
- **Main Street Streetscapes/ Treatments** are a mixture of hardscape design components that promote pedestrian and cyclist's amenity and sense of place through the referencing of historically and culturally significant attributes. These streetscapes utilise locally occurring building materials that integrate with the town's setting and are complimented with softscape treatments.
- **Public Art Treatments** are commissioned works of art incorporated into urban design components which reference local themes, detailing (such as colour, patterning and textured finishes) and materials in scale with the speed at which they are viewed.
- **Cultural & Historical Place-making** (Chapter 4 of part A) is related to urban design component theming and detailing that symbolises/abstracts/derives its form and aesthetic expression from cultural or historical references (Figure A3-11).



Figure A3-11: Theme used on screens reflects local culture and history of place

Road Landscape Frameworks have a hierarchical system based on the provision of public amenity and liveability. The quality and richness of this amenity is based upon the mixture of assets which are formulated into a framework of standards to be applied to the state controlled road network and transport systems. The basic premise to these frameworks is that it is uneconomical and undesirable to apply the same level of service to all state controlled roads in the network and transport systems.

3.4.2 How to Use the Road Landscape Framework Matrix

The levels of service are the minimum key result areas to be delivered and maintained by the QTRIP and MP&O Programs. The matrix defines the levels of service required in an urban context (Table A3-1) and in a rural context (Table A3-2). Both matrices list the road types across the top and include examples of state controlled roads with those attributes. The attributes and design components are listed down the page on the left and are divided into Landscape & Revegetation and Urban Design. With the exception of the Regional Landscape attributes and Urban Design Approaches, these attributes and design components are included as reference within this manual where further information may be found.

Applying this matrix and the design theory in this Manual will develop layers of meaning in the road landscape. Everyone should be able to read and understand some layers. The number of layers detected will be a factor of user perception. Some will see a shrub as only a flowering plant but it may function as a headlight glare screen and as part of the urban forest.

A well defined road landscape successfully translates the five strategic objectives of safety, community, aesthetics, environment and economics into intertwined layers of meaning. These are the primary drivers to successful road landscape designs.

ROAD LANDSCAPE FRAMEWORK - LEVELS OF SERVICE				
URBAN CONTEXT				
LANDSCAPE AND REVEGETATION				
Road Type	Access Controlled Motorways	Limited Access Highways	Divided Arterial Roads	Undivided Arterial Roads
Regional Landscape - The Urban Forest				
Core Landscapes	Provide all forms of connectivity. Conserve and enhance environmental values			
Landscape Corridors (<i>Greenways Section Ch. 8</i>)	Provide connectivity and landscape buffers to infrastructure along corridor to conserve and enhance environmental values			
Inter-Urban Breaks	Locate interchanges/intersections away from inter-urban breaks to minimise clearing. Conserve and enhance landscape character		Locate intersections away from inter-urban breaks to minimise clearing. Conserve and enhance landscape character	
Queensland Scenic Roads				
Scenic (<i>Ch. 1, 7, 11 & 15</i>)	Maintain and enhance views and vistas to the urban skyline, landscape features and open spaces		Maintain and enhance long and short views within the urban fabric	
Cultural (<i>Ch. 1, 7, 11, 14 & 15</i>)	Provide references of cultural and historical value through landscape and revegetation treatments			
Natural (<i>Ch. 1 & 11</i>)	Maintain and enhance views and vistas to natural features including waterways, mountains, forests, islands and the ocean			
Landscape Approaches				
Open Forest (<i>Ch. 8</i>)	Provide as a means to framing, filtering or maintaining views		Provide as a means to transitioning to recreational open space	
Closed Forest (<i>Ch. 8</i>)	Provide as a means to buffer/screen adjacent land uses and undesirable views, as urban forest within interchanges and to transition into cut embankments		Provide as a means to buffer/screen adjacent land uses, as urban forest	
Structured Planting Approach LR-02 (<i>Ch. 8 & 9</i>)	Provide as a controlled outcome to interchanges, intersections, city/town entries and throughout the clear zone			
Naturalistic Planting Approach LR-03 (<i>Ch 8 & 9</i>)	Provide as buffer/transition to greenways, urban forests, significant environmental areas and remnant vegetation			
Water Sensitive Planting Approach LR04 (<i>Ch. 8 & 9</i>)	Provide throughout the corridor			
Landmark /Feature Treatment RF-08 (<i>Ch. 8 & 9</i>)	Provide at Interchanges and service road roundabouts		Provide at roundabouts and intersections to act as gateways to local area	
Landscape Treatments				
Grass & Turf LR-04 & LR-05 (<i>Ch. 9</i>)	Restrict use to service road verges and/or where sight distance precludes planting and intersections where maintenance access does not require lane closures. Minimise risk of creating fuel load		Restrict species selection to varieties reaching heights of 400mm or less. Minimise risk of creating fuel load	
Street Trees	Provide on service roads	N/A	Provide where clear zone requirements can be achieved and where supported by LGA street tree strategy	
Raised Medians RF- 07	Provide continuous headlight glare protection where sight distance permits			N/A
Depressed Medians RF-07	Provide continuous headlight glare protection where sight distance permits utilising water sensitive urban design principles			N/A
Cuttings RF-02	Assess and identify medium to high erosion risk soils and adopt specialised treatment			
Fill Embankments RF-03	Assess and identify medium to high erosion risk soils and adopt specialised treatment			
Maintenance, Performance and Operations				
Contaminated Land	Meet legislative requirements and adopt principles of Element 1 Contaminated Land Element Management Plans (EMP)			
Nature Conservation	Meet legislative requirements and adopt principles of Fauna Sensitive Road Design Manual and Element 2 Nature Conservation Element Management Plans			
Degraded Areas	Prioritise rehabilitation as required by Element 3 Degraded Areas Element Management Plans			
Weed Management	Meet legislative requirements and adopt principles of Element 5 Declared Pest Species Element Management Plans			
Road Landscape	Prioritise renewal and enhancements as required by Element 8 Road Landscape Element Management Plans			

