

6.2 Landscape character zones

This section includes a description of landscape character and assessment of impacts to the landscape character from the project during both the operation and construction phases of the project. Refer to Figure 6.1 for the locations of the LCZ's.

6.2.1 Landscape character zone 1– Transport corridor

LCZ1 is defined by linear transport infrastructure including the rail corridor, and major roads including the Hume Highway and Cabramatta Road. This LCZ is consistent with existing urban condition described in section 5.1.1.

The existing conditions are described in Photo 6.1 and Photo 6.2 and Table 6.1 below. The impacts are assessed in Table 6.1 below.



Photo 6.1 Rail corridor

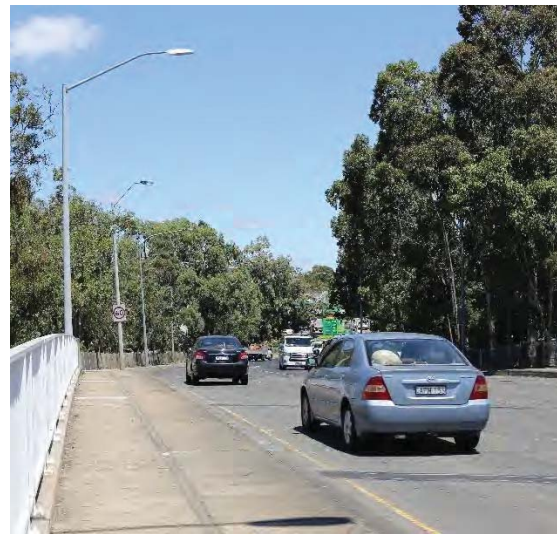


Photo 6.2 Cabramatta Road

Table 6.1 LCZ1 - Transport corridor description and impact assessment

Landscape character zone 1	
Existing conditions	The rail line rises gradually to the south from the Cabramatta Road bridge towards the bridge over Broomfield Street and Cabramatta Creek, sitting at elevation above adjoining roads. A vegetated batter is present on the western edge to Railway Parade, with a retaining wall to the eastern edge along Broomfield Street. A noise wall is present along the residential interface to Broomfield Street. Car parking is located along both sides of the rail line. There are street trees along the southern end of Broomfield Street towards Cabramatta Creek. There are two bridges over Sussex Street and Cabramatta Creek, at each crossing the bridges comprises of an historic brick arched rail bridge to the west, and a more recent concrete rail bridge to the east. A third shared path bridge is present at a lower elevation over the Cabramatta Creek Crossing. The rail corridor traverses the Cabramatta Creek corridor with fenced edges, a retaining wall part way to the eastern side and a vegetated batter with informal scattered trees. The south section the rail corridor traverses through a more urban context towards the Hume Highway, with very little vegetation present. Overhead wires, poles, and signals are present along the corridor. A shared path follows along the eastern side of the rail corridor from Cabramatta Station to Cabramatta Creek.

Landscape character zone 1	
	Cabramatta Road bridge in the north of the study area traverses the rail corridor spanning the rail lines, Railway Road and Bloomfield Street south of Cabramatta Station. The bridge has two lanes of traffic in each direction and a footpath on either side, with mature native canopy vegetation to the bridge batters. The Hume Highway bridge is located to the north of Warwick Farm Station and includes three west-bound traffic lanes, two east-bound lanes with additional turning lane, and footpaths and throw screen to either side. Mature native vegetation is present to the bridge batters. The condition of the existing elements within this LCZ is considered average to low due to the overgrown vegetated embankment and presence of noise wall and rail infrastructure such as ballast and overhead wires.
Anticipated change to LCZ	Construction During construction works areas would be located to the east of the existing tracks. Operation During operation the LCZ would see the addition of a new portion of track and realignment of 550 metres of existing track between Cabramatta Station and the Hume Highway along the existing SSFL. The rail corridor would be widened by five metres to the east with a new replacement fence and/or retaining wall and relocated Broomfield Street noise wall. Two new bridges would be added over Sussex Street and Cabramatta Creek to the east of the existing concrete bridges. The new bridges would be similar in size and materiality to the existing concrete bridges. Modifications and upgrades to signalling and overhead wires would occur for the length of the SSFL between Warwick Farm Station and Cabramatta Station.
Sensitivity to change	The sensitivity of the landscape represented by LCZ1 is considered to be negligible this is due to the existing elements being in below average condition and not particularly distinctive local features.
Magnitude of change	During construction the magnitude of change to LCZ1 during construction is considered to be low. This is due to the proposed works areas not being out of character with the existing landscape. During operation the magnitude of change to LCZ1 is considered to be negligible. This is due to the addition of new rail track and bridges but these elements are in keeping with the existing landscape character elements.
Significance of impact	During construction the significance of impact for LCZ1 during construction is therefore low to negligible as the works areas and machinery associated with the proposed works may be new but are in keeping with the existing landscape character and are temporary in nature. During operation the significance of impact for LCZ1 is therefore negligible as although the existing rail corridor would be widened and there would be the addition of new track and two new bridges, these elements are in keeping with the existing landscape character.

6.2.2 Landscape character zone 2 – Residential

This LCZ is defined by the residential areas on either side of the rail corridor, including to the north of the study area in Cabramatta, and an area to the south west in Warwick Farm, including Lawrence Hargrave School. This LCZ is consistent with existing urban condition described in section 5.1.1.

The existing conditions are described in Photo 6.3 and Photo 6.4 and Table 6.2 below. The impacts are assessed in Table 6.2 below.



Photo 6.3 Residential properties



Photo 6.4 Residential properties

Table 6.2 LCZ2 - Residential description and impact assessment

Landscape character zone 2	
Existing conditions	LCZ2 includes both apartments and detached dwellings. Apartments are located in a cluster to the north of the study area in Cabramatta, on both sides of the rail corridor towards the station. Built form is typically brick with tiled roofs, up to a height of four storeys often with car parking to the ground level, oriented both towards the street, or an internal driveway. Detached dwelling are typically weather board or brick with tiled roofs, with setback of between five and ten metres, oriented towards the street. A number of more modern two storey houses are also present, typically with a larger built form footprint. Along the eastern edge of the rail corridor on Broomfield Street there is a concrete noise wall on top of a blockwork retaining wall. The noise wall blocks views into the rail corridor and has a subtle leaf pattern on the street face of the wall. The area to the north has a gridded streetscape pattern aligning with the rail corridor, whereas the area to the south has a more curvilinear pattern. Concrete footpaths are present typically to one side of the street only, except along Broomfield Street where a shared path is present on the east side of the street and a footpath on the west. Overhead power lines are present throughout. Vegetation comprises of street trees, however these are not a common occurrence, and where present, are often small natives pruned below overhead wires. Garden planting within private properties commonly include palm and cypress pines. Front fence are not present on all properties. On street parking is present throughout this LCZ, generally consisting of parallel parking on both sides of the street. The condition of the existing elements within this LCZ is considered average to low due to the unmaintained nature strips and condition of the built form.

