13. **Urban design, landscape and visual**

13.1 **Introduction**

The urban design, landscape and visual assessment investigations provide a preliminary technical evaluation of the potential landscape and visual effects associated with the Ipswich to Springfield PTC. In the long-term the landscape character of significant parts of the preferred corridor will change due to planned and proposed residential development and will need to be reassessed closer to the time of construction, especially with regard to mitigation of specific impacts at this time.

The assessment does not consider off-site issues relating to construction or operational activities (e.g. vehicle movement), as these are not defined at this stage.

13.2 **Methodology**

The initial step in the assessment of the landscape and visual qualities was to undertake a site assessment of vehicle accessible portions of the preferred corridor and the broader contextual boundaries. These detailed site inspections facilitated a detailed understanding of the existing landscape character, vegetation cover and residential development.

This assessment of the visual character subsequently informed the desktop analysis of electronic data that included aerial photography, street directories, digital terrain models and preliminary electronic survey, engineering general arrangement and control line models. This combination of practical site experience and intellectual analysis provides for accurate visual character typology and character unit mapping which defines the assessment zones. To establish a visual sensitivity model for the area a 3D representation of the corridor was integrated with the aid of a digital terrain model and a more extensive digital terrain model of the surrounding area. This combined model was then analysed with MapInfo to create view sheds along the corridor at 400 m intervals. These view sheds were prepared with the following distance requirements and based at an elevation of 2 m above the base corridor levels:

- local view point – locations within 1 km of the corridor
- sub regional – locations between 1 km to 2.5 km from the corridor
- regional locations beyond 2.5 km from corridor.

13.3 **Regional landscape setting**

The preferred corridor is classified in the Road Landscape Manual as being located in an area straddling the South-East and the Moreton Uplands regions. The South-East Region is described as being the most populated section of Queensland and contains a variety of rural and semi-natural areas in addition to extensive urban development. The Moreton Uplands Region, including the Bremer River Catchments of Bundamba and Deebing Creeks, is described as
the most intensively farmed of the non-coastal areas of Queensland comprising rolling to undulating landforms with several larger rural townships and cities.

Relevant elements of the regional landscape include regionally significant geological formations, geo-heritage sites, bushland area and reserves, water bodies and waterways, sites and features with cultural heritage values, in addition to vistas and views offering high scenic amenity.

The broad landscape elements discussed in the following section define the major landscape features that contribute to the regional and sub-regional character of the Ipswich to Springfield PTC.

13.4 **Landscape character types**

13.4.1 **Landscape character types**

Landscape character types are defined by assessing the quality of the areas, not the attractiveness, with common features and reasonably consistent landscape characteristics. These areas were identified for the Ipswich to Springfield PTC (Figure 13-1) and analysed for visual quality.

The following terminology has been applied to describe the visual quality of the study site. The criteria used to determine these terminologies are subjective:

- high – good quality, unity and diversity, rare or unique elements, dramatic effect
- medium – common elements of average quality
- low – common elements of poor quality, limited views and viewing points.

Table 13-1 identifies the summary description of landscape character types along the preferred corridor and also an assessment of their visual quality.

13.4.2 **Sensitive landscape receptors**

Landscape receptor sensitivity is a measure of the direct or indirect effects that development based changes may have on a landscape resource, which could include physical elements, landscape character and cultural values.

National park areas are by definition sensitive receptor locations because of the status of the landscape and the visual expectations of visitors to park areas.

Residential locations, scenic lookouts and public places are sensitive receptors, due to expectations of continuity and unencumbered view breath of scenic values, public amenity and residential character.

In this landscape ridgelines and elevated areas are more sensitive than valleys because of the potential for views from public roads, residential areas and tourist locations (which are valued as a result of their landscape character and visual quality). It is important to distinguish that valley receptors may in fact be vastly more or less impacted by negative views. This is dependant upon detailed locations and size of impact nevertheless major adverse impacts may be restricted to a minority of valley receptors.
13.4.3 Landscape condition

Landscape condition is a measure of the physical status of the site and factors which may influence landscape changes over time. Overall though the landscape surrounding the Ipswich to Springfield PTC is considered to be in good physical condition with the following dominant characteristics:

- continuous vegetation cover, displaying the mosaic of plant types that is characteristic of the setting and soil types
- an apparently low level of physical change to the landscape in general and substantially remnant tertiary vegetative presence
- residential areas that have a mix of housing styles and open space that reflect the period of development
- an overall landscape which appears ‘nature dominated’ and where the residential area at one end of the corridor incorporates open space that dominates the middle and other end of the corridor.