ROAD LANDSCAPE FRAMEWORK - LEVELS OF SERVICE				
URBAN CONTEXT (cont)				
URBAN DESIGN				
Road Type	Access Controlled Motorways	Limited Access Highways	Divided Arterial Roads	Undivided Arterial Roads
Urban Design Approaches				
Regional Statement Treatments	Provide as part of Regional Planning Scheme		N/A	
Landmark Statement Treatments (Local Context Scale)	N/A		Provide as part of local planning area scheme	
Town Entry Treatments/ Statements	Provide at service road roundabouts and/or intersections	Provide in towns with population less than 100,000		
Main Street Streetscapes	N/A		Provide in towns with population less than 100,000	
Public Art Treatments (Ch. 10 & Appx. 1)	N/A	Provide treatments in scale with the viewing speed and in key locations that will not create driver distraction		
Cultural & Historical Placemaking (Ch. 1, 4, 7 & 14)	Provide treatments in scale with the viewing speed and in locations that will not create driver distraction			
Engineered Structures				
Vehicular Bridges and Overpasses UD-02 (Ch. 10)	Integrate purpose built structures into contextual setting		Integrate standard structures into contextual setting	
Tunnels UD-03 (Ch. 10)	Integrate purpose built structures into contextual setting		Integrate standard structures into contextual setting	
Noise Attenuation Structures UD-04 (Ch. 10)	Integrate purpose built structures into contextual setting		Integrate standard structures into contextual setting	
Retaining Systems UD-05 (Ch. 10)	Integrate purpose built structures into contextual setting		Integrate standard structures into contextual setting	
Rest Areas and Amenity Blocks				
Heavy Vehicle Rest Areas	Function to be provided by Commercial Service Centres		N/A	
Rest Areas UD-12 (Ch. 10)	Type 1	Type 2	Type 3	Type 3
Scenic Lookouts (Ch. 1, 11 & 14)	Provide where high quality scenic opportunities exist adopting CPTED principles			
Pedestrian/ Cyclist Facilities				
Cycleways UD-13 (Ch. 10)	Provide multi-modal opportunities in corridor		Ensure connectivity and linkages to cycling networks	
Pedestrian/ Cyclist Underpasses (Ch. 10)	Provide high quality urban design finishes and detailing		Integrate standard structures into contextual setting	
Pedestrian/ Cyclist overpasses (Ch. 10)	Provide high quality urban design finishes and detailing		Integrate standard structures into contextual setting	
Footbridges (Ch. 10)	Provide high quality urban design finishes and detailing		Integrate standard structures into contextual setting	
Pedestrian/ Cyclist Crossings (Ch. 10)	Provide high quality urban design finishes and detailing		Integrate standard structures into contextual setting	
Non-regulatory Signs				
Themed Tourism Routes (Ch. 1, 7, 11 & 15)	Incorporate into sign package for corridor		N/A	
Signs - Regional Gateway (Ch. 15)	Provide signs/ sculptures in scale with the viewing speed and in locations that will not create driver distraction		N/A	
Signs - Local Gateway	N/A	Provide signs/sculptures in scale with the viewing speed and in locations that will not create driver distraction		
Interpretative signs/ panels/ plaques - Regional	Provide at rest areas and scenic lookouts		N/A	
Interpretative signs/ panels/ plaques - Local	Provide tourism information within service road network		Provide at rest areas and scenic lookouts	