Landscape character zone 2	
Anticipated change to LCZ	Construction During construction the reconfiguration of Broomfield Street would affect traffic, cyclist and pedestrian access and use of the street. The existing vegetation would be removed and the partial closure of the street during the works period. Access would be maintained for the period of works but would be restricted to the eastern or western side of the street depending on the stage of works. Machinery, site fencing, construction lighting and increased activity from vehicles would be present during the construction period. Operation During operation changes to the LCZ2 would occur along Broomfield Street to the east of the SSFL. With the expansion of the rail corridor resulting in the removal of the existing street trees and reconfiguration of the street. The reconfiguration of Broomfield Street would include parallel parking on both sides of the street between Bridge Street and Sussex Street, the realignment of the shared path and the relocation of the existing noise wall. The street trees would be replaced along the eastern edge with in-lane trees to the north of Junction Street and within the grassed verge to the south of Junction Street. Compact native grasses would be planted between the shared path and realigned noise wall. Climbers on a catenary system would be grown where room allows on the blank noise wall panels.
Sensitivity to change	The sensitivity of the landscape represented by LCZ2 is considered to be low. This is due to the landscape character elements being in average condition and a development of this type would be unlikely to have an adverse effect on the landscape character that could not be mitigated.
Magnitude of change	During construction the magnitude of change is considered to be moderate. This is due to there being discernible change in the landscape character due to the removal of existing vegetation and the partial closure of Broomfield Street during the reconfiguration works. During operation the magnitude of change to LCZ2 is considered to be low. This is due to the reconfiguration of Broomfield Street being in keeping with the local character.
Significance of impact	During construction the significance of impact for LCZ2 is therefore moderate to low due to the removal of vegetation and partial closure of the street. During operation, although a portion of the LCZ2 along the western edge of the rail corridor would become part of LCZ1, the significance of impact for LCZ2 would be low. This is due to the reconfiguration of Broomfield Street being in keeping with the local character and the loss of a portion of the LCZ2 along the western edge would not result in a change to the LCZ's key characteristics. The edge of LCZ2 would remain similar to existing, with key features such as the noise wall and street trees replaced. The addition of the catenary climbers would be a positive new element within the LCZ.

6.2.3 Landscape character zone 3 – Commercial/light industrial

This landscape character zone is defined by the commercial and light industrial areas adjacent to the rail corridor. This includes the cluster of auto sales caryards and Warwick Farm shopping area between the rail corridor and the Hume Highway; the row of smaller scale auto services on Railway Parade with adjacent Rugby League Club to the west of the rail line; and The Warwick and Holiday Inn. This LCZ is consistent with existing urban condition described in section 5.1.2.

The existing conditions are described in Photo 6.5 and Photo 6.6 and Table 6.3 below. The impacts are assessed in Table 6.3 below.



Photo 6.5 Railway Parade



Photo 6.6 Sapho Road

Table 6.3 LCZ3 - commercial/light industrial description and impact assessment

Landscape character zone 3	
Existing conditions	The south-east portion of LCZ3 includes one to three storey large scale commercial buildings set within an expansive area of asphalt and concrete for outdoor car storage / car parking, which is accessed via an internal road network. The portion along Railway Parade is smaller in scale with direct access to the local road network with setbacks of approximately ten metres typically with fencing and car parking to the front. The buildings in this location are generally brick with flat roofs and signage. Overhead wires are present along the street frontage. Vegetation within LCZ3 is minimal, with no street trees present along the Railway Parade verge and minimal vegetation within and surrounding the auto services area to the south-east. However, palm trees are scattered throughout the Masterton Homes site as well and along Sapho Road. The condition of the existing elements within this LCZ is considered average to low due to the condition of the built form and presence of large expanses of hardscaping.
Anticipated change to LCZ	Construction During construction the proposed works would be limited to the track duplication, realignment, and retaining wall works between Peter Warren Automotive and the existing rail corridor. This would comprise acquisition of a strip of land less than five metres in width. There would be no works within a majority of this LCZ. Operation During operation a strip of land less than five metres in width along the eastern boundary of Peter Warren Automotive would be required to

Landscape character zone 3	
	accommodate the additional track. There would be a new retaining wall to the boundary of the Peter Warren Automotive and the rail corridor.
Sensitivity to change	The sensitivity of receivers represented by LCZ3 is considered to be low . This is due to the landscape character elements being in average condition and a development of this type would be unlikely to have an adverse effect on the landscape character that could not be mitigated.
Magnitude of change	The magnitude of change to LCZ3 is considered to be negligible during construction and operation. This is due to the imperceptible change to the existing landscape elements.
Significance of impact	The significance of impact for LCZ3 is therefore low to negligible during construction and operation as the proposed new track and retaining wall would be in keeping with the existing landscape character.

6.2.4 Landscape character zone 4 – Passive recreation

This landscape character zone is defined by the passive recreation and riparian areas within the Cabramatta Creek corridor. This LCZ is consistent with existing urban condition described in section 5.1.3.

The existing conditions are described in Photo 6.7 and Table 6.4 below. The impacts are assessed in Table 6.4 below.



Photo 6.7 Shared path along Cabramatta Creek

Table 6.4 LCZ4 Passive recreation description and impact assessment

Landscape character zone 4	
Existing conditions	This landscape character area directly interfaces with Cabramatta Creek and the wetland area to the western side of the rail corridor. It has a distinctively green character with a mix of dense native and exotic vegetation which provides significant tree canopy. The dense riparian vegetation further differentiates it from the surrounding active open spaces to the south and from the suburban residential areas to the north. The passive recreation areas along the creek provide important recreational and aesthetic benefits for the community. The shared paths present are largely isolated from surrounding roads and follow the alignment of the creek. The condition of the existing elements within this LCZ is considered moderate and elements such as the vegetation contribute to the character of the area.
Anticipated change to LCZ	Construction During construction the changes to LCZ4 would include the diversion of the shared path between Sussex Street and Cabramatta Creek and the works areas to the east and west of the existing rail corridor for the proposed new bridge over Cabramatta Creek. There would be some vegetation removal within the proposed works area. The existing embankment and chain mesh fence adjacent to the shared path would be removed and replaced with a retaining wall around three metres high. Operation During operation the project would see the addition of a new rail bridge over Cabramatta Creek adjacent to the existing bridge and the reinstatement of the existing shared path in its current location. There would be an approximately three metre high retaining wall adjacent to the eastern edge of the shared path. There would be revegetation of the creek corridor where vegetation was removed.
Sensitivity to change	The sensitivity of LCZ4 is considered to be moderate. This is due to the extent of vegetation cover and passive recreation opportunities the character area provides to the surrounding urban environment.
Magnitude of change	The magnitude of change to LCZ4 is considered to be moderate during construction. This is due to the introduction of machinery, site fencing, lighting and removal of vegetation being out of character with the existing landscape. These changes would be temporary. The magnitude of change to LCZ4 is considered to be low during operation. This is due to the minor loss of vegetation and although the addition of the new rail bridge would introduce a new element into the landscape, it would be on the edge of the LCZ adjacent to the existing rail bridge and would be in keeping with the existing landscape character. The vegetation would be replaced where practicable and a majority of the vegetation within the LCZ4 would be retained. The proposed high retaining wall would introduce a new element but this would be softened over time with the re-establishment of vegetation.
Significance of impact	The significance of impact for LCZ4 is therefore moderate during construction. This is due to the introduction of new elements which are out of character with the existing landscape. The significance of impact for LCZ4 is therefore moderate to low as the proposed works would be in keeping with the existing landscape character and the vegetation loss would be minor. Although the high retaining wall would be a new element, it would be softened over time as the vegetation re-establishes.