13.4.4 Visual absorption capability

Visual absorbency is a measure of the area’s ability to accommodate changes while maintaining existing landscape character without a significant reduction in landscape and visual quality or amenity.

Three major factors are likely to influence the visual absorption capability within the corridor:

- landform and its ability to visually conceal development at the view source or in the location of the change
- vegetation patterns, height and location that have the capacity to visually conceal development at the view source only
- urban/industrial development that conceal or reduce the view to the development.

Within the context of the agricultural landscape type, the preferred corridor has two areas with different absorption capabilities, these being ridgelines and creek valleys.

Ridgelines and hill slopes oriented toward residential and public road receptor locations have a low visual absorption capability.

Creek valleys that are screened by ridges have potentially higher environmental impacts, but a higher visual absorption capability based on view potential and the greater relative impact of screening vegetation.

13.4.5 Landscape value

Landscape value is a measure of the likely importance of the landscape to the community. There has been no specific assessment of community values through this project therefore there is no basis on which to make a detailed assessment of landscape value. Community values ascribed to this area are
subjective assumptions which have been derived from existing references and professional judgement. On the basis of existing references:

- the preferred corridor is likely to be considered an area of moderate scenic value that has additional value due to its close relationship with the residential developments
- residential properties are likely to consider existing landscape character and visual amenity as a significant residential amenity factor.

### 13.4.6 Landscape character zones

The landscape character zones for the preferred corridor are as outlined in Table 13-1.

