

Chapter 13.0 - Landscape and Visual Amenity Assessment

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13.0 Landscape and Visual Amenity Assessment

13.1 Overview

The objective of this chapter is to identify the existing landscape features and determine any significant impacts of the proposed KBP on the landscape and visual amenity of the study area and to provide potential mitigation measures where necessary.

13.1.1 Limitations and Assumptions

A number of assumptions and limitations have been made about the project.

13.1.1.1 Assumptions

The assumptions associated with the landscape and visual amenity assessment are:

- All noise walls are assumed to be 4.0 metres high (will be resolved by detailed noise modelling);
- The assessment considers one option for the Centenary Motorway connection;
- The assessment considers two options for the Moggill Road connection and;
- The assessment only considers the impacts associated with an embankment approach and bridge structure across Moggill Creek.

13.1.1.2 Limitations

The limitations associated with the landscape and visual amenity assessment are:

- The assessment is based on the engineers' preliminary drawings illustrating proposed vertical and horizontal road alignments and concepts for associated treatments. This scheme is currently conceptual and the final design may vary from that described within;
- The assessment is based upon publicly accessible views. This is in accordance with good practice as it considers that more people would obtain views from these locations, as opposed to views from private land. However, given the nature of this specific project, consideration has been made of the views observed from private property. The site work did not include access to private property, and, therefore, the conclusions drawn are based upon assumptions made from the publicly accessible locations;
- The photo simulations are based on a preliminary engineering concept scheme. The end built form may differ from that portrayed in the images and, therefore, these images are purely indicative;
- No detailed night-time assessment has been undertaken. However, impacts associated with the proposed lighting have been considered and a commentary, where appropriate, has been provided;
- The site assessment work was carried out in the day and at dusk between August and October 2008;
- The digital terrain model (DTM) used for the Geographic Information System (GIS) and Photo Simulation modelling is at one metre contours intervals along the KBP corridor (approximately one kilometre either side of the road);
- The projected visual character of the study area is based on the known character at present and the expected growth as per the current Local Growth Management Strategy (LGMS) and Brisbane City Plan; and
- At the time of assessment the construction timing and timeframe of the KBP and the Centenary Motorway Upgrade was unknown.

It is important to consider the conclusions of this assessment in the context of these limitations; however, it is not considered that any of these limitations would have a significant effect on the assessment of impact.

13.2 Approach and Methodology

There is no published guidance on landscape and visual amenity impact assessment specific to Australia. Therefore, industry typically refers to guidance from elsewhere as well as assessment guidance specifically developed for roads by DMR.

The methodology for this assessment has been developed in-house with reference to the:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA) developed by the (UK) Landscape Institute and Institute for Environmental Management (LI & IEMA 2002);
- The US Forestry Service, Scenic Management System (SMS) (US DAFS 1996);
- Landscape Character Assessment Guidance for England and Scotland (CA & SNH 2002); and
- Road Landscape Manual Part A2-1 Landscape Assessment Process and Part A3-1 Visual Assessment Process (DMR 1997).

The following steps were undertaken in the assessment of the landscape and visual impacts of the KBP.

13.2.1.1 Identification of Baseline Conditions

Baseline conditions were identified from a desktop survey, GIS analysis and site survey.

GIS analysis was used to understand the current landform and to generate "zone of visual influences" (ZVI) (i.e. parts of the surrounding area that could potentially view some part of the KBP). ZVI were undertaken of the proposed road carriageway.

Following the desktop and GIS analysis, a series of site inspections were carried out to evaluate the existing visual character of the area and specifically identify representative viewpoints for the assessment. These representative viewpoints were selected to comprehensively illustrate the visual impacts of the KBP on key viewer groups.

13.2.1.2 Assessment of Visual Impact

The assessment of visual impact is based on the identification of the level of visual modification created by the KBP, and the sensitivity of the viewer. Combined, these characteristics are considered to assign a level of likely visual impact. The visual impact for each representative viewpoint is assessed according to the assessment significance criteria identified in Table 13.1. The assessment methodology and associated terms are explained more fully in Appendix 13-A. Four photo simulations have been prepared to explore and illustrate the likely effect of the scheme on particular selected views.

	Visual Sensitivity					
Visual Modification		National sensitivity	State sensitivity	Regional sensitivity	Local sensitivity	Less than local sensitivity
	Considerable	Major	Major	High	High	Moderate
	Obvious	Major	High	Moderate	Moderate	Minor
	Slight / noticeable	High	Moderate	Moderate	Minor	Negligible
	None / Barely perceptible	Negligible	Negligible	Negligible	Negligible	Negligible

Table 13.1: Criteria for Significance of Visual Impact

Table 13.2 lists the terms that have been used to describe the existing landscape condition or quality.

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Table 13.2: Landscape Condition/Quality Terms and Definitions

Term	Definition
Recognisable	A landscape that visually functions as a specifically recognisable structure eg as a park or area of bushland.
Good	A recognisable landscape structure
	There is scope to improve landscape management
	Some features worthy of conservation
	There is a positive sense of place
	Occasional features of visual detraction e.g. large numbers of weeds
Ordinary	A recognisable landscape structure
	Scope to improve landscape management
	Occasional features worthy of conservation
	Some features of visual detraction e.g. large numbers of weeds
Poor	A weak landscape structure
	Lack of landscape management has resulted in general degradation
	Limited or no features worthy of conservation
	Frequent features of visual detraction

13.2.1.3 Mitigation

The landscape and visual mitigation opportunities identified have been developed collaboratively in conjunction with the engineering design team to alleviate impacts identified.

Mitigation has been divided as follows:

- Opportunities that can be incorporated into the existing scheme without modification to the engineering proposals; and
- Additional landscape and visual mitigation measures and opportunities that could change the engineering proposals.

13.2.1.4 Residual Effects

The effects that remain after consideration of the proposed mitigation measures (identified in Appendix 13-D) are described. The viewpoints are reassessed and again assigned with a significance level.

13.2.2 Applicable legislation

The KBP is within the south western suburbs of BCC. This area is subject to both Queensland government policy and BCC policy which includes provisions relating to visual issues.

The following section summarises the relevant strategic and local planning guidance in the study area and identifies any relevant policy direction for visual amenity.

13.2.2.1 Strategic Planning Framework

South East Queensland Regional Coastal Management Plan: 2006

The *Coastal Protection and Management Act 1995* requires regional coastal management plans to be prepared for the Queensland's coast. The South East Queensland Regional Coastal Management Plan (SEQRCMP) was completed in 2006. The SEQRCMP complements the South East Queensland Regional Plan (SEQRP) and seeks that growth in the coastal areas of this region occurs in a sustainable manner. The corridor crosses Moggill Creek which is located within the Coastal Management District of Darra and specifically coastal management district boundary segment numbers 1592-1594. The Creek is designated both as a "Coastal management district over water" and a "Coastal management district over land". These are shown on the Figure 13.1 below.



