

Airport Link

Phase 2 – Detailed Feasibility Study

EIS CHAPTER 15

URBAN DESIGN, LANDSCAPE AND VISUAL
ENVIRONMENT

■ October 2006

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15. Urban Design, Landscape and Visual Environment

This chapter addresses Section 5.8 of the Terms of Reference. Urban design, landscape and visual elements at key locations (in the vicinity of portals) within the corridor are identified on the basis of urban, environmental and visual context of the study corridor. These elements are considered in relation to the whole project within the wider urban context and also in relation to surface works at the local level. Urban design, landscape and visual goals, objectives and principles are developed for the wider project and in particular for key locations.

Design concepts and themes have been developed for the key locations reflecting predicted changes to land use, public amenity, access and sustainable design principles. Visual impacts have been assessed and urban design and landscape treatments developed for the directly affected areas including surface landscaping, portal design, ramp design and the design of surface structures including noise mitigation structures.

15.1 Description of Existing Environment

The assessment of the existing environment within the study corridor comprised a site analysis of existing conditions, context and issues relevant to the study corridor and its immediate locale, in terms of the urban design criteria of urban, landscape and visual character. From this analysis, five key urban design, landscape and visual principles have been identified. The issues contained in these key themes were applied to the study corridor to explore the existing environment. The assessment of the existing urban design, landscape and visual context has been structured under the following themes:

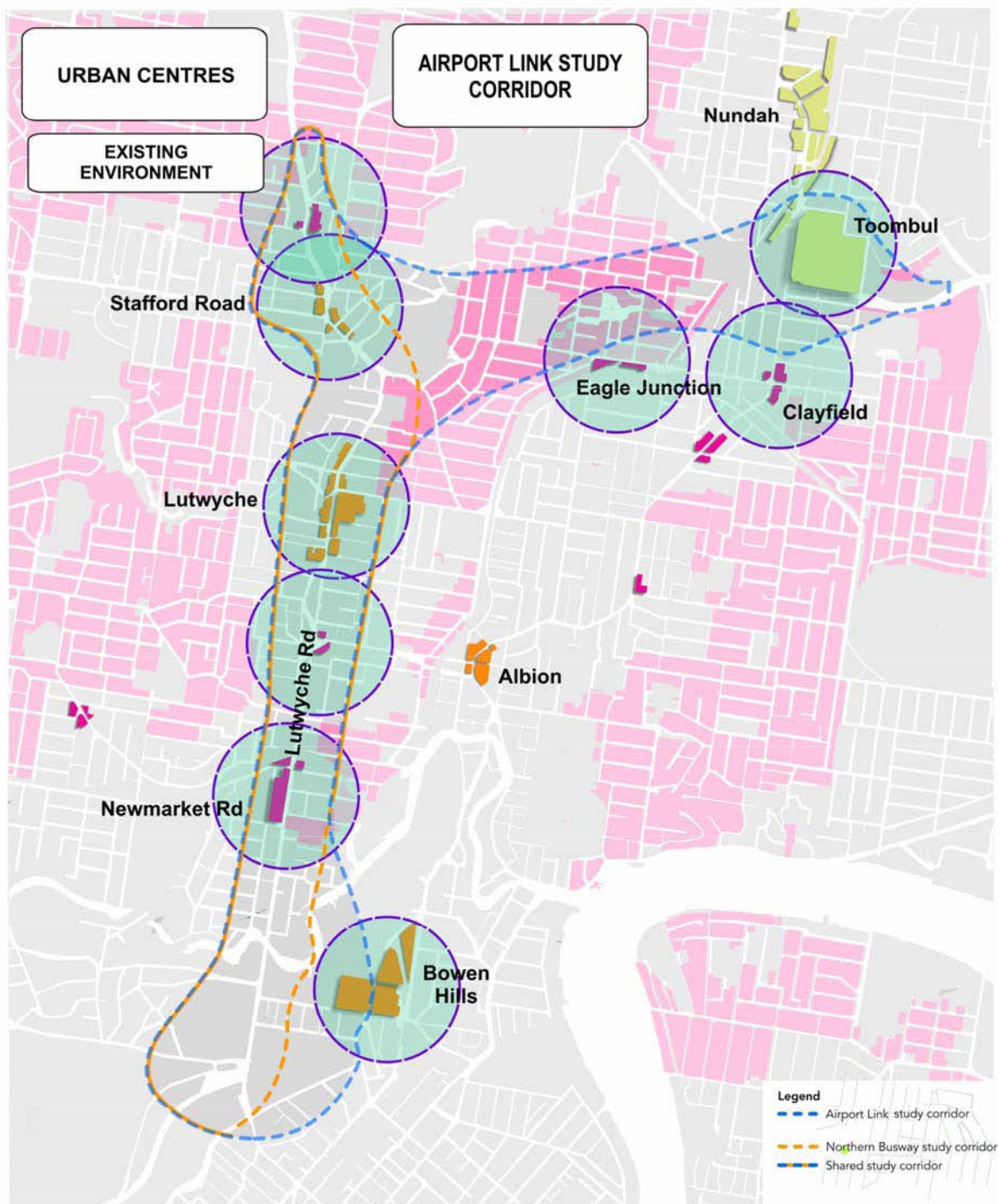
- **Urban Centres** provide critical social and economic activity nodes of a city.
- **Connections** provide movement networks that deliver transport choices to and from Urban Centres.
- **Urban Character** provides built form and open space patterns that underpin a city's sense of place.
- **Visual Values** provide the framework for a city's visual experience and meaning.
- **Landscape Elements** identify the unique natural attributes of places within a city.

15.1.1 Urban Centres

The study corridor contains seven distinct 'urban' centres reflecting a range of hierarchies following the north-south direction of Lutwyche Road, Gympie Road and Sandgate Road. The centres offer community services, access to public transport and employment to differing degrees. The pedestrian catchments around these urban centres mainly contain areas classified for Low to Medium Density Residential with the exception being Woolloowin with its predominantly Low Density Residential catchment. Key centres are identified on **Figure 15-1** and include:

Toombul Major Centre

The Toombul Shopping Centre displays the typical attributes of a 'big box' shopping centre where activity is predominantly internalised and disconnected from the public realm. This internal activity focus is supported by extensive customer parking at ground (and street) level which typically surrounds the shopping centre building and creates further barriers to easy pedestrian connections from the adjacent residential areas. Toombul's pedestrian catchment contains a small proportion of Low Density Residential (LR) areas. This potentially higher density of pedestrians tends to indicate that areas within the pedestrian catchment would benefit from safe and accessible pedestrian connections to the Centre.



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Figure 15.1
Urban Centres



Lutwyche Suburban Centre

This centre provides a more traditional active street frontage and connections to the public realm typical of a suburban strip centre. The core of this strip centre is located on the eastern side of Lutwyche Road. Lutwyche's pedestrian catchment contains a small proportion of LR areas, which tends to indicate that areas within the pedestrian catchment would benefit from safe and accessible pedestrian connections to the Centre.

Gympie and Stafford Road Suburban Centre

The suburban centre at the intersection of Stafford Road and Gympie Road provides a more traditional active street frontage and connections to the public realm typical of a suburban strip centre. This centre is evenly distributed east and west of Gympie Road but these sides alternate rather than align with each other. This centre's pedestrian catchment contains a small proportion of LR areas but also contains the significant open space corridor of the Kedron Brook waterway. Although there is a tendency towards increased activity through improved pedestrian connections, the physical barrier of the waterway restricts access by reducing the number of potential crossing points in the pathway network

Bowen Hills Suburban Centre (partial area)

The study corridor incorporates the western edge of this Suburban Centre. The activity of this centre is limited by adjacent activities to the west such as the Inner City Bypass (ICB) and Queensland Rail yards. Bowen Hill's pedestrian catchment contains predominantly Low-Medium Density Residential (LMR) areas and higher residential densities to its east with more extensive commercial areas to its south and south-west along O'Connell Terrace. Outside the major road and rail infrastructure to its north, this centre would benefit from safe and accessible pedestrian connections within the remaining areas of the catchment.

Gympie Road Convenience Centre

The Gympie Road convenience centre provides an active street frontage mainly to the eastern side of Gympie Road. The outer edges of this centre's pedestrian catchment contain significant LR areas to the east and west of Gympie Road. The current area classifications provide the central area of the pedestrian catchment with the potential for higher density housing. This tends to indicate that there would be a lesser demand on pedestrian connections at the periphery of the pedestrian catchment as compared to the potential pedestrian activity requirements for connections on the eastern side of Gympie Road.

Albion – Lutwyche Road Convenience Centre

The convenience centre at the intersection of Albion Road and Lutwyche Road consists of active street frontages with shopfront customer parking at the intersection corners typical of small convenience centres. This centre's pedestrian catchment contains a small proportion of LR areas which tends to indicate that areas within the pedestrian catchment would benefit from safe and accessible pedestrian connections to the centre. The corner nature of this centre combined with the heavy traffic impacts of Lutwyche Road on the western side of the centre tend to favour its north-eastern and south-eastern quadrants of its pedestrian catchment with the best opportunities for increased pedestrian connections.

Newmarket Road Convenience Centre

This centre provides a more traditional active street frontage and connections to the public realm typical of a suburban strip centre. The majority of this centre is located on the western side of Lutwyche Road. Newmarket's pedestrian catchment contains a small proportion of LR areas, which tends to indicate that areas within the pedestrian catchment would benefit from safe and accessible pedestrian connections to the centre.

15.1.2 Connections

Connections are an integral part of the urban fabric and are shown on **Figure 15-2**. They provide linkages, movement choices, local context, safety, traffic management and parking opportunities. The movement patterns of major roads and rail lines provide a strong north – south connection within the study corridor. There are much weaker connections running east–west within the study corridor.

The highest amenity networks for cyclists and pedestrians however have developed within the public open space along the waterway systems within the study corridor. These networks provide safe and enjoyable recreational and commuter travel opportunities. The north–south link along Lutwyche Road/Gympie Road is less safe with lower amenity due to pedestrians and cyclists having to negotiate the heavy traffic flows of a major arterial road.

15.1.3 Urban Character

Urban character identifies the particular mix of built form and open spaces within the study corridor that provide a “sense of place”. The social significance of a sense of place in a community is addressed in Chapter 14 – Social Environment. The factors, which make up a sense of place include:

- **Identity** – provides distinction, a sense that one is in a place that is like no other place. The identity of the study corridor can be described by its unique mix of open space, commercial and residential areas connected by a street network, which is often shaped by local topography. This mix of uses and open spaces provides a strong suburban character to the study corridor. The only exception to this suburban identity is the southern portion of the study corridor which projects a more inner city urban character due to the land use and scale of road and rail transport systems.
- **Legibility** – provides the ability to easily understand and navigate a place. The legibility of the study corridor’s urban character has been strengthened by the local topography of waterways and ridge lines. These elements have driven transport and development patterns to create a strong and predicable north – south corridor fringed by adjacent residential areas in various stages of transition.
- **Scale** – contributes to the degree of comfort one feels in a place, whether one feels alienated by physical size of a building or welcomed at a human scale. The scale of the study corridor is determined by the predominance of one and two storey detached dwellings of adjacent suburbs that are separated by the open space of the major waterways of Enoggera Creek and Kedron Brook. The dominant single storey residential building form and open space system reinforce a suburban scale to the study corridor.
- **Permeability** – provides choices of moving through a place, which in turn creates interesting and stimulating places. The permeability of the corridor is dominated by the north-south movement of Lutwyche Road and Gympie Road. The adjacent suburban areas connect to the north-south corridor via a regular series of east west local road connections. The convenience and accessibility of these east west connections is reduced due to impacts of steep topography and major water courses.
- **Variety** – provides the choice of activity or the possibility of experiences and interactions in a place. The variety of the study corridor’s character is rich in choice of potential activity. The study corridor provides open space experiences from tidal waterways to creek side walking and cycling trails. There are areas of significant remnant vegetation as well as informal recreation opportunities. The study corridor contains urban experiences that range from the suburban character of Woolloowin to busy strip centres such as the Lutwyche suburban centre as well as the more inner urban experience of Bowen Hills, RNA and RBH at the southern end of the study corridor.

Generally, the study corridor’s urban character could be described as one that is derived from a predominantly low scale suburban landscape bisected by a strong, dynamic transport corridor regularly punctuated by activity

nodes and east-west connections. This corridor offers a wide variety of experience afforded by different land uses and landform. Urban Character is identified on **Figure 15-3**.

15.1.4 Visual Values

The north-south component of the study corridor runs along undulating ridge lines that define the local water catchments. The two catchments of Kedron Brook and Enoggera Creek direct watercourses that cross west to east through the study corridor requiring bridge structures at both creeks. These crossing points open out views to the east and west, which is in contrast to the undulating north-south flow of built form within the Lutwyche Road, Gympie Road and Sandgate Road arterials.

The shallow waterway of Kedron Brook creates an area of moderate to high visual exposure due to the framing high points north and south of the creek line. The Enoggera Creek corridor is generally less visible than Kedron Brook due to the lack of elevated viewpoints. The exception to this is the taller commercial buildings around the Royal Brisbane Hospital (RBH) and O'Connell Terrace that provide north-east vantage points into the waterway.

The open space areas provide high visual values supported by clusters of culturally significant locations. The lower visual values are generated by areas of transition where the original residential fabric borders existing centres and transportation corridors. Visual values are shown on **Figure 15-4**.

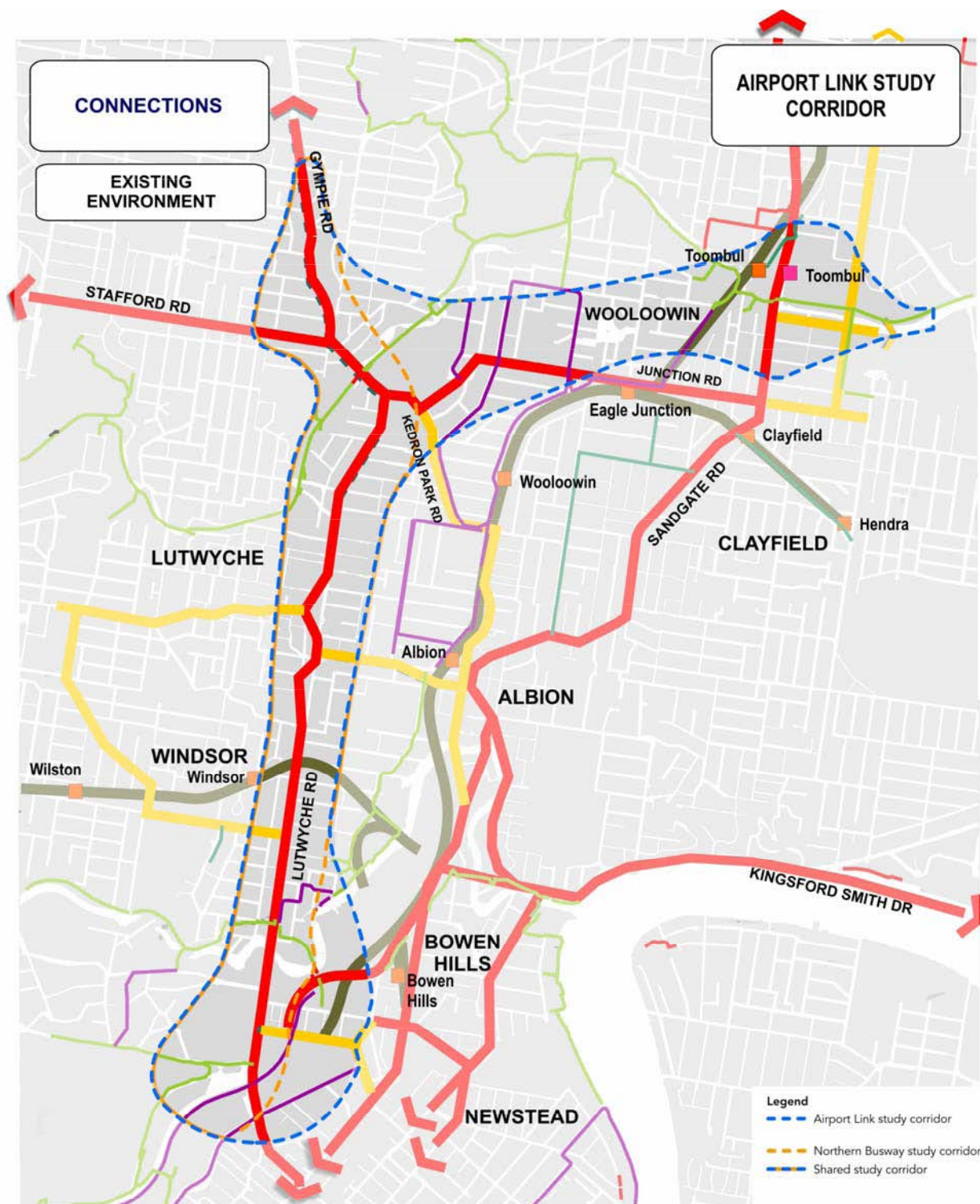
15.1.5 Landscape Elements

The landscape elements that contribute to landscape amenity are significant trees, open space, access to water, and scenic amenity. Landscape amenity also incorporates the values of cultural heritage, environmental, and recreational opportunities. Other reports deal with these contributions to landscape amenity. Landscape elements are located in **Figure 15-5** and illustrated in Appendices to Technical Report No 12 - Urban Design Landscape and Visual in Volume 3 of the EIS.

The pattern of urban development has dictated the location and health of ecological corridors and open spaces within the study corridor. Land development has been shaped by the local topography and drainage patterns. This has meant that areas above flood levels were developed for residential housing and commercial uses. These areas sought to maximise access to views and breezes whilst land within the creek floodplains has remained predominantly in an undeveloped state.

Open space corridors in the study corridor generally are aligned with creek corridors whose environments are sensitive to water flow and management regimes within the greater creek catchment. The consequences of adjacent urban development have significantly degraded the landscape quality of Kedron Brook. This has primarily occurred due to the loss of natural vegetation and its reshaping as a drainage channel to accommodate the increased stormwater flows of urban development. This degradation is particularly significant at the Gympie Road section of the study corridor. From Bradshaw Street down to Shaw Road, the Kedron Brook corridor has the character of an open floodway, with any vegetation in the form of shade trees or other significant trees standing well back and above the 1 in 100 year (100 ARI) flood line. Downstream from Shaw Road, Kedron Brook has a more 'natural' character, despite having been modified by activities associated with human habitation and use over many years. The landscape values of Kedron Brook are enhanced by the memorial plantings of eucalypts along Diggers Drive in Kalunga Park and the presence of hoop pine and other introduced, leafy species (e.g. Chinese elm, Camphor laurel) between the Airtrain and Sandgate Road. From comments received during preliminary community consultation, it is understood that the Kedron Brook corridor, particularly downstream from Shaw Road, has high community values, including community values relating to landscape and recreation opportunities.

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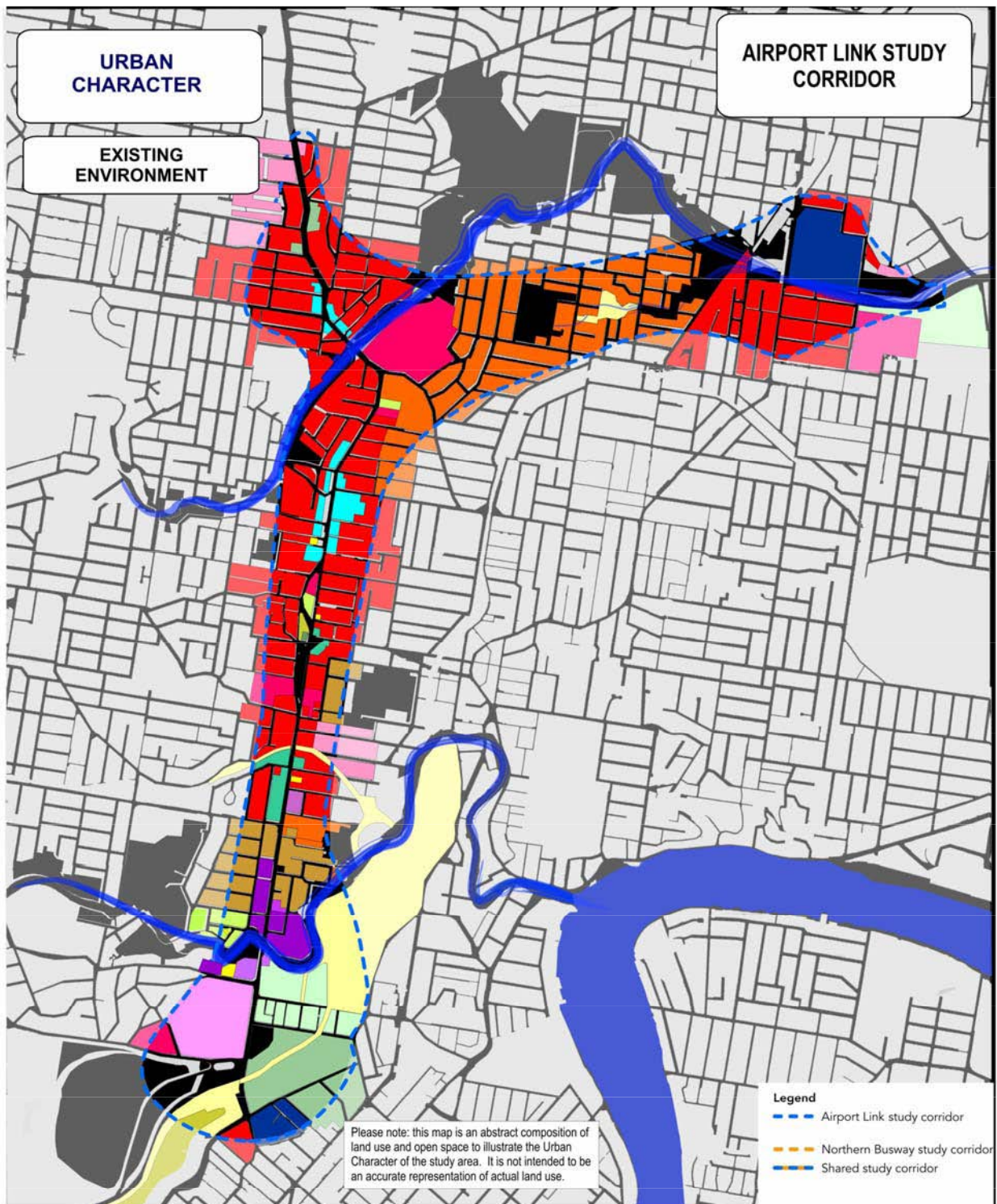
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Figure 15.2
Connections





KEY

Low-Medium Density Residential Area	Entertainment Centre	General Industrial Area	Open Space including roads
Low Density Residential Area	Sports and Recreation Area	Light Industry	Community Facility
Character Residential Area	Queensland Railway Area	Future Industrial Area	
Convenience Centre	Suburban Centre	Major Hospital and Medical Facility	
Office Park Area	Major Multi-Purpose Centre	Education Purpose Area	

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Figure 15.3
Urban Character

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SKM Connell Wagner
JOINT VENTURE

Downstream of Sandgate Road, Schulz Canal has been heavily modified to achieve drainage requirements. Much of the riparian corridor downstream from Sandgate Road is degraded with little vegetation of ecological or landscape value. Schulz Canal is tidal in this area.

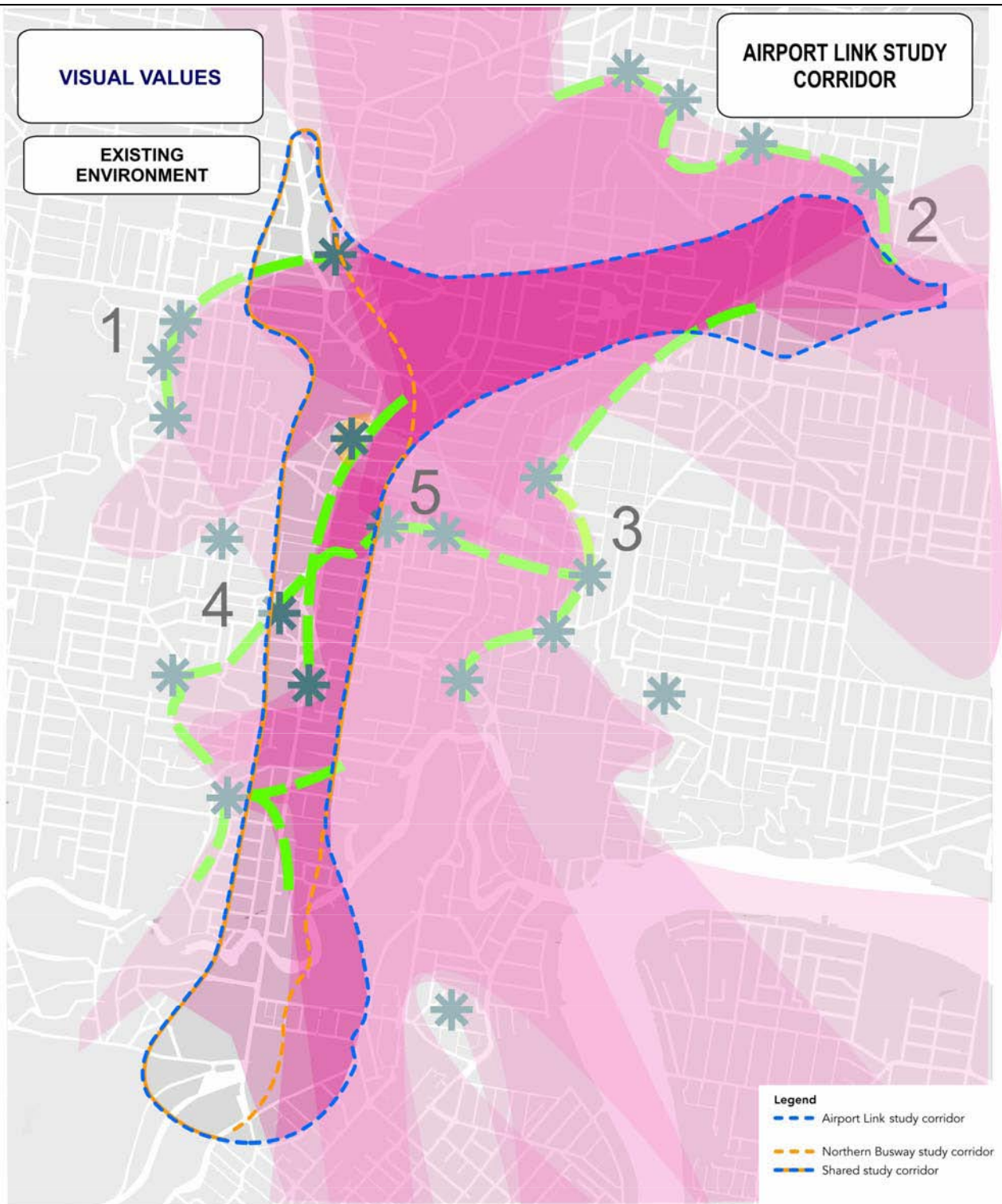
Enoggera Creek also provides other significant natural values to the study corridor. It is a tidal system with colonising mangroves flanking its banks as it travels through the southern end of the study corridor. As with Kedron Brook, Enoggera Creek supports a lineal system of open space providing residents and visitors with visual and physical access to the modified natural environment. The Downey Park open space system to the west of Lutwyche Road (Northey Street, Green Terrace) has district if not regional recreational significance, as well as contributing to the landscape character of the Enoggera Creek corridor.