**Table 13-1: Landscape character zones along the preferred corridor**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Landscape type</th>
<th>Landscape character</th>
<th>Landscape quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1A-1</td>
<td>Older residential</td>
<td>This is an older area of Ipswich. The corridor passes between houses, through parkland/open space, and then follows a road alignment past the Ipswich West Primary School. (1.2 km)</td>
<td>Medium to High (most of this section is older residential to commercial. There is evidence of the former rail line at various points along the zone)</td>
</tr>
<tr>
<td>Z1A-2</td>
<td>Recreation/University</td>
<td>Passing through a range of open space areas, the University of Queensland Ipswich Campus, Sandy Gallop Golf Club and Ipswich Go-Golf. The general zone is grassed open space with scattered trees; the corridor also passes a playground and BMX track. (1.4 km)</td>
<td>High (this area has long view lines and is removed from traffic noise)</td>
</tr>
<tr>
<td>Z1A-3</td>
<td>Recreational</td>
<td>This area is a semi natural creek valley between housing and industry. There is good vegetation and tree cover along the base of the valley. (1.3 km)</td>
<td>Medium (The creek and valley have good natural values but is not part of a recreational network)</td>
</tr>
<tr>
<td>Z1A-4</td>
<td>Residential Rural</td>
<td>At this location the corridor follows the alignment of roads with rural land to one side and residential to the other (corridor is sited in the rural). The rural area is on gently undulating low hills with scatter trees. (1.6 km)</td>
<td>Medium (the zone has a combination of rural and residential uses combined with open treed areas)</td>
</tr>
<tr>
<td>Z1A-5</td>
<td>Rural Industrial</td>
<td>The zone is defined by the two roads that establish the boundary. The area is presently low intensity industrial but proposed for a town centre development. (0.7 km)</td>
<td>Low</td>
</tr>
<tr>
<td>Z1A-6</td>
<td>Rural</td>
<td>Gently undulating rural areas with scattered trees and buildings. (3.2 km)</td>
<td>High (long viewing distances with sparse vegetation)</td>
</tr>
<tr>
<td>Zone</td>
<td>Landscape type</td>
<td>Landscape character</td>
<td>Landscape quality</td>
</tr>
<tr>
<td>--------</td>
<td>----------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Z1A-7</td>
<td>Forest</td>
<td>These are densely forested areas, some with numerous off-road tracks. (0.9 km)</td>
<td>Medium (Although the corridor will have a significant impact on the zone. The zone has a high degree of visual absorbency, reducing the effect)</td>
</tr>
<tr>
<td>Z1A-8</td>
<td>Rural</td>
<td>Gently undulating rural area with scattered trees and buildings. (3.7 km)</td>
<td>High (long viewing distances with sparse vegetation)</td>
</tr>
<tr>
<td>Z2A-1</td>
<td>Rural</td>
<td>Gently undulating rural area with scattered trees and buildings. (1.4 km)</td>
<td>High (long viewing distances with sparse vegetation)</td>
</tr>
<tr>
<td>Z2A-2</td>
<td>Forest</td>
<td>Densely forested area of natural bush, some with numerous off-road tracks. (1.8 km)</td>
<td>Medium (Although the corridor will have a significant impact on the zone. The zone has a high degree of visual absorbency, reducing the effect)</td>
</tr>
<tr>
<td>Z2A-3</td>
<td>Industry</td>
<td>This zone is an extension of the Swanbank Power Station’s former coal fields. The area is highly disturbed. (0.5 km)</td>
<td>Low (the area is an industrial landscape with views across to the power station)</td>
</tr>
<tr>
<td>Z2A-4</td>
<td>Rural</td>
<td>Gently undulating rural area with scattered trees and buildings. (1.6 km)</td>
<td>High (long viewing distances with sparse vegetation)</td>
</tr>
<tr>
<td>Z2A-5</td>
<td>Residential/Forest</td>
<td>This is where the present residential meets the forest edge and is a point of transition. (1.6 km)</td>
<td>Medium (due to the topography most of the residential area do not see the corridor)</td>
</tr>
<tr>
<td>Z2A-6</td>
<td>Rural Residential</td>
<td>At this location the corridor follows the alignment of roads with rural land to one side and residential to the other (corridor is sited in the rural). The rural area is on gently undulating low hills with scatter trees. (1.8 km)</td>
<td>Medium (the zone has a combination of rural and residential uses combined with open treed areas)</td>
</tr>
<tr>
<td>Z2A-7</td>
<td>Forest</td>
<td>This is a densely forested area with residential developments being constructed to the north. (1.1 m)</td>
<td>Medium (Although the corridor will have a significant impact on the zone. The zone has a high degree of visual absorbency, reducing the effect)</td>
</tr>
<tr>
<td>Z2A-8</td>
<td>Activity centre</td>
<td>This is the Orion shopping centre that is presently under construction planned to be the centre of Springfield.</td>
<td>Low (presently this area is in a state of change from forest to town centre)</td>
</tr>
</tbody>
</table>
13.5 Visual amenity

13.5.1 Introduction

Existing studies suggest that there are common visual aesthetic values and factors affecting visual perception that are likely to be consistent across communities. The following assumptions form a basis for the visual assessment and impact analysis.

Visibility: The degree of visual impact is determined by whether a view is available and the nature of that view – moving or static.

Field of view: The normal binocular field of vision is considered to be 124 degrees with a zone of visual acuity of 2.5 degrees (Abbott 1988 after Felleman 1986). The process of recognising and observing an object or scene is complex and involves constant scanning, recognition and refocussing within the field of view; a process that is modified (narrowed) by viewer movement, the speed of the viewer and secondary activities such as driving.

Distance: The greater the viewing distance, the less detail is observable and the more difficult it is to distinguish between the site and its background, diminishing the impact.

Relative elevation: Objects viewed against a skyline silhouette or at the edge of a break in slope are likely to have a greater visual impact than objects or changes viewed from an elevated location where features are viewed against a land backdrop.

Size, colour and form: The greater proportion of a view occupied by new features or activity the greater the impact. Contrasting colours and forms increase the relative impact of change.

Activity: Movement of objects, including vehicles and light reflection changing with movement will increase impact.

Familiarity: Changes to a familiar visual setting or where the viewer interacts with the setting is likely to have a relatively greater impact on the viewer than changes to a setting that is rarely seen or poorly understood.