Figure 13.1: Extract from SEQRCM Plan 2006 illustrating the KBP

No regional direction has been provided for the State Coastal Plan policies, as they have been addressed by the SEQ Regional Scenic Amenity Study. The guidance states "*The SEQ Regional Plan seeks to acknowledge, protect and manage significant scenic amenity areas and features such as coastal waters, wetlands, dunes and foreshores.*"

South East Queensland Regional Plan (SEQRP), 2005-2026

The SEQRP provides a statutory framework for the management of future urban growth, change, land use and development in the fastest growing region of Australia - South East Queensland - to 2026. The Plan is undergoing a formal review, in accordance with the *Integrated Planning Act 1997* (*IPA*), which should be completed by mid 2009. The review is extending the time frame to 2031 and is reviewing the strategic direction, principles and policies. It is anticipated that there will be changes to provisions relating to Scenic Amenity.

The SEQRP identifies a number of Regional Land Use Categories, which include the Regional Landscape and Rural Production Area; Urban Footprint; Rural Living Area; and Investigation areas. It is intended that areas of "significant scenic amenity, significant and popular viewpoints" (DLGPSR 2005 p3) in all land use categories are identified.

The KBP is located within both the Urban Footprint and Regional Landscape and Rural Production Area. A small section from Moggill Road to Moggill Creek falls within the Regional Landscape and Rural Production Area, whilst the remainder of the KBP is located within the Urban Footprint.

Currently the SEQRP aims to "*acknowledge, protect and manage significant scenic amenity areas and features*"¹. This theme is carried through Desired Regional Outcomes (DRO), which aim for sustainable outcomes within the context of the pressures for development. The provisions which relate to Scenic Amenity are discussed more specifically in DRO3, Regional Landscape².

¹ Part F: Regional policies 3 Regional landscape; 3.2 Scenic Amenity

² Part F, Section 3.2,

One of the policies (3.2.4) calls for "a common method of assessing scenic amenity" to be adopted for SEQ. In response to this the SEQRP's Implementation Guideline No 8—Identifying and protecting scenic amenity values" has been developed. It provides "voluntary procedures for Local and State government to implement scenic amenity policies of the SEQ regional plan by identifying and protecting areas of high scenic amenity, popular and significant viewpoints, and important view corridors".

A key component of these guidelines is the identification and mapping of areas of high scenic amenity. Areas of "high scenic amenity" are rated as 10, whilst areas of "lowest scenic amenity" are rated as 1. The rating is devised from the combination of two variables, "scenic preference" (i.e. what landscape or area members of the community generally like to view) and "highest visual exposure" (i.e. the extent to which a landscape is seen by viewers or people). An extract of the Interim Scenic Amenity Mapping is in Appendix 13-B, Figure 1. In accordance with the procedures, BCC has developed local scenic amenity mapping, called Landscape Amenity Values and Attributes (LAVA). However for reference, we have reviewed both the LAVA mapping and the *Interim Scenic Regional Amenity Maps 2004*. For details on LAVA mapping refer to Section 13.2.2.2 below. An extract of the LAVA mapping is in Appendix 13-B, Figure 1.

South East Queensland Infrastructure Plan and Program (SEQIPP), 2008-2026

SEQIPP outlines the infrastructure needed to support the SEQRP. It identifies \$82 billion worth of investment over the life of the plan, including transport projects. The KBP is one of the key projects identified in the Western Corridor to "*encourage urban development away from the coast*".

13.2.2.2 Local Planning Framework

Brisbane City Plan: BCC

KBP crosses urban, sport and recreation/open space and rural land uses. These land uses are shown on the proposed land use and zoning plan in Appendix 13-B, Figure 2.

The City Plan makes a number of provisions related to landscape and visual amenity issues. A number of these key issues are addressed in the Landscaping Code. Specific purposes of this code related to the KBP include:

- Maintain and strengthen the green subtropical character of the City;
- Create aesthetically pleasing, safe and functional environments for people to live, work, visit and invest in;
- Ensure landscaping enhances the local identity of different parts of the City;
- Provide attractive streetscapes that reinforce the functions of a street, enhance the amenity of buildings and are sensitive to the built form, landscape and environmental conditions of the locality;
- Ensure landscaping complements the built environment in terms of scale and composition;
- Ensure significant on-site vegetation is retained, protected and integrated into development design; and
- Ensure landscaping is a functional part of development design.

A number of performance criteria that are specifically related to this assessment include boundary treatments between development and residential areas (i.e. P3 and P8 which consider overlooking and buffering to private residents). Specifically P3 states "*landscaping along boundaries must maintain privacy between adjoining residences …*"

LAVA Mapping

In response to the SEQRP, BCC prepared a *draft Urban Open Space Strategy*, for inclusion in a LGMS (known as the *Cityshape Implementation Strategy*.) The LAVA map was developed to assist with policy responses for the protection and enhancement of landscape assets for Brisbane City and is part of the draft *Urban Open Space Strategy*.

The mapping "*provides citywide information about the landscape asset and outdoor services provided by the landscape asset*". Landscape assets across the city have been mapped, building on methods used in the SEQ Scenic Public Preference Survey/Visual Exposure Project, by including data on trees, water, terrain and microclimates. This LAVA mapping has rated areas of Brisbane ranging from 0 (red) to 25 (dark emerald, green). Zero is the area of lowest landscape amenity value e.g. areas with no tree cover, not near a waterway, of low scenic amenity value and with low topographic variation, as compared with areas of high value rated as 25, where there is a high degree of tree cover, the location is near water, has a high scenic amenity value and there is a high level of topographic variation.

"A LAVA score of 16 or higher potentially indicates relatively high levels of landscape amenity services that may deserve protection. A score of 15 or less potentially indicates an opportunity to enhance landscape amenity services."

Draft CityShape Implementation Strategy: BCC

The Pre-State Interest Review Draft CityShape Implementation Strategy is BCC's LGMS that translates the high-level polices, targets and spatial directions of the SEQRP into strategies that can be implemented at the local level. The strategy proposes eight strategies, one of which is the "Urban Open Space".

Specifically the strategy aims to recognise and protect landscape values. It states that LAVA mapping should be used "to inform proactive enhancement of landscape amenity" with particular emphasis on tree cover in areas undergoing redevelopment and areas identified as having low LAVA scoring "in recognising and protecting landscape values". Specifically it states "...ensure major transport corridors incorporate plantings to enhance landscape amenity".

13.3 Existing Visual Values

The following section describes the existing visual conditions and values in terms of the:

- Landscape and visual character of the study area (i.e. the appearance of the landscape surrounding the proposed KBP);
- Visual character of the site (i.e. the visual character of the current site or area that would be affected);
- Predicted future changes to the existing landscape; and
- Stakeholder and community concerns.

This understanding creates a baseline for the visual assessment to follow in Section 13.5 of this chapter.

13.3.1 Landscape and Visual Character of the Study Area

The KBP is proposed through the south western suburb of Kenmore in Brisbane. The study area is a typical Brisbane suburban residential area, built from the 1960's onwards. The suburb is supported by local community services such as schools and small commercial precincts and open space infrastructure such as sport and recreation playing fields and public parks.