At the finer grain of urban development, smaller more discrete natural features can also exist due to topographical impediments i.e. cliffs, rock outcrops, and as a result of purpose built parks or 'left over' spaces following the development of land and movement corridors. The cliff face and adjoining open space at Windsor Town Quarry Park is an example of old development activities that contribute natural values within the study corridor.

Special natural features are also present on private development parcels and in community use areas, often as individual specimen trees or distinctive landforms. This has resulted in a number of significant trees and groups of trees and open space within the study corridor. The large fig trees at Office Works on Lutwyche Road are an example of the high aesthetic values outside the public realm that contribute to the landscape quality of the study corridor.

The ridgeline that separates the two creek catchments contains several high points within the study corridor. There is a high point just north of the Stafford Road and Gympie Road intersection. The next high point occurs close by the Lutwyche suburban centre. The top of the exposed face to the old quarry top above the Windsor Town Quarry Park provides the highest point within the study corridor. The most southerly high point occurs at Windsor Memorial Park. All of these high points contribute to the landscape character of the study corridor by providing visual expression to the changing landform.

Natural features are sensitive to change. The mitigation works proposed in this EIS (refer to Chapter 22 – Conclusions and Recommendations) seek to retain such features, enhance their health and integrity, and if necessary, replace their loss.



KEY

VIEWS FROM RIDGES INTO STUDY AREA

- 1 VIEW FROM RIDGE 1
- 2 VIEW FROM RIDGE 2
- 3 VIEW FROM RIDGE 3
- 4 VIEW FROM RIDGE 4
- 5 VIEW FROM RIDGE 5

- RIDGES
- * HIGH POINTS 25 AHD AND OVER

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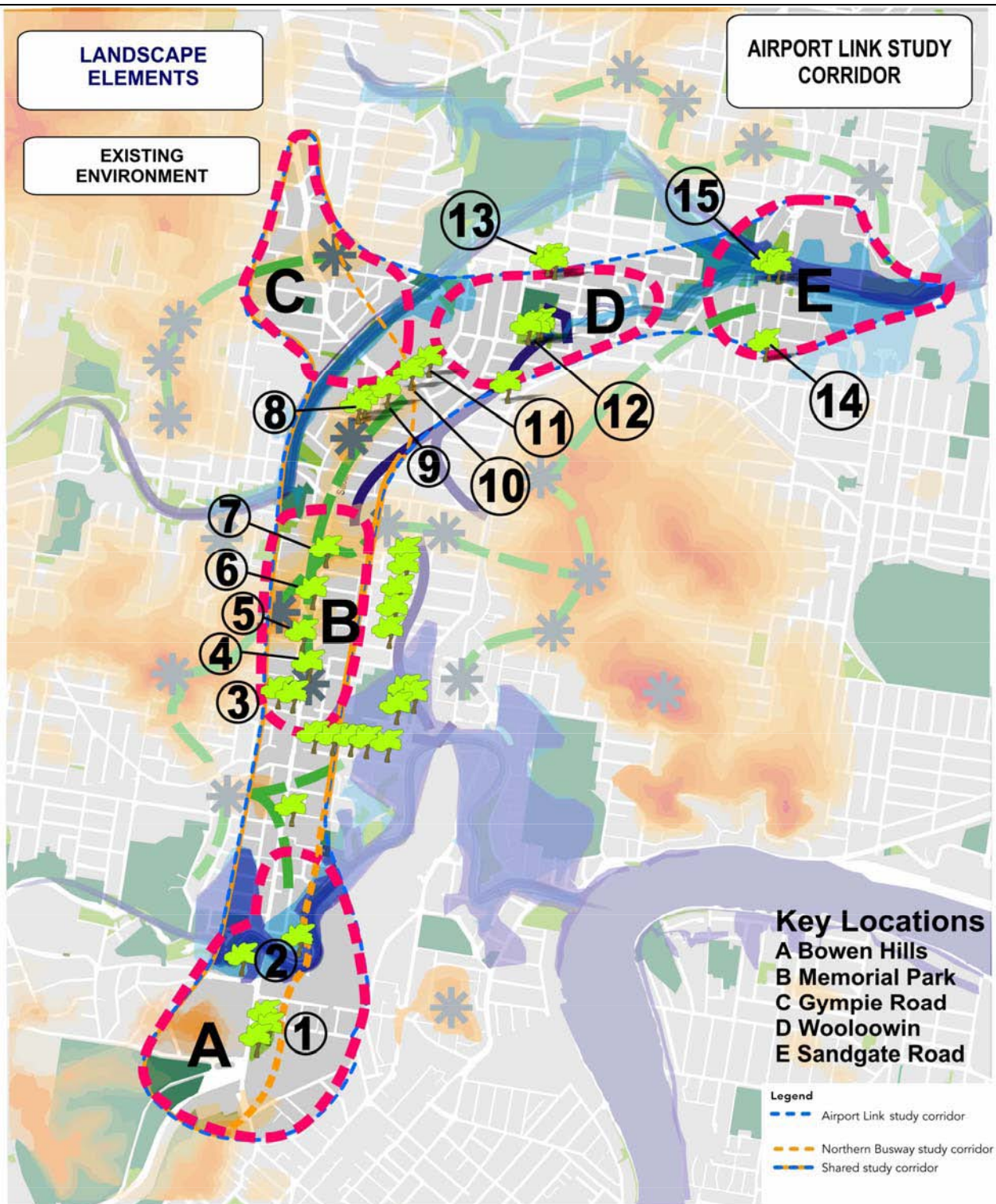
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Figure 15.4
Visual Values





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Figure 15.5
Landscape Elements



15.1.6 Key Locations

The following key locations are primarily areas of the surface works for the Airport Link Project where direct impacts on the built urban, landscape and visual context will be most apparent. Key locations are shown in **Figure 15-6**. The five key locations identified are:

- Windsor and Bowen Hills
- Memorial Park, Windsor (not impacted, but an important landmark in the study corridor)
- Kedron (Gympie Road)
- Woolloowin
- Clayfield (Sandgate Road).

The areas surrounding Memorial Park on Lutwyche Road, and the Woolloowin residential area are not expected to be affected by direct surface works. However they are likely to indirectly benefit from an expected reduction in surface traffic. They have been identified due to their unique qualities as discreet localities within the study corridor.

Each of the five key locations have been reviewed with regard to visual elements and values of the built, landscape and visual form, including access and amenity, considerations for residents, pedestrians, cyclist and public transport users.

Each key location has also been reviewed with regard to landscape amenity and those elements protected by local planning orders or similar laws. Landscape amenity in this report refers to the type and combination of natural landscape elements that provide physical comfort and contributes to the attractiveness of an area by providing a benefit to the local community. The landscape elements that contribute to landscape amenity of each key location are significant trees, open space, access to water, and scenic amenity.

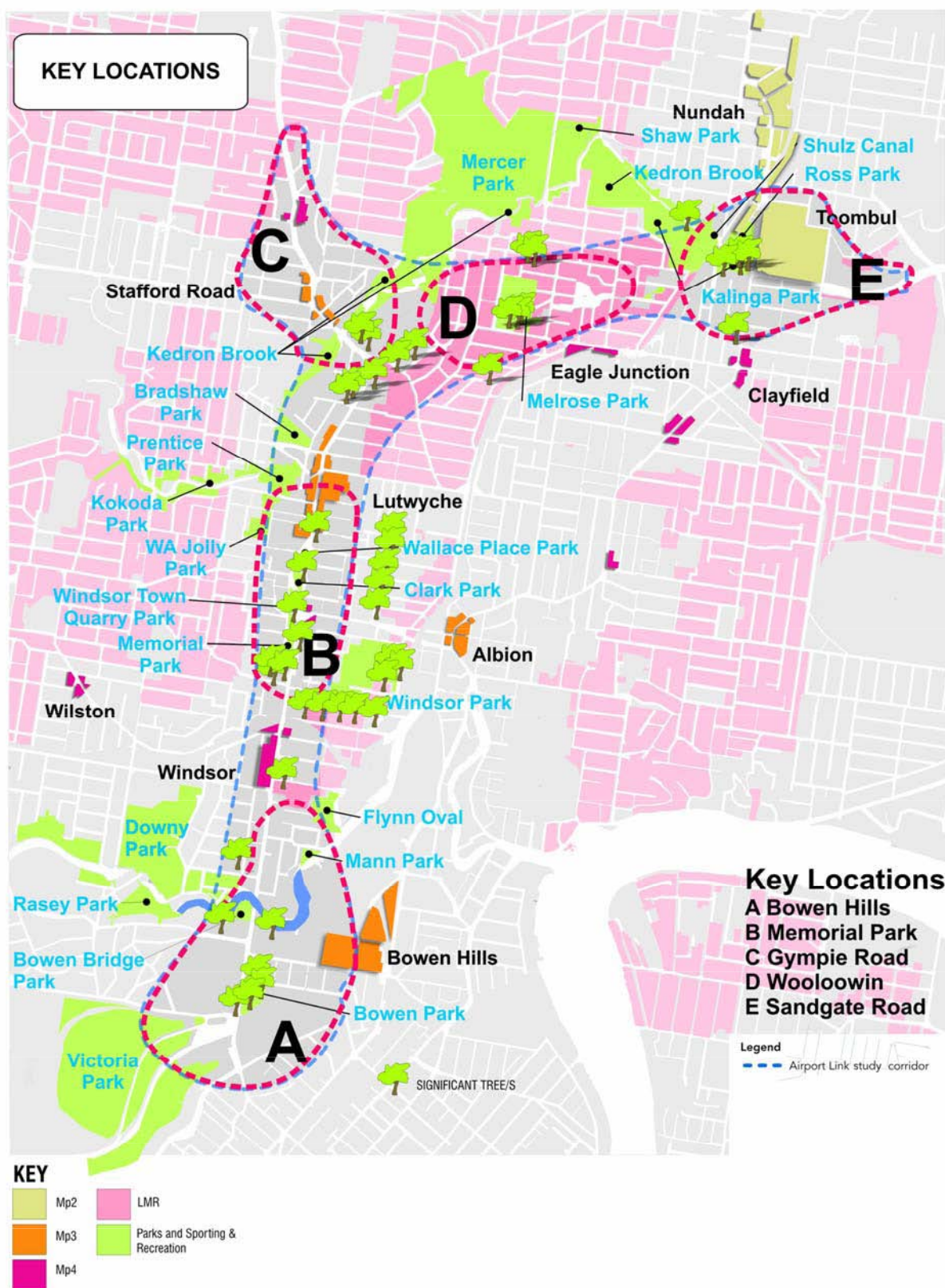
Bowen Hills

The Bowen Hills suburban centre near the Bowen Hills train station, provides an activity node to the eastern edge of this key location. The western pedestrian catchment of the Bowen Hills suburban centre within this key location is highly fragmented by areas classified for railways activities and office park. The existing environment for the Bowen Hills key location is shown on **Figure 15-7**.

Lutwyche Road creates a strong north-south connector with O'Connell Terrace providing an east-west link and the ICB a strong diagonal connector. The mangrove edges of Enoggera Creek combined with rail line activities and the arterial activity of Lutwyche Road have created barriers to completing the extensions of existing pedestrian and cycle networks.

The character of the area is dominated by large-scale special uses such as the Royal Brisbane Hospital (RBH), the Royal National Association (RNA) Showgrounds, Mayne rail yards and office park developments. With the least amount of residential use in the study corridor this key location has the built form character of inner city commercial precincts, as does the Bowen Bridge Road / Campbell Street precinct. The Mews apartments on Campbell Street and the recently completed housing in Tufton Street are the key residential exceptions to the commercial character of the locality.

Enoggera Creek provides open space character albeit difficult to access. Predominantly this area is influenced by the presence of the RBH and RNA precincts and some left over open space between road infrastructures. The lack of the smaller scale street pattern and supporting built form creates a fragmented urban character.



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Figure 15.6
Key Locations

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JOINT VENTURE

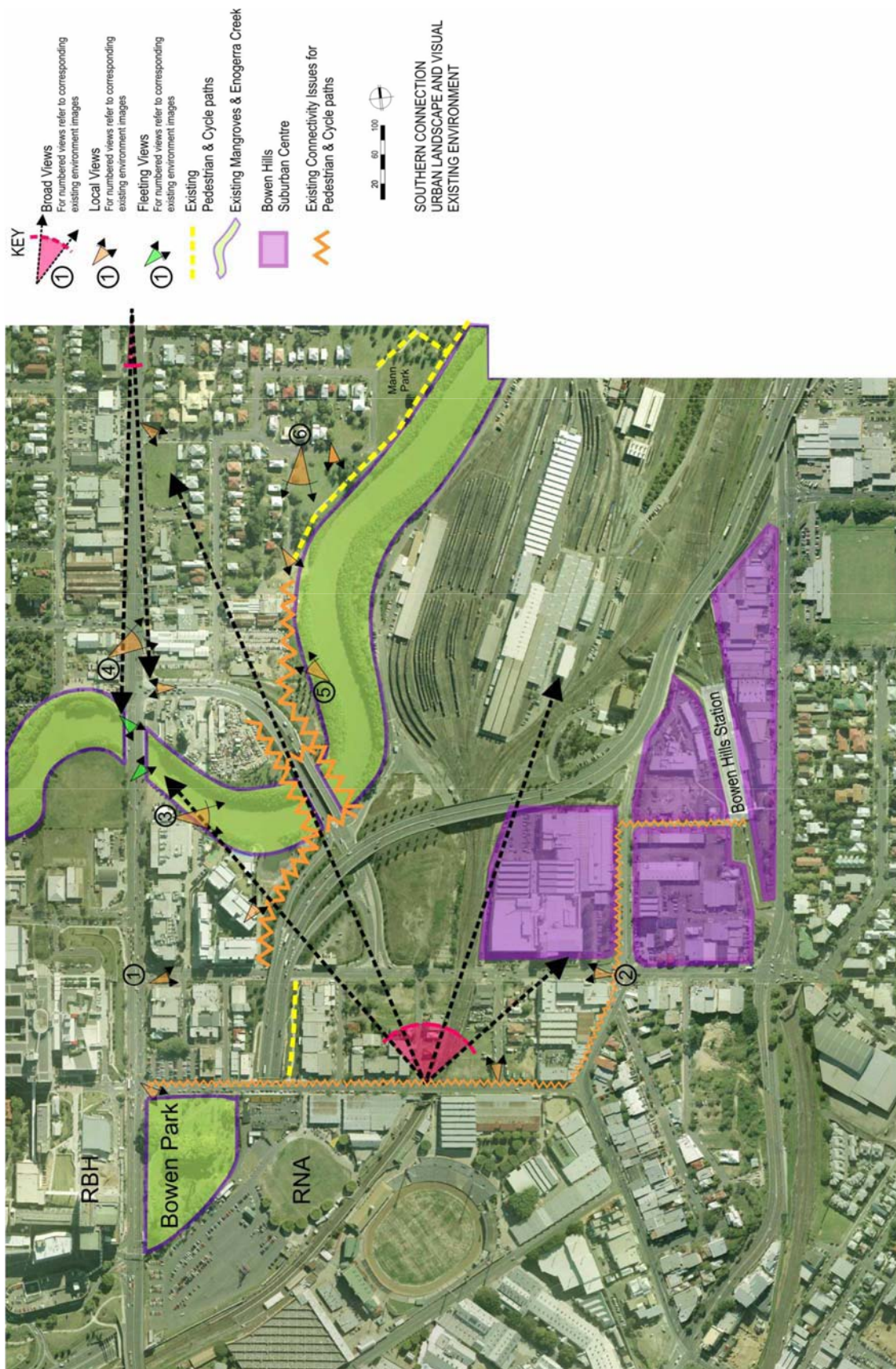


Figure 15.7
Bowen Hills Key Location
Existing Environment

This location is viewed from local high points external to the study corridor (i.e. Windsor and Albion). There are no ridge lines or hilltops in this area, although there is a ridge line to the north, external to this key location at Newmarket Road-Lutwyche Road) that provides elevated views to the south.

The landscape elements of this key location are centred on Enoggera Creek, Bowen Park and the north-east tip of Victoria Park. The study identified two groups of significant trees and one park within this key location of high landscape value:

- Bowen Park and its significant trees contain landscape amenity of high quality. Direct impact on this park is unlikely, and adjacent impacts need to be mindful of the users of this park, i.e. weddings; and
- The mangroves fringing Enoggera Creek provide high landscape amenity for creek users, which is a rarity in such an urban environment.

Memorial Park, Windsor

The convenience centre at the intersection of Albion Road and Lutwyche Road provides a local activity node in the central area of the study corridor. The southern half of the larger suburban centre at Lutwyche defines the location's northern boundary. Due to the spacing of the convenience centre and the Lutwyche suburban centre their supporting pedestrian catchments nearly fully contain this key location. The evolution of these centres has provided this key location with high levels of activity and movement.

Lutwyche Road again provides the north-south arterial connector supported by east-west sub-arterial connections at Albion Road and Days Road. The topography of this area and traffic management has shaped Memorial Park into an island surrounded by heavy traffic flow. Pedestrian and cyclist connections through this park exist but are not attractive for use. The limited existing pedestrian and cycle access into the park results in the apparent lack of use of this landmark open space.

The area contains a strong spine of community uses and open space within the Lutwyche Road corridor. The existing centres provide one and two storey commercial buildings with regular connecting side streets to adjacent residential areas. The southern end of the Lutwyche suburban centre provides an active streetscape frontage typical of strip centres while the convenience centre at the Albion Road intersection provides small-scale commercial buildings within in this predominately LMR location. The parks contained within this area contribute to a strong sense of place provided by the War Memorial monument, the old Windsor Council Chambers, substantial stone retaining walls to the park edges and mature trees. This cluster of character elements forms a prominent and memorable city gateway for motorists travelling to and from the city.

Due to the intersection of the north-south ridge along Lutwyche Road and the east-west ridge in the vicinity of Chalk Street, this key location contains the strongest ridge line grouping in the Study Corridor. These ridges also provide peaks at Memorial Park and at the top of the cliff at Windsor Town Quarry Park. These topographical attributes make this key location a significant viewing location as well as highly visible from the lower areas of the Enoggera Creek and Kedron Brook catchments.

This location contains a north-south ridgeline along Lutwyche Road and an east-west ridge line in the vicinity of Chalk Street. There are a number of significant landscape features and trees in this area, such the Old Town Quarry Park cliffs, Pop's Fig, and the trees around the war memorial at Memorial Park. These features make this an area with high landscape values.

Gympie Road

The Stafford Road and Gympie Road suburban centres provide a focus for activity in this key location. The northern extent of activity is defined by a smaller convenience centre. The functionality of both centres in this

key location is affected by the increasing traffic flows on Gympie Road and Stafford Road. The pedestrian catchments of both centres overlap. However, due to the road system, topography and the spatial impacts of Kedron Brook, the connections to these centres are difficult. This has tended to reduce their activity levels and ability to consolidate their commercial cores. The existing environment for the Gympie Road key location is shown on **Figure 15-8**.

The north-south alignment of Gympie Road/Lutwyche Road with the east-west connector of Stafford Road and Junction Road create the dominant movement pattern in this key location. This road pattern reduces the opportunities for convenient or amenable pedestrian and cyclist movements. The strong west-east flow of the Kedron Brook waterway has created an alternate movement system for pedestrian and cyclist, which is highly patronised by locals and visitors. The pedestrian and cycle movement network along the Kedron Brook waterway contributes to the character of this key location.

Kedron Brook dominates the landscape amenity provided in this key location. The open space corridor of Kedron Brook runs through the centre of this key location. An engineered open drain acts as the water conduit and in high flows the area floods over the grassy banks containing pedestrian and cyclist paths. The area does not directly contain documented significant trees. However, to the south a number of mature figs fringe Norman Avenue, Lutwyche Road and Kedron Park Road. Fragmented groups of trees line the outer edges of this corridor. Overall, the limited variety of landscape features in this area contributes to low landscape value at present.

Woolloowin

Whilst there are no formally defined centres in this area of the study corridor, a portion of the corridor is within the walking catchment of the Eagle Junction convenience centre. The eastern and western edges of this key location provide a low-density residential frame to the key locations of Sandgate Road and Gympie Road. The pre-dominance of low density residential provides this key location with a small-scale and well-connected suburban catchment to support the activity of the adjacent Eagle Junction convenience centre.

The main east-west arterial connector is Junction Road, which is supported by the north-south connections of Dawson Road and Shaw Road. The North Coast Railway defines its eastern edge. The residential street pattern provides a good framework for pedestrian and cyclist movement, and access to the Kedron Brook open space system. Much of the area is within the 400m pedestrian catchment of the Eagle Junction railway station.

The predominantly low-density residential character creates a predictable and highly legible character within this key location. Kedron Brook and Schulz Canal provide green space and recreational variety to the northern edge of this key location. The south-eastern edge is defined by the rail line that reduces pedestrian, cycle and vehicle permeability. Residential built form and street patterns edged by open space are the dominant characteristics of this key location.

Due to its position between the Lutwyche Road ridge line and the Sandgate Road ridge line, this key location is the most highly visible location within the study corridor. This key location also provides the most intact and consistent visual character of suburban low density housing and domestic landscaping within the study corridor.

Although this key location is predominantly above flood inundation lines, it is one of the lower lying areas within the study corridor. Melrose Park, and its vegetation and waterways, are the dominant natural features in this key location. A degraded and fragmented minor drainage system rises in the vicinity of Melrose Park. This drainage system would have previously connected to Schulz Canal. There is also a mature grouping of Eucalypts of sufficient scale to provide native habitat at the southern end of Melrose Park, as well as established

vegetation surrounding this residential precinct. Melrose park itself is somewhat exposed and unattractive to use due to the lack of shade trees and other amenities, particularly in the northern ‘half’.

Sandgate Road

The major centre at Toombul provides the focus for this key location. The scale of this activity is typical of its “big box” typology where the large commercial floor space necessitates large areas of supporting customer parking. The surrounding car parking which is mostly at surface reduces its capacity to link into supporting pedestrian catchments. This centre is the only one along the corridor, which is clearly removed from the property boundary and is “introverted” in nature. The existing environment for the Sandgate Road key location is shown on **Figure 15-9**.

The area also contains the northern pedestrian catchment of the convenience centre located at Clayfield. Most of the residential areas contained within both centres’ catchments are classified as LMR and accordingly provide access to more potential pedestrians such as the LR catchment contained within the Woolloowin key location.

North-south links are provided by the North Coast Railway to the west of Sandgate Road. Melton Road provides an increasingly significant alternative north-south connection further east. The East West Arterial provides the dominant east-west connection supported by the Airtrain.

Pedestrian and cycle paths of low amenity but high utilisation are provided along the edges of the Schulz Canal waterway system and some adjacent open space areas.

The combination of Schulz Canal and the North Coast Railway impact on connectivity in the area. Toombul Shopping Centre and the pylons of Airtrain provide a larger scale in the built form than are normally found in suburban areas. The range of built form associated with transport infrastructure and buildings of the major shopping centre, and residential areas predominantly classified as LMR dissected by a tidal waterway, has created a location of fragmented character.

The fragmented nature of this key location provides a mix of spaces, ranging from waterway areas to highly degraded areas underneath the Sandgate Road bridge and along the waterway to Melton Road. The upper and lower reaches of Schulz Canal are very well utilised and provide the local community recreation infrastructure. The upper reach has a strong sense of place, whilst the lower reach has a very weak sense of place.

This location is framed by ridge lines to the north and south with Schulz Canal (part of Kedron Brook Open Space) creating a valley running east-west. The most visible areas are to the east of the Sandgate Road ridgeline looking toward Toombul shopping centre. The area to the west of Sandgate Road has moderate to low visibility due to the combination of railway infrastructure and mature vegetation. To the west there are significant groupings of *Araucaria* sp., *Eucalyptus* sp., other cultural plantings and weed species.



Figure 15.8
Gympie Road Key Location
Existing Environment



Figure 15.9
Sandgate Road Key Location
Existing Environment

15.2 Urban Design Principles, Goals and Objectives

The key urban design, landscape and visual aim for the Airport Link Project is to assist with the integration of tunnel and surface infrastructure with the existing environment and where possible provide increased cultural, economic and environmental benefits to the local community and the city as a whole. Principles for urban design have also been established for the project, based on consultation with key stakeholders, including Council officers, State agencies and local community members, as well as the outcomes of investigations into the context of the existing environment and its associated themes described above.

Community Issues

Preliminary consultation for the Airport Link Project identified a range of urban design and amenity issues for local areas within the vicinity of the proposed works. These included:

- Replacement of public open space in Kedron Brook and Kalinga Park, including replacement of mature tree species;
- Visual impact and disruption of views from ventilation stations and ventilation outlets, transition and elevated structures, including noise barriers;
- Noise barriers at the Sandgate Road connection (end of Stuckey Road/Alma Road) should incorporate a landscaped buffer to soften the visual impact of both the barriers and the ventilation station and outlet;
- Need to provide cycle and pedestrian paths, including need to provide better pedestrian environments, which are away from roadways and provide or reinstate pedestrian and cycle linkages to community facilities and open spaces;
- Traffic noise impacts, including at Kedron and Sandgate Road portals, acceleration and braking of heavy vehicles, from elevated structures;
- Need for attractive landscaping, public art and urban design to be incorporated into project;
- Light pollution from elevated structures;
- Loss of sunlight from shadow of elevated structures;
- Loss of visual amenity and serenity of Kedron Brook parklands due to elevated structures and increase in traffic across Kedron Brook; and,
- Disruption to breezes from transition and elevated structures, including noise barriers at Lutwyche (Colton Avenue), Sandgate Road (Stuckey/Alma Roads).

Principles and Goals

These issues, and the assessment of the existing character of the study corridor have led to the establishment of a number of principles and goals to identify urban design outcomes and possible mitigation measures for the project as a whole and also for key locations. Urban design principles and goals proposed for the study corridor as a whole are:

- Urban Centres - maintain compact and accessible centres with well integrated pedestrian and vehicle movement networks.
- Connections – Provide or maintain well connected pedestrian, cycle and vehicle networks to centres and places of community value (e.g. community facilities and open spaces).
- Urban Character – Integrate the infrastructure and rehabilitated open space into local neighbourhoods to retain the sense of place within the corridor.
- Visual values – Respect and enhance where practicable, existing and locally identifiable visual qualities which contribute to the character of the locality.

- Landscape Values - Protect and enhance where practicable areas of significant natural value to the locality.