6.2.5 Landscape character zone 5 – Active recreation

This landscape character zone is defined by the active recreation areas on either side of the rail corridor adjacent to Cabramatta Creek. This includes Jacquie Osmond Reserve, Warwick Farm Recreation Reserve, Cabramatta Sportsground, Don Dawson Oval, and the Cabramatta Rugby League Club fields. This LCZ is consistent with existing urban condition described in section 5.1.4.

The existing conditions are described in Photo 6.8 and Photo 6.9 and Table 6.5 below. The impacts are assessed in Table 6.5 below.



Photo 6.8 Jacquie Osmond Reserve



Photo 6.9 Warwick Farm Recreation Reserve

Table 6.5 LCZ5 Active recreation description and impact assessment

Landscape character zone 5	
Existing conditions	LCZ5 is situated on lower-lying terrain associated with the Cabramatta Creek riparian corridor and floodplain. As such, land cover is predominantly level turf playing fields bordered by canopy vegetation, either dense trees associated with Cabramatta Creek or sporadic linear boundary plantings along fence lines and roadways. The flatness of the terrain leads to edges ranging from gently sloping turf batters to retaining walls. Built form comprises of isolated amenities buildings. Infrastructure elements include floodlighting, wire mesh boundary fencing, and sporting elements such as goals and mesh safety fencing. The condition of the existing elements within this LCZ is considered moderate and elements such as the sporting fields surrounded by vegetation make a contribution to the character.
Anticipated change to LCZ	Construction During construction there would be construction works associated with the additional track, new retaining wall and embankment and the removal of the existing trees in front of the railway corridor on the east side of the SSFL rail corridor. There would be site fencing to the rail corridor boundary along the western edge of Jacquie Osmond Reserve. A portion of Jacquie Osmond Reserve would be occupied during construction for use as a construction compound. Machinery, site fencing, construction lighting and increased activity from vehicles would be present during the construction period.

Landscape character zone 5	
	Operation During operation the change would include an additional track and new retaining wall with chain mesh fencing on top and a grassed batter in front on the east side of the SSFL rail corridor. The existing trees on the east side of the track would be removed. The softball nets would be reinstalled. Proposed changes would be limited to Jacquie Osmond Reserve with the rest of LCZ5 remaining untouched.
Sensitivity to change	The sensitivity of LCZ5 is considered to be moderate . This is due to the active recreation opportunities the character area provides to the surrounding urban environment.
Magnitude of change	During construction the magnitude of change to LCZ5 is considered to be moderate . This is due to the removal of vegetation and softball nets on the east side of the SSFL rail corridor, addition site fencing and machinery which would result in a discernible change within LCZ5. During operation the magnitude of change to LCZ5 is considered to be low . This is due to the removal of existing trees and taken down and re-installed of the softball nets on the east side of the SSFL rail corridor which would result in a minor loss of key landscape character elements in LCZ5.
Significance of impact	During construction the significance of impact for LCZ5 is therefore moderate . During operation the significance of impact for LCZ5 is therefore moderate to low . The removal of the existing trees within Jacquie Osmond Reserve would be a minor change and the general landscape character would be maintained.

6.3 Summary of impacts

The following section summarises the construction and operation impacts of the project on the landscape character areas in Table 6.6 and Table 6.7.

Table 6.6 Summary of construction impacts

Landscape character area (LCZ)	Sensitivity to change	Magnitude of change	Significance of impact
LCZ1 – Transport corridor	Negligible	Low	Low to negligible
LCZ2 - Residential	Low	Moderate	Moderate to low
LCZ3 – Commercial/light industrial	Low	Negligible	Low to negligible
LCZ4 – Passive recreation	Moderate	Moderate	Moderate
LCZ5 – Active recreation	Moderate	Moderate	Moderate

Table 6.7 Summary of operation impacts

Landscape character area (LCZ)	Sensitivity to change	Magnitude of change	Significance of impact
LCZ1 – Transport corridor	Negligible	Negligible	Negligible
LCZ2 - Residential	Low	Low	Low
LCZ3 – Commercial/light industrial	Low	Negligible	Low to negligible
LCZ4 – Passive recreation	Moderate	Low	Moderate to low
LCZ5 – Active recreation	Moderate	Low	Moderate to low

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7. Visual impact assessment

This section outlines the implications of the proposed works and summarises the visual impact analysis during construction. An outline of the proposed works is provided in section 3 and in further detail in the main REF document.

7.1 Existing visual environment

The existing visual environment consists of an urban setting with residential areas to the east and west of the SSFL, the densely vegetated Cabramatta Creek and sporting fields running east-west through the centre of the study area. The southern portion of the study area is defined by a light industrial/commercial area in the east and a suburban residential areas to the west.