Table A3-1: Road landscape framework - urban context

ROAD LANDSCAPE FRAMEWORK - LEVELS OF SERVICE				
RURAL CONTEXT				
LANDSCAPE AND REVEGETATION				
Road Type	Access Controlled Motorways	Limited Access Highways	Divided Arterial Roads	Undivided Arterial Roads
Regional Landscape				
Core Landscapes	Provide connectivity at environmental areas. Conserve and enhance environmental values			
Landscape Corridors	Provide buffers to infrastructure along corridor to conserve and enhance environmental values			
Queensland Scenic Roads				
Scenic (Ch. 1, 7, 11 & 15)	Maintain and enhance views and vistas to the rural landscapes			
Cultural (Ch. 1, 7, 11, 14 & 15)	Provide references of cultural and historical value through themed tourism route and interpretive signage			
Natural (Ch. 1 & 11)	Maintain and enhance views and vistas to natural features including waterways, mountains and the ocean			
Landscape Approaches				
Open Forest (Ch. 8)	Provide as a means to framing or filtering views and minimising maintenance	Provide as buffer to Significant Environmental Areas		
Closed Forest (Ch. 8)	Provide as a means to buffer/screen adjacent industrial land uses, as reinforcement of the regional landscape within interchanges and to transition into cut embankments	Provide as a buffer to Significant Environmental Areas		
Structured Planting Approach LR-02 (Ch. 8 & 9)	Provide as a controlled outcome to interchanges, intersections, landmarks/ town entries where required in the clear zone	Provide as a controlled outcome buffer to Significant Environmental Areas		
Naturalistic Planting Approach LR-03 (Ch. 8 & 9)	Provide as buffer/transition to national parks and state forests, significant environmental areas and remnant vegetation			
Water Sensitive Planting Approach LR-04 (Ch. 8 & 9)	Provide throughout the corridor	Provide within 300m of waterways		
Landmark /Feature Treatment RF-08 (Ch. 8 & 9)	Provide at Interchanges, town entries and service road roundabouts	Provide at roundabouts and intersections to act as gateways to local area		
Landscape Treatments				
Grass & Turf LR-04 & LR-05 (Ch. 9)	Restrict species selection to varieties reaching heights of 400mm or less. Minimise risk of creating fuel load and fauna attraction			
Street Trees	Provide on service roads where connecting to local area or town	Provide in main street where clear zone requirements can be met		
Raised Medians RF- 07	Provide headlight glare protection	Provide continuous headlight glare protection at curves where sight distance permits	N/A	
Depressed Medians RF-07	Provide headlight glare protection	Provide continuous headlight glare protection at curves where sight distance permits	N/A	
Cuttings RF-02	Assess and identify medium to high erosion risk soils and adopt specialised treatment			
Fill Embankments RF-03	Assess and identify medium to high erosion risk soils and adopt specialised treatment			
Maintenance, Performance and Operations				
Contaminated Land	Meet legislative requirements and adopt principles of Element 1 Contaminated Land Element Management Plans			
Nature Conservation	Meet legislative requirements and adopt principles of Fauna Sensitive Road Design Manual and Element 2 Nature Conservation Element Management Plans			
Degraded Areas	Prioritise rehabilitation as required by Element 3 Degraded Areas Element Management Plans			
Weed Management	Meet legislative requirements and adopt principles of Element 5 Declared Pest Species Element Management Plans			
Road Landscape	Prioritise renewal and enhancements as required by Element 8 Road Landscape Element Management Plans			