Complexity: Changes to a visually complex field of view with elements of varying scales and form are likely to result in lower impacts than changes to a relatively uniform field of view.

Context: The extent to which the proposed development is in character with the land use and landscape character of the site will affect the perceived level of impact.

Weather conditions: The overall clarity of the view, the angle of the sun and the degree to which skyline silhouettes are masked by clouds etc will affect visibility.

Change: The degree of change in the view and the process of change will affect the degree of impact on the viewer.

The perception of the adverse visual impact or visual merit of a public transit corridor will differ between communities and amongst members of a community.
The preferred corridor passes through a range of rural to residential areas with significant industry midway along the overall alignment. The combination of land uses creates the situation where there is potential for significant views to the corridor but also interesting and stimulating view for users of the corridor. Residents and visitors are likely to be highly sensitive to visual changes that alter the perception of a landscape dominated setting. Each of the perception categories listed above are relevant to sections and in some situations will overlay each other.

13.5.2 Visual character and scenic quality

Scenic quality relates to landscape character, which is largely determined by the intactness of the landform and vegetation cover and other qualities which are considered to be intrinsic to the location. The corridor has a moderate to high scenic quality based on the landscape character type criteria features (Section 13.4.1), and the range in elevation of view points and the relative level of the corridor combine to provide a range of viewing distances.

In terms of management for scenic quality:

- the visual character of the feature landforms and the visual dominance of the natural setting should be maintained within the corridor
- where possible maintain foreground landform features as visual barriers to valley based development
- concentrate development on ‘background’ valley areas and not elevated ridgelines
- maintain the open vista/large scale of scenic landscape views.

13.5.3 Visual sensitivity

Visual sensitivity refers to the extent to which a landscape can change without unacceptable adverse effects on its visual character or scenic quality. For the purposes of the detailed impact assessment, visual sensitivity is defined as a combination of:

- **The level of use (number of receptors):** The number of people within a location affected by landscape and visual change will increase or decrease the likely sensitivity to that change.

- **The distance of the receptor from the potential impact:** Distance zones indicate the spatial relationship between site facilities and community receptors. Distance is a measure of the visual magnitude of the impact and the degree of detailed information and the experience a viewer is likely to receive. Distance zones are defined according to the nature of the proposal and receptor sites.

Within the context of this study, the nature of the change to the relatively ‘natural’ park and residential landscape have the potential to be clearly discernible from all viewing distances, but particularly foreground and middle ground where the impact of the likely visual change would be most apparent.
The following impact assessment measures have been adopted in this study:

**Foreground – high level sensitivity (<1 km):**
- dominant visual change to the landscape and landform characteristics
- structure likely to be a dominant visual feature
- clear appreciation of the form and size of corridor and vehicle movement
- visual recognition of infrastructure
- landform, vegetation, colours, surface textures and other landscape features are discernible to a detailed level.

**Middle ground – moderate level sensitivity (1 – 2.5 km):**
- obvious or dominant visual change to the landscape and landform characteristics
- structure is a moderate to significant element within the view and may or may not be a dominant feature
- infrastructure is generally not evident
- views are more likely to be broken by foreground features
- landform characteristics and the relationship between landscape features are clearly discernible.

**Background – low level sensitivity (2.5+ km):**
- minor visual change to the landscape and landform characteristics
- landform and vegetation silhouettes, overall form and scale is more visually prominent than individual landform features or surface characteristics
- visual impact is partly dependant on weather, colour contrasts, light conditions etc
- low recognition of form and detail, including vehicle movement.

**The nature of the visual receptor**

*High level sensitivity:*
- designated state level parks and scenic reserves and major recreation trails
- highways and major tourist routes
- town centres
- residential properties (not rural)
- rural residential properties that are sited to take advantage of existing landscape views
- residential care facilities.
Moderate level sensitivity:

- large volume regional link roads
- secondary roads and recreational driving routes
- major landscape dependant outdoor recreation facilities, i.e. golf
- rural residential properties
- schools and hospitals.

Low level sensitivity:

- local rural roads
- farming properties
- industrial land uses
- local sports facilities.