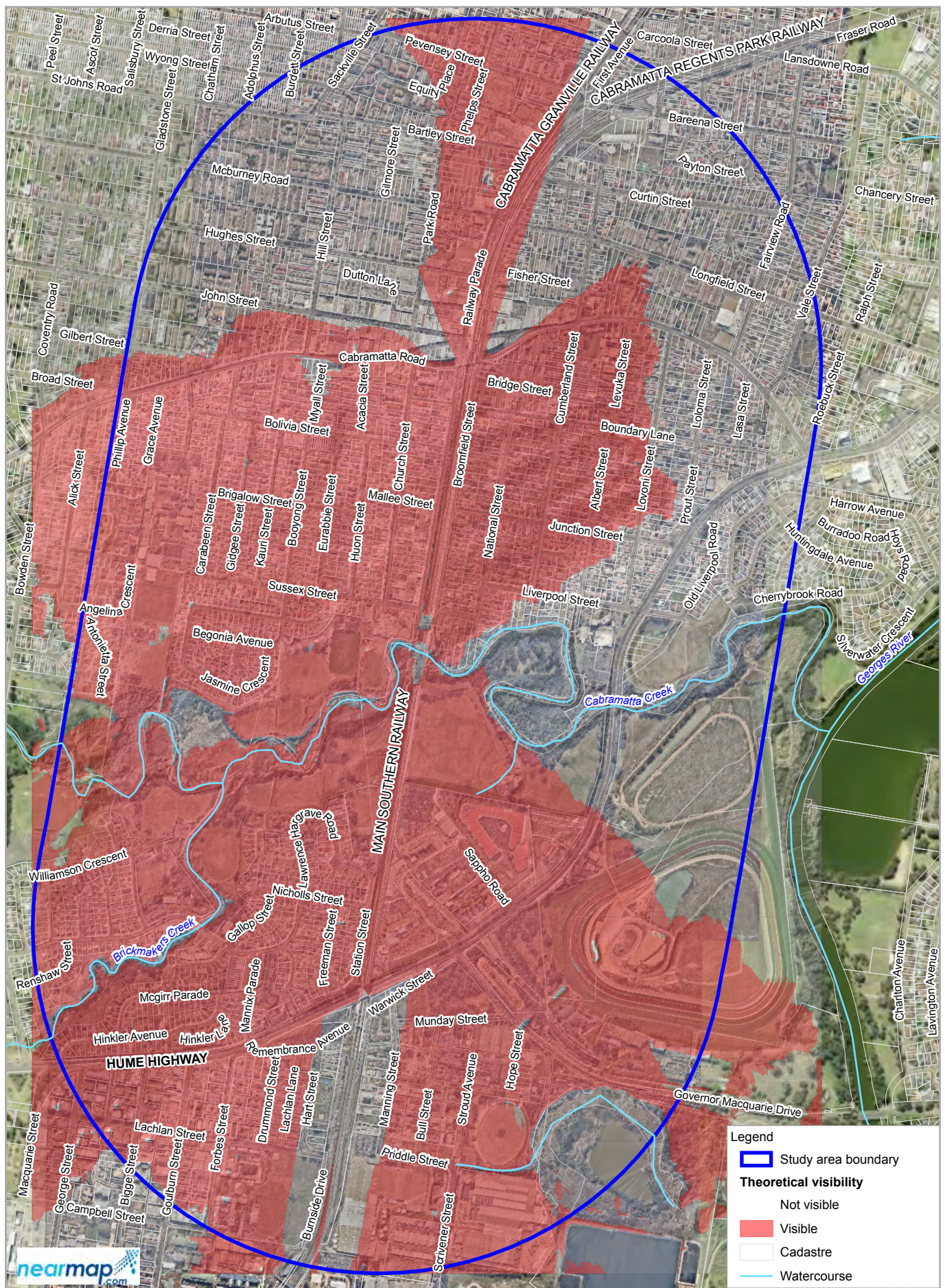
Due to the topography within the study area the visual environment varies, with long views from Cabramatta Road overpass to vegetated ridgelines in the distance and Cabramatta Creek forming the backdrop to the rail corridor and suburban residential setting.

Within the residential areas and low lying sporting fields surrounding Cabramatta Creek short enclosed views to the SSFL and surrounding built form and vegetation are available.

Sensitive visual receivers within the study area include residents of the residential properties surrounding the SSFL, users of the Cabramatta Creek corridor and surrounding sporting fields, pedestrians and cyclists within the streets surrounding the SSFL and workers within Peter Warren Automotive and Hometown Warwick Farm shopping centre. Residential visual receivers would generally have long viewing periods and visual receivers such as cyclists and pedestrians would have short term transient viewing periods.

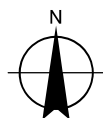
The ZTV demonstrates the visibility of the elevated project components such as the noise walls and new rail bridges as shown in Figure 7.1. This ZTV is based on topography alone and does not take into account the existing intervening built form and vegetation.

The ZTV indicates that the project would be visible from the surrounding residential areas to the south of Cabramatta Road, passive and active recreation areas along Cabramatta Creek and the commercial/light industrial and residential areas in the south. The project is set within a highly urban setting with existing built form and established vegetation and these would reduce the extent of visibility of the project.



Paper Size ISO A4
0 110 220 330 440
Meters

Map Projection: Transverse Mercator
Horizontal Datum: Australian 1966
Grid: AGD 1966 ISG 56 1



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Cabramatta Rail Loop
Landscape and Visual Impact Assessment