To the north and south of the KBP corridor within the study area, the low density, detached residential housing is typically one or two storey and of brick or wood construction. Modern infill, sub-division development has occurred in selected areas. To the west of the study area, the less developed, rural residential suburbs of Brookfield and Pullenvale are found, typified by larger rural residential lots, greater tree cover and less local road and associated lighting infrastructure. Similarly there are larger acreage properties at the eastern end of the corridor towards Fig Tree Pocket and the Centenary Motorway.

The local topography (Appendix 13-B, Figures 3 and 4) shows that the study area's topography is varied, with pronounced undulations and steepness of slopes. Distinct topographic and visually prominent hydrological features include:

• A locally prominent ridgeline along which Kenmore Road is located;

- A series of spurs located off the Kenmore Road ridgeline including:
 - a spur along Wyndarra Street and dividing Moggill Creek and Gem Road; and
 - a spur along Sunset Road;
- A pronounced valley running on an east to west orientation from Kenmore Road to Rialanna Street;
- The Moggill Creek floodplain; and
- The Brisbane River.

These features are shown on the Landscape Analysis (Appendix 13-B, Figure 5). The KBP corridor is crossed by the Kenmore Road ridgeline and the Wyndarra Street spur.

The existing landscape and visual character of the local area, including the location of built form is heavily influenced by the local topography, for example the existing local distributer roads have been located on the elevated ground.

Scattered established vegetation is found throughout the study area within property boundaries, along the local roads, and to separate Centenary Motorway from adjacent residential areas and in open spaces.

13.3.2 Visual Character of the Site

The three kilometre corridor is currently perceived broadly as a linear green space between Centenary Motorway and Moggill Road. Sections of the existing road reserve provide an informal suburban park for local residents (i.e. between Kenmore and Gem Roads), however only Marland and Twilight Street Parks (north of Sunset Road), areas of Moggill Creek floodplain, as well as open space between Marland and Twilight Streets are formally designated as parkland in BCC's area classification (refer Appendix 13-B, Land Use and Zoning, Figure 2) and Chapter 11 Land Use and Planning.

For the purposes of this study, the KBP corridor can be divided into four landscape character precincts as shown on Figure 13.2:

- Kersley Road Gully: Chainage 1100-1900.
- Kenmore Road to Gem Road Open Space Corridor: Chainage 1900-2850.
- Gem Road Spur: Chainage 2850-3200; and
- Moggill Creek Floodplain: Chainage 3200-4100.



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Legend

	Centenary Motorway
	Kenmore Bypass
	Moggill Road
	River/creek
Chair	age Sections
	1100 to 1900
	1900 to 2850
	2850 to 3200
	3200 to 4100

Data sources: Roads, railway, rivers etc - Copyright 2006, MapData Sciences PTY LTD, PSMA

Aerial Imagery: Copyright Qasco Surveys Pty Limited (2005). Air Quality Information provided by ENSR Australia, Brisbane for the Kenmore Bypass Environmental Study.

KENMORE BYPASS

Landscape Character Precincts

Figure 13.2

Kersley Road Gully: Chainage 1100-1900

This precinct is characterised by a deep, pronounced and tree covered gully sitting between Kersley Road spur and Kenmore Road ridgeline. Existing tree cover includes *C. citriodora* (Lemon Scented Gum) and *E. tereticornis* (Forest Red Gum) and forms a closed canopy up to 20 metres high which is visually prominent from the locally surrounding area. A key feature is the unmanaged and weed invested drainage channel on the gully floor.

Overall, this area's landscape condition (quality) is considered to be "good" (See Table 13.2) as there is established tree cover, which is worthy of protection and the area retains a recognisable landscape structure. However, there are some detracting features including the weed invested waterway and the poor quality of slashed grass.

Kenmore Road to Gem Road Open Space Corridor: Chainage 1900-2850

At the eastern end of this area the landform drops off steeply from Kenmore Road resulting in a precinct characterised by a deep, pronounced and tree covered gully. Existing tree cover includes large gums such as *Corymbia citriodora* (Lemon Scented Gum), *E. acmenoides* (White Mahogany) and *E. tereticornis* (Forest Red Gum), which form a closed canopy for the majority of its length from Kenmore Road to Marland and Twilight Street Parks. This is the same unnamed drainage line that exists in the Kersely Road Gully character precinct described above.

Overall this area's landscape condition (quality) is considered to be "ordinary" (See Table 13.2) as there is established tree cover and the area retains a recognisable landscape structure. Detracting features are the weed invested waterway and the poor quality of slashed grass. However this preserved corridor is valued by the local community and has a sense of place that contributes to the existing local visual amenity.

Gem Road Spur: Chainage 2850-3200

This area is a wooded spur (potentially hard rock) that divides the Moggill Creek floodplain from Gem Road. Most of this area is covered in visually intact and prominent bushland that forms a closed canopy. Tree cover includes eucalypt species such as *Eucalyptus melanophloial* (Silver Leafed Ironbark) and *E. tereticornis* (Forest Red Gum).

Overall this area's landscape condition (quality) is considered to be "ordinary" (See Table 13.2) as there is established tree cover, which is worthy of protection and some of the area retains a recognisable landscape structure. Detracting features include weed cover throughout and poor quality slashed grass.

Moggill Creek Floodplain: Chainage 3200-4100

This mildly undulating floodplain has a distinct open, rural character with pastoral fields, grazed by horses, and tree cover confined to property boundaries, the creek or field boundaries. Most field boundaries are wooden post and wire fence. This area contrasts markedly with the urban areas of the study area immediately to the north, south and east. Moggill Creek is a key landscape feature that is a relatively visible cue in the area. It should be noted that the riparian vegetation along Moggill Creek provides a valuable corridor for fauna movement.

Overall the existing road reserve landscape condition (or quality) is considered as generally "good" (See Table 13.2). This area has a "recognisable" rural landscape structure (See Table 13.2).

13.3.3 Predicted Future Changes to the Existing Landscape

Some of the study area's landscape is anticipated to undergo a number of major changes in the next 20 years, whilst other areas are predicted to undergo very minor, incremental changes.

Predicted future changes that may impact on the existing character of the area include:

- The upgrade and widening of Centenary Motorway;
- The upgrade of Moggill Road; and
- Continued infill residential development on larger lots increasing the urban density of the area.

The anticipated considerable changes are associated with the upgrade of the road infrastructure at either end of the KBP (i.e. Centenary Motorway in the east and Moggill Creek Road in the west). The exact extent of these upgrade proposals is currently unknown but for the purpose of this assessment it has been assumed that both roads would be widened. This intensification of transport infrastructure could impact significantly on the areas immediately adjacent to the proposals and whilst cumulatively, with the provision of the KBP itself, would further lead to urban intensification of the area. Interactive impacts and effects will be associated with elevated ambient levels of noise (refer to noise assessment for detail) and the loss of established tree cover.