ROAD LANDSCAPE FRAMEWORK - LEVELS OF SERVICE				
RURAL CONTEXT (cont)				
URBAN DESIGN				
Road Type	Access Controlled Motorways	Limited Access Highways	Divided Arterial Roads	Undivided Arterial Roads
Urban Design Approaches				
Regional Statement Treatments	Provide treatments in scale with the viewing speed and at junctions of two national highways that will not create driver distraction			
Cultural & Historical Placemaking	Provide treatments in scale with the viewing speed and at significant C&H locations that will not create driver distraction			
Engineered Structures				
Vehicular Bridges and Overpasses UD-02 (Ch. 10)	Provide high quality urban design finishes and detailing		Integrate standard structures into contextual setting	
Tunnels UD-03 (Ch. 10)	Provide high quality urban design finishes and detailing integrating into contextual setting		Integrate standard structures into contextual setting	
Noise Attenuation Structures UD-04 (Ch. 10)	Integrate standard structures into contextual setting			
Retaining Systems UD-05 (Ch. 10)	Integrate standard structures into contextual setting			
Rest Areas and Amenity Blocks				
Heavy Vehicle Rest Areas	Type 1		N/A	N/A
Rest Areas UD-12 (Ch. 10)	Type 1	Type 2	Type 3	Type 3
Scenic Lookouts (Ch. 1, 11 & 14)	Provide where opportunities exist			
Pedestrian/ Cyclist Facilities				
Cycleways UD-13 (Ch. 10)	N/A			
Pedestrian/ Cyclist Underpasses (Ch. 10)	N/A			
Pedestrian/ Cyclist Overpasses (Ch. 10)	N/A			
Footbridges (Ch. 10)	Integrate standard structures into contextual setting			
Pedestrian/ Cyclist Crossings (Ch. 10)	N/A			
Non-regulatory Signs				
Themed Tourism Routes (Ch. 1, 7, 11 & 15)	Develop and provide sign package for designated routes		N/A	
Interpretative Signs/ Panels/ Plaques - Regional (Ch. 15)	Provide at rest areas and scenic lookouts		N/A	
Interpretative Signs/ Panels/ Plaques - Local (towns)	Provide tourism information within service road network		Provide at rest areas and scenic lookouts	

Table A3-2: Road landscape framework - rural context

3.4.3 Application of Road Landscape Frameworks

Road Landscape Framework levels of service must be applied to all state controlled roads in the network. The method of delivery is through two programs:

- Queensland Transport & Roads Implementation Program (QTRIP) for new and upgraded roads and transport systems
- Maintenance, Performance and Operations (MP&O) Program for renewal and upgrading to minimum levels of service as well as routine maintenance

This commitment will be realised progressively over time, with a program of continual improvement based on this manual and the MP&O Program.

3.4.3.1 Transport & Roads Implementation Program

The transport planning and design process is funded through the QTRIP as is the construction. The sources of the funding may include both the Federal and State Governments. The program funds special government initiatives for one-off projects. Application of the Road Landscape Frameworks will ensure consistent outcomes in the planning, design, construction and maintenance across the State. The frameworks are flexible enough to allow planners and designers to explore creative and diverse design responses that ensure public amenity, liveability and sense of place (Figure A3-12).



Figure A3-12: Effective urban design finishes and artwork creates a unique experience for users of integrated transport corridors

3.4.3.2 Maintenance, Performance and Operations (MP&O) Program

Maintenance Performance and Operations Program is a sub-program of within QTRIP that funds the Elements.

“A work element is a work activity, responsibility or system management issue driving the need for delivery of network enhancement works, maintenance and preservation works, and road system operations. A work element requires significant investment allocation or action and prioritisation over the long term. A work element also requires a consistent, defensible state-wide management approach, based on identified needs against performance targets” (Road System Manager Framework, 2008: p 20).

3.4.3.3 Transport and Road System Manager Framework

The transport and road system manager framework groups like elements together. The work elements have been categorised into the following groups:

- corridor management (environment) – including environmental legislative requirements as per the Department’s Environmental Legislation Register;
- corridor management (road safety);
- program maintenance;
- rehabilitation;
- routine maintenance; and
- traffic operations.

The corridor management elements are contaminated land, nature conservation, degraded areas, heritage management, declared pest species, fire risk management and road landscape. The corridor management (road safety) include several elements to which road landscape makes a significant contribution towards. These include bicycle and pedestrian facilities, driver fatigue management, batter slope management, and pedestrian accessible overpasses (Figure A3-13).

The road landscape frameworks cross over numerous work elements requiring all asset managers to be aware of the requirements of this manual. It is through progressive implementation of these levels of service that the objective of the road landscape policy will be achieved.



Figure A3-13: Overpass for pedestrians and cyclists safely links rail station to car park, bus stops and pathways, providing effective access and connectivity for users

Routine maintenance addresses the reoccurring tasks across the whole range of assets and the network. The intervention levels are prescribed under the Road Maintenance Performance Contract.

