Appendix 13-A Full Methodology

Appendix 1: Full Methodology

Methodology

There is no published guidance on landscape and visual amenity impact assessment specific to Australia. Therefore, the industry typically refers to guidance from elsewhere as well as assessment guidance specifically developed for roads by the Queensland Department of Main Roads. The methodology for this assessment has been developed in-house with reference to the:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), 2002, developed by the (UK) Landscape Institute and Institute for Environmental Management;
- The US Forestry Service, Scenic Management System (SMS) as described in the publication 'Landscape Aesthetics: A Handbook of Scenery Management', US Forestry Service, 1996;
- Landscape Character Assessment Guidance for England and Scotland (Countryside Agency and Scottish Natural Heritage, 2002); and
- Road Landscape Manual Part A2-1 Landscape Assessment Process and Part A3-1 Visual Assessment Process (Queensland Department of Main Roads, September 1997).

The assessment of landscape and visual impacts is both quantitative and qualitative. The assessment describes what would be affected i.e. the level of landscape/visual modification, makes a judgement regarding the capacity of the landscape to accommodate change by assigning a landscape/visual sensitivity and then assesses the significance of the resulting impact. These factors and the ways in which they are combined to identify the extent of landscape/visual impact are outlined in the following sections.

The landscape and visual assessment is based upon the following:

- **Desk Study:** Contextual assessment of the landscape and proposals based on published material including cadastral maps, air photographs, planning documents, preliminary engineering concept plans for the Kenmore Bypass as well as a desk-based computer analysis of the viewsheds (through Zone of Visual Influence (ZVI) study); and
- **Field Study:** Daytime visits to the area to identify representative viewpoints, where potential views to the proposal are obtained, and photographic recording of potential assessment viewpoints. The assessment has been undertaken by qualified Landscape Architects/Planners, with experience in the field of landscape and visual impact and character assessment.

Visual Impact Assessment Methodology

The visual impact of the preferred alignment has been primarily evaluated on the basis of a combination of two main factors:

- Visual modification; and
- Visual sensitivity.

Visual Modification

Visual modification refers to the change to the landscape that would occur as a result of development from a given viewpoint. This includes what has changed and how it has changed by considering the visual contrast of the proposed road alignment with the existing landscape character. Visual modification describes the extent of change and identifies elements which are removed or added, changed (e.g. in colour and texture) and compatibility of the new elements with the existing landscape. Visual modification can result in an improvement or reduction in visual amenity.

The following terminology is used to describe the magnitude of the effect on visual values:

- **Considerable modification** - substantial part of the view is altered;
- **Obvious modification** - alteration or partial change in the view is clearly visible
- **Slight or noticeable modification** – a small change to the view is clearly visible; and
- **None or barely perceptible modification** - either the development is not visible or, if it is, the change in the view is generally unlikely to be perceived by viewers.

The impacts identified can be either adverse or beneficial. (or occasionally neutral). The assessment of this is acknowledged to be subjective. However, based on an understanding of viewer preferences, the following is used as a guide:

- **Adverse** – a visual change that is likely to be perceived as unfavourable by *most* affected viewers e.g. the loss of vegetation and replacement by an industrial unit;
- **Beneficial** – a visual change that is likely to be perceived as favourable or advantageous by *most* affected viewers e.g. removal of a derelict building and replacement with new residential area;
- **Neutral /Subjective–** a visual change that is likely neither to be perceived as favourable or unfavourable by *most* affected viewers or there would be very mixed opinions making consultation the only suitable way to define effect e.g. replacement of farmland with natural woodland.

Visual Sensitivity

Visual sensitivity refers to the nature and duration of views. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity. Residential areas are of higher visual sensitivity, for example, than industrial areas largely because of the greater importance of visual amenity to the users undertaking typical activities in these land uses. Other areas of higher sensitivity may include from roads where, despite a short duration of view there may be large numbers of potential viewers, and parks or recreation trails where the duration of views is not particularly long but where visual amenity is fundamental to the experience of using the park.

The following terminology is used (where applicable) to describe the level of visual sensitivity:

- **National visual sensitivity** – heavily experienced view to a national icon, for example, view to Sydney Opera House from Circular Quay; view to Parliament House, Canberra, down Anzac Parade;
- **State visual sensitivity** – heavily experienced view to a feature or landscape that is iconic to the state, for example, views of the Brisbane River and Story Bridge from key riverbank locations; or is

a heavily used viewpoint to a view across lands which are protected by state legislation for example, views across Moreton Bay which is protected by the State Government as a Marine Park;

- **Regional visual sensitivity** – heavily experienced view to a feature or landscape that is iconic to a major portion of a city or non-metropolitan region, an important view from an area of regional open space, or a heavily used viewpoint from which a wide region can be viewed, for example, a view to Brisbane from Mount Coot-tha, a view of Wivenhoe Dam from the Brisbane Valley Highway or views from Mount Glorious or Mount Nebo;

- **Local visual sensitivity** –view experienced by concentrations of residents and/or local recreational users, and / or road and rail users, for example, views from residential areas to the Brookwater Golf Course near Springfield; and

- **Less than local visual sensitivity** – views experienced by residents, road/rail users, or from recreational areas where visual amenity is not a primary value, or views that are likely to be experienced by only a small number of people, due to the remoteness of their location.