Project No. 22-19800
Revision No. 0
Date 28/06/2019

Zone of Theoretical Visibility

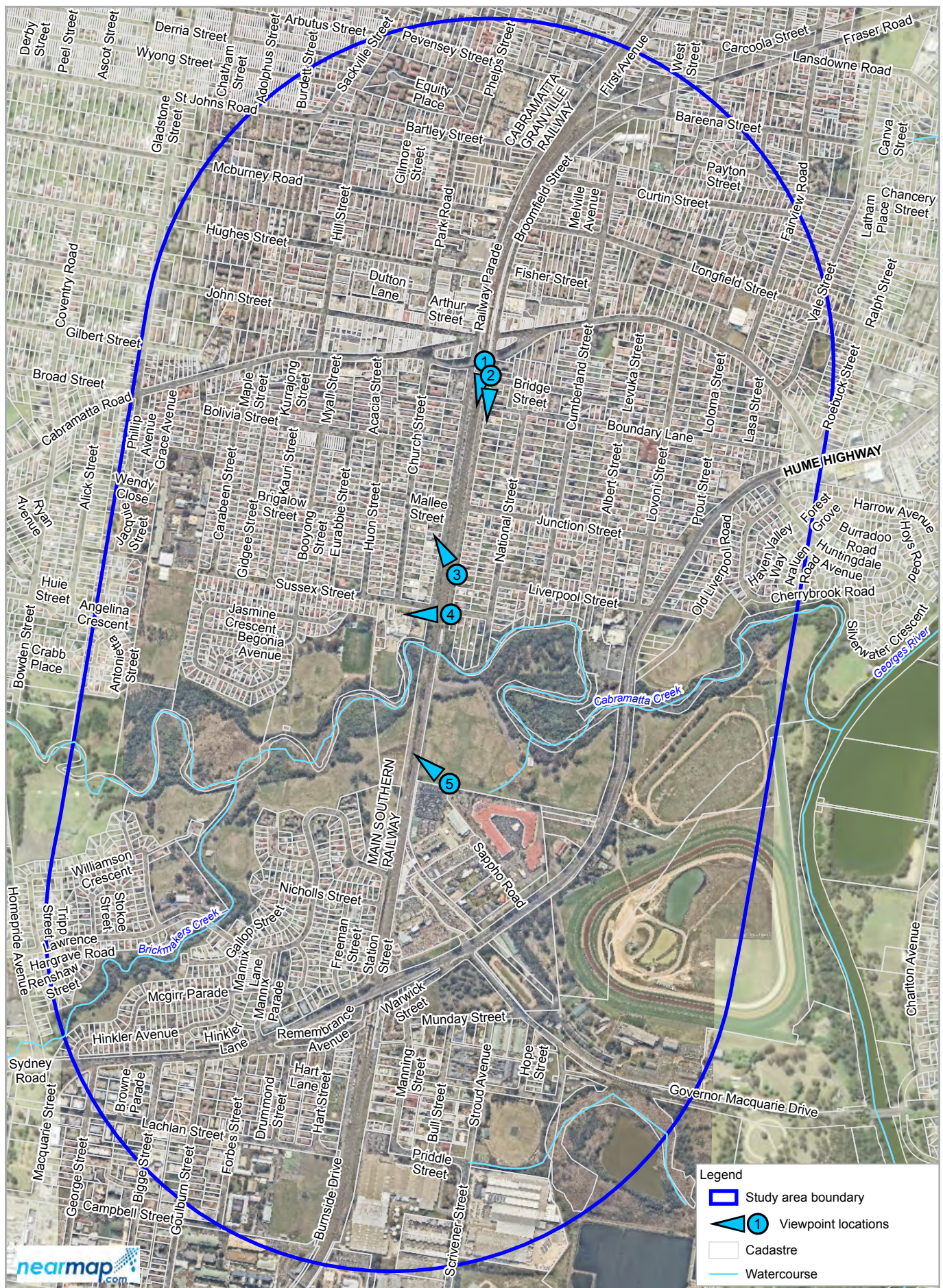
FIGURE 7.1

7.2 Visual impact assessment

The sections outlines the operation and construction impacts of the project for the following viewpoints:

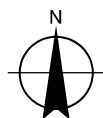
- Viewpoint 1 – Cabramatta Road
- Viewpoint 2 – Corner of Broomfield Street and Bridge Street
- Viewpoint 3 – Broomfield Street
- Viewpoint 4 – Corner Broomfield Street and Sussex Street
- Viewpoint 5 – Jacquie Osmond Reserve.

Refer to Figure 7.2 for viewpoint locations.



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Meters

Map Projection: Transverse Mercator
Horizontal Datum: Australian 1966
Grid: AGD 1966 ISG 56 1



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Viewpoint locations

FIGURE 7.2

7.2.1 Viewpoint location 1 – Cabramatta Road East

Viewpoint 1 is located within the Landscape Character Zone 1 Transport corridor and looks south from Cabramatta Road East overpass. This would represent views from pedestrians, cyclists and road users using Cabramatta Road East overpass.

Table 7.1 VP1 description and visual assessment

Viewpoint location 1 (VP1)	
	
Photograph of existing view south along the SSFL	
Description of existing view	This viewpoint represents views of the project corridor looking south, with the adjacent residential neighbourhoods visible on either side of the rail corridor. The three track, rail corridor is bordered by timber noise walls on the eastern side and by a narrow grassed verge, rail fence and commuter car park on the western side. Two local roads separate the rail corridor from the surrounding residential areas. The adjacent low to medium density residential areas are characterised by detached one to two storey houses and brick apartment blocks with established trees and a relatively flat topography. The long distances views towards Cabramatta Creek and densely vegetated ridgeline beyond are largely uninterrupted by built form and provide a green backdrop to the area.
Anticipated change to view	Construction During construction the view would be of the construction works associated with the removal of the existing retaining wall, noise wall and street trees along Broomfield Street, the addition of new track and signalling and the reconfiguration of Broomfield Street. There would be construction machinery, fencing and site compounds. Operation During operation the view would be to a widened rail corridor with an additional track to the east and associated overhead signalling wires. The retaining wall and noise wall would be moved approximately five metres to the east. There would be a new concrete noise wall to the eastern edge of the rail corridor and Broomfield Street would be reconfigured with the street trees removed.
Sensitivity to change and sensitive receivers	The sensitivity of receivers represented by VP1 is considered to be low. This is due to the type of sensitive receivers and their experience of this view, which includes pedestrians, cyclists and road users along Cabramatta Road.

Viewpoint location 1 (VP1)	
Magnitude of change	During construction the magnitude of change to VP1 is considered to be low. This is due to the construction works introducing new elements into the view but these would be contained to the rail corridor and Broomfield street and would be temporary. During operation the magnitude of change to VP1 is considered to be low as the widening of the rail corridor and removal of vegetation within Broomfield Street would be visible but not uncharacteristic within the existing view.
Significance of impact	During construction and operation the significance of impact for VP1 is therefore low due to the widening of the rail corridor and loss of vegetation Broomfield Street introducing new infrastructure into the existing view where the SSFL rail corridor is a key feature.

7.2.1 Viewpoint location 2 - Corner Broomfield Street and Bridge Street

Viewpoint 2 is located within the Landscape Character Zone 2 Residential. This viewpoint would represent views from residents in adjacent residential properties, including from within the house and the front yard, residents as they return to and leave their properties, and pedestrians and cyclists along Broomfield Street.

Table 7.2 VP2 description and visual assessment

Viewpoint location 2 (VP2)	
	
Photograph of existing view south along Broomfield Street	
Description of existing view	This viewpoint represents views of the eastern side of the project corridor looking south, from residential street directly adjacent to the SSFL. The noise walls on the western side of the street are a dominant built form feature and the railway gantries are visible from behind the walls. A row of highly utilised, on street parking runs along the railway corridor side of the street. Visually prominent, electricity power lines run along the eastern, residential side of the street which is characterised by detached, medium density housing. Vegetation and landscaping is largely informal and the presence of mature trees provide a leafy back drop to the residential area.

Viewpoint location 2 (VP2)	
Anticipated change to view	Construction During construction the existing noise wall would be removed and the rail corridor would have construction works for the new track and noise wall. Broomfield Street would be temporarily closed in stages with one lane of access always available. The existing vegetation along Broomfield Street would be removed. The overhead power lines would be relocated east within the verge. The removal of the existing noise wall during construction would temporarily open up views to the rail corridor. Machinery, site fencing, construction lighting and increased activity from vehicles would be present during the construction period. Operation During operation the view would be towards the relocated noise wall approximately five metres closer to the viewpoint and similar height to the existing. This would include the retaining of noise walls panels with art work, the design of which the community had an input into (refer to Technical Report 11 – Social impact assessment). The view would also include parallel car parking on both sides of the street and a reduced grassed verge on the eastern side of the street. The street trees would be replaced along the eastern edge and would be planted in-lane. Along the western edge compact native grasses would be planted between the shared path and noise wall. To the south of Boundary Lane climbing plants on a catenary system would be installed on the blank noise wall panels.
Sensitivity to change and sensitive receivers	The sensitivity of receivers represented by VP2 is considered to be high. This is due to the type of sensitive receivers and their experience of this view, which includes residents of the adjacent residential properties and pedestrians (who would have a moderate sensitivity) along Broomfield Street. Both types of visual receiver would be in close proximity to the project.
Magnitude of change	During construction the magnitude of change to VP2 is considered to be moderate. This is due to proposed construction works with machinery, construction fencing and the removal of vegetation being out of scale with the existing view which currently consists of a residential street with the built form elements consisting of a concrete noise wall and residential properties. The removal of the existing noise wall temporarily opening up views to the rail corridor. During operation the magnitude of change to VP2 is considered to be low. This is due to the relocated noise wall and car parking being visible new elements but not out of scale with the existing view and the climbers on the catenary system would be a positive new element.
Significance of impact	During construction the significance of impact for VP2 is therefore high to moderate. This is due to the amount of construction activity that would be occurring in close proximity to the residents along Broomfield Street. During operation the significance of impact for VP2 is therefore moderate. This is due to the close proximity to the residents to the project along Broomfield Street.