Objectives

At a more specific level, a range of design objectives have been identified for the project, including:

- Integrate project infrastructure (i.e. transition structures, flyovers, portal, ventilation outlets and sound barriers) with the environment to the extent possible, and in a consistent manner through urban design and landscape treatments;
- Provide inclusive public spaces supporting neighbourhood identity through design;
- Reinststate and reconnect existing pedestrian and cycle networks safely and conveniently through and around project infrastructure, to the extent practicable;
- Integrate, to the extent practicable, existing Landscape Elements with the project infrastructure;
- Facilitate where possible and practicable the integration of transport nodes and community facilities into movement networks;
- Facilitate the provision of safe and accessible new pedestrian and cycle networks;
- Provide a well connected and high amenity streetscape in the vicinity of the project infrastructure and in the locations indicated in the mitigation works (refer to Chapter 22 – Conclusions and Recommendations);
- Through design, ensure public spaces created by the Project provide for relaxation and recreation, framed where practicable by active edges;
- Respect and where practicable, protect critical views and vistas, and minimise and mitigate visual impacts of project;
- Strengthen green space values of the existing network of open space and rehabilitate Project construction areas in accordance with the environmental management plans and good design practice;
- Where possible and practicable, promote water wise subtropical urban design and landscape treatments, including environmental treatments for water quality management and habitat enhancement, for both project infrastructure and public open spaces;
- Apply Crime Prevention Through Environmental Design (CPTED) principles through the design process in respect of areas of the Project likely to be in the public domain; and
- To the extent reasonable and practicable, apply Sustainable Design principles through the design process;

Urban design principles, goals and objectives were devised to frame the investigation of the key locations within the study corridor. These deal with issues of commercial activity, access, landscape and visual amenity, local character, integrated movement networks, protection and enhancement of natural and cultural features, increased public access and improved neighbourhood character. They are described below for the key locations affected by the proposed surface works.

Bowen Hills and Windsor

- Principles:
 - Maintain its functionality as a social and economic activity node within the City, to the extent practicable;
 - Provide effective and efficient connections and accessibility to support locality functions;
 - Support the creation of a strong urban character and amenable sense of place by the relationship between distinctive built form and public open spaces;
 - Provide and support orientation and movement through the locality;

- Support and where practicable reinforce the landscape elements characteristic to the locality and seek to provide landscape amenity to the community.
- Goals:
 - Achieve a high functional amenity integrating pedestrian, cycle and vehicle movement networks;
 - Develop a highly effective network of movement which interfaces with the existing infrastructure;
 - Reinforce the visual qualities of Bowen Hills, to the extent practicable, by supporting environmental values and providing strong positive visual references;
 - Mitigate, to the extent practicable, the visual impacts of project infrastructure, including the elevated roadways over Enoggera Creek and those adjacent to The Mews apartments, the ventilation station and outlet in Windsor, and the connections with the local road network (i.e. Campbell Street, O’Connell Terrace, Lutwyche Road);
 - Rehabilitate and reinforce the Enoggera Creek riparian corridor, to the extent practicable, for its landscape and aesthetic values.
- Objectives:
 - Integrate transport and land use effectively;
 - Provide good connectivity and access to transport along and across Bowen Hills;
 - Expand on transport modes including pedestrians and cycling;
 - Maintain and enhance where practicable existing views and vistas;
 - Minimise and mitigate the visual impacts of Project infrastructure;
 - Strengthen natural corridors and rehabilitate construction worksites;
 - Integrate the Project into the existing landscape elements to the extent practicable;
 - Strengthen access to and vistas of significant public areas and open spaces possessing landscape amenity, such as the Enoggera Creek and associated open space corridor, and Bowen Park to the south of the project.

Gympie Road, Kedron Key Location

- Principles:
 - Maintain the functionality of the Kedron/Lutwyche locus as a social and economic activity node within the transport corridor;
 - Provide for a highly accessible place;
 - Integrate topography, community spaces, water bodies and surrounding built form through landscape and open space development;
 - Provide a memorable and distinct visual experience;
 - Identify and reinforce unique landscape elements.
- Goals:
 - Provide for a strong functional amenity at Kedron through enhanced accessibility and connectivity;
 - Improve pedestrian, vehicle movement networks and land use by effective integration of each element in the detailed design phase;
 - Restore connectivity and equitable accessibility to activity areas;

- Restore and enhance open spaces and their accessibility from residential areas and community facilities, to the extent practicable and required by the mitigation works;
 - Maintain where practicable existing views and vistas, or mitigate impacts through design and landscaping;
 - Mitigate the visual impacts of project infrastructure, including surface connections, elevated roadways over Kedron Brook and the approaches to the Project portals, ventilation stations and outlets, and noise barriers on the approach roads;
 - Respect and restore, to the extent of any disturbance, areas of significant natural value in the vicinity of the Project works.
- Objectives:
- Provide enhanced, safe and secure linkages across and through surrounding areas for pedestrians, cyclist and all modes of transport;
 - Rehabilitate and enhance urban amenity in the vicinity of the portals and elevated roadways;
 - Mitigate Project impacts on existing visual access, views and vistas of green spaces and community facilities;
 - Provide infrastructure with high quality design and high quality landscape treatments;
 - Strengthen existing landscape elements, rehabilitate construction worksites;
 - Integrate the Project infrastructure into existing landscape elements to the extent practicable;
 - Strengthen access to and vistas of to all public areas and open spaces possessing landscape amenity.

Sandgate Road, Clayfield

- Principles:
- Support the role of the Toombul centre as a social and economic activity node within the transport corridor and the city;
 - Maintain a positive, vital, safe and attractive integration of residential, commercial land uses and natural and modified landscape features;
 - Support orientation and movement through the locality.
- Goals:
- Maintain connectivity and accessibility between residential areas south of Kalinga Park and the Toombul rail station, bus exchange, the commercial centre and surrounding open space;
 - Create a visually attractive and legible environment for pedestrians and cyclists as well as local and commuter traffic;
 - Mitigate the visual impacts and potential impacts on access and connectivity of the project infrastructure including surface connections with Sandgate Road, and the ventilation station and outlet;
 - Rehabilitate and where practicable enhance areas of significant green space value, particularly along Kedron Brook and Schulz Canal.
- Objectives:

- Reinforce main linkages from the residential communities south of Kalinga Park with transport, commercial and community infrastructure to the north;
- Provide attractive, safe and convenient access through or around the infrastructure connections for pedestrians, cyclist and all modes of transport to surrounding open space, residential and commercial areas;
- Rehabilitate and enhance views of Kedron Brook and Schulz Canal, taking into account the presence of Project infrastructure including the surface connections and the ventilation station and outlet;
- Ensure Project infrastructure exhibits high quality design and high quality landscape treatments;
- Rehabilitate and landscape the construction worksites along Schulz Canal and in Kalinga Park;
- Ensure the Project is integrated with retained existing landscape elements where practicable;
- Restore access to public areas and open spaces possessing landscape amenity.

15.2.1 Urban Design, Landscape and Visual Strategies

Based on the above design principles, goals and objectives, the following six strategies are proposed to guide the urban design, landscape and visual concepts for the Project and the mitigation of urban design, landscape and visual impacts:

- Revegetation/waterway rehabilitation – protect existing endemic vegetation. Revegetate construction worksites following construction and reinstate riparian habitat where appropriate and practicable;
- Urban Forest Treatment – create well connected and safe landscapes of diverse and high quality where the project creates open space, incorporating existing parks and open space, where possible and practicable;
- Activity Zones – create well connected and safe community areas for active or passive recreation within existing open spaces;
- Boulevard Treatment – provide significant tree planting, street furniture, public art and accessible pathways to major roads;
- Suburban Centre Improvement Schemes – create well connected and safe new opportunities or strengthen existing viability of centres through urban design and landscape treatments;
- Design Intervention in response to infrastructure proposals – create themed urban design and landscape treatments for retaining and transition structures, flyovers, portals, ventilation outlets and sound barriers and integrate these with the existing environment of the each key location.

15.3 Urban Design Impacts & Mitigation

The key urban design, landscape and visual task is to assist with the integration of project infrastructure with the existing environment and where possible provide enhanced landscape, and environmental benefits to the local community and the city as a whole.

Surface impacts affect areas of both open space and urban areas. Urban design and landscape concepts have been developed for each key location affected by surface impacts – Bowen Hills/Windsor, Kedron and Clayfield. The concepts graphically illustrate the mitigation measures in plan, sketches and sections. These measures have considered a range of treatments for visual elements and urban design opportunities, including surface landscaping, portal design, ramp design and design of surface structures, including noise mitigation structures. However, the physical outcomes will be the subject of detailed design, prepared in accordance with any conditions set for the Project by the Coordinator-General.

15.3.1 Bowen Hills/Windsor (Southern Connection)

Impact Assessment

The impacts of the proposed works for the Airport Link Project at the southern connection are likely to include:

- The **Urban Centre** is not likely to be compromised further than by the works required for the NSBT Project, despite the introduction of ramps at Campbell Street east and also connections to O'Connell Terrace. These ramps introduce additional infrastructure into Campbell Street east of the railway, impacting on the potential to establish a high level of cohesion in future development. Future development of the Bowen Hills area will need to be consistent with the planning provisions in City Plan and, desirably, integrate with the street enhancements proposed as part of the NSBT works.
- **Connectivity** for east-west movements through Bowen Hills will be made more difficult for pedestrians and cyclists where all proposed roads and ramps impact on existing road and open space networks. This will be relevant to the eastern end of Campbell Street, the western end of O'Connell Terrace and the northern reach of Enoggera Creek. In Windsor, pedestrian and cycle connectivity with Bowen Hills will be achieved through connections with linkages to be provided as part of the NSBT Project. Movement from Windsor to other areas will become more constrained, as local streets connecting with Lutwyche Road are limited to Federation Street and Gallway Street.
- The **Urban Character** of Bowen Hills between Enoggera Creek and O'Connell Terrace will be further affected by road infrastructure, taking into account the likely impact of implementation of the NSBT Project. The inclusion of additional elevated roadways, particularly in close proximity to The Mews apartments will have an adverse impact for which no effective mitigation measure is apparent. Also, the additional road infrastructure will create remnant spaces, which will require landscape treatments and on-going maintenance but which will not have any utility. The construction worksite in Windsor East will result in the change in land use, and character, of that area south of Federation Street. However, this area could be expected to be subject to fundamental change over time without implementation of the Airport Link Project, due to its accessibility and proximity to major employment centres such as the RBH campus, Fortitude Valley and the CBD. Local planning for managing land use change and the future development in this locality is required.
- **Visually** the project will impact on broad views looking north from O'Connell Terrace and views south from Windsor East and Lutwyche Road. Fleeting views to mangroves from Bowen Bridge Road will be impacted by the installation of multi-layered roadways, including a double-decked roadway, enclosed for acoustic screening. Other urban views to be impacted by project infrastructure would be to the west along Campbell Street, as well as the views to and from Mann Park in Windsor East. In addition to the roadways and other infrastructure associated with the surface connections, further visual impacts will be imparted by the scale and height of the ventilation station and ventilation outlet to be sited above the portals of the southbound tunnels near Earle Street.
- The **Landscape Elements** likely to be impacted are the mangroves on the southern and northern banks of Enoggera Creek and the setting for Mann Park.

Figure 15-10 shows the impact assessment for the Bowen Hills key location.

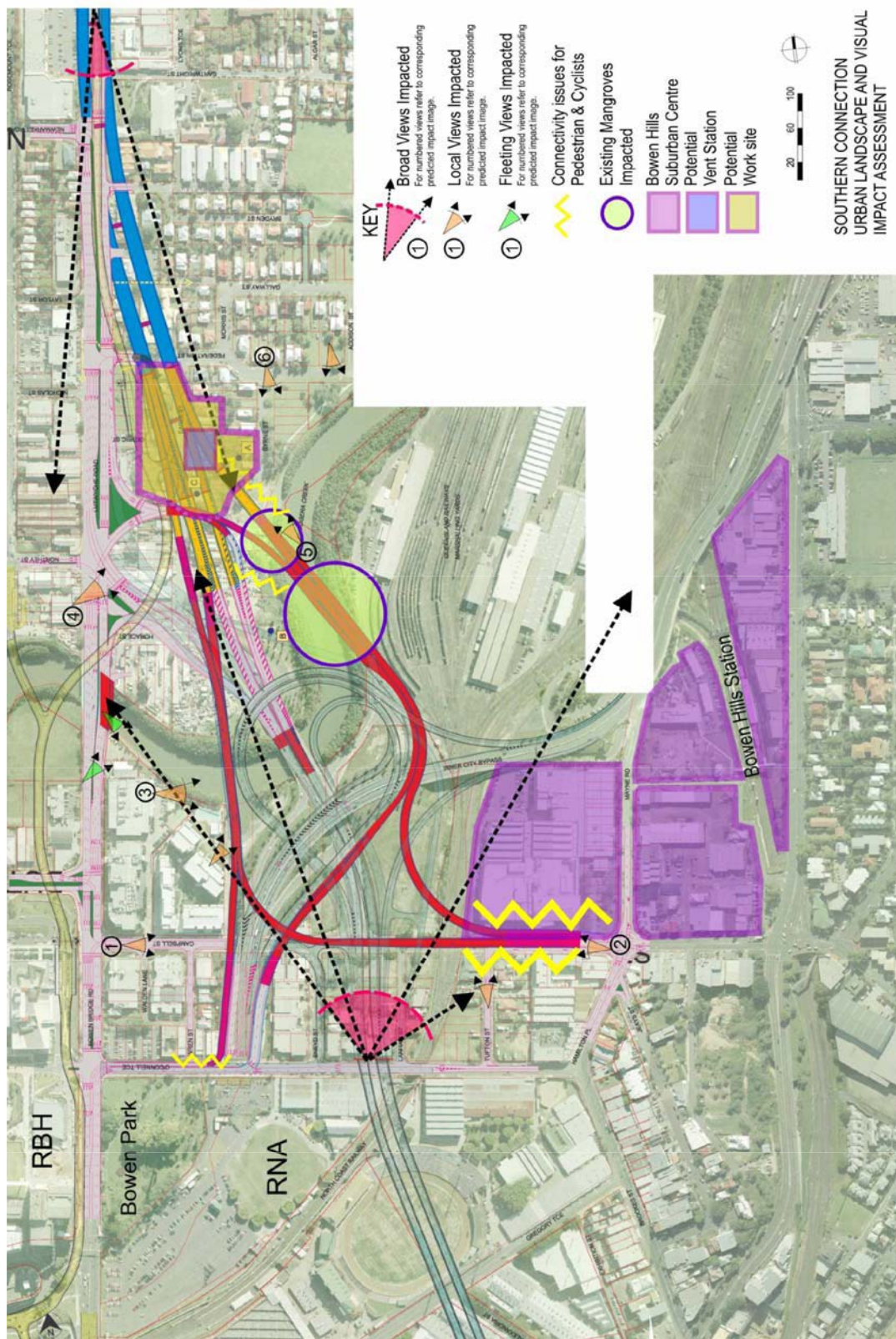


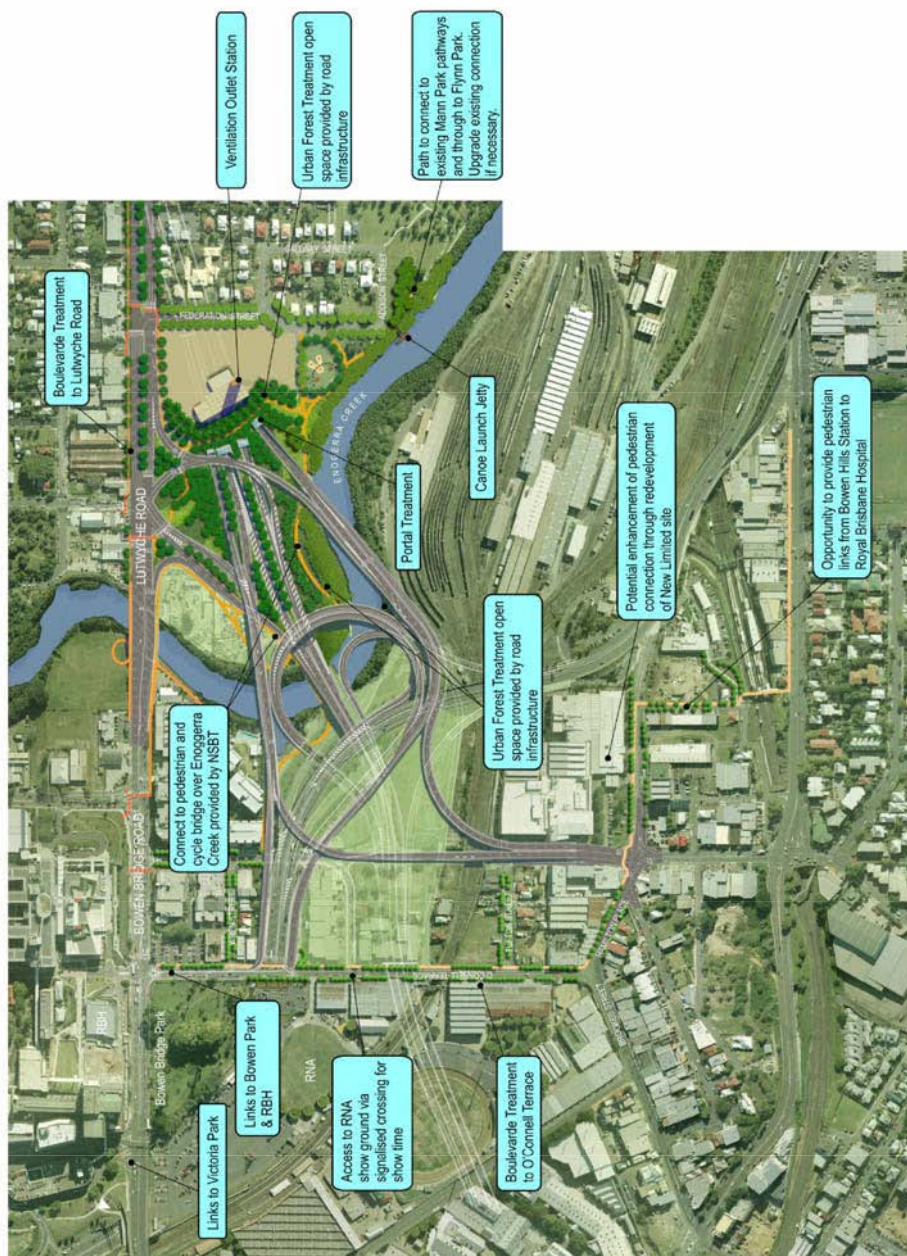
Figure 15.10
Bowen Hills Key Location
Impact Assessment

Urban Design Outcomes and Mitigation

The **mitigation measures** propose urban design and landscape concepts to offset project impacts in line with the design strategies outlined in 15.2.1 above. All measures will be required to apply urban design and landscape standards, codes and practices. **Figure 15-11** shows the mitigation measures for the Bowen Hills key location. The following six strategies are proposed to deal with project impacts:

- Revegetation / waterway rehabilitation
 - Protect existing significant vegetation to the extent practicable; and
 - Revegetate, where practicable, riparian vegetation and open space areas impacted during construction of project infrastructure.
- Urban Forest Treatment (Refer **Figure 15-12**)
 - Create water-wise subtropical landscapes with mature trees over the majority of remnant urban space and the open space of Mann Park on the north bank of Enoggera Creek;
 - Ensure integration of connections to and from open space connecting the north and south banks of Enoggera Creek and the pedestrian/cycle bridge provided by the NSBT; and
 - Plant groves of large trees and recreate open space to the northern side of Enoggera Creek.
- Activity Zones
 - Opportunities exist to create areas of high quality landscape amenity to remnant space created by project infrastructure;
 - Repair any damage to NSBT planting; and
 - Provide facilities such as picnic / barbecues, play space for all ages and access for viewing Enoggera Creek in Mann Park.
- Boulevard Treatment (Refer **Figure 15-13**)
 - In conjunction with the works to be provided by the NSBT Project, provide street enhancements (e.g. boulevard street trees, accessible pathways, street furniture, art work) to Lutwyche Road between Newmarket Road and the Ferny Grove railway; and
 - Also in conjunction with the works to be provided by the NSBT Project, provide tree plantings to Hamilton Place, Tufton Street and Wren Street.
- Design Intervention in Response to Engineering Proposals (Refer **Figure 15-14 – Figure 15-32**)
 - Create themed urban design and landscape treatments for retaining and transition structures, flyovers, portals, ventilation outlets and sound barriers and integrate these with the existing environment of Bowen Hills; and
 - Adopt a high quality design approach integrating architecture and landscape design to achieve a visually acceptable outcome for the southern ventilation station and ventilation outlet. The ventilation outlet could form part of a city gateway to or from the Airport.

SOUTHERN CONNECTION

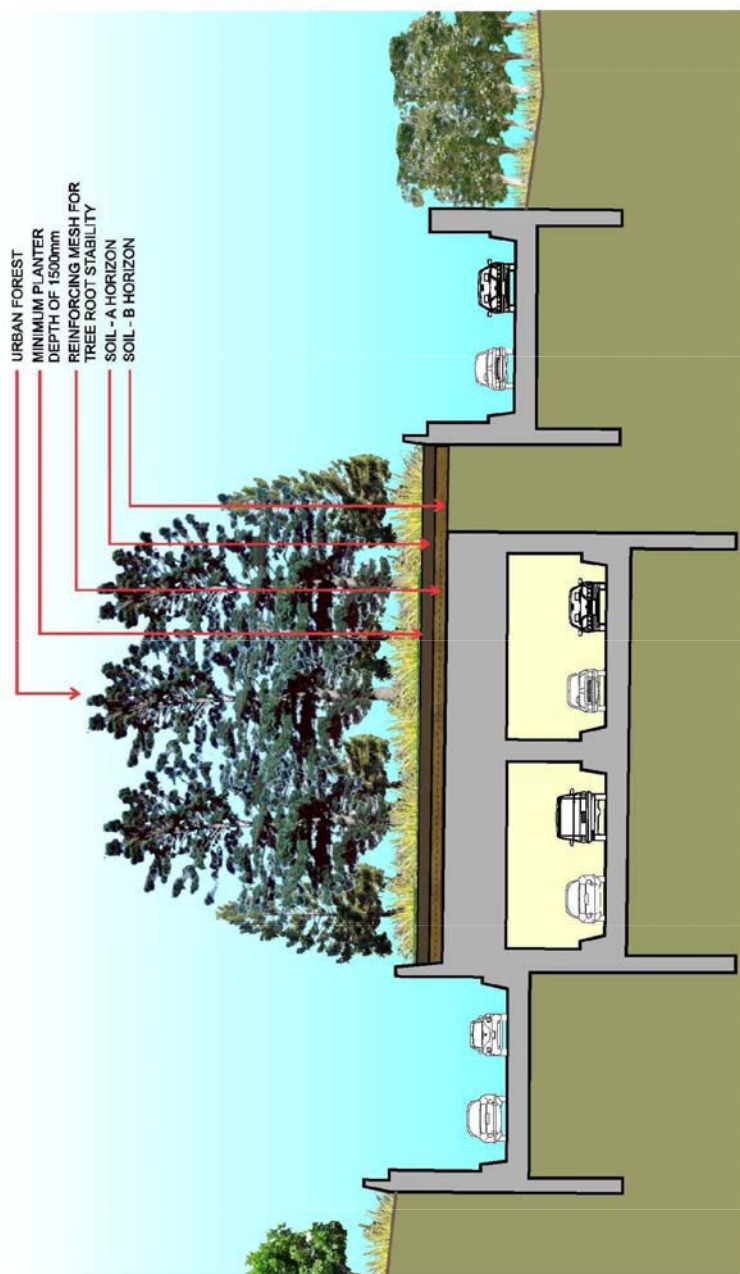


SOUTHERN CONNECTION MITIGATION MEASURES



Figure 15.11
Bowen Hills Location
Mitigation Measures

URBAN FOREST



AIRPORT LINK TUNNEL AND TRANSITION STRUCTURE - SECTION
SCALE 1:200

NOTE: Preliminary Landscape Treatment dependent on final design and treatment. Key considerations include:

- Service Alignment
- Property Access
- Community Consultation
- Hydraulic Considerations
- Traffic Considerations
- Traffic Signage