Assessment of Visual Impact Significance

Although there are no recognised standards for determining the significance of visual impact, there is a need to assign significance to this assessment so that there can be a clear and consistent method of evaluating visual impact. The significance criteria set out in the table below have been developed to allow for this consistency to occur.

Criteria for Significance of Visual Impact

		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

Cumulative and Interactive Effects

Assessment of cumulative and interactive effects widens the impact assessment to consider direct or indirect effects arising from the scheme and other schemes that may be occurring in the vicinity of the development proposal and effects arising from other elements of the scheme. For example, the construction of the bypass may lead to a change in land use patterns in the surrounding area. However, because at this stage the full details of any schemes for complementary development are unknown, this assessment has not considered cumulative or interactive effects.

Management/Mitigation Measures

A part of the assessment is to identify landscape and visual management and mitigation measures that are not inherent in the bypass design proposal. A landscape and urban design concept (for full details refer to the Landscape and Visual Integration Guidelines) has been prepared, prior to the assessment being undertaken. Therefore the assessment takes into account the likely viewer perception of the engineering

scheme combined with the landscape and urban design treatments identified in the concept. This approach therefore assesses a "mitigated scheme".

Following on from the assessment, a series of additional mitigation opportunities (**section 4.5**) have been developed that should be investigated in the next engineering phase to reduce the impacts further, particularly those that are still considered to be high adverse. Examples of strategies that may be developed include addressing removal of vegetation and reducing the height of embankments, particularly those backing onto private property boundaries. Mitigation or management measures may include a range of techniques including, but not limited to, amendments to broad conceptual design, detailed site planning, staging or construction methodology, materials and colour selection and buffer planting. It is the intention that these will be developed and, where appropriate, input into the overall Environmental Management Plan.

Supporting Assessment techniques

In addition to the methodology described above, three additional specific tools and assessment analysis techniques have been used to support the assessment. These three are:

- Landscape Character Assessment;
- Zone of Visual Influence Analysis; and
- Photo Simulation Tool.

Landscape Character Assessment Methodology

In order to understand the existing site, a simple landscape character assessment has been undertaken of the road corridor to determine four character precincts. A study area character assessment was not deemed necessary, given the relatively uniform nature of the remainder of the study area.

A landscape character assessment includes consideration of landscape elements and how they combine to create character. The landscape character assessment process identified distinct character precincts along the existing road corridor. In brief, this assessment considers the way different components of the environment - both natural (the influences of geology, soils, climate, flora and fauna) and cultural (the historical and current impact of land use, settlement, enclosure and other human interventions) - interact together and are perceived by us forming a distinct pattern. The characterisation exercise assists the determination of the existing baseline situation and the subsequent precincts identified are used to facilitate the proposed landscape and urban design concept integration proposals.

The following terms have been used to describe the existing "landscape condition or quality":

"Good": A recognisable landscape structure e.g. visually functions as a park or area of bushland.

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

Zone of Visual Influence Analysis Methodology

A GIS-based visual constraint model has been developed which identifies the broad area over which it was judged that there may be potential for the proposed bypass and associated infrastructure options to be meaningfully visible. The Zone of Visual Influence (ZVI) studies are computer-generated analyses which identify land in the study area from which it is theoretically possible to view the preferred alignment or components of the options including bridges and noise walls. It only takes account of the topographic constraints on the view and does not include land cover factors such as the presence of buildings and vegetation. It also does not take into account the effect of distance. Generally the greater the distance from the preferred alignment, the lower the impact, as the development will take up a smaller portion of the view. Accordingly, the ZVI studies are used primarily to guide the area of field work and representative viewpoint selection and to run comparison studies. **Figures 6 and 7**: **Zone of Visual Influence** (in **Appendix 2**) illustrates the ZVI of the preferred alignment, the preferred alignment with the noise walls and the three pedestrian bridge options.

The GIS data distribution type used for the ZVI is based on a standard method known as "natural break" (Jenks). The class breaks or rankings of visibility are based on "natural groupings" which are grouped by similar values or where there is a relatively large difference in data value. 48 spot heights along the centre line of the preferred alignment, plus 4 metres where noise walls are proposed, at approximately 50 metres intervals were selected and the following four ratings devised:

- Less than 5.9 Low Visibility;
- 6 - 13.9 Medium ;
- 14 - 22.9 High Visibility ; and
- Greater than 23 Very High Visibility.

Photo Simulations

Four photo simulations have been prepared to explore and illustrate the likely effect of the scheme on particular views.

A photo simulation is a technique whereby an image of the proposed development is produced using an existing photograph to provide a realistic representation of the scheme. The use of photo simulations plays an important part in visual impact assessments to convey the proposals to the assessors, decision makers and the local community.

Simply, the process entails inserting a computer-generated model of the proposal into a photograph. Once inserted into the photograph, the model is integrated into the photograph using digital rendering

techniques. Note the images produced are indicative only to illustrate the development from a handful of representative views.