A breakdown of visual sensitivity was undertaken and divided into a number of zones as outlined in Table 13-2 along with their associated chainages (refer to Figure 13-2).

Table 13-2: Visual sensitivity of defined landscape character zones

<table>
<thead>
<tr>
<th>Zone</th>
<th>Chainage (km)</th>
<th>Landscape type</th>
<th>Sensitivity</th>
<th>Visibility</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1A-1</td>
<td>0 – 1.2</td>
<td>Older residential</td>
<td>High</td>
<td>Not visible to extreme</td>
<td>This area is densely populated with surrounding elevated areas that will see the alignment. Visibility in this area extends to over 5 km.</td>
</tr>
<tr>
<td>Z1A-2</td>
<td>1.2 – 2.5</td>
<td>Recreation/University</td>
<td>Moderate</td>
<td>Mostly negligible to extreme</td>
<td>Due to topography the areas west of the corridor are most affected with the most significance within 2.5 km of the corridor.</td>
</tr>
<tr>
<td>Z1A-3</td>
<td>2.5 – 4.0</td>
<td>Creek</td>
<td>Moderate</td>
<td>Severe</td>
<td>Due to topography the areas west of the corridor are the most affected with the most significance within 1 km of the corridor.</td>
</tr>
<tr>
<td>Z1A-4</td>
<td>4.0 – 5.5</td>
<td>Residential Rural</td>
<td>High</td>
<td>Moderate to severe</td>
<td>Due to topography the areas west of the corridor are most effected although there are areas severely effected to the east with the most significance within 1.0 km of the corridor.</td>
</tr>
<tr>
<td>Z1A-5</td>
<td>5.5 – 6.0</td>
<td>Rural Industrial</td>
<td>Low</td>
<td>Low</td>
<td>The visibility in this section is very limited.</td>
</tr>
<tr>
<td>Z1A-6</td>
<td>6.0 – 9.5</td>
<td>Rural</td>
<td>Moderate</td>
<td>Low</td>
<td>Visibility is restricted to the more elevated areas to the north-east of the corridor.</td>
</tr>
<tr>
<td>Z1A-7</td>
<td>9.5 – 10.3</td>
<td>Forest</td>
<td>Moderate</td>
<td>Low</td>
<td>Due to the forest cover in this area the moderate visibility on both sides of the corridor is not expected to be a problem.</td>
</tr>
<tr>
<td>Z1A-8</td>
<td>10.3 – 14.0</td>
<td>Rural</td>
<td>Low</td>
<td>Mostly low</td>
<td>There are isolated areas to the south that will experience severe visual impacts.</td>
</tr>
</tbody>
</table>
### Zone Chainage (km) Landscape type Sensitivity Visibility Comment

<table>
<thead>
<tr>
<th>Zone</th>
<th>Chainage (km)</th>
<th>Landscape type</th>
<th>Sensitivity</th>
<th>Visibility</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z2A-1</td>
<td>14.0 – 16.0</td>
<td>Rural</td>
<td>Moderate</td>
<td>Negligible</td>
<td>This area is fairly visible but has a maximum reading of low.</td>
</tr>
<tr>
<td>Z2A-2</td>
<td>16.0 – 17.5</td>
<td>Forest</td>
<td>Moderate</td>
<td>Negligible</td>
<td>Due to the forest cover in this area the moderate visibility on both</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sides of the corridor is not expected to be a problem.</td>
</tr>
<tr>
<td>Z2A-3</td>
<td>17.5 – 18.0</td>
<td>Industry</td>
<td>Low</td>
<td>Low</td>
<td>This small area has limited visibility close to the corridor.</td>
</tr>
<tr>
<td>Z2A-4</td>
<td>18.0 – 20.0</td>
<td>Rural</td>
<td>Moderate</td>
<td>Low to moderate</td>
<td>Most of this area within the 1 km zone experiences low visibility.</td>
</tr>
<tr>
<td>Z2A-5</td>
<td>20.0 – 21.3</td>
<td>Forest /</td>
<td>Moderate</td>
<td>Negligible</td>
<td>This section is most visible from the south with a low proportion of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>residential</td>
<td></td>
<td></td>
<td>visibility compared to other sections.</td>
</tr>
<tr>
<td>Z2A-6</td>
<td>21.3 – 23.2</td>
<td>Rural</td>
<td>Moderate</td>
<td>Low</td>
<td>This area experiences negligible to moderate visibility over most of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>residential</td>
<td></td>
<td></td>
<td>the 1 km zone with a large area of negligible to the north between the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 and 2.5 km zones.</td>
</tr>
<tr>
<td>Z2A-7</td>
<td>23.2 – 24.3</td>
<td>Forest</td>
<td>Moderate</td>
<td>Negligible</td>
<td>Forest cover will limit the visibility in this area and the topography</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>limits the view to about 500 m from the corridor.</td>
</tr>
<tr>
<td>Z2A-8</td>
<td>24.3 – end</td>
<td>Activity centre</td>
<td>Low</td>
<td>Negligible</td>
<td>Visibility here is negligible due to the topography and the site</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>being the end of the corridor.</td>
</tr>
</tbody>
</table>