3.4.3.4 Element Management Plans

The Road Landscape Frameworks support the Element Management Plans by establishing the minimum service levels for state controlled road corridors throughout Queensland. The purpose of an Element Management Plan is to set the technical governance for the administration of each element to meet legislative and corporate obligations. The plan outlines:

- the scope;
- legislative and corporate obligations;
- the network deficiencies against the levels of service;
- data collection and storage processes;
- forecasts costs; and
- business rules to set priorities.

The goal of these management plans is to deliver consistent outcomes across the state, focusing funding and resourcing in a systematic way. The environmental elements listed above are the primary method for achieving renewal and upgrading current deficiencies.

3.4.3.5 Maintenance Forward Planning

When planning and designing transport corridor upgrades, the maintenance activities of the existing corridor should be reviewed to create a benchmark for assessing against the road landscape frameworks level of service. While an upgrade may create a new set of maintenance requirements, the goal must be to reduce or eliminate the frequency of high cost activities. This may mean a higher capital investment.

There are significant differences in maintenance costs, as well as reduced safety risks to personnel, when alternative maintenance activities in lieu of traditional slashing / mowing practices are developed, adopted and applied.

The most common traits exhibited relative to existing roads prior to any upgrades occurring are:

- single carriageway (with no median);
- lower speeds;
- lower traffic volumes (potentially); and
- relatively undisturbed and minimal surrounding landforms.

The maintenance activities undertaken are standard activities are undertaken as a reactive measure to an unplanned event or once an intervention level has been reached (Figure A3-14). These activities are often limited to the following, as a way of maintaining sightlines for safety and also as a measure of weed control:

- tractor slashing and/or mowing;
- clearing; and
- herbicide treatment/ spraying or spot spraying.



Figure A3-14: Slashing/ mowing to grassed median and verge requires 8 to 10 maintenance interventions per annum

Upgrading to a multi-lane roadway creates a different physical environment often requiring alternative maintenance activities. The most common traits exhibited are:

- dual carriageway (with a median);
- possible higher speeds;
- increasing higher traffic volumes over time; and
- potentially a high level of disturbance to surrounding landforms, and the creation of often steeper and more extensive batters and embankments.

The maintenance activities required for these roadways are often not more intensive; they can actually be less intensive if the landscape and revegetation treatments are designed effectively (Figure A3-15). Different maintenance activities require planning and scheduling in order to be most effective. Some of these activities include:

- herbicide spraying;
- re-mulching – topping up the existing mulch in planting beds;
- renewal – removal of poor performing, dead or dying, or at end of life vegetation and replacement with like for like plant species; and
- tree pruning and/or thinning.



Figure A3-15: The maintenance interventions of planted median will progressively reduce to one intervention per annum

Understanding the magnitude of the change in the infrastructure profile should guide the design process in attaining a maintenance minimisation strategy for the constructed works.

3.5 Designing and Constructing to Regional Differences

Each region will have variations within them that must be taken into account when designing the road landscape. For ease of association, the state has been divided into three zones.

3.5.1 Arid Regions west of the Dividing Range

The vast arid areas west of the Great Dividing Range pose a unique set of challenges. These include:

- extremes in temperature;
- limited rainfall and prolonged droughts;
- highly dispersive soils that dissolve easily; and
- remoteness and limited available resources including water to economically rehabilitate disturbed area.

Areas disturbed in these regions may take years to regenerate. Design solutions need to be focused on protecting the soil layers until the next rainfall event.

3.5.2 Subtropical Regions east of the Dividing Range

Subtropical areas have the most flexibility in terms of design solutions. The challenges of subtropical areas are:

- moderate to mild temperatures;
- variable rainfalls with cyclical droughts;
- rapid growth of and high variety of subtropical and some tropical invasive weeds; and
- moderate diversity of micro-climate and vegetative communities.

Design responses need to focus on maintenance minimisation and safety while integrating the road landscape into communities.

3.5.3 Wet Tropics of Far North Queensland

The Wet Tropics of far north Queensland pose challenges that require specific management. These are:

- definite wet and dry seasons which limit most types of construction activity;
- prolonged periods of high humidity and rapid growth;
- tropical rainfall and cyclonic conditions which require higher resolution of erosion and sediment control measures;
- rapid growth of and high variety of invasive tropical weeds; and
- diverse micro-climates and vegetative communities.

Design responses need to focus on establishing permanent erosion and sediment control measures quickly while producing tree and shrub canopy to minimise weed infestation and establishment.