Within the general wider study area changes are considered to be minor. There are a number of trends that will continue to influence the area and these include gradual infill development such as further sub-division of larger lots (particularly at the eastern end of the KBP around Kersley Road) and further urban encroachment and land take of open space (both public and private) for urban development and formal recreation facilities such as playing fields.

13.4 Description of the Engineering, and Landscape and Urban Design Proposals

13.4.1 Landscape and Urban Design Proposal

Landscape and urban design treatments are proposed to visually integrate the KBP into the suburb of Kenmore. These integration proposals are illustrated within the Landscape and Visual Integration Guidelines contained in Appendix 13-D.

13.4.1.1 Kersley Road Gully: Chainage 1100-1900

This precinct is characterised by a deep, pronounced and extensively tree covered gully sitting between Kersley Road spur and Kenmore Road ridgeline. The tree cover is a visually prominent feature in the local area and its removal would be highly visible from adjacent areas. It should be noted that on-going sub-division in this area may also affect its semi-rural character.

Landscape Design

The key components of the landscape design through this character area include:

- Dense tall tree planting should be incorporated along the entire northern and southern flank of the road through this precinct as far as possible, mimicking the existing native planting that already exists here and adopting a bushland regeneration approach. Note, for planting to successfully establish along the embankment it should ideally need to be at a minimum grade of 1 in 2.5.
- Dense tall planting to the interchange to frame the proposed structures.
- Cutting treatment at Kenmore Road preferably to be, exposed bedrock (depending on the outcomes of the geotechnical investigations). Alternatively, where space allows, use a green cutting treatment, using a benching system to allow planting in the cutting on individual benches. Refer to Appendix 13-D.
- Seek soft or hard landscape measures to provide visual separation between the road and shared recreational path.

Urban Design

The key components of the urban design that could be harnessed to visually integrate the KBP include:

- The design of the Centenary Motorway bridge should visually integrate the structure with existing infrastructure and the surrounding landscape. The intersection urban design works should reinforce the proposed local connection node idea.
- Urban design treatment and planting at the base of the retaining structures using climbers that could grow over the wall and soften its visual impact. Refer to Appendix 13-D for the options to integrate the walls.

13.4.1.2 Kenmore Road to Gem Road Open Space Corridor: Chainage 1900-2850

This corridor is perceived by the local community as a public open space, even though it is a preserved transport corridor. This open space would be entirely replaced by road infrastructure. The

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landscape and urban design responds to the loss of this open space infrastructure by providing compensatory mitigation measures as well as trying to provide some visual relief for those residents immediately adjacent to the corridor (i.e. those along Marland and Twilight Streets) who are anticipated to be significantly impacted by the KBP.

Landscape Design

The key components of the landscape design through this character area include:

- Given there is very limited or no space between the property boundaries and the KBP, existing property boundary tree planting should be retained or consideration given to the planting of new trees to the greatest extent possible (refer to additional mitigation opportunities in Section 13.5.5 on tree planting through this precinct).
- Upgrade Marland and Twilight Street Parks for the local community, providing additional facilities such as a playground, BBQ and shelter, new footpaths and sport equipment.
- Provide native feature, formal planting to accentuate the preferred pedestrian bridge option.
- Off site tree planting program for the residential properties on the south side of Marland Street and the north side of Twilight Street should be considered that allows tree planting works to be incorporated on the property boundaries to visually screen the noise walls and retaining walls.
- Seek soft or hard landscape measures to provide visual separation between the road and shared recreational path.

Urban Design

The key components of the urban design that could be harnessed to visually integrate the KBP include:

- Utilise transparent materials in the noise walls, particularly in the upper components of the walls to lighten the visual mass of the structures and avoid over shadowing of properties to the south of the KBP (i.e. along Twilight Street).
- Urban design treatment and planting at the base of the retaining structures using climbers that would grow over the wall. Refer to Appendix 13-D for the options to integrate the walls.
- The pedestrian bridge is to be utilised as a key visual cue for both the road users and for the adjacent community.

13.4.1.3 Gem Road Spur: Chainage 2850-3200

The existing wooded spur has a recognisable landscape feature (See Table 13.2). This feature would be cut in half with the construction of the KBP. The aim here should be to alleviate and reduce the landscape and visual impact of the KBP by treating the cuttings and retaining walls appropriately to integrate the potentially harsh forms back into the landscape as far as possible. In addition, the proposal aims to provide a sufficient visual and physical landscape buffer for adjacent residents of Parkway and Summerfield Places, and Sachs Court.

Landscape Design

The key components of the landscape design through this character area include:

- Existing edge tree planting to be retained as far as possible through this section, with particular consideration of the existing vegetation on the back of the properties at Parkway and Summerfield Places.
- Dense tall tree planting should be incorporated along the entire northern and southern flank of the KBP through this precinct as far as possible, mimicking the existing native planting that already exists here and adopting a bushland regeneration approach.
- Consideration of an off site tree planting program for the residential properties around Sachs Court that allows tree planting works to be incorporated onto the property boundaries to visually screen the noise walls. Species selection and proximity to the corridor should be considered.
- Cutting treatment to be preferably exposed bedrock or green (depending on the outcomes of the geotechnical investigations). Alternatively, where space allows, investigate a benching system that allows planting on the individual benches. (Refer to Appendix 13-D).
- Seek soft or hard landscape measures to provide visual separation between the road and shared recreational path.

Urban Design

The key component of the urban design that could be harnessed to visually integrate the KBP is for urban design treatment and planting to the top of the retaining structures. Refer to Appendix 13-D, for options to integrate the walls.

13.4.1.4 Moggill Creek Floodplain: Chainage 3200-4100

The existing wooded rural area has a recognisable landscape structure (See Table 13.2). Given the KBP corridor clashes with this existing character, the integration measures aim to lighten the visual mass of the KBP will in effect, screen it from the majority of the surrounding area. The landscape and urban design proposal aims to go further than just the KBP corridor boundary, therefore enhancing the landscape and further reinforcing the existing wooded character.

Landscape Design

The key components of the recommended landscape design through this character area include:

- Dense tall tree planting to and around the Moggill Road connection. The planting works here would adopt a bushland regeneration approach utilising the existing tree cover within the local area.
- Riparian and mangrove habitat regeneration along Moggill Creek at the bridge crossing and within the area between the road and the creek to the north of the road between Chainage 3400-3700. Combined with the low planting along the northern embankment, this will utilise Moggill Creek as a key visual node along the corridor by allowing views from the KBP corridor to the waterway.
- Investigate if there is potential for off site tree planting program (between BCC and DMR) in the Rafting Ground Reserve.
- On the south side of the KBP between Chainages 3400-3700, dense tall tree planting between Moggill Creek and the start of the Gem Road Spur. The pony club area could be utilised for offset planting or, as a minimum, planting works should be undertaken to the embankment to screen views of the road and noise walls for users of the club and residents along Yarawa Street. Note for planting to occur on the embankment, the embankment structure would ideally need to at a minimum grade of 1 in 2.5.
- Seek soft or hard landscape measures to provide visual separation between the road and shared recreational path.