Figure 15.12
Bowen Hills Key Location
Impact Assessment

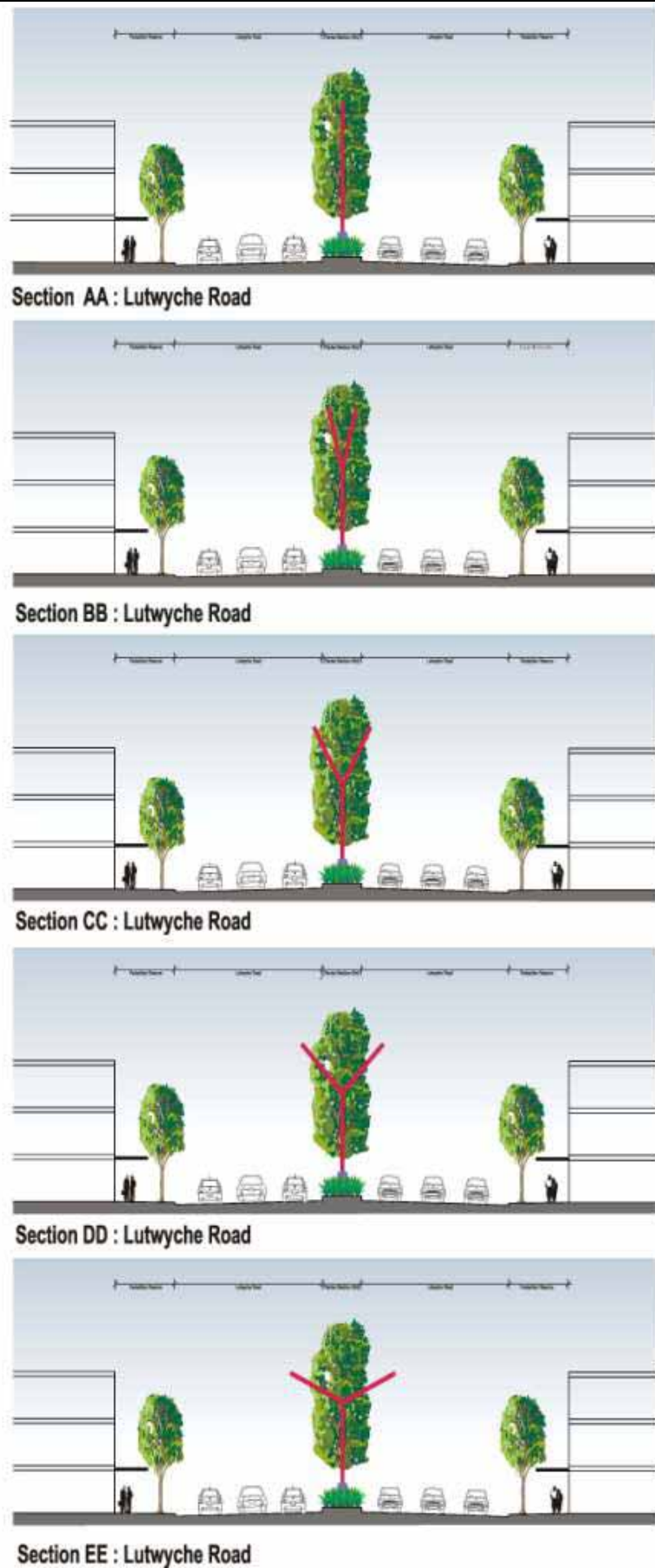


Figure 15.13
Bowen Hills Key Location
Lutwyche Road Boulevard

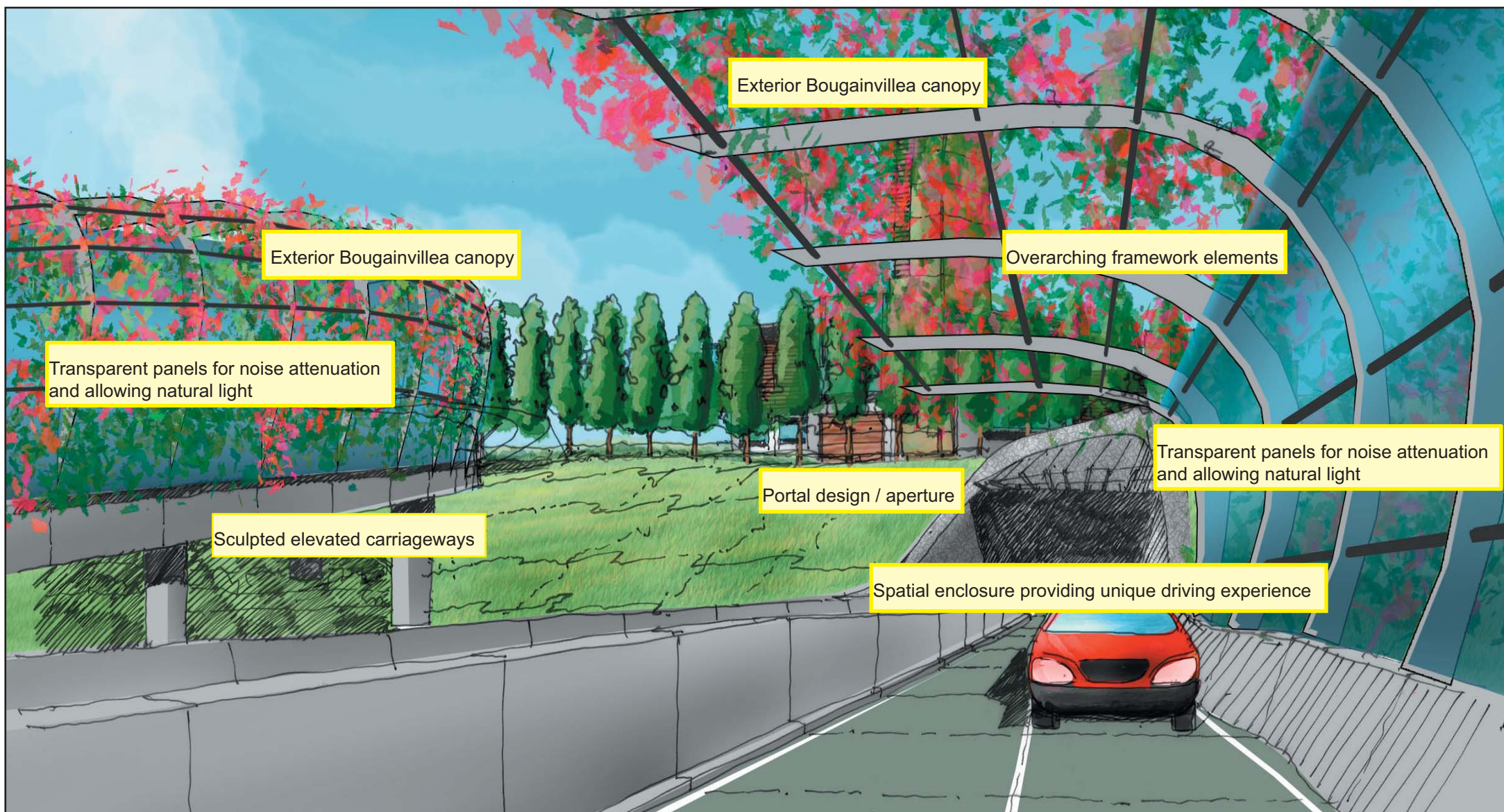


Figure 15.14
Southern Connection
 Urban, Landscape and Visual

Proposed NSBT north-bound portal
 Looking North towards Byrne Street
MITIGATION FOR ENGINEERING PROPOSALS



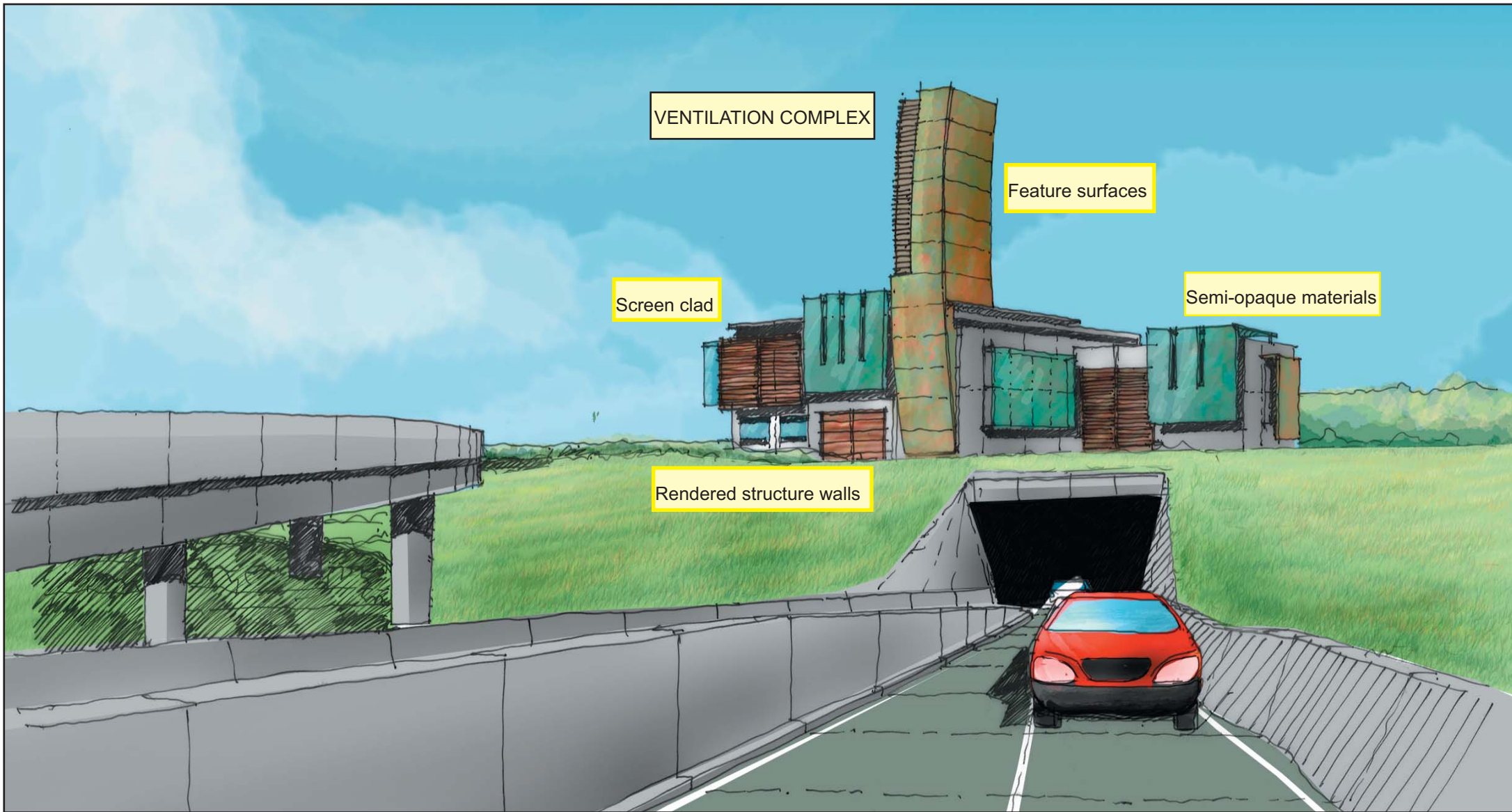


Figure 15.15
Southern Connection
 Urban, Landscape and Visual

Proposed NSBT north-bound portal
 Looking North towards Byrne Street
MITIGATION FOR ENGINEERING PROPOSALS





Figure 15.16
Southern Connection
 Urban, Landscape and Visual

Vantage Point 1
 Campbell Street adjacent to The Mews
 Looking East towards QLD Newspapers
EXISTING IMAGE





Figure 15.17
Southern Connection
 Urban, Landscape and Visual

Vantage Point 1
 Campbell Street adjacent to The Mews
 Looking East towards QLD Newspapers
IMPACT IMAGE





Figure 15.18
Southern Connection
 Urban, Landscape and Visual

Vantage Point 1
 Campbell Street adjacent to The Mews
 Looking East towards QLD Newspapers
MITIGATION IMAGE



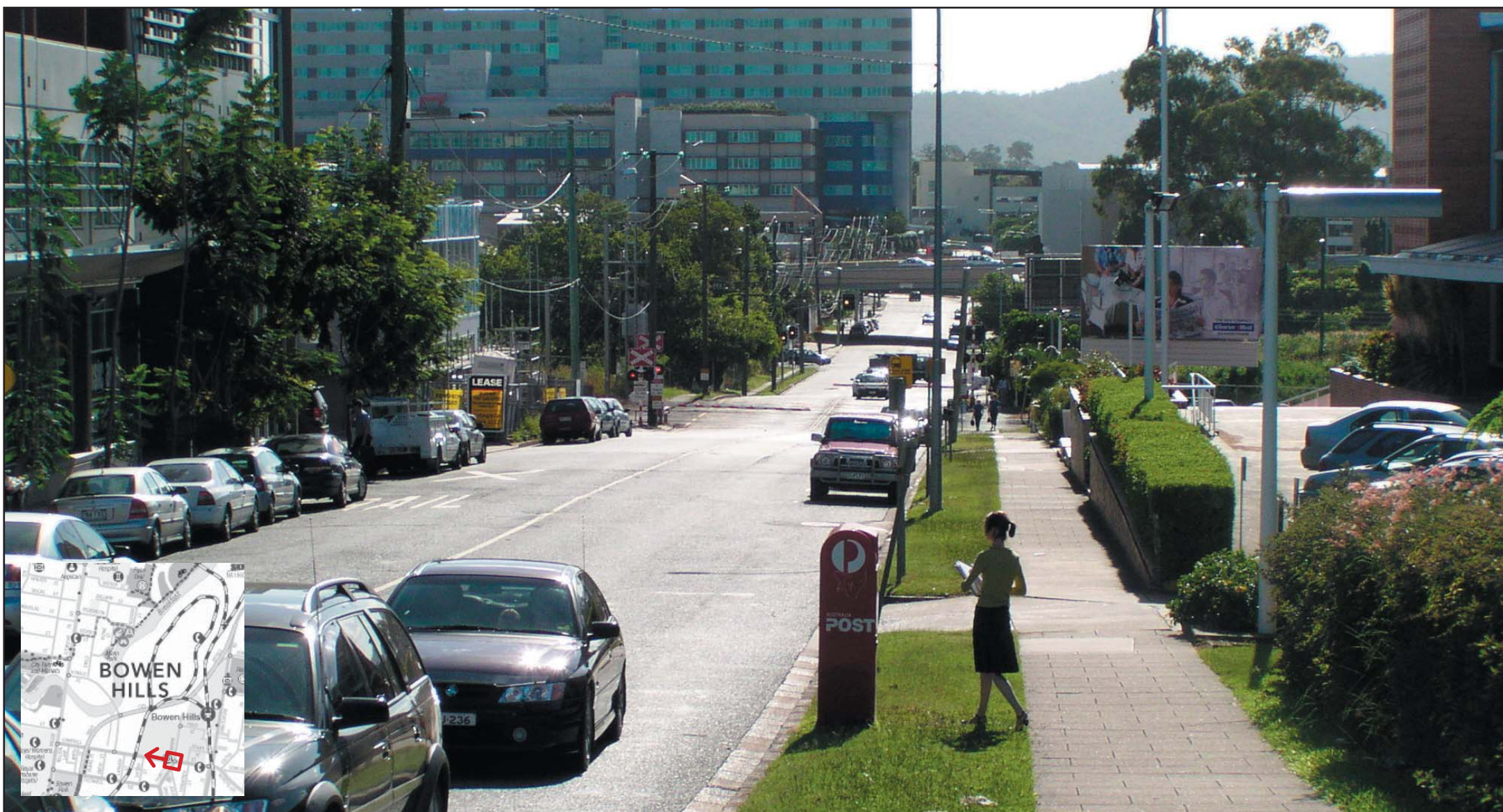


Figure 15.19
Southern Connection
 Urban, Landscape and Visual

Vantage Point 2
 Campbell Street adjacent to QLD Newspapers
 Looking West towards RBH Complex
EXISTING IMAGE



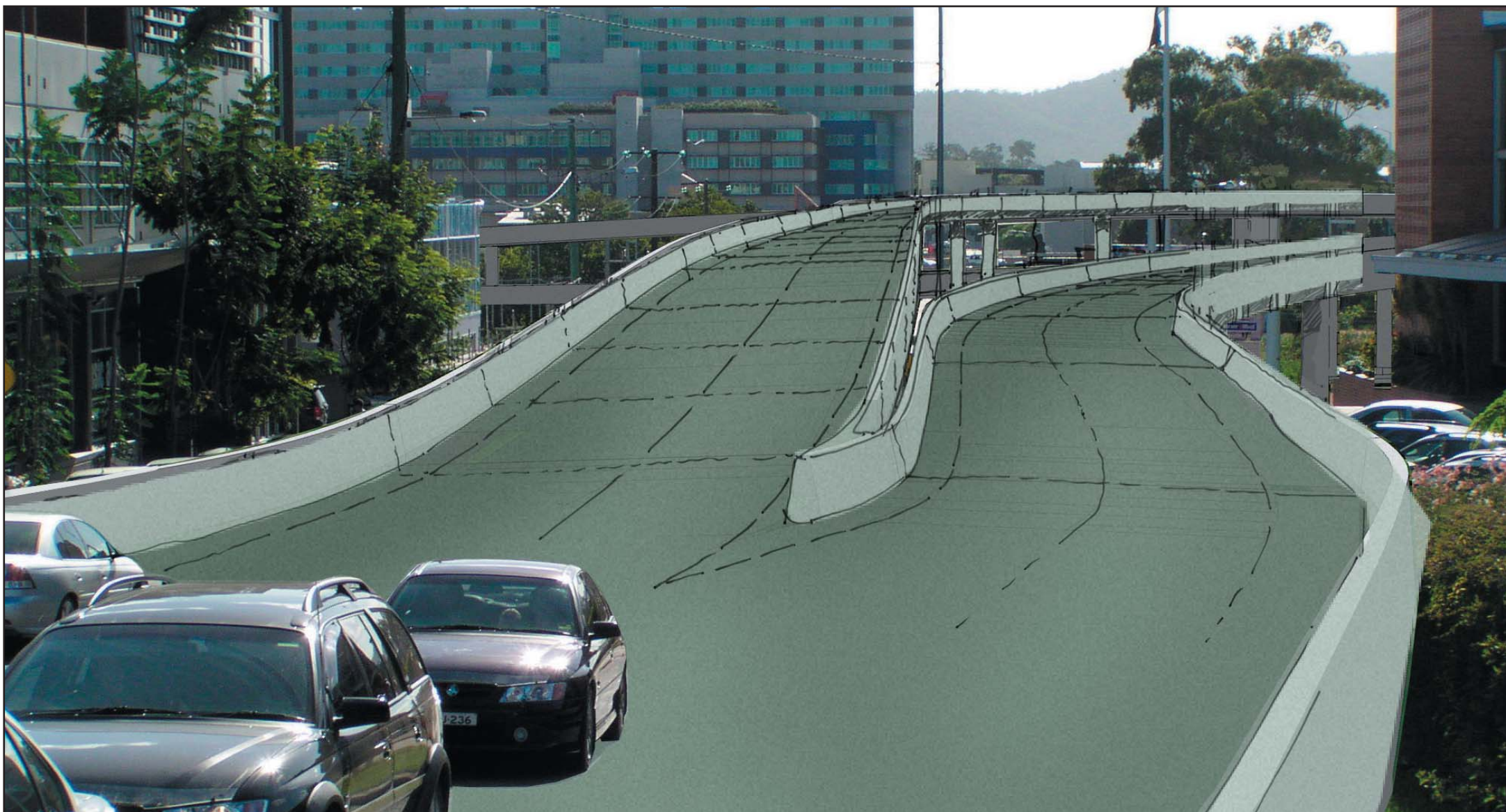


Figure 15.20
Southern Connection
 Urban, Landscape and Visual

Vantage Point 2
 Campbell Street adjacent to QLD Newspapers
 Looking West towards RBH Complex
IMPACT IMAGE



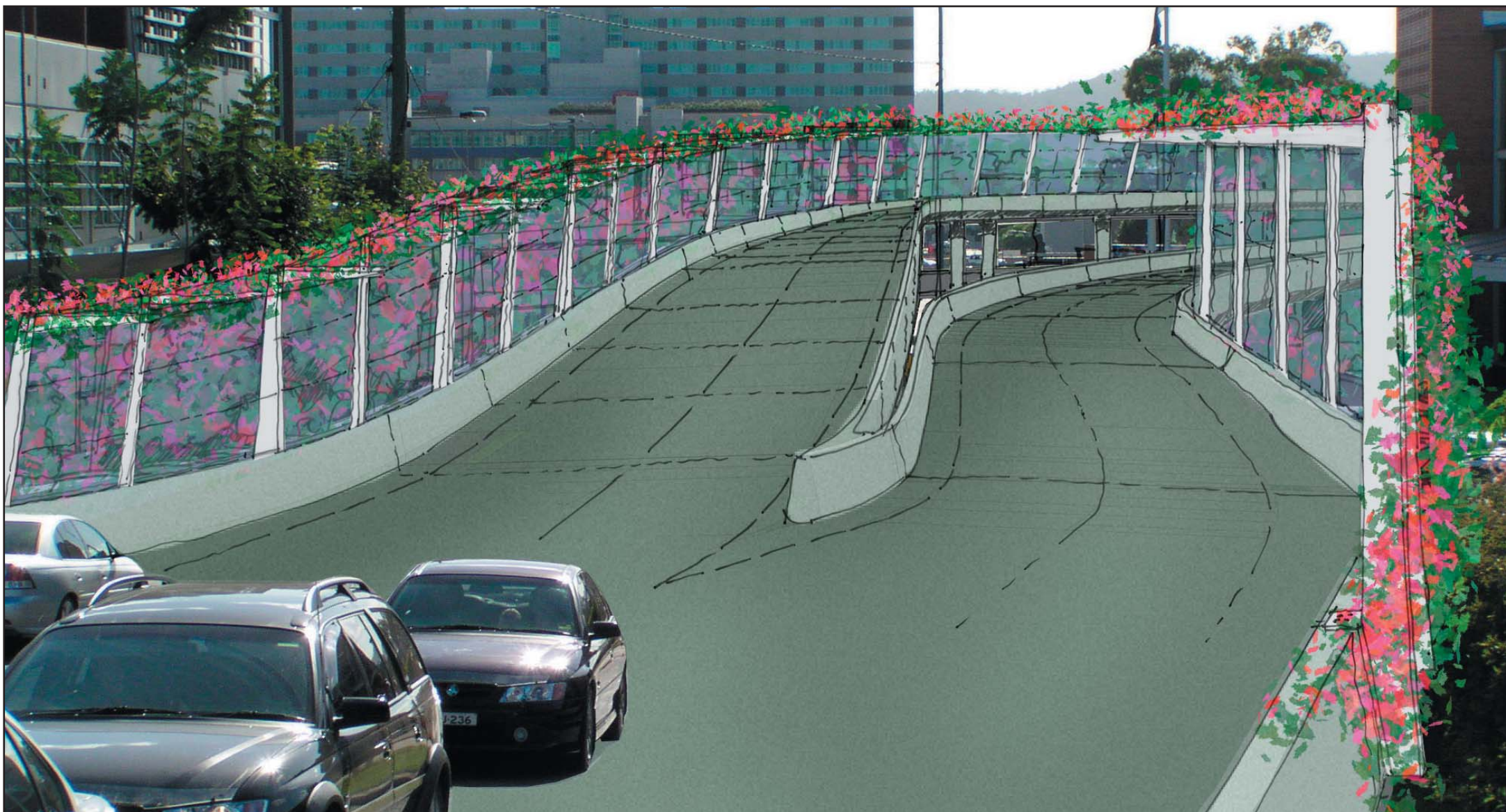


Figure 15.21
Southern Connection
 Urban, Landscape and Visual

Vantage Point 2
 Campbell Street adjacent to QLD Newspapers
 Looking West towards RBH Complex
MITIGATION IMAGE



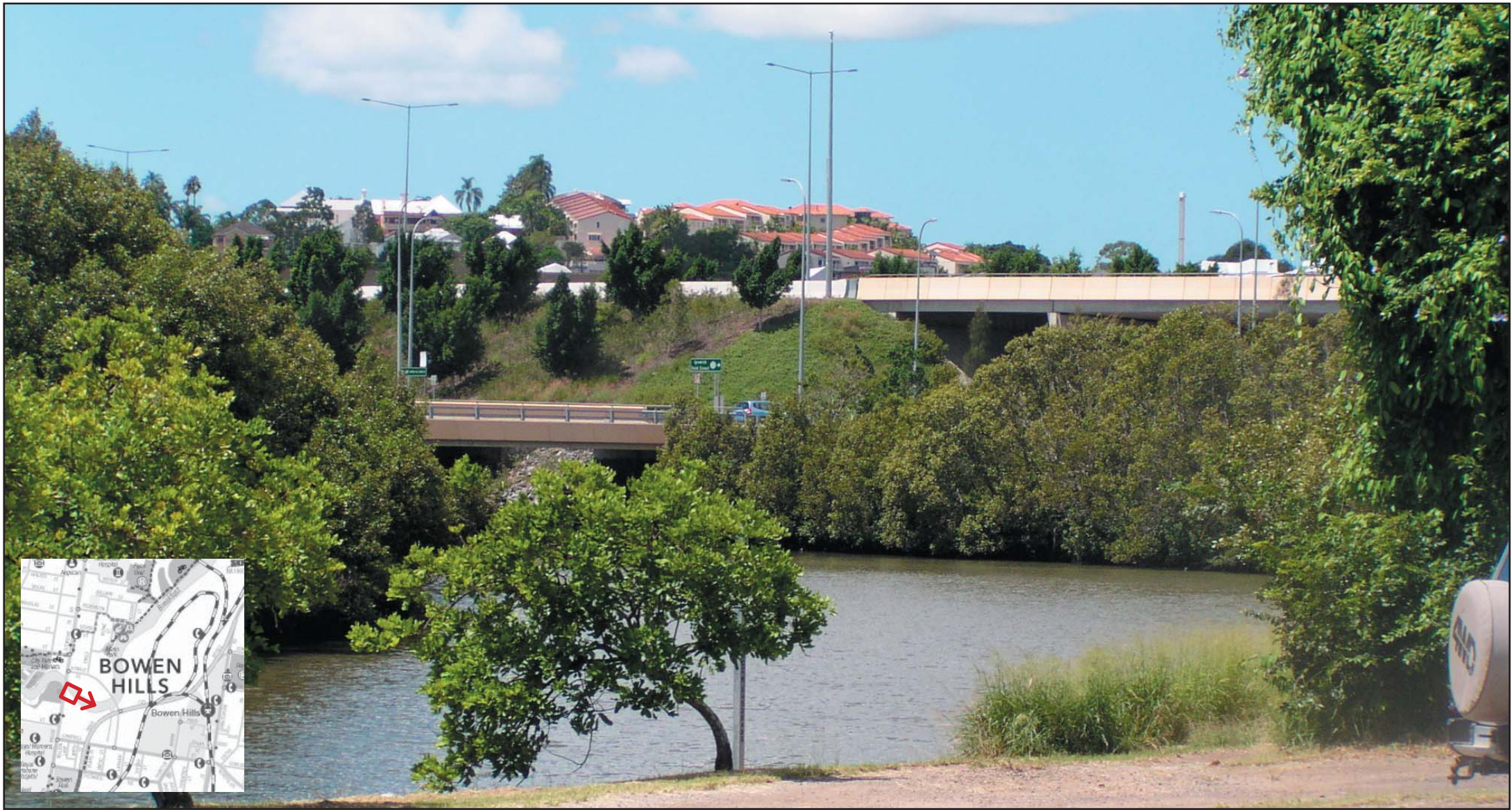


Figure 15.22
Southern Connection
 Urban, Landscape and Visual

Vantage Point 3
 Lutwyche Road intersection
 Looking across Horace Street
EXISTING IMAGE



Figure 15.23
Southern Connection
 Urban, Landscape and Visual

Vantage Point 3
 Bowen Bridge Road across Enoggera Creek
 Looking East
IMPACT IMAGE



Figure 15.24
Southern Connection
 Urban, Landscape and Visual

Vantage Point 3
 Bowen Bridge Road across Enoggera Creek
 Looking East
MITIGATION IMAGE



Figure 15.25
Southern Connection
 Urban, Landscape and Visual

Vantage Point 4
 Lutwyche Road intersection
 Looking across Horace Street
EXISTING IMAGE





Figure 15.26
Southern Connection
 Urban, Landscape and Visual

Vantage Point 4
 Lutwyche Road intersection
 Looking across Horace Street
IMPACT IMAGE





Figure 15.27
Southern Connection
 Urban, Landscape and Visual

Vantage Point 4
 Lutwyche Road intersection
 Looking across Horace Street
MITIGATION IMAGE