### 13.5.4 Potential sensitive receptors identified

These sites are locations around the preferred corridor that could be considered sensitive. The points are shown on Figure 13-1.

Potentially sensitive receptors in the study area excluding residences include the following:

11 Ipswich Grammar
11 Blair Primary School Education
14 Complex recreation
17 Immaculate Heart Catholic Primary School Education
18 Leichhardt Community Centre Recreation
18 Denmark Hill Environmental Park Education
19 Ipswich West Primary School Education
19 Ipswich Hospital Health
26 University of Queensland Ipswich Campus Education
26 Ipswich Showground Recreation
27 Sandy Gallop Golf Club Recreation
30 George and Eileen Hasting Sports Ground Recreation
34 Benthany Lutheran Primary School Education
35 Raceview Primary School Education
36 Blue Care Lady Leone Edwards Nursing Home Health
38 Yamanto Tavern Commercial
40 Crestridge Youth and Conference Centre Recreation
41 Paperbark Flats Picnic Area and White Rock Conservation Park Recreation
42 Redbank Plains Primary School Education
43 Redbank Plains Recreational Reserve Recreation
44 Redbank Plains High School Education
46 Redbank Plains-Goodna Pony Club Recreation
47 St. Augustines Catholic College and Early Years Precinct Education
50 Proposed Springfield College – Middle and Senior School Education.

13.6 Impact assessment

The impact assessment was divided into two broad zones and assessed against the visual impact and landscape impact. The first zone stretching from Ipswich to Ripley (Chainage 0 – 14.0 km) and the second from Ripley to Springfield (Chainage 14.0 to 24.50 km).

The landscape impact also examined the potential affects on the landscape in terms of effects on an environmental resource, independent of views of that landscape.

Each section of the corridor is briefly discussed under the following headings:

1. Visual character
2. Landscape character
3. Visual impact
4. Landscape impact
5. Impact rating

13.6.1 Ipswich to Ripley (Chainage 0.00 – 14.00 km)

Visual character

In this section the preferred corridor passes through an older area of Ipswich before looping past the Ipswich West Primary School, passing close to a playground then beside the University of Queensland Ipswich campus and golf course. At this point the corridor follows a creek valley with industry to the east
and residential areas to the west. Through these sections the corridor is visible to large areas, and is in close proximity to moderate to high level visual receptors. The corridor then passes between residential and rural areas before moving through farming land and forests. In areas where the corridor is planned to be built on structure, in order to elevate the corridor, the visual impacts will increase to high.

**Landscape character**

The landscape character close to Ipswich is an older urban area that will not be highly sensitive to change. As the route passes the Ipswich West Primary School and to a lesser extent the University of Queensland Ipswich campus, pedestrian and vehicle movement patterns will need to change to accommodate the route. The creek valley south of the university rapidly changes from the golf uses to an undeveloped green corridor with extensive tree growth. The corridor then passes through an area of scattered trees and undulating landform which provides a natural barrier between the adjacent land uses. In the farming and forested areas movement tracks for fauna, and the impacts of potential weed infestation through vehicle movement and construction activities require consideration. The landscape character at the end of this section of the corridor is of open rolling pastoral land.