7.2.2 Viewpoint location 3 - Broomfield Street

Viewpoint 3 is located within the Landscape Character Zone 2 Residential. This viewpoint would represent views from residents in adjacent residential properties, including from within the house and the front yard, residents as they return to and leave their properties, cyclists and pedestrians along Broomfield Street.

Table 7.3 VP3 description and visual assessment

Viewpoint location 3 (VP3)



Photographs of existing view north along Broomfield Street

Description of existing view

This viewpoint represents the views looking north towards the project corridor and from the residential street which directly interfaces with it. The residential side of street is characterised by single storey, detached housing with a fairly consistent built form edge. Mature street trees along the nature strip reinforce the suburban character of the low density residential area.

Along the railway corridor on the western side, grey concrete noise walls provide a consistent, built edge to the street. Street trees planted in front reduce the visual dominance of the walls, helping them recede into the background. A shared path runs along the

Viewpoint location 3 (VP3)

western side of the street and is located directly adjacent to the road. Parking consists of parallel on street parking on both sides of the street.



Photomontage of Broomfield Street showing landscape concept

Anticipated change to view

Construction

During construction the existing noise wall would be removed for a limited period of the works. Within the rail corridor there would be construction works for the additional track, noise wall, retaining wall and road. The existing vegetation along Broomfield Street would be removed. The overhead power lines would be relocated east within the verge. Broomfield Street would be temporarily closed in stages with one lane generally available. During construction there would be site fencing, machinery and increased activity within and surrounding the project site. The removal of the existing noise wall during construction would open up views to the rail corridor. Machinery, site fencing, construction lighting and increased activity from vehicles would be present during the construction period.

Operation

During operation the view would be towards the new retaining wall and relocated noise wall along the rail corridor edge. The noise wall would be approximately 5 metres closer to the viewpoint with the realigned shared path in front. Parallel parking would be on both sides of the street and the verge on the eastern side of the street would be reduced. The street trees along the eastern edge would be replaced within the grassed verge. Along the western edge compact native grasses would be planted between the noise wall and shared path. Where there are blank panels on the noise wall along this section there would be climbers on a catenary system. The panels with art work would be left uncovered.

Sensitivity to change and sensitive receivers

The sensitivity of receivers represented by VP3 is considered to be **high**.

This is due to the type of sensitive receivers and their experience of this view, which includes residents of the adjacent residential properties and pedestrians along Broomfield Street. Both types of visual receiver would be in close proximity to the project and the residential receivers would have long uninterrupted viewing periods.

Viewpoint location 3 (VP3)	
Magnitude of change	During construction the magnitude of change to VP3 is considered to be moderate. This is due to proposed construction works with machinery, construction fencing and the removal of vegetation being out of scale with the existing view and the removal of the existing noise wall temporarily opening up views to the rail corridor. During operation the magnitude of change to VP3 is considered to be low. This is due to the relocated noise wall and car parking being visible new elements but not out of scale with the existing view. Although the trees have been removed, the climbers and compact native grasses would be a positive new element.
Significance of impact	During construction the significance of impact for VP3 is therefore high to moderate. This is due to the presence of construction works along Broomfield Street creating discernible changes in the view in close proximity to residents, although these changes would be temporary. During operation the significance of impact for VP3 is considered to be moderate. This is due to the close proximity to the residents to the project along Broomfield Street.

7.2.3 Viewpoint location 4 – Corner Sussex Street and Broomfield Street

Viewpoint 4 is located within the Landscape Character Zone 2 Residential. This viewpoint would represent views from residents in adjacent residential properties, including from within the house and the front yard, residents as they return to and leave their properties, cyclists and pedestrians along Broomfield Street.

Table 7.4 VP4 description and visual assessment

Viewpoint location 4 (VP4)
 Photograph of existing view south-west towards SSFL

Viewpoint location 4 (VP4)	
Description of existing view	This viewpoint shows the view looking south-west from the corner of Broomfield Street and Sussex Street towards the project corridor and the adjoining Cabramatta creek corridor. The Sussex Street railway bridge, which is a concrete form with a steel cantilevered walkway on the eastern side, is a dominant built form feature in this viewpoint and interrupts views to the red brick, heritage listed bridge behind. The bridge and its associated vehicle barriers have also been vandalised by graffiti. Parkland on the east side of the road within this viewpoint consists mainly of grass and relatively scattered, informal vegetation. A shared path follows the curve of the road. Timber power poles and bollards are situated along the creek side of the road. The established trees from the adjoining creek corridor provide a vegetated backdrop to the arched, rail bridge. The trees are partly obscured by the power lines which run along the railway corridor. The topography is fairly flat in this viewpoint.
Anticipated change to view	Construction During construction the view would be to the construction of the new rail bridge over Cabramatta Creek, temporarily realigned shared path between Sussex Street and Cabramatta Creek and the removal of some of the creek vegetation. The existing embankment and chain mesh fence adjacent to the shared path would be removed and replaced with an approximately three metre high retaining wall. Operation During operation the view would be to the new concrete rail bridge to the east of the existing concrete bridge, the shared path over Cabramatta Creek reinstated in its current location and re-established vegetation. There would be an approximately three metre high retaining wall adjacent to the eastern edge of the shared path.
Sensitivity to change and sensitive receivers	The sensitivity of receivers represented by VP4 is considered to be high. This is due to the type of sensitive receivers and their experience of this view, which includes residents of the adjacent residential properties and pedestrians along Broomfield Street. Both types of visual receiver would be in close proximity to the project and have uninterrupted views to the project
Magnitude of change	During construction the magnitude of change to VP4 is considered to be moderate. This is due to the introduction of construction works including machinery, fencing and removal of vegetation being discernible changes to the existing view. These would be temporary changes to the view. During operation the magnitude of change to VP4 is considered to be moderate. This is due to the removal of vegetation and the addition of the proposed high retaining wall adjacent to the shared path. The new bridge would be in keeping with the existing view.
Significance of impact	During construction the significance of impact for VP4 is therefore high to moderate as the construction works would result in a discernible change to the existing view for visual receivers in close proximity to the works, although the change would be temporary. During operation the significance of impact for VP4 is therefore high to moderate as although the new bridge would be in keeping with the existing view and the vegetation would be re-established where possible, the proposed high retaining wall would be a dominant visual element until the vegetation re-establishes.

7.2.4 Viewpoint location 5 – Jacquie Osmond Reserve

Viewpoint 5 is located within the Landscape Character Zone 5 Active recreation. This would represent views from users of Jacquie Osmond Reserve such as softball players, spectators and people using the reserve for other recreation purposes such as walking and informal sports.