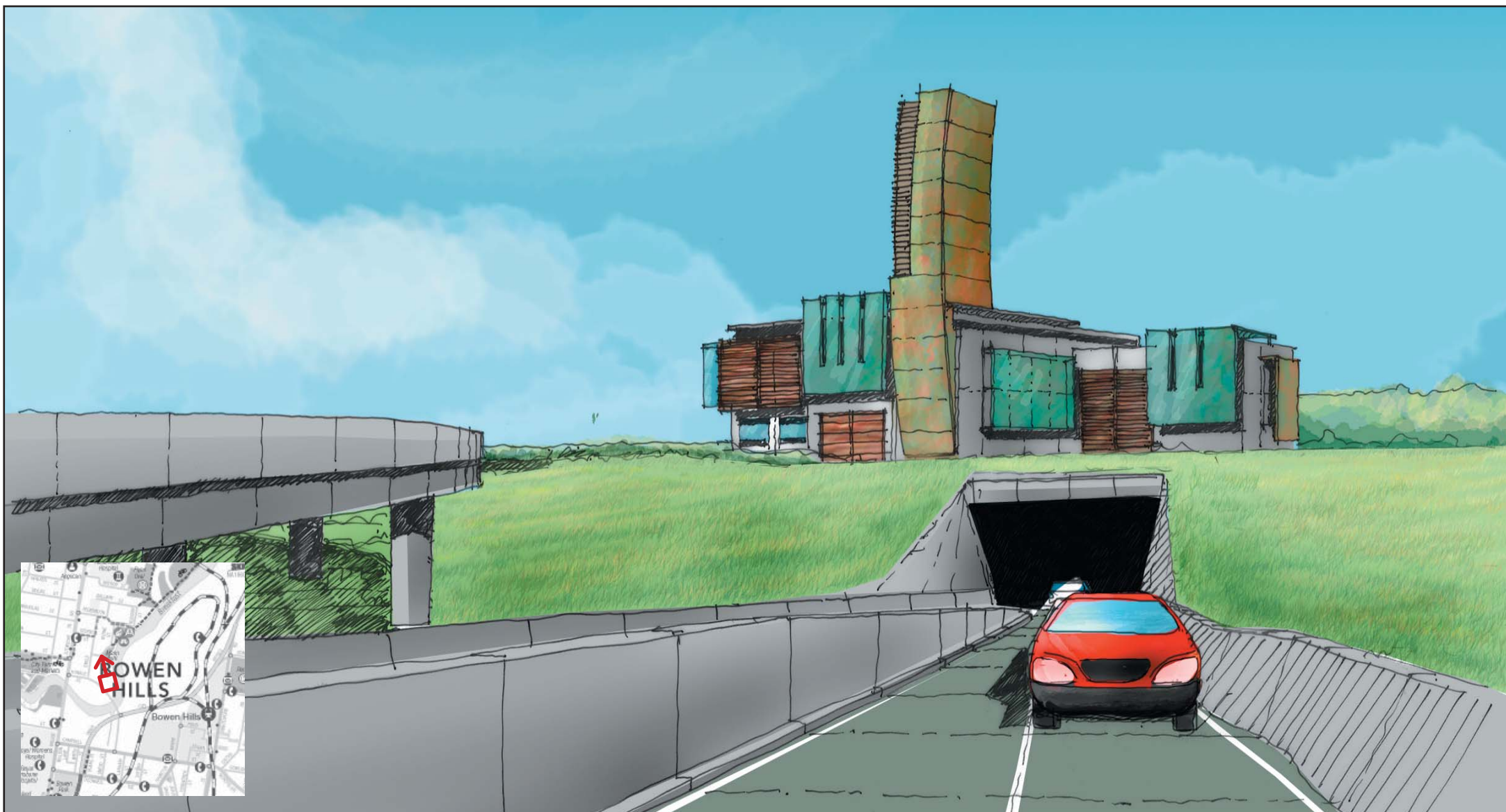


Figure 15.28
Southern Connection
 Urban, Landscape and Visual

Vantage Point 5
 Proposed NSBT north-bound portal
 Looking North towards Byrne Street
IMPACT IMAGE



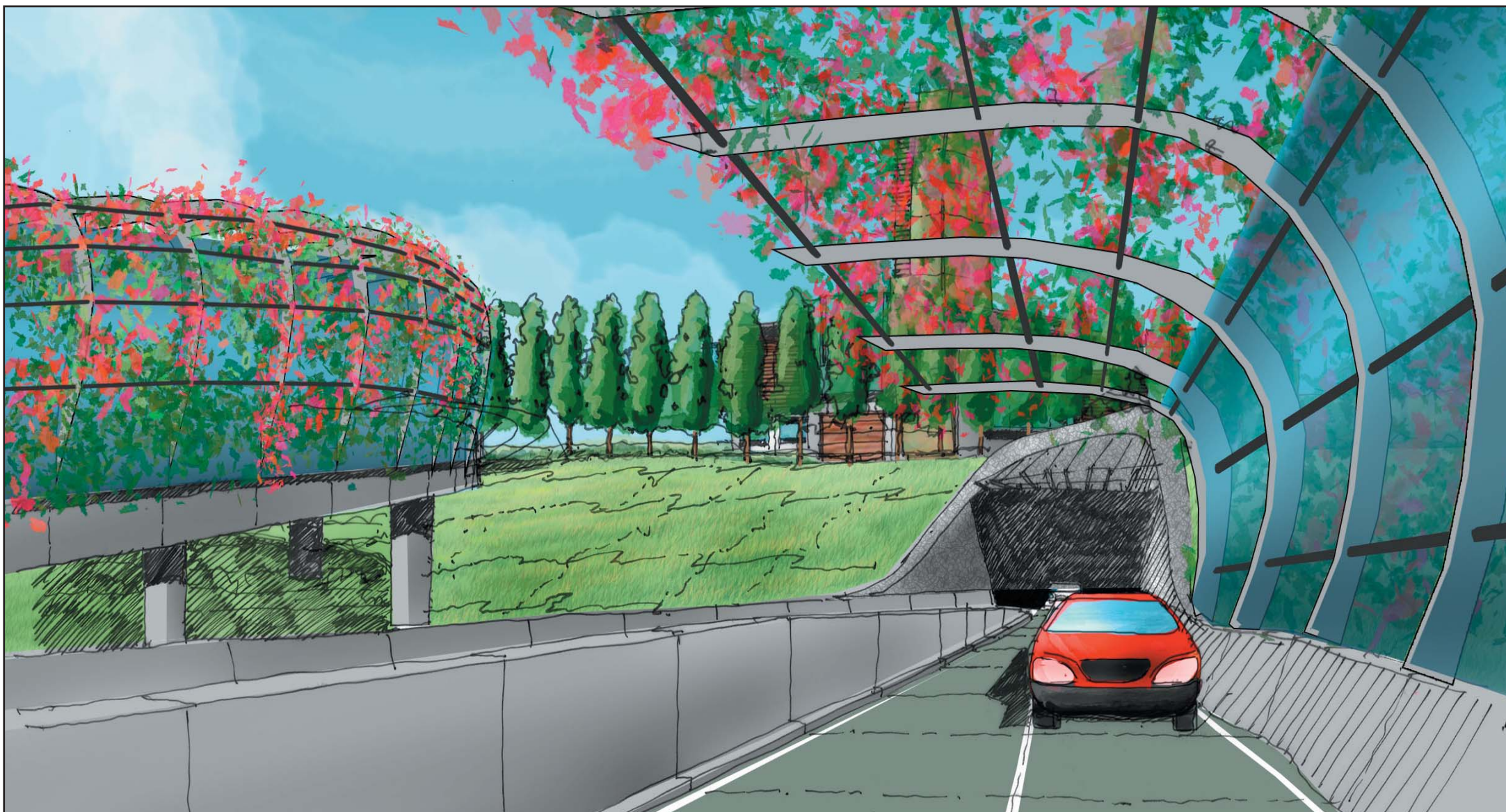


Figure 15.29
Southern Connection
 Urban, Landscape and Visual

Vantage Point 5
 Proposed NSBT north-bound portal
 Looking North towards Byrne Street
MITIGATION IMAGE





Figure 15.30
Southern Connection
 Urban, Landscape and Visual

Vantage Point 6
 Federation Street
 Looking South-East towards Earle Street
EXISTING IMAGE





Figure 15.31
Southern Connection
 Urban, Landscape and Visual

Vantage Point 6
 Federation Street
 Looking South West towards Earle Street
IMPACT IMAGE





Figure 15.32
Southern Connection
 Urban, Landscape and Visual

Vantage Point 6
 Federation Street
 Looking South West towards Earle Street
MITIGATION IMAGE



15.3.2 North-western Connection

Impact Assessment

The likely impacts of the proposed works for the Airport Link Project on Gympie Road are:

- The **Urban Centres** will be impacted by the proposed road infrastructure in Stafford Road and Gympie Road including embankments, elevated roadways and road widening. The centres are already weak because of fragmentation of activity patterns by existing traffic levels on both roads. Increased traffic flows and changes to local access are expected to maintain the existing constraints on development of centres.
- The proposed infrastructure will not interfere with the **Connectivity** of the east–west connection through Kedron Brook.
 - The north-south pedestrian/cycle movement to the Kedron State High School will become more complex at grade with the road due to proposed two stage crossing points at Lutwyche Road and Kedron Park Road.
 - Pedestrian and cycle movements along Kedron Brook and beneath the infrastructure will be maintained, possibly with some landscape enhancement of the Kedron Brook riparian corridor.
- The **Urban Character** of this key location will change from open space, commercial, special uses and residential to that of a location dominated by road infrastructure, including elevated roadways, tunnel portals rising to or leaving the surface, traffic noise barriers and a large ventilation station and ventilation outlet. The scale and function of the infrastructure reflects an intensification of the transport function of the Gympie Road crossing at Kedron Brook which is already occurring without the Airport Link Project but which will be brought forward as a consequence of it. The form of the infrastructure also is expected to impact on the urban character of the locality, changing it from a somewhat disjointed, heavily trafficked commercial thoroughfare to a highly developed transport connection with above and below-ground infrastructure. It should be noted that impact mitigations for some aspects of the Airport Link Project (e.g. noise barriers, ventilation station and ventilation outlet) also impose impact on the urban character of the locality.
- **Visually** the Project will impact on views looking into this key location due to constructions of ramps and flyovers to the north and south of Kedron Brook. At a local scale there will be changes in the urban landscape for properties to the north-west and to the south-west of the Gympie Road crossing of Kedron Brook and for some properties to the north and to the south of Gympie Road, east of Kedron Brook. Despite the scale and intensity of the Gympie Road connections, the impact on more distant views is not likely to be as great as the local impacts. This is due to the location of the infrastructure in the Kedron Brook corridor, situated at elevations below the surrounding urban areas. The extent of the visual intrusion of the infrastructure is expected to be most significant towards the Lutwyche Road end of the above-ground works. This impact is due to the scale of the traffic noise barriers and also the scale of the ventilation station.
- **The Landscape Elements** of this location are characterised by the Kedron Brook floodway, which will remain relatively intact. However the footprint of the bridge crossings and flyover structures over Kedron Brook will increase the covered area, giving rise to other potential impacts on amenity, perception of safety and therefore utility of the Kedron Brook pedestrian and cycle path.

Figure 15-33 shows the impact assessment for the Gympie Road key location.

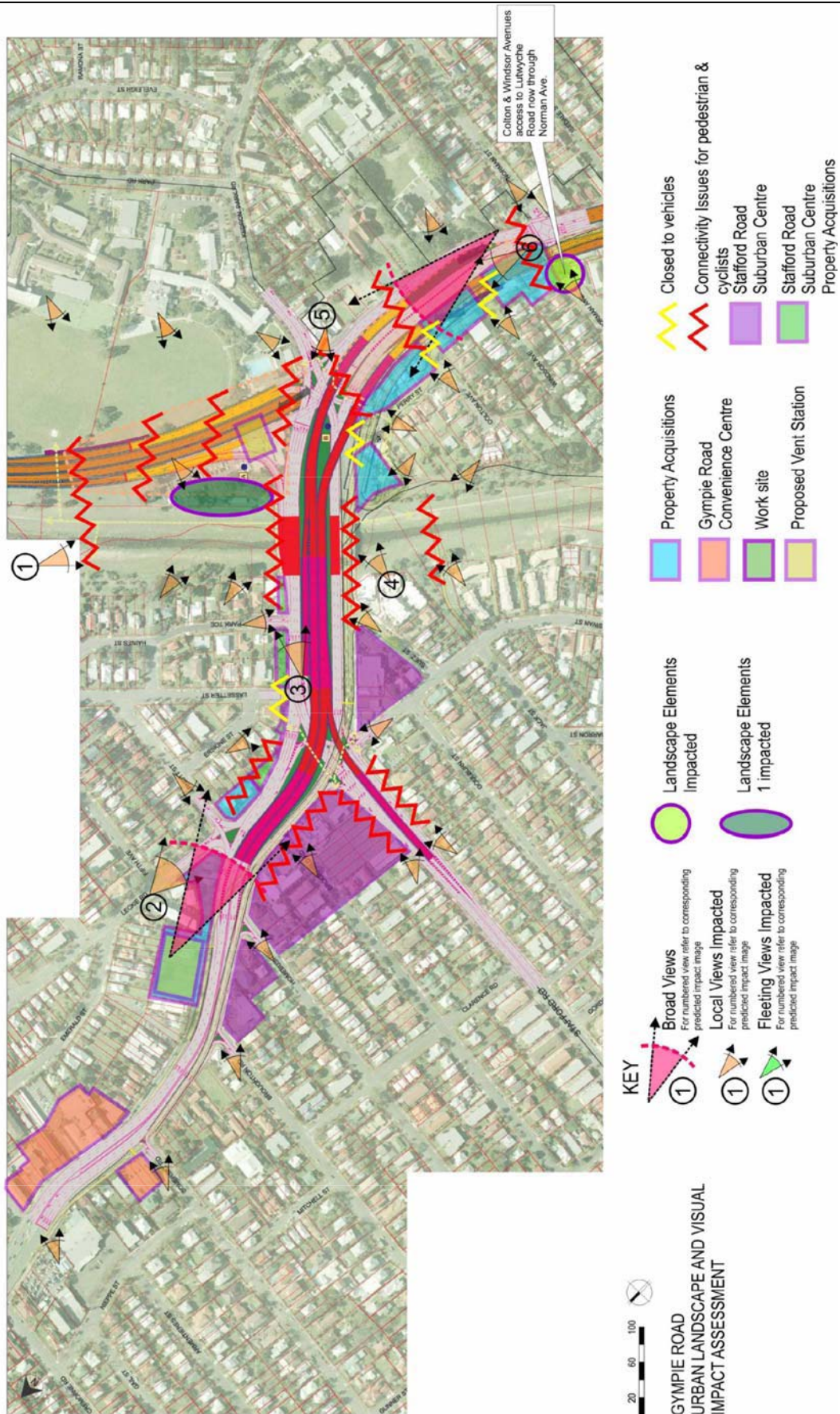


Figure 15.33
Gympie Road Key Location
Impact Assessment

Urban Design Outcomes and Mitigation

The **mitigation measures** propose urban design and landscape concepts to offset project impacts. All measures will be required to apply Australian urban design and landscape standards, codes and practices. **Figure 15-34** shows mitigation measures for the Gympie Road key location. The following six strategies are proposed to deal with project impacts:

- Open Space Revegetation/waterway rehabilitation
 - Rehabilitate and revegetate areas impacted during construction adjacent to Kedron Brook (if any), including the construction of a ‘natural’ waterway including pools and riffles in the low-flow channel of Kedron Brook; and
 - Provide high amenity planting to screen the sound barriers, ramp and transition structures impacting on the local residential precinct at Lutwyche (Colton and Windsor Avenues), Gordon Park (Swan and Suez Streets) and Kedron (Gympie Road, Erskine Street, Lasseter Street, Leckie Road and Park Terrace) (Refer **Figure 15-35**).
- Urban Forest Treatment
 - Create water-wise subtropical landscapes with mature trees over the majority of new spaces caused by the transition structures into the tunnel (Refer **Figure 15-36**).
 - Connect the north-south crossing of Kedron Brook with new pedestrian/cycle footbridge over the creek.
- Activity Zones
 - There is an opportunity to create areas of high quality landscape and recreation amenity to the south western side of the bridge over Kedron Brook at Lutwyche Road. Opportunities include play spaces for all ages, bicycle storage facilities, and typical park amenities;
 - In consultation with Education Queensland, and the school community, explore options for an attractive, safe and accessible entrance for the Woolloowin State School, and to the extent reasonable and practicable, contribute with appropriate works, towards the improvement of this entrance.
- Boulevard Treatment
 - Enhance sections of Lutwyche Road, Kedron Park Road, Gympie Road and Stafford Road with themed street plantings, improved accessible pathways and streetscape amenities;
 - Adopt an intense screen planting program for the above-ground infrastructure, particularly the acoustic screens at and above ground level, to achieve an acceptable urban landscape in an intense transport corridor.
- Design Intervention in Response to Engineering Proposals (Refer **Figure 15-37** – **Figure 15-53**)
 - Create themed urban design and landscape treatments for retaining and transition structures, flyovers, portals, ventilation outlets and sound barriers and integrate these with the existing environment of the Gympie Road key location.
 - Adopt a high-quality design response, integrating architecture and landscape planning to achieve a visually pleasing outcome for the ventilation station and ventilation outlet. The building design should be consistent with the public nature of land use in and around the site for a long period (e.g. the existing Emergency Services building), and yet should complement the predominantly ‘corridor’ character of the locality. The landscape theme, combined with the materials, colours and built form of the ventilation station and ventilation outlet should enhance the rate at which it assimilates in the changing landscape of the locality.

GYMPIE ROAD CONNECTION

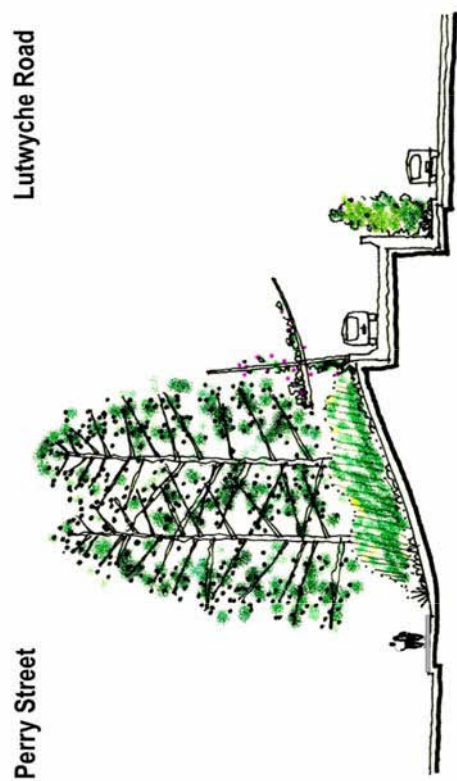


GYMPIE ROAD CONNECTION URBAN DESIGN, LANDSCAPE AND VISUAL MITIGATION MEASURES

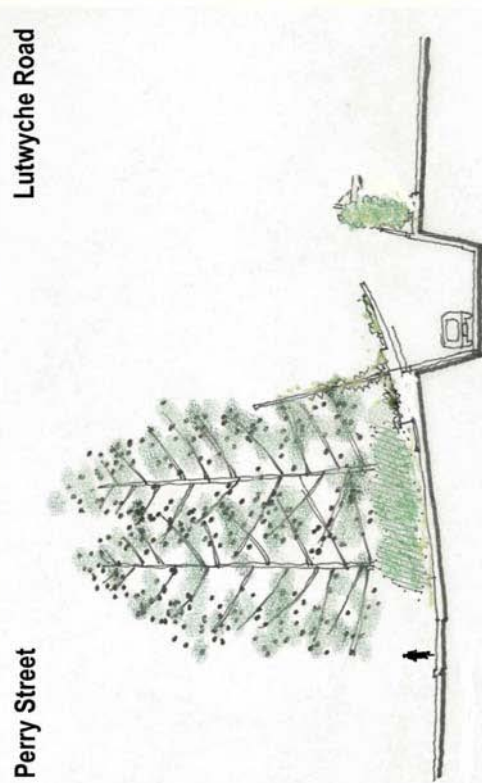


Figure 15.34
Gympie Road Key Location
Mitigation Measures





1. Section of Ramp Treatment at Perry Street and Lutwyche Road

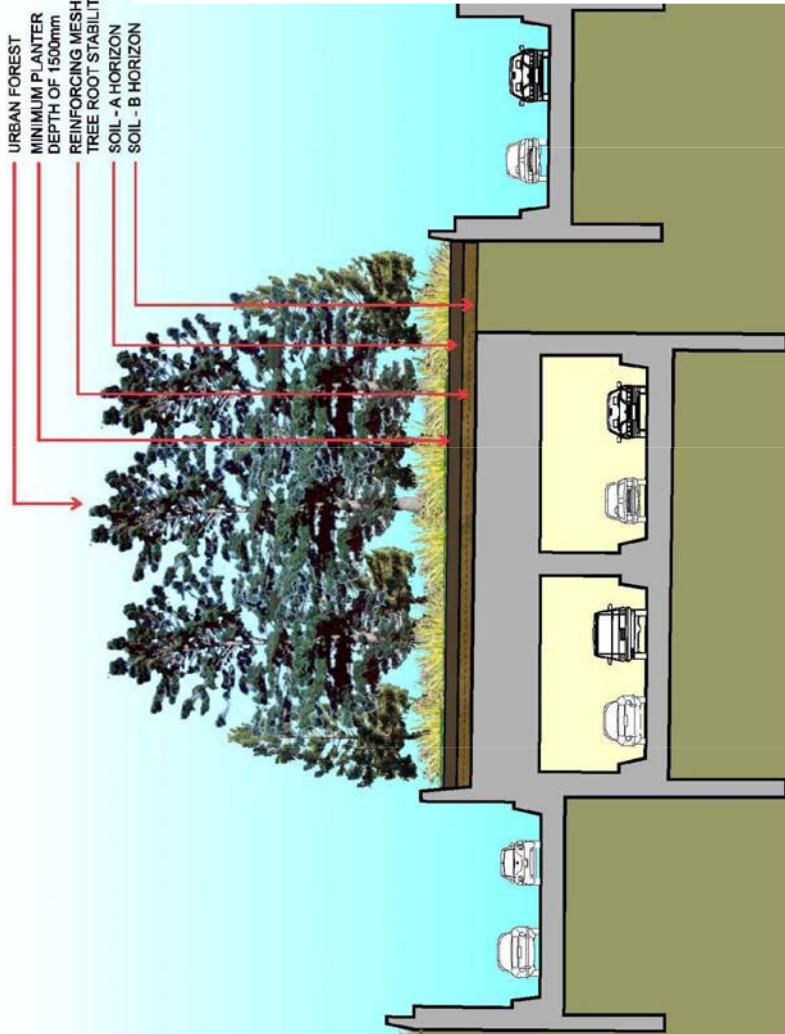


2. Section of Transition Treatment at Perry Street and Lutwyche Road

Figure 15.35
Gympie Road Key Location
Mitigation Measures

URBAN FOREST

URBAN FOREST
MINIMUM PLANTER
DEPTH OF 1500mm
REINFORCING MESH FOR
TREE ROOT STABILITY
SOIL - A HORIZON
SOIL - B HORIZON



AIRPORT LINK TUNNEL AND TRANSITION STRUCTURE - SECTION
SCALE 1:200

NOTE: Preliminary Landscape Treatment dependant
On further investigation of:-
- Site Specifics
- Property Access
- Community Consultation
- Hydraulic Considerations
- Other Studies
- Traffic Site Lines

Figure 15.36
Gympie Road Key Location
Urban Forest

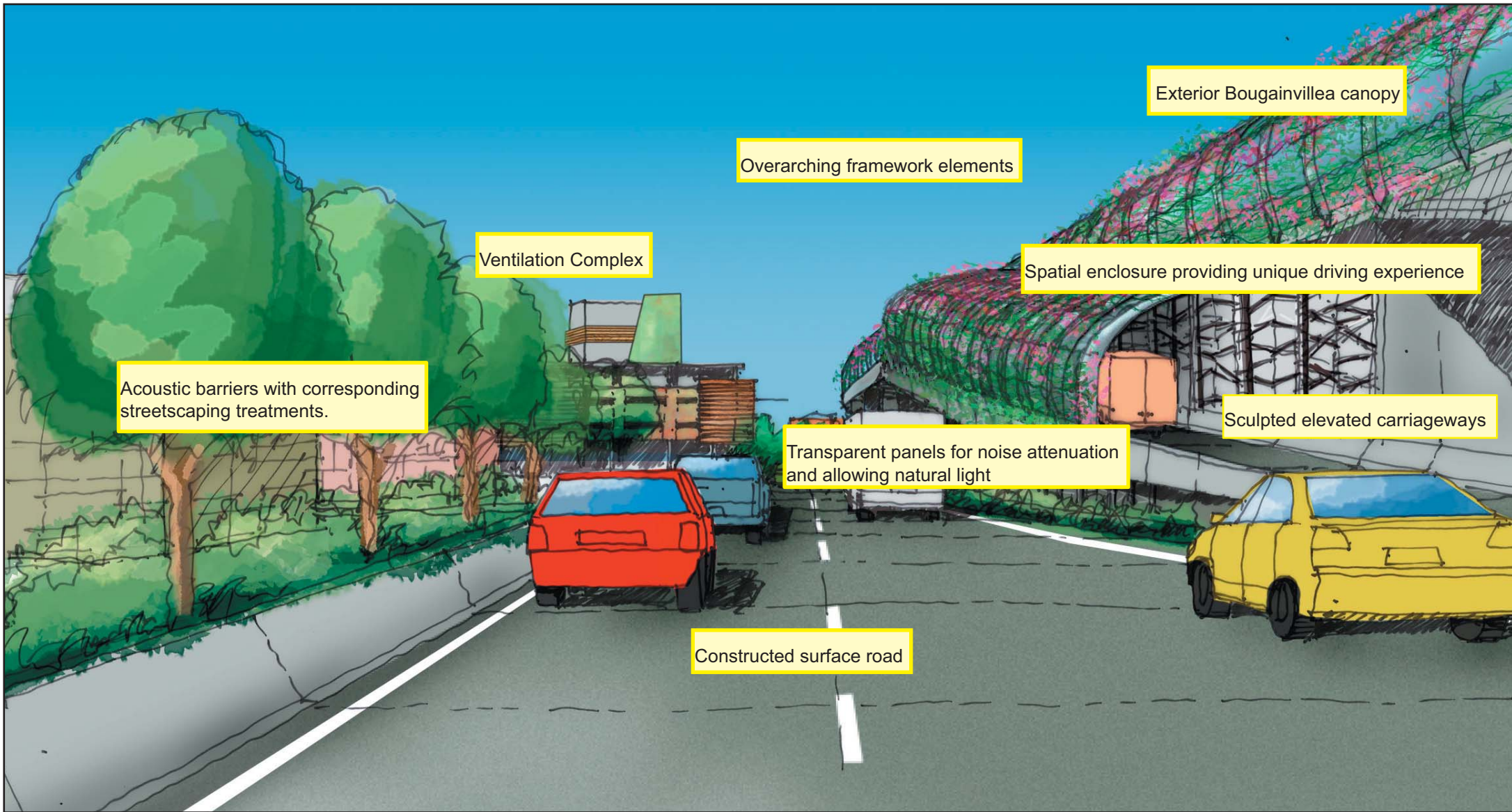


Figure 15.37
Gympie Road Connection
 Urban, Landscape and Visual

Gympie Road adjacent to Lassetter Street
 Looking East along Gympie Road
MITIGATION FOR ENGINEERING PROPOSALS