**Visual impact**

The visual impact of the preferred corridor changes from low to high where it passes the proposed University station south to Berry Street. After this point it becomes low to moderate for the remainder. Between chainage 13.0 km and 14.0 km the visual impact will be low as it passes underground through the future Ripley town centre.

**Landscape impact**

The landscape impact starts as fairly low near the urban areas then becomes high along the creek and moderate through the rural forested areas.

**Overall impact**

This impacts due to the range of setting for both visual and landscape they would average out to moderate for both settings.

The overall impact in this area is deemed to be “Moderate”. Areas to the west of the corridor and north of the Cunningham Highway, however, are deemed to be “high”.

**13.6.2 Ripley to Springfield (Chainage 14.00 km – 24.50 km)**

**Visual character**

In this section the preferred corridor starts in rural/grazing areas before passing through forests before running beside a section of the Swanbank power station mine area. This section is not highly visible. The corridor then passes through open grazing land with residential development in some areas to the north. The end of the corridor passes through a forested area before running beside the existing Centenary Motorway and Orion shopping centre. This area features rapidly establishing residential areas.
Landscape character
The landscape character at the start of this section of the preferred corridor is through open rolling grazing land. In the forested areas fauna may be affected by restricting natural ranges of movement, noise, pollution and separating populations. The vegetation will be affected by clearing, change in overland flow paths, creating a wind corridor and potential infestation with weed species. The small section of industrial area is presently degraded due to land clearing, earth works and pollution. The remainder of the corridor follows valleys and small creeks; these areas will be affected by changes to animal movements.

Visual impact
This section of the preferred corridor has a generally low visual impact due to the rolling rural county and grouped residential areas. The most significant impact would be at the end near the Orion shopping centre. Visual impacts in an overall context are deemed ‘low’.

Landscape impact
As most of this section of the corridor passes through rural and forested areas the landscape impact would be uniformly moderate

Overall impact
The overall impact in this area is deemed to be “Moderate”.

13.7 Mitigation strategies

13.7.1 Vertical alignment changes
The level that the preferred corridor is designed for has a significant bearing on the landscape and visual impact. As a general premise, if the corridor is located below ground level, either by cuttings or tunnels, the impact is reduced as what is seen in a static view, provided it is treated in context with the surrounding area that greatly reduces the impact. The most desirable treatment from a landscape and visual perspective would be to increase the use of tunnels either driven or cut and cover to totally remove the presence of the corridor from view.

The other major impacting feature pertinent to the alignment and vertical geometry is the presence of elevated structures.

The higher the corridor is above the natural ground the greater the view shed. In a local context elevated structure would be preferable to embankments which could be vegetated. Where the corridor passes through open space or rural areas, circulation patterns are not affected and there is a reduced impact on the local flora and fauna when structure is used in place of embankments.

However this would add significantly to the capital cost of the project. There is also a potential for increased noise impacts with the use of elevated structure instead of embankments. These potential increases in noise impacts can however be mitigated through appropriate design structures.
13.7.2 Screening

Screening of the corridor can be achieved by walling or landscaped planting buffers. This treatment increases the barrier effect of the corridor as the screen itself becomes the visual barrier – when a vehicle is travelling along the alignment, only the track would be visible (if no fence is in place). Where space is available it is preferable to use a planting screen to create a softer effect and by so doing keep more in line with the surrounding areas.

13.7.3 Urban design

The urban design treatments and arrangements will greatly influence the community’s perception of the corridor. All structure, stations, overhead gantries and screens should be designed to make a positive contribution to the surrounding visual, social and environmental communities.

13.8 Conclusion

The combination of land uses encountered within the study area, creates the situation of potential significant views of the preferred corridor but also interesting and stimulating views for users of the public transport facility. The alignment of the corridor has a moderate to high scenic quality based on landscape features and the range of elevations along the corridor. Visual sensitivity impacts range from low to being highest in areas west of the preferred corridor and north of the Cunningham Highway. The overall impact for the preferred corridor, over its full length, is deemed to be ‘moderate’.

Modifications to the design of features of the public transport facility may reduce negative visual impacts that will occur. In areas where the corridor passes underground the visual impact will be negligible.