Table 7.5 VP5 description and visual assessment

Viewpoint location 5 (VP5)	
	
Photograph of existing view north-west towards SSFL	
Description of existing view	The softball fields are characterised a large swathe of maintained grass with relatively flat topography. The railway corridor is visible in the background to the west and runs along a significant portion of the sports grounds. The retaining walls and gantries associated with the railway infrastructure are the most perceptible built form features in this viewpoint. The Cabramatta Creek corridor provides a heavily vegetated and consistent, green backdrop to the playing fields.
	
Photomontage of Jacquie Osmond Reserve showing proposed landscape concept	
Anticipated change to view	Construction During construction the view would be towards the construction works associated with the additional track, new retaining wall and the removal of the existing trees in front of the railway corridor. There would be site fencing to the rail corridor boundary along the western edge of Jacquie Osmond Reserve. Operation During operation the view would be towards the new track and retaining wall with chain mesh fencing on top and a grassed batter in

Viewpoint location 5 (VP5)	
	front. The softball nets on the east side of the track would be reinstated along with some of the trees where practicable.
Sensitivity to change and sensitive receivers	The sensitivity of receivers represented by VP5 is considered to be moderate. This is due to the type of sensitive receivers and their experience of this view, which includes users of Jacquie Osmond Reserve who are in close proximity but would have limited viewing periods with their attention on the game or sport and not the setting.
Magnitude of change	During construction the magnitude of change to VP5 is considered to be moderate. This is due to the construction works associated with the additional track, retaining wall and batter resulting in the removal of existing trees and softball nets and the location of a construction compound within the reserve resulting in a noticeable but change to the view. During operation the magnitude of change to VP5 is considered to be low. This is due addition of the track and new retaining wall with chain mesh fence being in keeping with the existing view although the removal of the existing trees and relocation of softball nets would be minor change. The grassed embankment allows for increased passive surveillance from the reserve to the rail line.
Significance of impact	During construction the significance of impact for VP5 is therefore moderate as the construction works would result in a noticeable change to the existing view for visual receivers in close proximity to the works, although the change would be temporary. During operation the significance of impact for VP5 is therefore moderate to low as the additional track, new retaining wall, chain mesh fence and grassed batter would be in keeping with the existing view and softball nets would be replaced. The visual impact of the retaining wall would be reduced due to the proposed grassed batter.

7.3 Summary of impacts

The following section summarises the construction and operation impacts of the project on the surrounding visual receivers in Table 7.6 and Table 7.7.

Table 7.6 Summary of construction impacts

Viewpoint	Sensitivity to change	Magnitude of change	Significance of impact
Viewpoint 1 – Cabramatta Road	Low	Low	Low
Viewpoint 2 – Corner Broomfield Street and Bridge Street	High	Moderate	High to moderate
Viewpoint 3 – Broomfield Street	High	Moderate	High to moderate
Viewpoint 4 – Corner Sussex Street and Broomfield Street	High	Moderate	High to moderate
Viewpoint 5 – Jacquie Osmond Reserve	Moderate	Moderate	Moderate

Table 7.7 Summary of operation impacts

Viewpoint	Sensitivity to change	Magnitude of change	Significance of impact
Viewpoint 1 – Cabramatta Road	Low	Low	Low
Viewpoint 2 – Corner Broomfield Street and Bridge Street	High	Low	Moderate
Viewpoint 3 – Broomfield Street	High	Low	Moderate
Viewpoint 4 – Corner Sussex Street and Broomfield Street	High	Moderate	High to moderate
Viewpoint 5 – Jacquie Osmond Reserve	Moderate	Low	Moderate to low

8. Recommended mitigation measures

The following section outlines the recommended mitigation measures that respond to issues arising within the assessment that have potential to adversely impact on:

- the character of the landscape within which the project is located
- views to the project.

Mitigation measures address the most visual elements of the project, are in line with the projects Urban Design principles and objectives and reference any relevant considerations drawn from the legislation and policy review. These recommendations should be considered in the detailed design of the project, and in conjunction with other design considerations.

8.1.1 Detailed design

During detailed design the following will be carried out:

- An Urban Design and Landscape Plan will be developed as part of the detailed design, building on the landscape concept (Section 3), the urban design principles and objectives (Section 5.2) and the following mitigation measures and recommendations. The Urban Design and Landscape Plan will be consistent with the existing environment through maintaining and improving pedestrian and cycling connectivity, reinstating vegetation where possible and ensuring constructed elements improve on existing design and materiality. The Urban Design and Landscape Plan will be developed in consultation with Fairfield and Liverpool City Councils.
- The Urban Design and Landscape Plan will include a planting pallet consistent with the existing area. Native species selected will be of local significance from the relevant ecological vegetation community and will be sourced from nurseries in the local area, where possible.
- The design and materiality of the bridges will integrate with the existing built form in line with the SEARs reference documents; *Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW* (RMS, 2012). The bridge design will minimise visual clutter where possible, through incorporating cabling and barriers into a single bridge façade. The bridge design should be in accordance with ARTC's requirements to visually monitor bridge structures.
- The noise walls along Broomfield Street will be reused where practicable in the project due to the existing value placed on them by the Broomfield Street community as identified in Technical Report 11 – Social Impact Assessment. Where vegetation screening is implemented views to the artwork panels will be retained. Along Broomfield Street where retaining walls are to be replaced, colour is to match existing noise wall. High quality materials, textured and graffiti resistant surfaces will be used, where possible, on retaining walls along Broomfield Street and Jacquie Osmond Reserve to deter graffiti, particularly at lower levels of the walls. The design will be finalised following consultation with maintenance stakeholders.
- Permanent lighting will be designed in accordance with AS 4282-1997 Control of obtrusive effects of outdoor lighting. This will avoid light spill into residential properties along Broomfield Street and surrounding residential streets and ecologically sensitive areas along Cabramatta Creek. The design of permanent lighting would consider the following:
 - for Broomfield Street lighting will be provided in accordance with Roads and Maritime Services or local council specifications to ensure standards are met for adequate

lighting required for vehicles traversing under the new Sussex Street bridge and pedestrians/cyclist crossing next to the new Sussex Street bridge.

- lighting within the project site would consider CPTED principles to ensure spaces such as the shared path where it crosses Cabramatta Creek and underneath the Sussex Street bridge are adequately illuminated.
- All signage will be integrated with proposed infrastructure where possible. The location and type selected will minimise visual clutter.
- The Urban Design and Landscape Plan will consider safety and clear sightlines for the replanting of any removed vegetation adjacent to the shared path near Cabramatta Creek. Clear sightlines will be provided through strategies such as reduction of clutter and adequate lighting (especially in relation to the addition of bridge structures and new signage). Signage and lighting will be installed where the shared path diverts under the bridge at Jacqui Osmond reserve. This will improve connectivity and safety in this location.