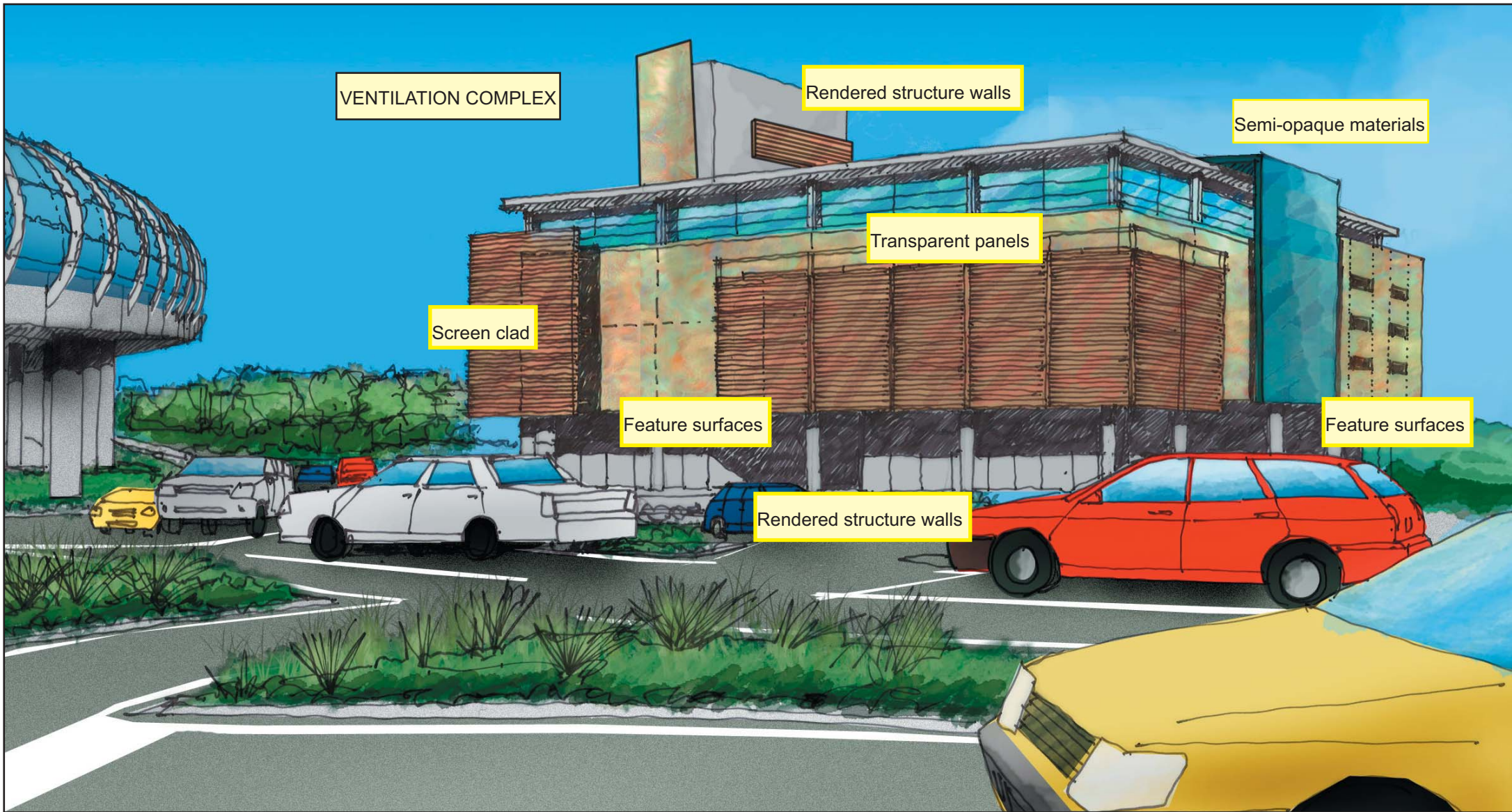


Figure 15.38
Gympie Road Connection
 Urban, Landscape and Visual

Gympie Road and Kedron Park Road intersection
 Looking North from the Kedron Park Hotel
MITIGATION FOR ENGINEERING PROPOSALS



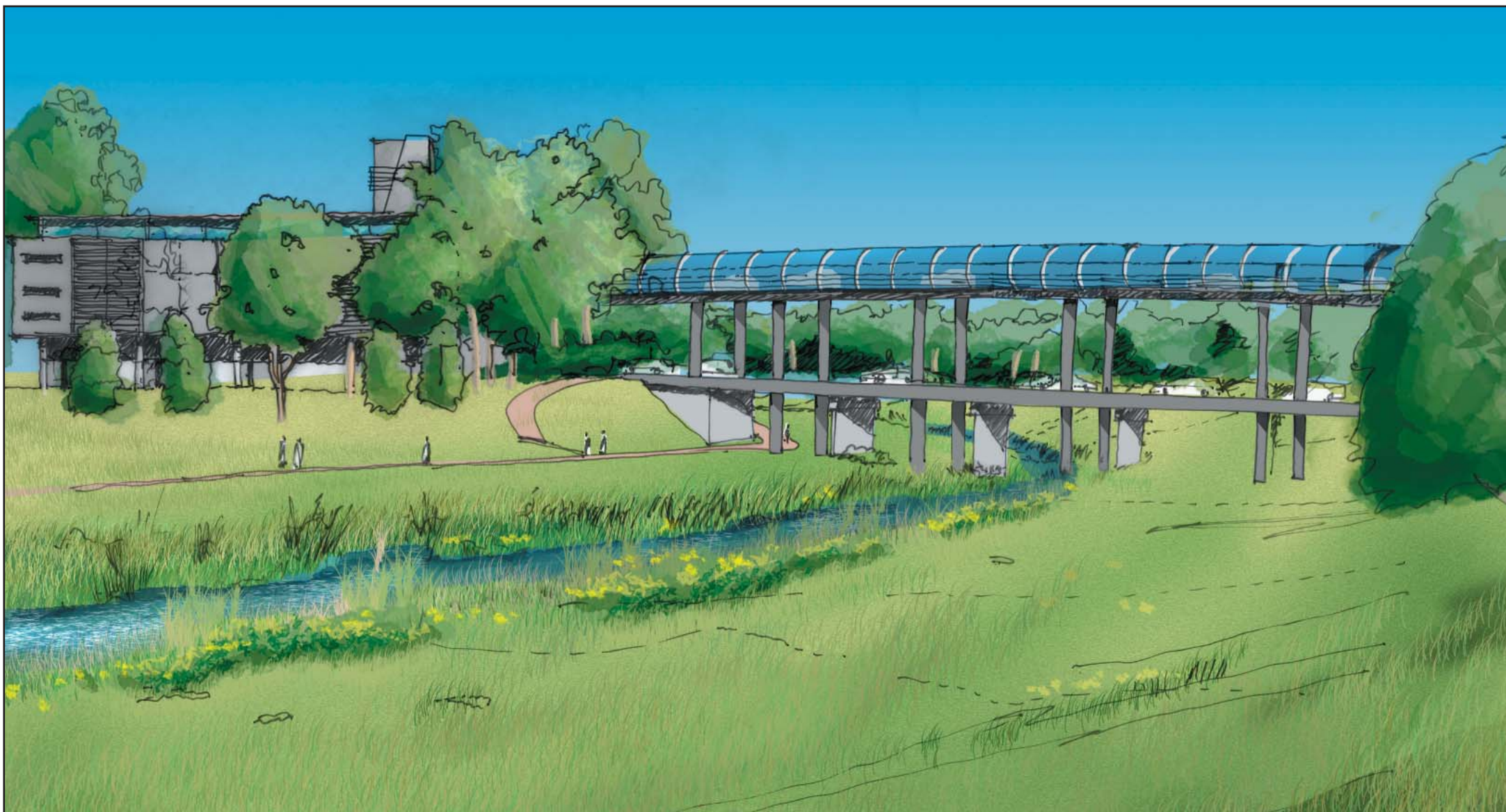


Figure 15.40
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 1
 Gympie Road and QLD Emergency Services Complex
 Looking South West along Kedron Brook
IMPACT IMAGE





Figure 15.41
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 1
 Gympie Road and QLD Emergency Services Complex
 Looking South West along Kedron Brook
MITIGATION IMAGE



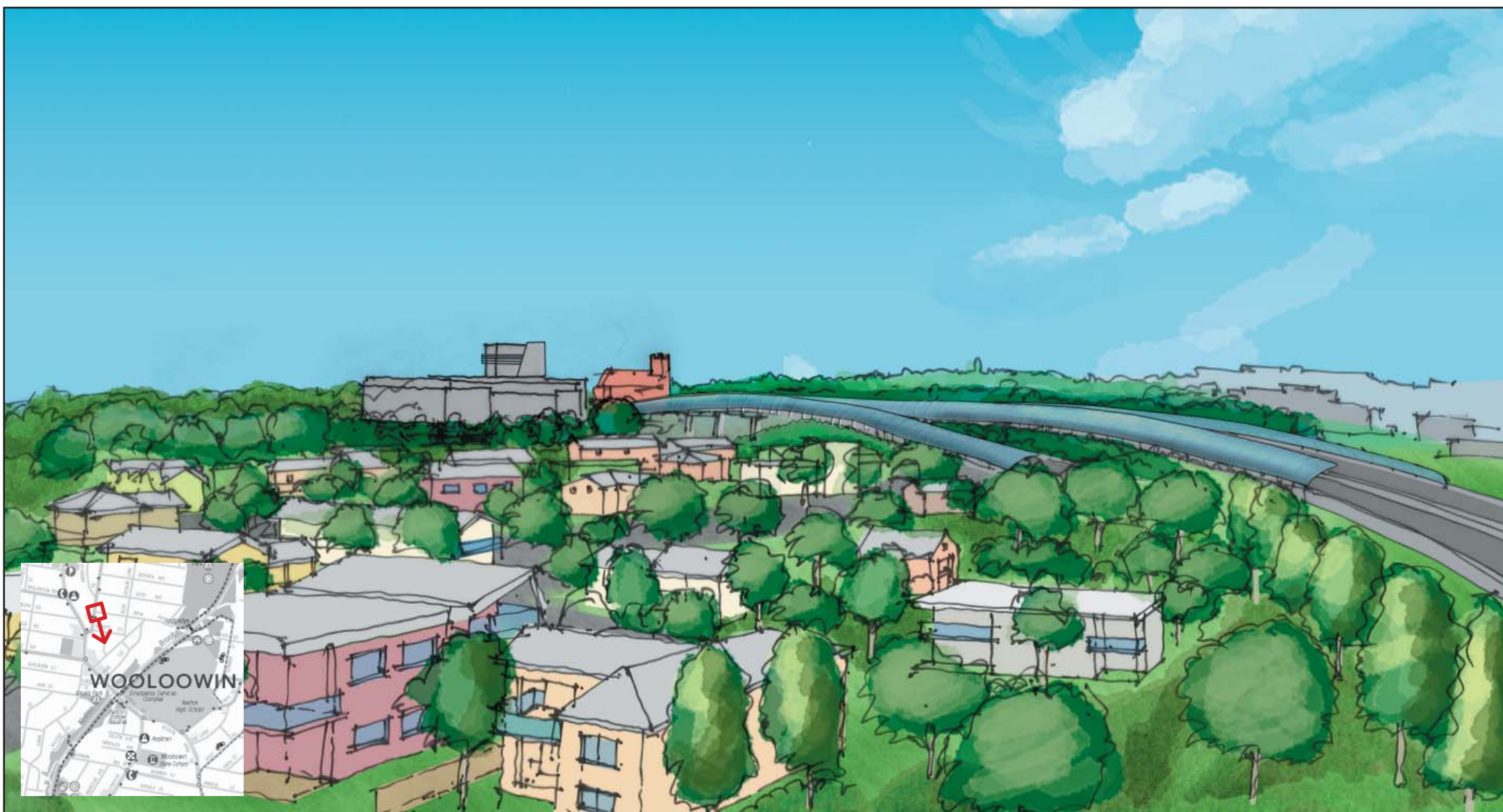


Figure 15.42
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 2
 Leckie Road aligned with Fifth Avenue
 Looking East along Gympie Road
IMPACT IMAGE





Figure 15.43
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 2
 Leckie Road aligned with Fifth Avenue
 Looking East along Gympie Road
MITIGATION IMAGE



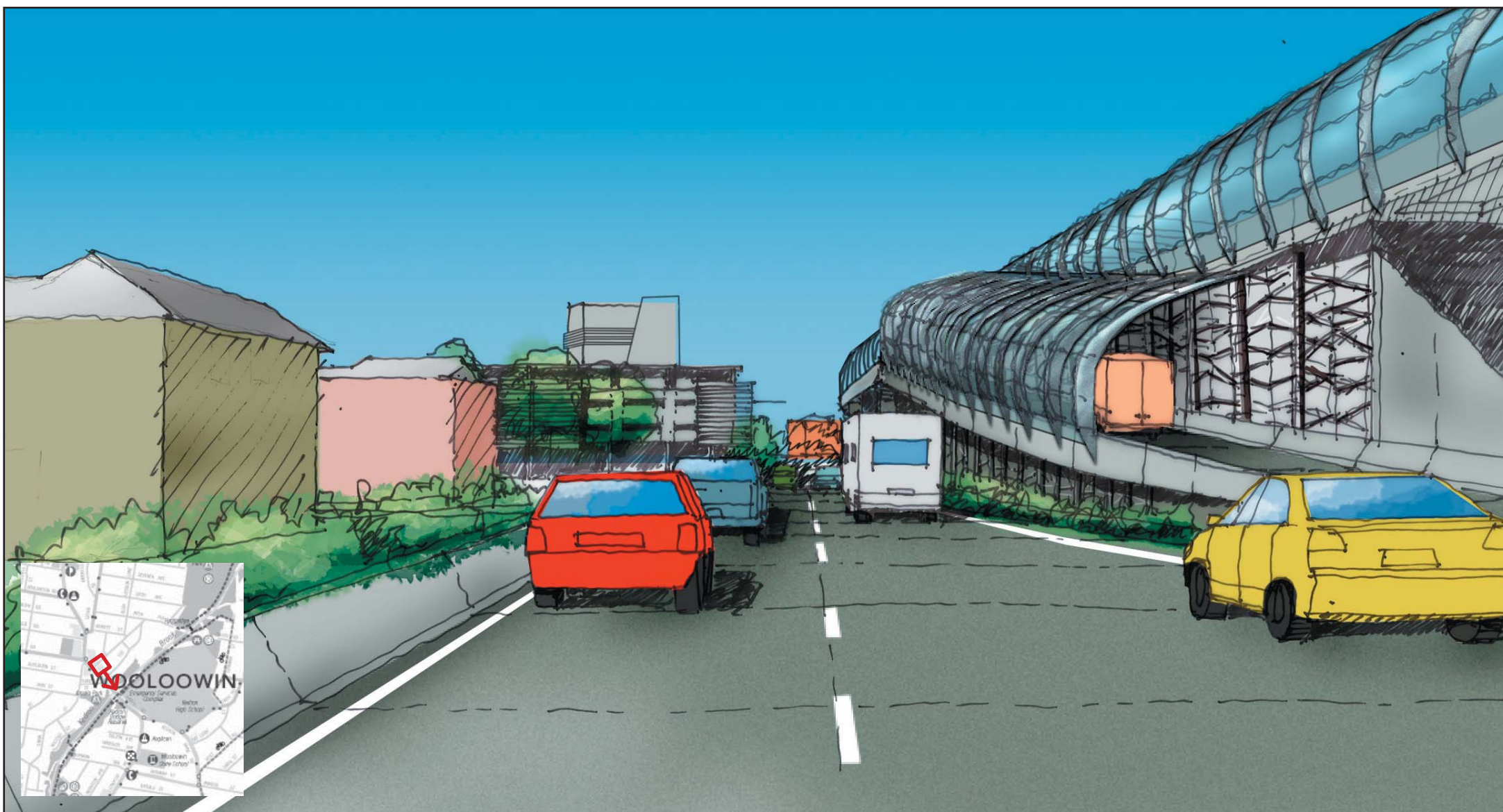


Figure 15.44
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 3
 Gympie Road adjacent to Lassetter Street
 Looking East along Gympie Road
IMPACT IMAGE



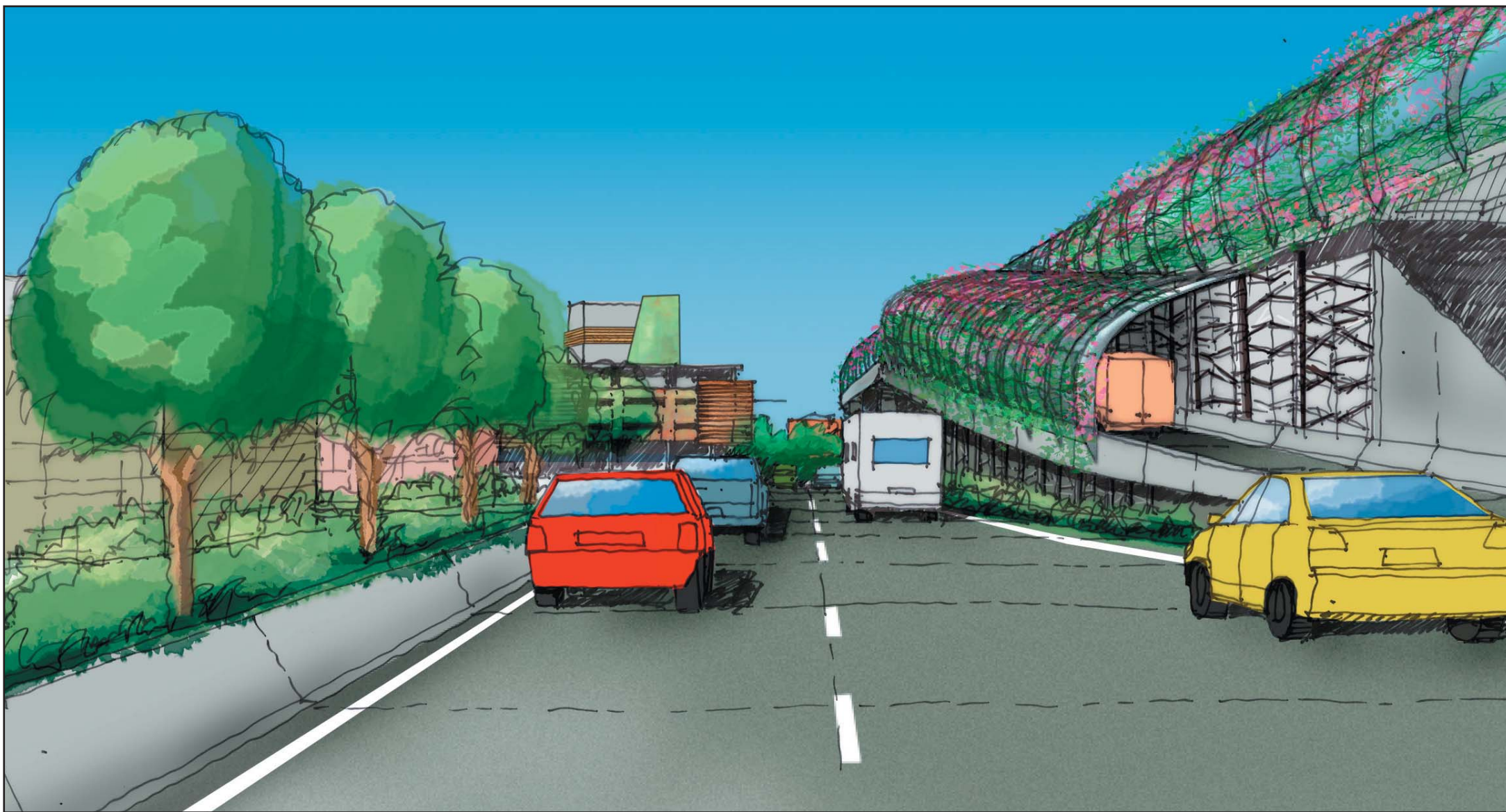


Figure 15.45
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 3
 Gympie Road adjacent to Lassetter Street
 Looking East along Gympie Road
MITIGATION IMAGE





Figure 15.46
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 4
 Gympie Road over Kedron Brook
 Looking East towards Lutwyche Road
EXISTING IMAGE



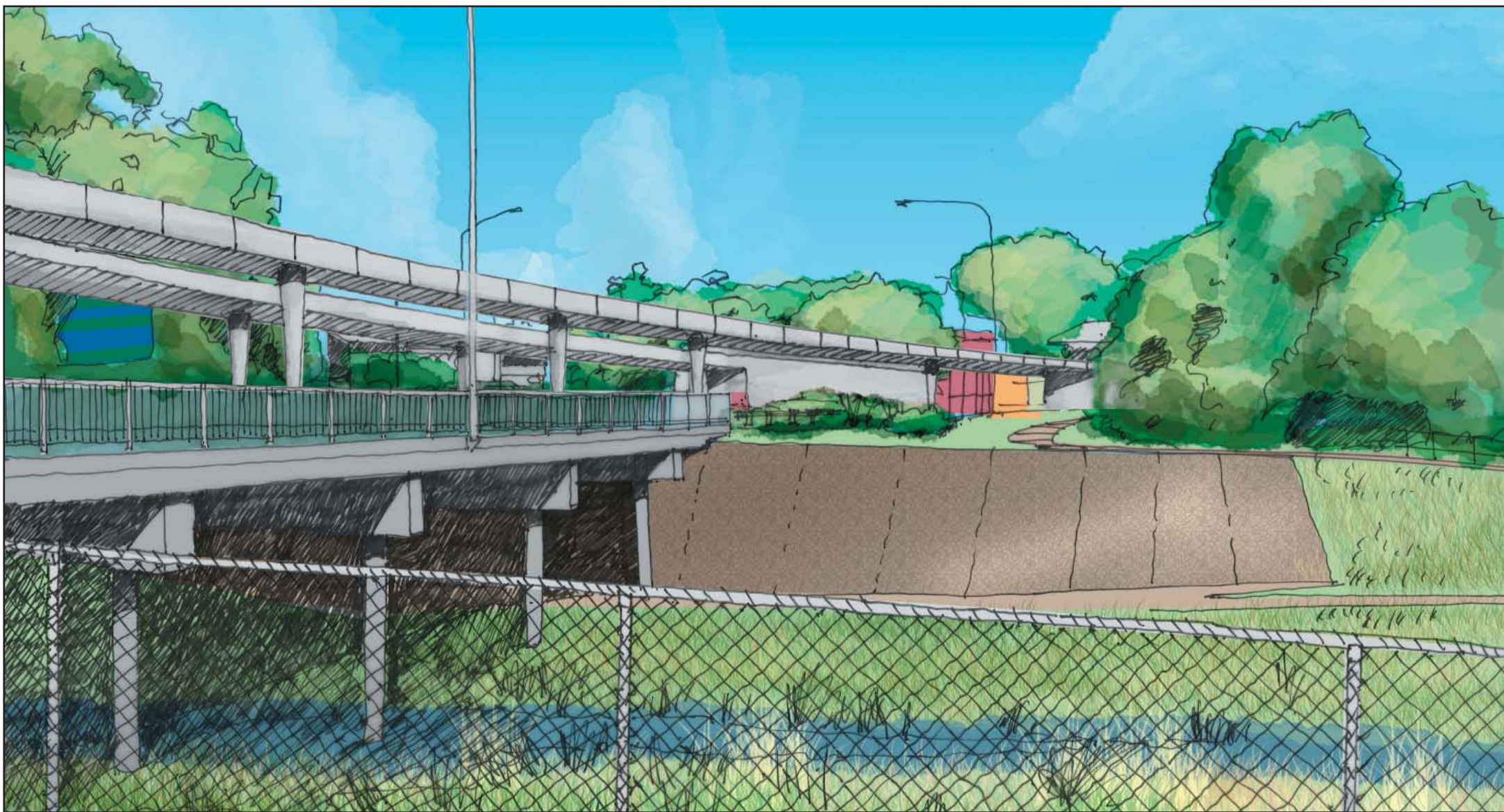


Figure 15.47
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 4
 Gympie Road over Kedron Brook
 Looking East towards Lutwyche Road
IMPACT IMAGE



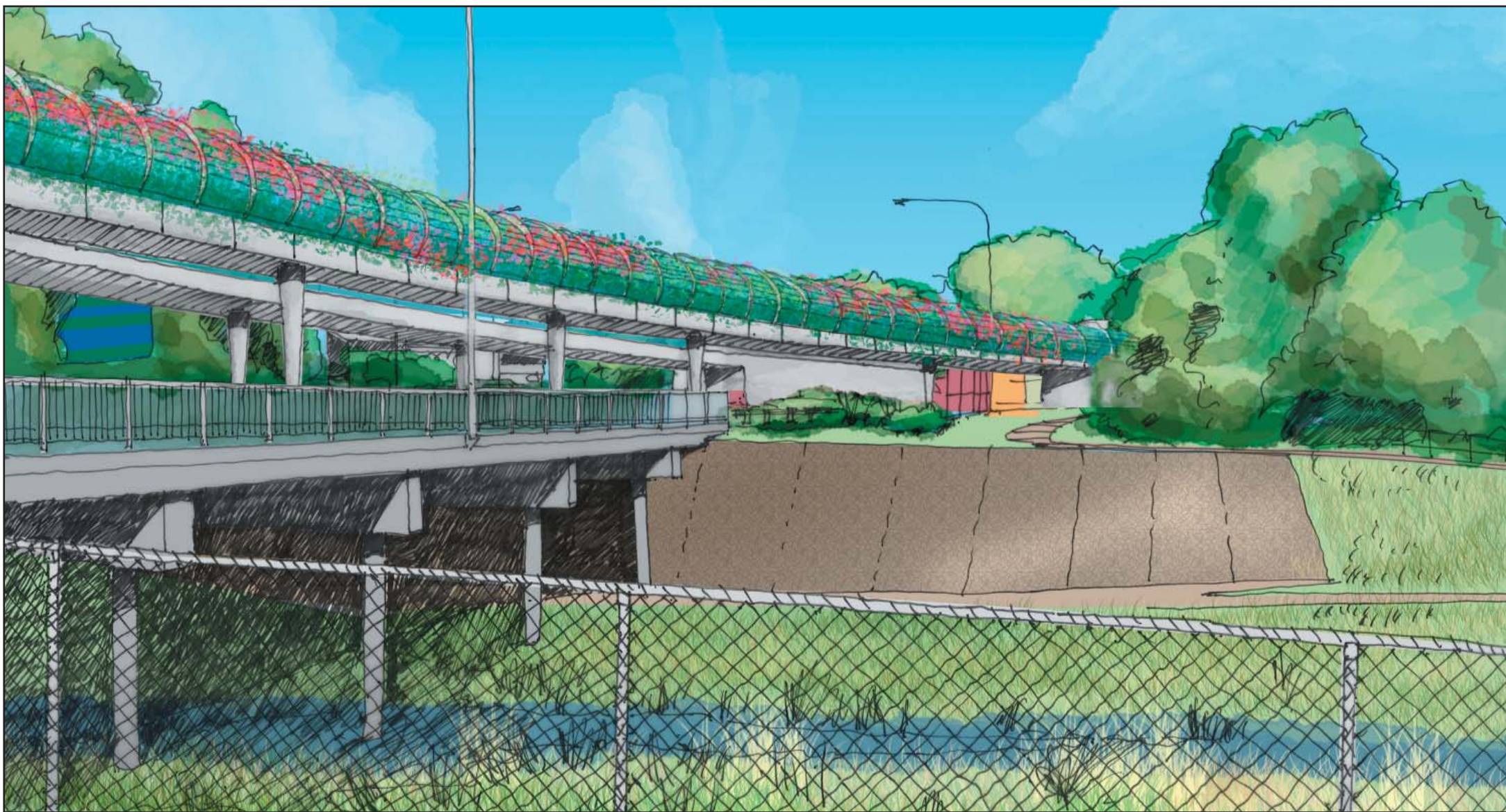


Figure 15.48
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 4
 Gympie Road over Kedron Brook
 Looking East towards Lutwyche Road
IMPACT IMAGE