Urban Design

The key components of the urban design that could be harnessed to visually integrate the KBP include:

- Provide a bridge structure that is responsive to the rural character of the existing area. The design of the structure should be in character with the waterway e.g. separate structures for individual carriageways, no piers in the waterway, planted abutments. Refer to Appendix 13-D.
- As a compensatory mitigation measure, provision of a shared recreational path connection between the road and the Rafting Ground Reserve (two possible options are illustrated in Appendix 13-D) could be provided.
- Utilise transparent materials in the noise walls, particularly in the upper components of the walls to lighten the visual mass of the structures.

13.5 Potential Impacts and Mitigation Measures

The following impact assessment of the KBP is divided into the following:

- Description of the visual changes associated with the KBP;
- Visual impacts on the Regional Scenic Amenity and Brisbane City's Landscape Values;
- Visual influence of the KBP;
- Selection of representative viewpoints; and
- Assessment of representative viewpoints.

13.5.1 Visual Changes Associated with the Preferred Alignment

To understand KBP, the impact assessment commenced with a description of the visual changes associated with the KBP. This sets the scene for the subsequent visual impact assessment and significance evaluation in the following sections.

The descriptions of the proposed visual changes have been divided into the four landscape character precincts.

Table 13.3:	Visual Changes	Associated with the	Preferred Alignment
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Character Precinct	Description of the KBP through the landscape precinct
Kersley Road gully	The natural landform through this section is the most varied. The northbound Centenary Motorway connection would have two on and off slip roads. One would allow free flowing traffic from the KBP to the Centenary Motorway north bound carriageway whilst the other on ramp will connect to the west bound lanes of the KBP. Overall this would result in land take for infrastructure, and tree removal. The connection from and onto the Centenary Motorway southbound carriageway would require grade separation (a bridge would be provided over Centenary Motorway) and a signalised intersection.
	From the Centenary Motorway until around Chainage 1500, the KBP would be located on a new embankment structure up to a maximum of 9.4 metres high. From Chainage 1500 to Kenmore Road a cutting would be required, firstly smaller, followed By a larger cutting under Kenmore Road up to 8.1 metres.
	Noise walls up to 4 metres high would be required from approximately Chainage 1400 to 1650 on the northern side of the KBP, and from approximately Chainage 1650 until Kenmore Road along the southern side of the road.
	Visually significant bushland tree cover would be removed where land take is required for the KBP infrastructure.
Kenmore Road to Gem Road open space corridor	This open space corridor would be changed to road infrastructure that would be in the most part located on a raised embankment, formed by a combination of battered slopes and retaining walls. Noise walls, up to 4 metres high, would be located along the entire southern and northern lengths of KBP through this section. The noise walls would be located on the top of the embankment / retaining structure adjacent to the road.
	At Chainage 2260 the KBP gradually rises to go under Kenmore Road with minimal cut. By Chainage 2050 a large embankment structure would be required through this narrow corridor section and as a result would require vertical retaining structures up to a maximum height of approximately 9 metres high. The greatest impact would occur at around Chainage 1880.
	A relatively low embankment structure would be required between Chainage 2260 and 2850, up to a maximum of approximately 2.0 metres high. Along the south side of the corridor from Chainage 2000-2600 a retaining wall would be required. This is because of the very constrained nature of the existing corridor.
	At the time of assessment, three pedestrian bridge options were considered, around Gem Road. All would be a visually prominent structure. Refer to Section 13.5.3 for a comparison of the visual impact of the three options.
	Visually significant individual, scattered trees would be removed and there will be very limited space remaining for replacement tree cover on the housing boundaries. The largest amount of tree cover to be removed is at the Kenmore Road end of the corridor between Chainage 1900 and 2300.

Character Precinct	Description of the KBP through the landscape precinct
Gem Road spur	A visually prominent cut up to 12 metres deep would be required for the KBP to traverse this locally prominent spur, with a combination of battered slopes and retaining walls (pile type with facing). The concept design proposes a vertical retaining wall (approximately 300 metres long) along the majority of the northern length of this section. Along the southern side of the road from the floodplain, a battered cut of approximately 200 metres at 1:2 gradient is required, followed by a retaining wall of approximately 100 metres long to Gem Road. Gem Road would be severed and cul-de-saced by the KBP.
	This current concept allows a visually significant stand of vegetation to be retained on the south side of the road. This provides a significant visual buffer for the properties along Parkway and Summerfield Places.
	Noise walls, up to 4 metres high, are to be sited on the top of the cutting and retaining walls from approximately Chainage 2900 - 3090 on the northern side of the KBP and from approximately Chainage 2940 – 3150 on the southern side of the KBP through this section.
	A large stand of visually significant bushland cover between Chainage 3000 and 3300 would be removed.
Moggill Creek floodplain	At the time of the assessment, there were two Moggill Road connection options. Both comprise signalised T junctions. Option A is designed for priority flow along Moggill Road with the KBP as a "T" Junction. Option B provides priority flow for through traffic on and off the KBP to Moggill Road South, with Moggill Road North as the "T" Junction and slip lanes for northbound traffic on Moggill Road. The second option requires a larger footprint. This would result in greater visual disturbance associated with larger areas of vegetation removal along Moggill Road and intensification of road infrastructure and vehicle movements along Moggill Road once operating.
	Through the lightly undulating floodplain the KBP would be on an embankment structure, with batters of 2:1 typically up to 7 metres high. The highest embankments of approximately 10 metres would be at the Moggill Creek crossing. Noise walls up to 4 metres high would be sited on the south side of the road, from approximately Chainage 3400 to 3780 on top of the embankment.
	A four span bridge structure 325 metres in length, with abutments, would be introduced over Moggill Creek and would require some mangrove vegetation to be removed. A fauna crossing may be considered in this location.
	From Moggill Road to approximately Chainage 3400, existing scattered tree cover associated with field, road and waterway boundaries within the floodplain, would be removed. In addition between Chainage 3250 and 3400, a stand of visually significant bushland cover would be removed.

13.5.2 Visual Impacts on the Regional Scenic Amenity and Brisbane City's Landscape Values

13.5.2.1 Interim Regional Scenic Amenity Mapping

The Interim Regional Scenic Amenity Map in Appendix 13-B, Figure 1 (sourced from the SEQRP Implementation Guideline No 8 as discussed in Section 13.2.2.1) illustrates that the study area has a highly variable scenic amenity, ranging from the lowest value of 1 to the highest value of 10.

The scenic amenity rating for the KBP corridor itself is highly varied and rated between 1 and 9. The two areas of highest scenic amenity within the road corridor that would be impacted are:

• Kersley Road gully rated 9; and

• Moggill Creek Floodplain rated 8.

Gem Road spur and the open space corridor between Kenmore and Gem Roads are rated 4 or 5, whilst the Centenary Motorway, Kenmore and Gem Roads have the lowest scenic amenity values.