8.1.2 Construction recommendations

- The CEMP will identify measures to minimise visual impact from construction compounds and general construction sites.
- Construction compounds located within Jacqui Osmond Reserve, Warwick Farm Recreation Reserve and within the rail corridor should, where possible, have screening measures implemented such as hoarding, shade cloth or temporary vegetation. Where equipment or stockpiles are to be located in a visually prominent location for any reasonable period of time, screening measures and practices will be incorporated to ensure sites are kept tidy.
- Temporary lighting required during the construction period will be sited and designed to avoid light spill into residential properties along Broomfield Street and surrounding residential streets and ecologically sensitive areas along Cabramatta Creek.
- Existing vegetation will be protected and retained where possible, particularly mature canopy trees. Tree removal and protection measures for trees to be retained, will be carried out as stated in the Arboricultural assessment provided in Appendix B of this report.

9. Conclusion

This landscape and visual impact assessment has been undertaken to understand the potential effects of the 1.3 kilometre long passing loop on the Southern Sydney Freight Line between Warwick Farm Station and Cabramatta Station on the natural and urban fabric within the surrounding area. At the time of writing, the project was in the reference design phase.

A landscape concept was prepared as part of the reference design through an iterative design process that considered the urban landscape as well as the findings of the preliminary landscape and visual impact analysis. The resulting landscape and visual impact assessment took the landscape concept plan into consideration in the finalisation of the project impacts.

The suburbs of Cabramatta and Warwick Farm are distinctly suburban residential settings within the Western suburbs of Sydney. The SSFL runs north-south down from the elevated Cabramatta Station to the low-lying, vegetated passive and active recreation areas surrounding Cabramatta Creek, past the commercial and light industrial precinct of Peter Warren Automotive and the Warwick Farm shopping centre to Warwick Farm Station in the south. In the north the areas surrounding the rail line are suburban residential with single and double storey homes adjacent to the existing rail corridor. Established street trees are scattered throughout the surrounding residential areas and provide a vegetated outlook. Views from the residential areas, Cabramatta Road and Hume Highway overpasses are generally towards the vegetated corridor of Cabramatta Creek. Cabramatta Creek and the surrounding passive and active recreation areas such as Jacquie Osmond Reserve provide visual relief from the surrounding urban environment. A total of five landscape character zones were identified within the one kilometre study area, including LCZ1 Transport corridor, LCZ2 Residential, LCZ3 Commercial/light industrial, LCZ4 Passive recreation and LCZ5 Active recreation. Of these the project was found to have a negligible impact on LCZ1 and LCZ3, a low LCZ2, and a moderate to low impact on LCZ4 and LCZ5.

Sensitive visual receivers in the study area include residential properties along Broomfield and Sussex Street, users of Jacquie Osmond Reserve and pedestrians, road users and cyclists along Cabramatta Road.

Five viewpoint locations were chosen to assess the visual impact of the project on sensitive receivers within the study area. Visual impacts were assessed using panoramas of the existing view, and photomontages were created illustrating the proposed view of the project from two viewpoint locations. The assessment found that the visual impacts from the project range from moderate-to-low to high-to-moderate. The most significant impact is from VP3, due to the residential receiver type, their proximity to the project and the amount of visual change due to the project.

Mitigation measures have been developed to minimise the potential landscape and visual impacts of the project. These measures should be taken into consideration in the next design phase of the project which would include the preparation of an urban design and landscape plan. The urban design and landscape plan would build on the existing landscape concept, be informed by the urban design principles and objectives and consider the mitigation measures provided in this assessment.

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10. References

Fairfield City Council, *Fairfield Local Environmental Plan 2013*, NSW Government.

Department of Planning and Environment:

https://mapprod1.environment.nsw.gov.au/arcgis/rest/services/Soil/Soils_GSG_SoilTypes_EDP/MapServer

Department of Planning and Environment:

https://mapprod1.environment.nsw.gov.au/arcgis/rest/services/LandCap/LandAndSoilCapability_EDP/MapServer

Department of Finance, Services and Innovation point cloud data: <http://elevation.fsdf.org.au/>

Department of Finance, Services and Innovation:

https://maps.six.nsw.gov.au/arcgis/rest/services/public/NSW_Hydrography/MapServerESRI
<http://maps.six.nsw.gov.au/arcgis/services>

Land and Property Information:

https://mapprod1.environment.nsw.gov.au/arcgis/rest/services/Planning/EPI_Primary_Planning_Layers/MapServer

Landscape Institute and Institute for Environmental Management and Assessment (LIEMA) (2013), *Guidelines for Landscape and Visual Impact Assessment*. Routledge 3rd Edition.

Liverpool City Council, *Liverpool Local Environmental Plan 2008*, NSW Government.

Office of Environment and Heritage (2015), *Urban Green Cover in NSW: technical guidelines*, NSW Government.

Roads and Maritime Services (2014), *Beyond the Pavement: Urban Design Policy, Procedures and Design Principles*, Transport for NSW.

Roads and Maritime Services (2012), *Bridge Aesthetics: Design guideline to improve the appearance of bridges in NSW*, Transport for NSW.

Roads and Maritime Services (2013), *Environmental Impact Assessment Practice Note: Guidelines for Landscape Character and Visual Impact Assessment EIA-NO4* Version 2.0 (First reissue), Centre for Urban Design, Roads and Maritime Services, NSW Government.

Transport for NSW (2013), *Sustainable Design Guidelines Version 3.0*.

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Appendices

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Appendix A – Photomontages

EXISTING VIEW



5 YEARS POST CONSTRUCTION



View Direction: 340°
Horizontal Field Of View: 60°
Camera Height: 1.6 m
Camera Type: Cannon 5D Mark III
Lens Type: 50 mm
Photograph Time & Date: 9:48 am,
23 November 2018

Location: 166A Broomfield Street,
Cabramatta, Sydney
Coordinates: 309356.242 , 13753155.647
(GDA 1994 MGA Zone 56)
Viewpoint Elevation: 8.70 m
Date of Photomontage: 14th Febuary 2019
Issue: v01

Cabramatta Loop Project
Australian Rail Track Corporation (ARTC)
Viewpoint 3 : Figure 1



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EXISTING VIEW



5 YEARS POST CONSTRUCTION



View Direction: 290°
Horizontal Field Of View: 60°
Camera Height: 1.6 m
Camera Type: Cannon 5D Mark III
Lens Type: 50 mm
Photograph Time & Date: 10:25 am,
23 November 2018

Location: Jacquie Osmond Reserve,
Warwick Farm, Sydney
Coordinates: 309317.167 ,13753769.021
(GDA 1994 MGA Zone 56)
Viewpoint Elevation: 8.90 m
Date of Photomontage: 14th Febuary 2019
Issue: v01

Cabramatta Loop Project
Australian Rail Track Corporation (ARTC)

Viewpoint 5 : Figure 2



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Appendix B – Arboricultural assessment

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