Figure 15.49
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 5
 Gympie Road and Kedron Park Road intersection
 Looking North from the Kedron Park Hotel
IMPACT IMAGE





Figure 15.50
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 5
 Gympie Road and Kedron Park Road intersection
 Looking North from the Kedron Park Hotel
MITIGATION IMAGE





Figure 15.51
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 6
 Lutwyche Road adjacent to Kedron State School
 Looking North towards Emergency Services Complex
EXISTING IMAGE



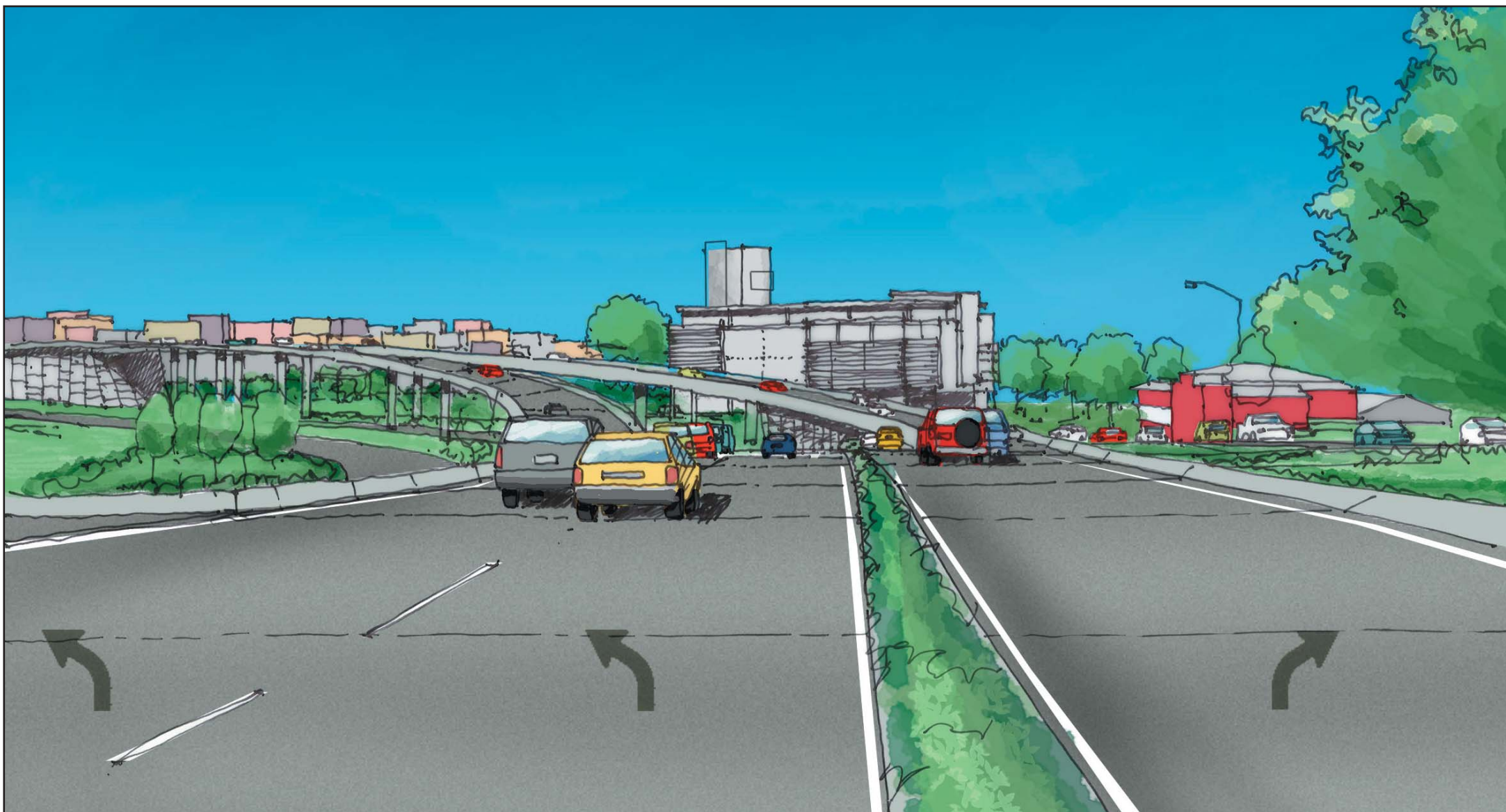


Figure 15.52
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 6
 Lutwyche Road adjacent to Kedron State School
 Looking North towards Emergency Services Complex
IMPACT IMAGE



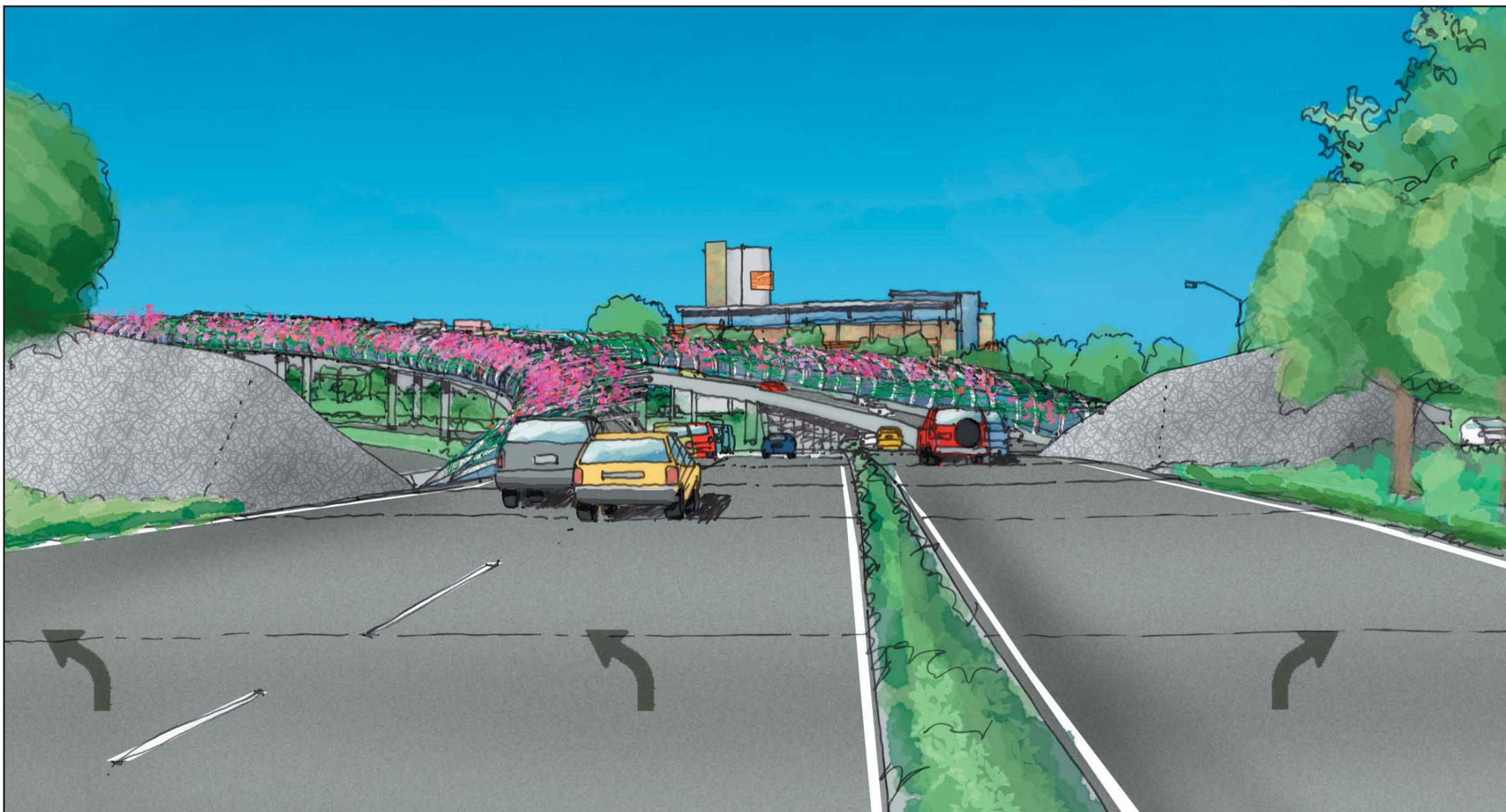


Figure 15.53
Gympie Road Connection
 Urban, Landscape and Visual

Vantage Point 6
 Lutwyche Road adjacent to Kedron State School
 Looking North towards Emergency Services Complex
MITIGATION IMAGE



15.3.3 Woolloowin

The area of Woolloowin is not expected to be affected by direct surface works and there are no urban design or landscape impacts to mitigate. A direct impact of the Airport Link Project will see a decrease in traffic travelling along Junction Road, creating an opportunity for improved amenity for local residents than currently exists.

15.3.4 North-eastern Connection

Impact Assessment

The likely **impacts** of the proposed works for the Airport Link Project on Sandgate Road will be:

- The **Urban Centre** of Toombul will be impacted during construction by changes in circulation and connectivity arrangements. However, the post-construction connections and accessibility will remain largely the same as the existing situation. The works in Schulz Canal to recreate a more 'natural' waterway to accommodate elevated road connections and to offset flooding impacts will create an attractive and 'soft' green edge to the centre;
- **Connectivity** will be impacted by the surface connections in Kalinga Park to the west of Sandgate Road. The existing pedestrian and cycle network at the northern ends of Stuckey Road & Alma Road are to be relocated to accommodate the transition structures, with new connections north across Schulz Canal to the Toombul rail station, the shopping centre and bus station;
- Pedestrian crossings, on signals, in the new intersection arrangement of Sandgate Road and East-West Arterial will cater for north-south movements along Sandgate Road for pedestrians;
- The project will impact on the **urban character** and **visual values** by removing mature trees in Kalinga Park adjacent to Sandgate Road and the East West Arterial to accommodate the transition structures for the surface connections. The trees to be removed include hoop pine (*Araucaria* sp), Chinese elm and Camphor laurel which serve to provide a visual screen to the Airtrain structure and to provide a green edge to Kalinga Park for the residents of Alma Road, Stuckey Road and Elliott Street;
- The proposed siting of the ventilation station and ventilation outlet on two allotments on the southern edge of Kalinga Park will introduce a non-residential element in to the streetscape of Alma Road. The height of the ventilation outlet, at 30m makes it difficult to screen or disguise effectively. The scale and bulk of the ventilation station is consistent with a large apartment building constructed in the 'six-pack' form;
- The transformation of the existing T-intersection into a four way intersection will increase the surface footprint and will impose a visual impact in this location;
- The amenity of the eastern end of Lewis Street and the northern end of Jackson Street will be impacted by construction works, however post-construction mitigation will be able to address this. The Project construction works will also require the short-term removal of the existing play ground and barbecues at Kalinga Park. These can be relocated for the duration of the works; and
- The project will impact on the existing drainage path from Jackson Street requires the redirection of this stream to Schulz Canal upstream of the present location under the Sandgate Road bridge. Rehabilitation and landscape works will be required after construction to restore and possibly enhance local landscape and recreation values for this part of Kalinga Park.

Figure 15-54 shows the impact assessment for the Sandgate Road key location.

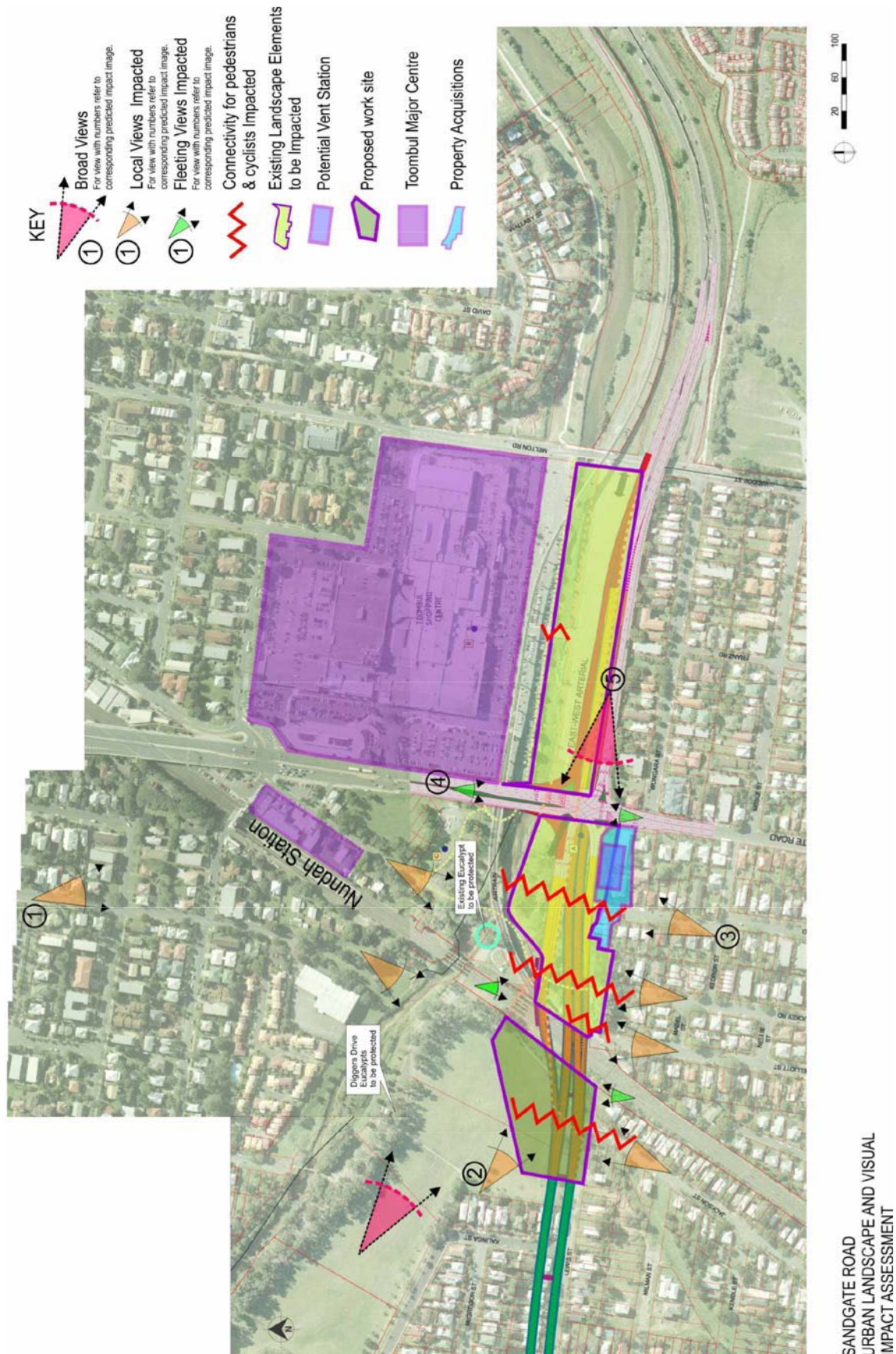


Figure 15.54
Sandgate Road Key Location
Impact Assessment

Urban Design Outcomes and Mitigation

The **mitigation measures** propose urban design and landscape concepts to offset project impacts. All measures will be required to apply Australian best practice urban design and landscape standards, codes and practices. **Figure 15-55** shows mitigation measures for the Sandgate Road key location. The following six strategies are proposed to deal with project impacts:

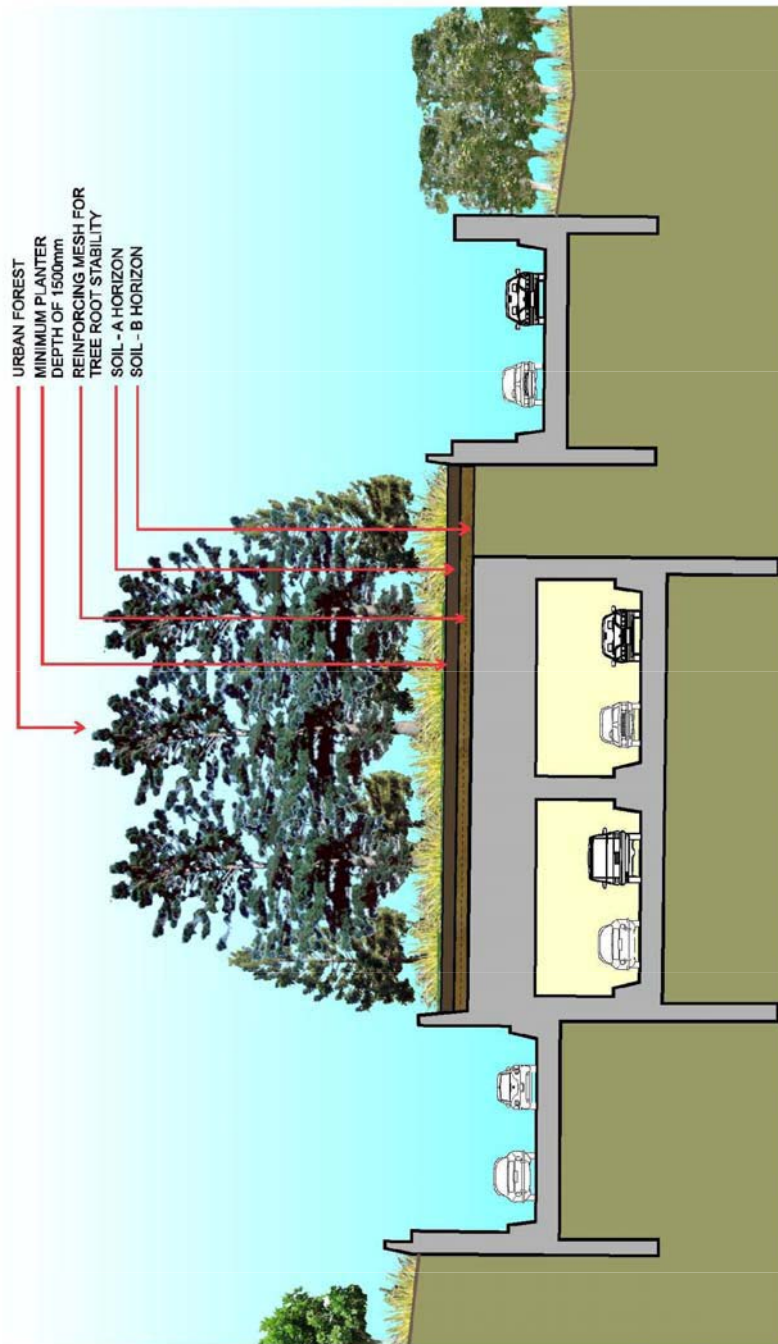
- Open Space revegetation/waterway rehabilitation
 - reconstruct Schulz Canal to form a ‘natural’ wetland and waterway suitable for floodway performance and consistent with the urban design objectives for an attractive urban wetland habitat, such that the works include board walks and viewing platforms.
 - reinstate the drainage path from Jackson Street to Schulz Canal, with planted beds and banks for landscape effect, ecological robustness and streambank stability.
 - provide defined informal recreation space adjacent to Diggers’ Drive in Kalinga Park, within the context of an overall landscaping scheme which is generally consistent with the Kedron Brook landscape master plan.
- Urban Forest Treatment (Refer **Figure 15-56 – Figure 15-57a**)
 - create water-wise subtropical landscapes with mature trees over the majority of the spaces caused by the transition structures into the tunnel, including the planting of advanced-growth trees reminiscent of the existing vegetation (e.g. hoop pines).
 - provide equitable pedestrian and cycle connections north-south crossing of Stuckey and Alma Roads across Schulz Canal through to Ross Park, the Toombul rail station and the bus station.
- Activity Zones
 - create areas of high quality landscape amenity and recreation, including the reinstatement of the playground, picnic and barbeque facilities in Kalinga Park, adjacent to Lewis Street. Other enhancement opportunities include play spaces for all ages, viewing platforms, interpretive trails and typical park amenities.
- Boulevard Treatment
 - provide for pedestrian and cycle movements along Sandgate Road, with themed street plantings, improved accessible pathways and streetscape amenity between Grace Street and Noble Street.
- Design Intervention in Response to Engineering Proposals (Refer **Figure 15-58 – Figure 15-70**)
 - Create themed urban design and landscape treatments for retaining and transition structures, flyovers, portals, ventilation outlets and sound barriers and integrate these with the existing environment.
 - Adopt a high-quality design response for the ventilation station and ventilation outlet, having regard for the proximity of residential development and the scale and form of nearby buildings. The design response should integrate architecture and landscape planning to achieve a desirable visual and urban outcome in this sensitive location, without compromising the air quality outcome sought for the tunnel ventilation system.



AirportsLink
SKM Connell Wagner
JOINT VENTURE

SKM *Connell Wagner*
JOINT VENTURE

URBAN FOREST



NOTE: Preliminary Landscape Treatment dependant
On further investigation of:-
- Services Alignments
- Property Access
- Existing Conditions
- Planning Considerations
- Hydraulic Considerations
- Other Studies
- Traffic Site Lines

Figure 15.56
Sandgate Road Key Location
Urban Forest

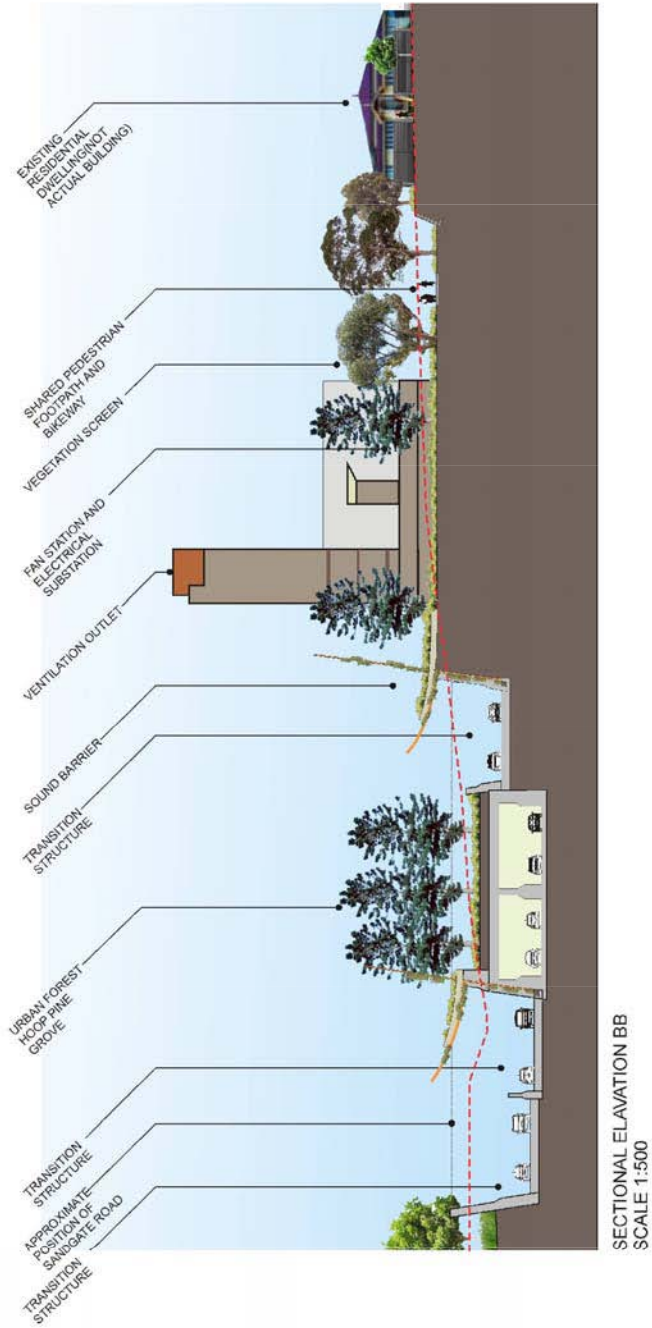
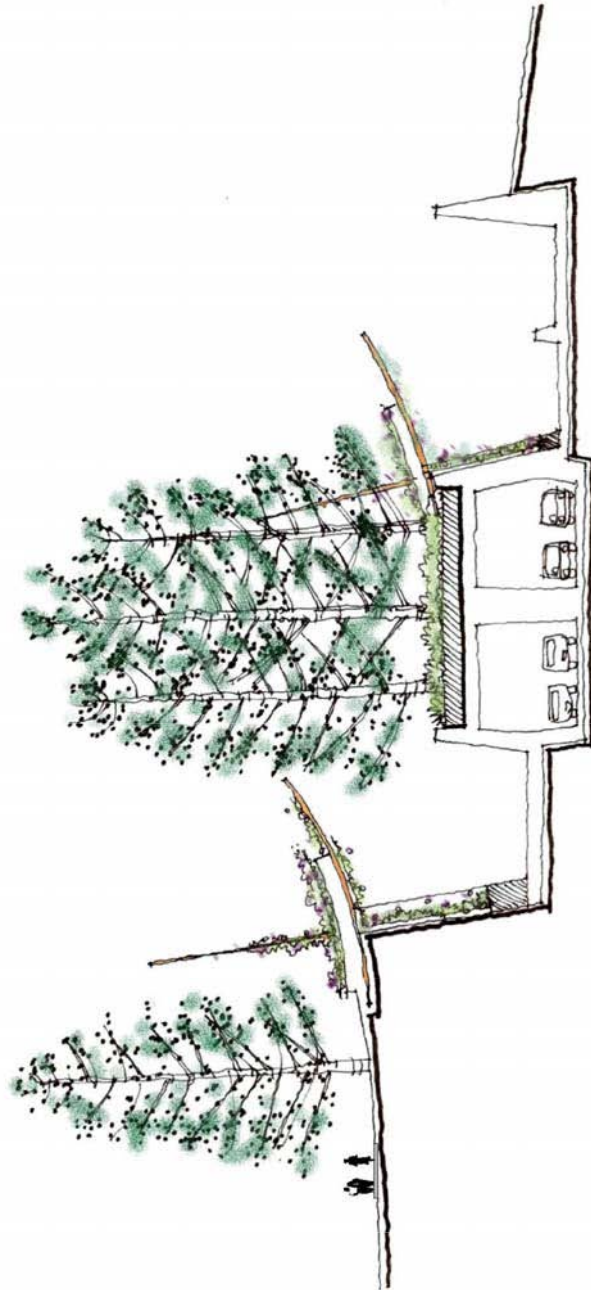


Figure 15.57
Sandgate Road Key Location
Section Through Transition Structure and
Alma Street