When comparing aerial photography and land use with the interim scenic amenity map, there is some correlation between the scenic amenity rating and the level of development or clearing that has occurred in the area. Typically road and infrastructure provision has been given the lowest rating, residential development a medium rating of 5, disturbed open space affords a locally important rating of 7 and 9, whilst intact areas of bushland and the river itself are rated 9 to 10 'regionally high'.

13.5.2.2 LAVA

The LAVA mapping developed by BCC is illustrated in Appendix 13-B, Figure 1 and described in Section 13.2.2.2.

Gem Road spur, at approximately Chainage 3200 – 3400 has the highest value within the study area (rated at above 18), primarily due to the existing tree cover. This potentially indicates relatively high levels of landscape amenity services that may deserve protection. This rating would be significantly lowered by the KBP, due to the truncation of the wooded spur and tree removal. Kersley Road Gully and the open space corridor between Kenmore and Gem Roads have a moderate rating of around 12, and again it is anticipated that this rating would be lowered with the introduction of the KBP. In the area where tree cover in the KBP corridor is lower, the rating is lower i.e. at the pony club fields (rated 7) and the steep grassed slope west of Gem Road around Chainage 2800 has the lowest rating (rated 1).

Overall, it is anticipated that the introduction of the KBP would lower the scenic amenity values on the land directly impacted by the KBP as well as the area immediately adjacent to the KBP where interactive effects are anticipated.

13.5.3 Visual Influence of the KBP

Analysis of three ZVI (Appendix 13-B, Figures 6 and 7) were undertaken for this assessment. They are:

- Three ZVI of the pedestrian bridge options;
- A ZVI of the alignment only; and
- A combined ZVI of the alignment and noise walls.

When comparing the three pedestrian bridge options, Option C has the lowest ZVI whilst Option A across Gem Road has the greatest.

When comparing the ZVI alignment only with the ZVI of the combined alignment and noise wall, predictably the intensity of the visual impact is greater on the later. However, the extent of the visual impact remains relatively similar.

The alignment and noise wall ZVI were used to help guide the field work. They both illustrate that the ZVI are constrained between Centenary Motorway and the eastern edge of Moggill Creek by the existing landform and the fact that the KBP itself is located on the lower ground of this undulating landform. In addition, these two ZVI anticipated that the visual influence was greater in the area to the west, primarily because of the rising nature of the Moggill Creek valley. However, the field investigations proved views from this western area were limited given the influence of the intervening land cover (primary vegetation) that blocked views to the KBP.

Both the alignment and noise wall ZVI analyses illustrate that the KBP is viewed over a relatively small area but by potentially a large number of viewers, given the large numbers of residential viewer groups lining the KBP corridor. These two ZVI anticipate the greatest intensity of visual impact is upon the elevated areas, immediately adjacent to the road corridor, i.e. around Sachs Court, Summerfield Place, and Marland and Twilight Streets.

13.5.4 Selection of the Representative Viewpoints

Based on the ZVI studies and subsequent field work a series of representative viewpoints have been selected on the basis of potential views to the KBP from publicly accessible locations. The field work showed that the actual ZVI would be far less than that illustrated in the GIS visual constraints model. This is due to intervening land cover such as vegetation and built form.

The viewpoints represent the range of publicly-accessible views where visual impact arising from the KBP could be expected. No viewpoints were taken from private property but through this assessment the impact on private views has been considered. Visual impact for each representative viewpoint is assessed based on the assessment criteria listed in Section 13.2.1.2 and Table 13.1.

The fourteen locations have been selected as representative viewpoints for the purposes of undertaking the visual impact assessment. These are detailed in Table 13.4. The Representative Viewpoints Locations are shown in Appendix 13-B, Figure 8.

13.5.5 Assessment of Representative Viewpoints

The assessment of representative viewpoints considers the visual impacts arising from the KBP upon the fourteen representative viewpoints identified through the GIS analysis and the site work. It evaluates the significance of the level of visual impact anticipated for each of these viewpoints. The full assessment is included in the accompanying Appendix 13-C.

13.5.6 Summary of Visual Impact Assessment

The assessment of fourteen representative viewpoints, included in Appendix 13-C, has been used to determine the visual impacts associated with the KBP. These views were selected using two upfront ZVI analyses (refer Section 1.4.3 and Appendix 13-B, Figure 6); the ZVI of the alignment and the combined ZVI of the alignment and noise walls, followed by a number of field investigations conducted in August to October 2008. The views selected represent the worst case scenario from publicly accessible locations where the clearest views from the most sensitive viewer groups, all at close and middle distances (maximum of which is 250 metres from the site) of the KBP are anticipated.

A range of visual impacts significance were identified, from negligible adverse to high adverse and a summary of these results are presented in Table 13.4.

Table 13.4: Assessment of Significance of Impact on Viewpoints

Ref ³	Viewpoint	Viewer Group⁴	Sensitivity to Change	Likely Magnitude of Impact (Daytime)	Significance of Impact	Significance of Residual Impact
14	South from Centenary Motorway	к	Local	Obvious	Moderate adverse	No change
13	South from Plumeria Close	J	Less than local	Considerable	Moderate adverse	No change
12	West from Kenmore Road	G	Local	Considerable	High adverse	No change
11	North-west from Sundown Street	I and G	Less than local (Local for residents on Twilight Street)	Considerable (Considerable for those residents directly affected)	Moderate adverse (High adverse for those residents directly affected)	No change
10	North from Twilight Street	I and G	Local	Considerable	High adverse	No change
9	North from Sunset Road bus stop	Н	Local	Considerable (Obvious with mitigation)	High adverse	Moderate adverse
8	South from Marland Street	G	Local	Considerable	High adverse	No change
7	South-west from Marland Street	F	Local	Considerable (Considerable for those residents directly affected)	High adverse (High for those residents directly affected)	No change
6	East from Gem Road	G	Local	Considerable (Considerable for those residents directly affected)	High adverse (High for those residents directly affected)	No change
5	East from Summerfield Place	E	Less than local	Obvious (Considerable for those residents directly affected)	Minor adverse (Moderate for those residents directly affected)	No change
4	East from Sachs Court looking East	D	Less than Local	None/Barely Perceptible (Obvious for those residents directly affected)	Negligible adverse (Minor for those residents directly affected)	No change
3	North-west from Yarawa Street	С	Less than Local	Obvious	Minor Adverse	No change

³ Appendix C ⁴ Figure 8, Appendix B

Ref ³	Viewpoint	Viewer Group ⁴	Sensitivity to Change	Likely Magnitude of Impact (Daytime)	Significance of Impact	Significance of Residual Impact
2	South-east from the Rafting Ground Reserve public open space	В	Local	Obvious (Slight/Noticeable with mitigation)	Moderate Adverse	Minor adverse
1	Northbound along Moggill Road	А	Local	Obvious (Slight/Noticeable with mitigation)	Moderate Adverse	Minor Adverse

Assessed assuming some relief for affected receptors provided by implementation of landscape and urban design mitigation strategy.



The KBP would be viewed by a large number of people but within a relatively confined area. The ZVI mapping (Appendix 13-B, Figure 6) illustrates how the existing topography, combined with the fact that the KBP is located within the lower ground of a valley, limits the visual influence of the proposed KBP between the Centenary Motorway and the Gem Road and to a corridor of less than approximately 400 metres on either side of the road. By contrast, at the western end of the KBP, at Moggill Creek corridor, the ZVI study suggests the visual influence extends a far greater distance to the west and north into the rural residential areas of Pullenvale and Brookfield. However, field investigation identified that these publicly accessible locations located further from the KBP and identified as visible in the ZVI study, were in reality not visible due to the intervening land cover (vegetation and built form).

The majority of the viewpoints assessed are in close proximity to the KBP, (i.e. less than 150 metres away). However, all viewers' sensitivity is generally considered low, of either local or less than local sensitivity. There are no scenic lookouts (such as Mt Coot-tha) in the study area that are anticipated to be impacted by the KBP. Instead the majority of the viewers here are local residents who would consider themselves sensitive to change due to the potential adverse long-term impact on views from their dwelling, particularly those whose properties are on the boundary of the KBP, such as those on Marland and Twilight Streets.

The magnitude of impact or change is in most cases rated as considerable, which is in part due to the fact that the corridor is currently perceived as greenspace with no transport infrastructure and there is no other road infrastructure of this scale in the immediate local area surrounding the corridor. In addition, the viewers are very close, which means the proportion of change viewed is general high. There is only one case where the change is anticipated to be none/barely perceptible and this is because the proportion of change anticipated to be viewed is very small.

The potential impact for viewers around Kersley Road Gully (viewer groups J and K) is considered to be of moderate adverse significance. This is due to the fact that there is already large scale infrastructure in the local area (i.e. Centenary Motorway) and thus views achieved of the intersection would be an intensification of existing infrastructure as opposed to the introduction of new, alien elements. In addition, with the exception of views obtained from the Centenary Motorway, there are lower numbers of viewers and the KBP is harder to view from the surrounding area because the road is in cut and it is anticipated that the existing tree cover would partially screen views.

The section of road through the Kenmore Road to Gem Road open space corridor is anticipated to cause the most significant impacts (viewer groups F, G, H and I). All these impacts are anticipated to be high adverse, with the exception of the view from Sundown Street, which is moderate adverse. This high adverse impact is because the viewers are in very close proximity to the KBP, there is no road infrastructure of this scale visible in this area and the KBP contrasts significantly with the suburban area. Moreover, the implementation of the potential mitigation measures has little scope for lowering the impact of the KBP here, although they may offer some visual relief to the worst affected receptors, i.e. those residents whose properties directly back onto or overlook the KBP.

The impact for viewers at Gem Road Spur is considered minor to negligible (viewer groups D and E). This is because the KBP would be in cutting at this location and it is intended that the scheme allows some vegetation to be retained on the southern side of the KBP adjacent to residents at Parkway and Summerfield Places. Views along the corridor are generally truncated for viewers by intervening land cover.

The impact for viewers around Moggill Creek floodplain (viewer groups A, B and C) is anticipated to be moderate – minor adverse, given that the viewers are generally further from the KBP and intervening landscape elements, such as tree cover, partially filters the views. The impact of the moderate impacts could be readily lowered in this area through the provision of landscape buffers (refer to Appendix 13-D)

The above clearly illustrates that where there is sufficient space, the implementation of the landscape and urban design or mitigation measures (identified in Section 13.4.1), could lower the magnitude of change and thus the overall significance of the impact (refer to viewpoints 1, 2 and 9). However, for

the majority of cases (i.e. viewpoints 6, 7, 8 and 10), the magnitude cannot be lowered by the implementation of landscape and urban design intervention. This is primarily because the engineering infrastructure is too close to sensitive viewer groups for the measures to be effective e.g. there is no space for screen planting. In such locations the emphasis would be on enhancing the character and appearance of the KBP so that the impact (which has limited scope to be lessened quantitatively) is at least of less adverse/more positive (qualitative) visual effect.

13.5.7 Additional Mitigation Measures Opportunities

The visual impact assessment has assessed the engineering scheme with an integrated landscape and urban design scheme. However, there are further landscape and visual mitigation opportunities that should be adopted and incorporated into the Environmental Management Plan, whilst others should be investigated in the next design phase.

A summary of all the potential impacts and mitigation measures can be found in Table 13.5.

Table 13.5: Potential Impacts and Mitigation Measures

Reference Code	Project Phase	Potential Impact	Trigger	Potential Mitigation Measures
LVA 01	Construction	A reduction in landscape and visual amenity during the construction period.	Introduction of contrasting features and elements into a suburban area i.e. construction traffic, temporary works compounds, stockpiles and	Aim to limit works compound areas. Where practical, locate in areas furthest from residential properties and where views from residential areas are harder to achieve. E.g. at Centenary Motorway and Moggill Road, thus avoiding unnecessary visual impact.
LVA 02			weed colonisation	Control invasive species, for example, through preparation of a weed management plan.
LVA 03				Limit disturbance of existing topsoil where possible. Where unavoidable, stockpile soil which is free from invasive species for use within the project.
LVA 04				Limit construction works to daylight hours only if possible.
LVA 05	~			Avoid disturbance in the residential areas to the greatest extent possible e.g. limit construction access to Centenary Motorway and Moggill Road.
LVA 06	Construction	View of construction activities by residents and visitors.	Clearance of vegetation within the proposed KBP corridor	Undertake a detailed survey of the existing vegetation and, where opportunities arise, seek to retain good quality/screening vegetation. Demark trees in the planting plans and on site, worthy of retention at detailed design stage, prior to construction.
LVA 07				Protect existing vegetation adjacent to the corridor works falling outside of the clearing boundary in order to prevent inadvertent damage or unnecessary removal during the construction process. Particular attention should be made to those private property boundaries along Marland and Twilight Streets.
LVA 08				Keep construction works site and corridor to a minimum to minimise clearance of vegetation as far as possible.
LVA 09				Undertake progressive landscape works to the KBP during the construction process to encourage rapid screening of views, in order to minimise visual disturbance.
LVA 10				Investigate opportunities for advance planting that would not be impacted by KBP (for example off site planting program in private properties).