END OF ALMA ROAD SECTION



 Airport Link

Figure 15.57a
Sandgate Road Key Location
Section Through Transition Structure

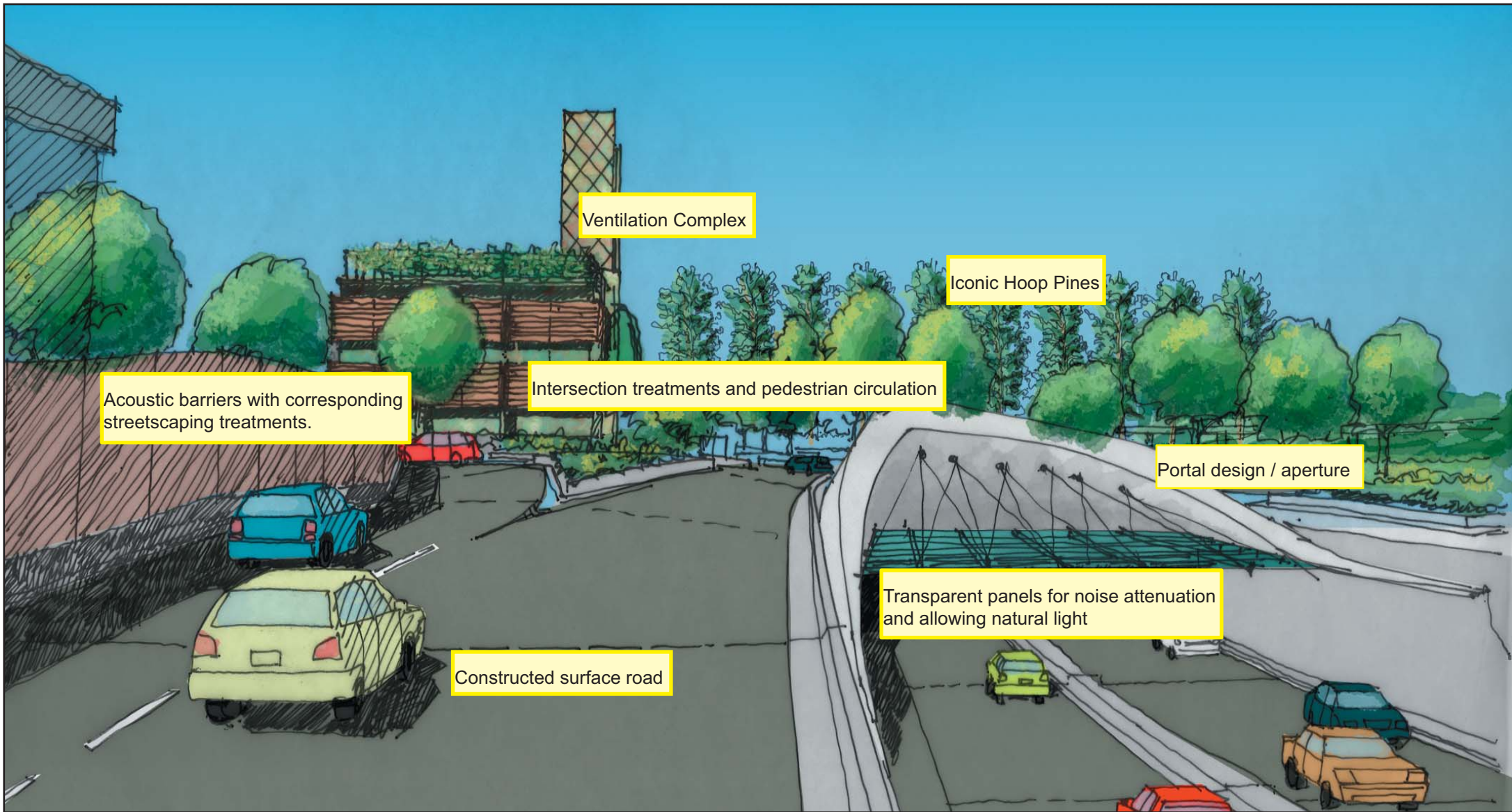


Figure 15.58
Sandgate Road Connection
 Urban, Landscape and Visual

East-West Arterial intersection with Sandgate Road
 Looking West
MITIGATION FOR ENGINEERING PROPOSALS



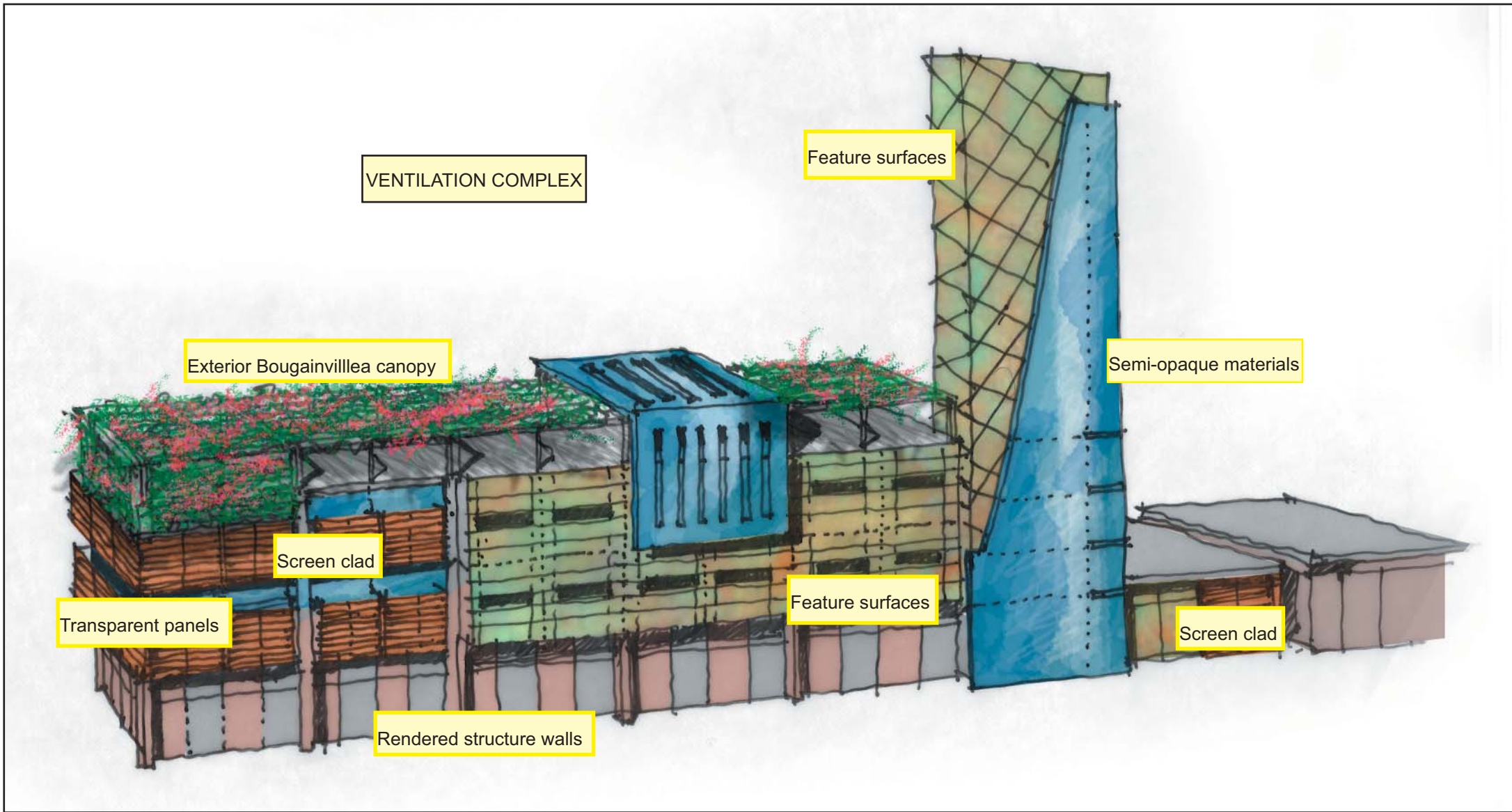


Figure 15.59
Sandgate Road Connection
 Urban, Landscape and Visual

Sandgate Road Ventilation Complex
 Looking South at Northern Face
MITIGATION FOR ENGINEERING PROPOSALS



Figure 15.60
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 1
 Bage Street and corner of Oxenham Street
 Looking South
EXISTING IMAGE





Figure 15.61
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 1
 Bage Street and corner of Oxenham Street
 Looking South
IMPACT IMAGE





Figure 15.62
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 2
 Kalinga Park adjacent to Lewis Street
 Looking East
EXISTING IMAGE





Figure 15.63
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 2
 Kalinga Park adjacent to Lewis Street
 Looking East
IMPACT IMAGE





Figure 15.64
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 3
 Alma Road and corner of Kedron Street
 Looking North
EXISTING IMAGE





Figure 15.65
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 3
 Alma Road and corner of Kedron Street
 Looking North
IMPACT IMAGE





Figure 15.66
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 3
 Alma Road and corner of Kedron Street
 Looking North
MITIGATION IMAGE



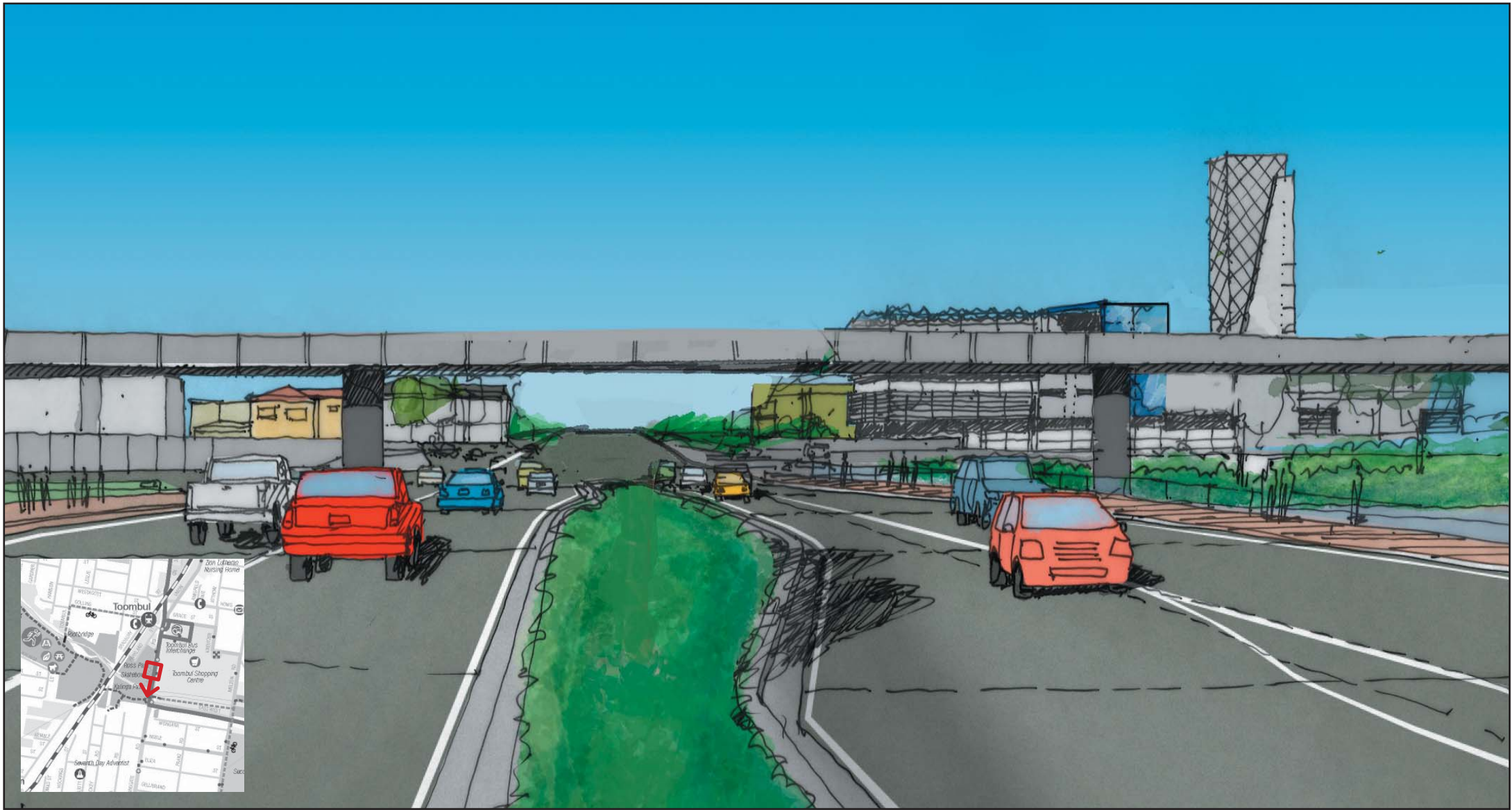


Figure 15.67
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 4
 Sandgate Road with Centro Toombul to the left
 Looking South
IMPACT IMAGE





Figure 15.68
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 4
 Sandgate Road with Centro Toombul to the left
 Looking South
MITIGATION IMAGE



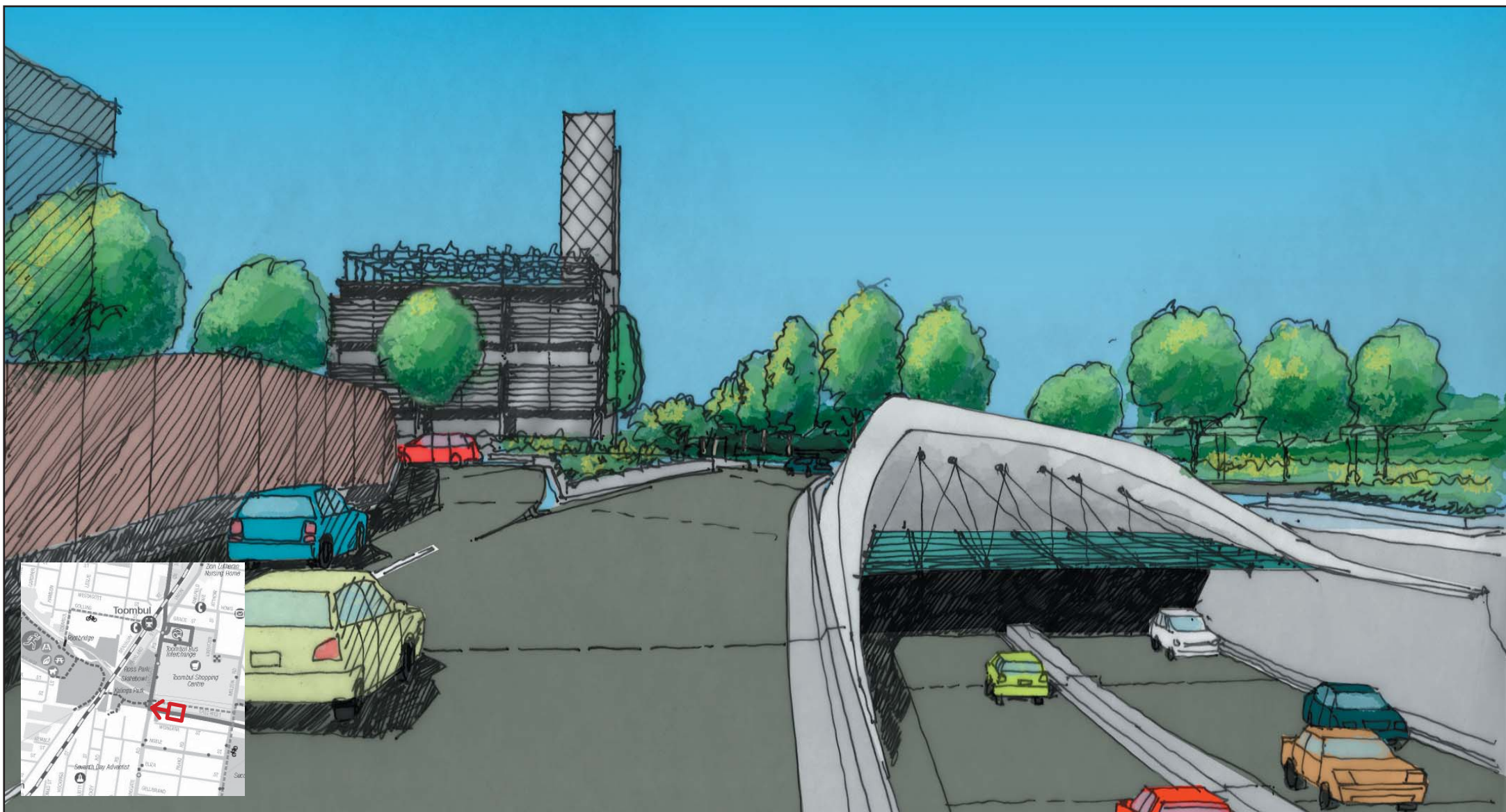


Figure 15.69
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 5
 East-West Arterial intersection with Sandgate Road
 Looking West
IMPACT IMAGE



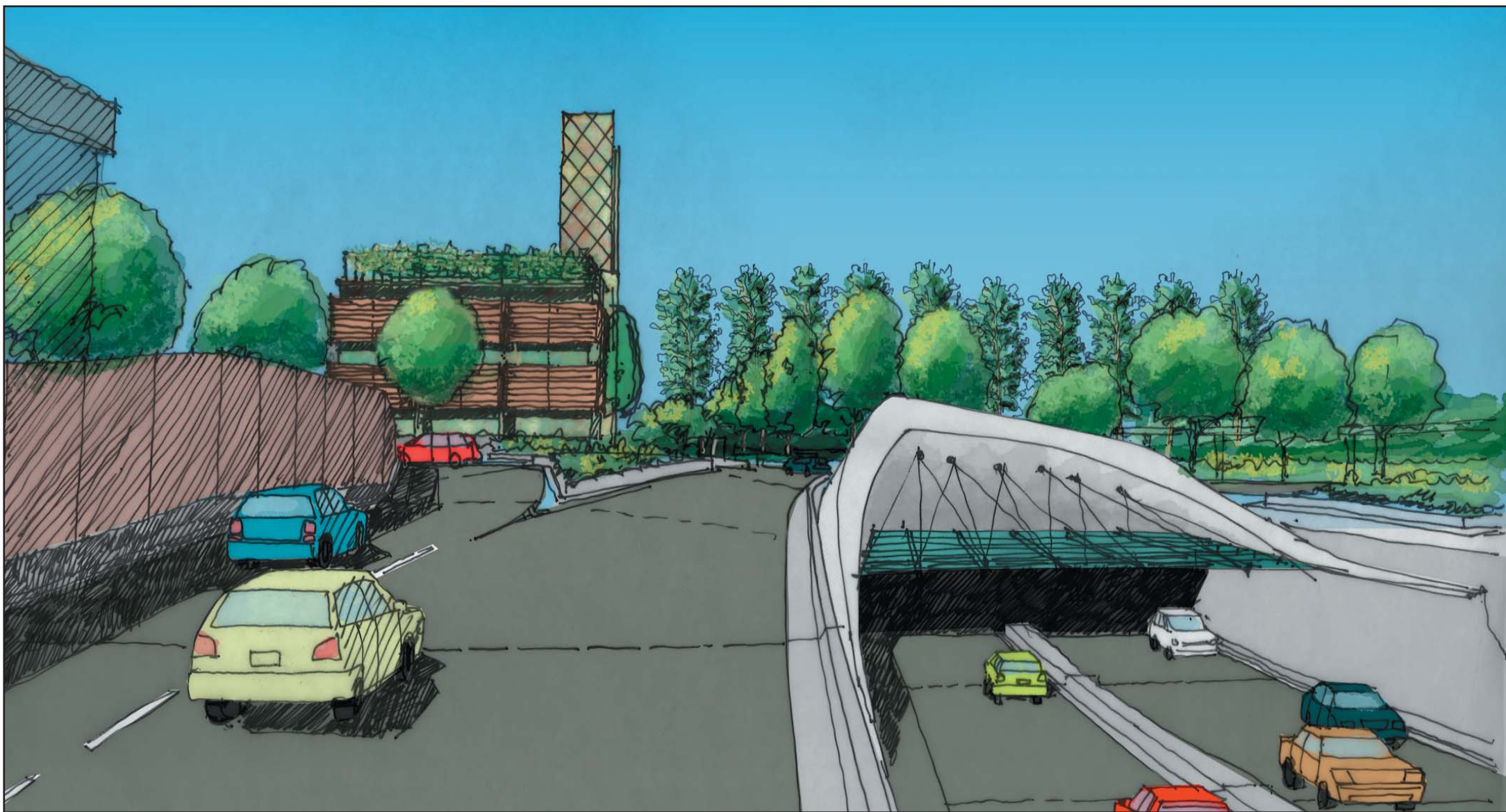


Figure 15.70
Sandgate Road Connection
 Urban, Landscape and Visual

Vantage Point 5
 East-West Arterial intersection with Sandgate Road
 Looking West
MITIGATION IMAGE



15.4 Cumulative Impacts

In the study corridor, the projects to have an impact on the urban amenity and landscape values are the Airport Link Project, the NSBT Project and the Northern Busway Project.

15.4.1 Windsor / Bowen Hills

In the Windsor / Bowen Hills area, these three major projects come together to service the existing and future traffic and transport needs of the city. This confluence occurs in an area bounded by the Mayne railyards and the Exhibition Line, the RNA Showgrounds, the Royal Brisbane Hospital, Lutwyche Road and Enoggera Creek. It is a focal point for the transport and traffic activities of northern Brisbane. The pattern of land use, the urban form and landscape setting reflect this intense transportation activity.

Within this area, above-ground and at-grade infrastructure will intersect north of O'Connell Terrace and on either side of Enoggera Creek. The NSBT Project infrastructure entails a complex array of elevated roads and ramps straddling Enoggera Creek to provide connections to Lutwyche Road, the Inner City Bypass and the local road network. The proposed Northern Busway entails above-ground and at-grade infrastructure on either side of Lutwyche Road, both to the north and to the south of Enoggera Creek. The proposed Airport Link Project provides above-ground and at-grade connections to the NSBT Project, the Inner City Bypass westbound and the local road network. On the horizontal plane, the proposed Airport Link infrastructure generally sits around the NSBT infrastructure. The exception to this is in the O'Connell Terrace ramps which sit above the NSBT – ICB off-ramps.

Despite the complexity and the scale of the transport infrastructure in this location, the impact on it's visual character is expected to be less severe than the plan view might suggest. Mitigating factors in support of this conclusion are:

- The confluence of transport infrastructure occurs at the southern edge of Windsor in a location bounded by Enoggera Creek which is already impacted by industrial activities including the silos of a concrete batching plant;
- On the Bowen Hills side, views into the area are constrained by the existing land use pattern combined with the topography;
- The locality is already a hard urban landscape influenced by road and rail transport infrastructure, large public buildings, and commercial and industrial buildings, such that the addition of more transport infrastructure represents an intensification of a challenging urban setting;
- The Enoggera Creek corridor, while also subject to some disturbance with the construction of elevated roadways for each of these projects, serves to provide a visual screen from the north; and
- The expected land use changes that will accompany the implementation of all three projects will result in a changed and more intense urban form which is better able to respond to the infrastructure impacts as well as providing an effective visual screen of it for the more distant residential areas in Windsor, Bowen Hills and Albion.

With this latter point, a recommendation of this EIS is that local planning commence in order to manage the expected land use change in the corridor to avoid unintended or undesirable urban outcomes, and also, to guide and direct development towards an urban form which is responsive to the intensifying setting and the presence and operation of three modes of transport infrastructure.

The local impacts, such as would occur at The Mews and at Queensland Newspapers, both in Campbell Street and also in Federation Street, would require innovative urban design solutions integrated with comprehensive landscaping will help to off-set but not resolve these local impacts.

15.4.2 Kedron

The transport tasks required to be accommodated at the north-western connection are considerable and require extensive infrastructure beneath the surface, on the surface and above the surface, to be efficient and effective. The projects that will extend through this area are the Airport Link Project and the Northern Busway Project.

The proposed infrastructure entails elevated roadways and ventilation station and ventilation outlet to service the Airport Link tunnels, and busways and bus stations. The visual impacts of the combined infrastructure will be extensive at the local level, but much less evident beyond the immediate vicinity of the infrastructure. Mitigating factors for this locality include:

- The separation distances across Kedron Brook and the Kedron State High School campus from both the north, south and west for views to the elevated roadways and ventilation station and outlet;
- The combination of topography, settlement pattern, built form and vegetation to screen the areas in which the infrastructure will be situated;
- The existing visual context is characterised by an expansive surface roadway and large institutional buildings in the Emergency Services complex; and
- The heavily modified nature of the landscape along Kedron Brook.

The mitigation works recommended in this EIS, combined with the urban design and landscape treatments proposed for the Airport Link and Northern Busway infrastructure will serve to provide an effective mitigation for many aspects of these projects. Detailed design studies will be required to provide innovative, effective and acceptable solutions for the noise barriers required to mitigate road traffic noise on Lutwyche Road and Gympie Road. The barrier heights required to achieve acceptable acoustic environments for residential areas along these arterial routes are significant in some places. It is likely that a combination of landscaping, barrier design and the use of a range of materials in their construction, will be required to mitigate the impacts of these barriers.

15.4.3 Clayfield

At Clayfield, the Airport Link Project will join with the East West Arterial in the vicinity of the Airtrain viaduct, the Toombul shopping centre and the floodway of Schulz Canal. Already this is a hard urban environment, although it does have a green edge on its western side with Kalinga Park and Ross Park providing visual relief and amenity.

The Airport Link Project will impact on this area with two tunnel ramps coming to the surface in Kalinga Park, between the Airtrain viaduct and Sandgate Road. Also, a ventilation station and a ventilation outlet are proposed on the southern side of these ramps between Sandgate Road and Alma Road. The provision of this infrastructure will cause the loss of existing mature hoop pines and exotic species, such as Chinese elm and Camphor laurel, which provide the green edge to Sandgate Road.

The visual impact of the infrastructure in this location is partially mitigated by its setting, as follows:

- From the north, the Airtrain viaduct serves to break up the visual mass of the ventilation station and the ventilation outlet,

- From the south, views of the infrastructure are confined to the immediate vicinity, and would be most evident from Alma Road, if there was no landscaping or mitigation implemented;
- From the west, views of the infrastructure are blocked by the Airtrain embankment and vegetation in the Stuckey Street, Elliott Street area; and
- The separation distances from other vantage points in Nundah and Toombul are such that, views are either broken up by vegetation or buildings, or the infrastructure merges somewhat within its setting.

The scale of the ventilation station is likely to be consistent with but slightly larger than a residential apartment building. The scale and form of the ventilation outlet will be inconsistent with its surroundings, due to the height proposed to ensure a good outcome for ambient air quality in the locality. Consequently, innovative design solutions will be required to provide visual relief to this structure, with the intention of reducing its apparent scale. This would be achieved with the use of landscaping, combined with a range of materials and design features.

There will be some overshadowing of three residential properties to the south of the ventilation outlet during the hours of 9.00am to 3.00pm on 22 June, as the shadow swings through its arch. There are no over-shadowing effects during the summer months. Again, detailed design and siting studies are required to address this impact, albeit one of short-term duration.