Reference Code	Project Phase	Potential Impact	Trigger	Potential Mitigation Measures
LVA 11	Construction	Loss of characteristic landscape elements, such as existing tree cover.	Clearance of characteristic vegetation along the route (for example, tree cover on Gem Road Spur and at Moggill Creek bridge crossing).	Seek appropriate areas for offset replacement tree planting, and in those areas not impacted by the KBP seek opportunities for advance planting.
LVA 12	Operation	Loss of green space through land-take of perceived and actual	Introduction of uncharacteristic transport infrastructure (i.e. road, noise walls) into an open	The aim should be to provide a visual barrier between the residents and KBP such as landscaping. This is a particular consideration for residents along Marland and Twilight Streets.
LVA 13		public open space.	space corridor, sections of which are perceived to be actual open space.	Avoid unnecessary land take for KBP infrastructure. For example the pedestrian bridge option C in Marland and Twilight Street Parks.
LVA 14	Operation	Reduction and loss of visual amenity with the	Introduction of uncharacteristic transport infrastructure that will	Encourage development of detailed Landscape, Revegetation and Urban Design Guidelines at the detailed design stage.
LVA 15		introduction of a bypass into a Brisbane suburb.	be viewed by a large number of viewers in the surrounding area both during the day and	Where retaining structures or steep embankments or cuttings are required, opportunities for benching for planting should be investigated to reinstate green outlook.
LVA 16			night.	Design cuttings and embankments so they can be vegetated, where practicable. Ensure embankments are sufficiently shallow (i.e. 1: 2.5 or preferably shallower) for vegetation treatments such as planting and grass cover to establish and be maintained.
LVA 17				Seek to use other materials in preference to shotcrete. Where necessary ensure shotcrete is as visually integrated into the landscape as possible (refer to the NSW Road Traffic Authority Shotcrete Design Guidelines).
LVA 18				Avoid reflective materials on all external surfaces (such as noise barriers) that are to be viewed by private residents.
LVA 19				Use recessive colours (for example, muted, light greys) where appropriate to assist integrating structures into the landscape (with the exception of the pedestrian footbridge).

Reference Code	Project Phase	Potential Impact	Trigger	Potential Mitigation Measures
LVA 20	Operation	Reduction and loss of visual amenity with the introduction of a bypass into a Brisbane suburb.	Introduction of uncharacteristic transport infrastructure that will be viewed by a large number of viewers in the surrounding area both during the day and night.	Where significant structures such as noise walls and bridges are required, seek to create a consistent urban design language to unify the structures. The language or theming should reflect aspects of the local character to engender a sense of place and community pride. For example patterning on concrete noise walls and retaining structure.
LVA 21				Avoid over lighting the KBP. Develop a lighting strategy that minimises the impact of lighting on residential properties, for example edge lighting that is directed onto the road. Investigate passive means of lighting e.g. installation of reflectorised roadway markers, lines, warnings or informational signs.
LVA 22	Operation	Potential for adverse change in landscape	Deliberate introduction or invasion of non-indigenous	Encourage development of detailed Landscape, Revegetation and Urban Design Guidelines at the detailed design stage.
LVA 23		character and decline in existing suburban	character and decline in plant species and weeds existing suburban (particularly grasses) due to	Control invasive species, for example, through preparation of a weed management plan.
LVA 24	-	quality.	need for embankment stabilisation and landscaping,	Ensure that sufficient funds are set aside for planting and landscape management.
LVA 25	-		or insufficient vegetation re- establishment at completion of construction on disturbed ground.	Seek to include a minimum 12 month establishment period for vegetation.
			Inappropriate buffer planting that does not respect established vegetation patterns.	
LVA 26	Operation	Visual perception of community severance.	Introduction of a new bypass transport corridor into an existing suburb.	Ensure the proposed pedestrian over-bridge is an attractive, positive feature and safe to use to minimise the sense of separation between communities north and south of the KBP.
L	1		1	

13.6 Summary

This landscape and visual assessment has quantitatively and qualitatively assessed the impacts of the current selected engineering proposal for the proposed three kilometre KBP that passes through a reserved road corridor located in the residential suburb of Kenmore.

The KBP traverses a fairly uniform and typical Brisbane residential suburb, which does, however, have marked topographic / landform variation. This local topography heavily influences the existing landscape and visual character of the study area, as well as the road corridor itself and is a key factor that determines the road corridor's four distinct landscape character precincts. These precincts are:

- Kersley Road Gully;
- Kenmore Road to Gem Road Open Space Corridor;
- Gem Road Spur; and
- Moggill Creek Floodplain.

The introduction of the KBP would radically change the character of the existing precincts. The main sources of change or impact are the land take of perceived open space for road infrastructure, the loss of existing tree and the introduction of additional lighting. These changes would be viewed by the local community of Kenmore, particularly those residents overlooking the preserved corridor. This road infrastructure will not only contrast significantly with the character of the existing corridor but also with that of the surrounding Kenmore residential area, particularly through the mid sections of the KBP which are not already influenced by the Centenary Motorway and Moggill Road. In addition, it is anticipated that the scenic amenity ratings given in the Interim Regional Scenic Amenity Mapping and BCC's LAVA score would be lowered significantly both on land taken for the road proposal and within areas lying immediately adjacent to the KBP.

The unique existing valley topography of the study area limits the visual exposure or influence of the KBP to approximately 400 metres on either side of the road corridor. However, despite the relatively small area of visual influence there are anticipated to be a large number of viewers. The fourteen viewpoints selected in the detailed representative viewpoint assessment are all located in close proximity to the KBP. They were selected based on the ZVI analysis and field investigations. It is important to note that no viewpoints are selected from private property; however, the assessment makes due consideration of these viewers, given that a large number of views from private property are anticipated to be affected.

The viewpoint assessment shows that the viewers affected by the KBP are of low sensitivity (i.e. of local or less than local sensitivity). There are no regionally important lookouts or viewing locations in the study area. In addition, it shows that the visual modification rating of most affected viewpoints is high i.e. either obvious or considerable magnitude of change. This is primarily due to the close location of the viewers to the KBP, which means the proportion of change viewed is large, thus elevating the level of change. Overall it is concluded that the significance of the visual impacts of the KBP will be high/moderate adverse.

The greatest visual impacts experienced are those associated with the introduction of the road and associated infrastructure in the perceived open space corridor between Kenmore Road and Gem Road. The detailed viewpoint assessment illustrates that the impacts are anticipated to be of high adverse significance. This is primarily due to two reasons. Firstly, there is highly limited space within the constrained corridor for any buffer or screen planting and, secondly, the existing topography means that some sections of the KBP need to be elevated onto embankment further increasing the level of visual prominence and thus adverse visual impact.

The Gem Road Spur precinct is anticipated to experience the lowest visual impacts, primarily because the KBP is located within a cutting and the scheme currently allows existing vegetation to be retained along property boundaries providing an adequate visual screen.

The visual impact significance of KBP within the two other precincts, Kersley Road Gully and Moggill Creek Floodplain, is considered to be moderate adverse. This is principally because the viewers are

generally at a greater distance from the KBP and because there is space for existing and proposed land cover (trees mostly) to screen the views.

The assessment considers the residual impact of the scheme when accompanying landscape proposals are successfully applied, such as those illustrated in Appendix 13-D. However, in this instance the residual impact assessment shows that only in some cases would the proposed treatments reduce the significance level of the visual impact significance i.e. at Moggill Creek Floodplain. This is because, in most cases, there is insufficient space for effective measures such as screen buffers to be implemented in relation to the large scale of the KBP.

Additional mitigation measures should be thoroughly investigated in the next stages of the design to reduce the visual impacts of the scheme further both during the construction and the eventual operation of the proposed KBP.