4 Proposed modification

This chapter describes the proposed modification to the project approval related the inclusion of The Crescent overpass and the relocation of the Pedestrian and Cycling Green Link ('green link'). This chapter also discusses the design options that were considered for the proposed modification.

4.1 Project design development

NSW Roads and Maritime Services (Roads and Maritime) is seeking to modify the existing project approval for the construction and operation of the project. An overview of the approved project is provided in Chapter 3 (Approved Project) of this report.

As stated in section 5 of the Environmental Impact Statement (EIS), the EIS assessed indicative concept designs, which were subject to the detailed design process by the appointed contractor. Approval for the project was granted by the former NSW Minister for Planning on the 17 April 2018 (application number SSI 7485). After the planning approval was granted for the project, a contractor has been appointed to construct Stage 2 of the project on behalf of the proponent, Roads and Maritime. Stage 2 comprises the Rozelle Interchange and Iron Cove Link.

The contractor or the proponent may offer an alternate design or construction methodology that has a beneficial project outcome in consideration of environmental and social impacts. Where this occurs, a post-approval process under the *Environmental Planning & Assessment Act 1979* (EP&A Act) (as detailed in Chapter 2 (Assessment Process)) is undertaken. These processes may include a consistency assessment where proposed changes are deemed consistent against the current Planning Approval or, where the proposed changes are not considered to be consistent, a modification to the Planning Approval under section 5.25 of the EP&A Act would be sought, as stated in section 2.6 of the EIS.

4.2 Overview of the proposed modification

Roads and Maritime is seeking to modify the existing project approval for the construction and operation of the project. The proposed modification relates to Stage 2 of the project. Roads and Maritime is proposing to include the following key components as part of the proposed modification (refer to **Figure 4-1**):

- A new elevated vehicular overpass ('The Crescent overpass') that would allow eastbound traffic heading north on The Crescent from Annandale to bypass the signalised intersection at The Crescent/City West Link junction and continue east on The Crescent towards Victoria Road and the Anzac Bridge
- Modifications to the eastbound lanes of the City West Link and The Crescent on either side of the intersection and northbound lanes on The Crescent at Annandale to provide space for the tie-in of The Crescent overpass
- Upgrades to the intersection of The Crescent/Johnston Street/Chapman Road (including lane reconfiguration and marking, signal phasing, adjusting positions of traffic signals kerb works etc.)
- Realignment of the green link to the west of The Crescent, providing a connection between the Rozelle Rail Yards and the Rozelle Bay light rail stop
- A new shared user path bridge spanning The Crescent to the east of The Crescent/City West Link intersection. The shared user path bridge provides a connection between the Rozelle Rail Yards and the shared user path to Bicentennial Park along the east side of The Crescent and adjacent to Rozelle Bay. The shared user path bridge and shared user path would provide the pedestrian and cyclist connectivity required by Conditions E120 and E121 for the project albeit in a different arrangement to that shown in the EIS
- Minor changes to the layout of the approach roads leading to the Anzac Bridge from Victoria Road, The Crescent and the Rozelle Interchange to improve traffic merging arrangements

- Use of a minor construction ancillary facility, established in accordance with Condition C24, as a construction ancillary facility. The proposed C6a construction ancillary facility site is located on the south side of The Crescent to the west of James Craig Road and adjacent to Rozelle Bay. The proposed modification would allow use of the site for a limited number of additional purposes which are not permitted by Condition C24 including:
  - Light vehicle parking for workers (around 9 spaces) and
  - Material laydown areas and a limited number of associated vehicle movements (small delivery vans and rigid trucks).

  These additional purposes would support the various construction activities at the C6 civil site.

Not all of the proposed changes can be accommodated within the existing project approval. In addition, the proposed modification would require amendments to the Conditions of Approval (CoA) for the project (refer to Chapter 7 (Conditions of approval)). As such Roads and Maritime is seeking a modification to the project approval in accordance with section 5.25 of the EP&A Act (application number SSI 7485 MOD2). This Modification report has been produced to support the application for this modification. Approval of the modification application would allow the contractor to construct the project using the approach outlined within this report.

Figure 4-1 Overview of the proposed modification

4.3 Design options considered

Various options were considered to meet the aim of the proposed modification. These options looked for opportunities to reduce potential adverse impacts of the project, to improve intersection performance and to maintain active transport connections across the intersection of City West Link and The Crescent. The options considered relate to the following design elements of the modification:

- The Crescent/City West Link intersection
- The alignment of pedestrian and cyclist infrastructure including the green link
- The Crescent/Johnston Street/Chapman Road intersection.

An overview of the options considered is provided below.

4.3.1 The Crescent/City West Link intersection

Three main options were considered to improve the performance of The Crescent and City West Link intersection during operation of the project. A summary of the comparative assessment of the three options is provided in **Table 4-1.**

Table 4-1 The Crescent/City West Link intersection options

Option	Overview	Discussion
EIS arrangement (option1)	An at-grade signalised intersection containing three right turn lanes from The Crescent (northbound) to The Crescent (eastbound).	Updated traffic modelling has identified that the at-grade signalised intersection proposed by Option 1 would likely result in inferior intersection performance at the two key intersections (City West Link/The Crescent and The Crescent/Johnston Street) by comparison to the other options. In addition, the EIS design would not provide sufficient capacity for additional traffic generation should other proposed projects, including the proposed Western Harbour Tunnel and Warringah Freeway Upgrade project ('Western Harbour Tunnel project'), receive planning approval. As a result, additional works would be required at the intersection in the future resulting in increased construction works over a longer timeframe around The Crescent/City West Link intersection.
The Crescent underpass (option 2)	A tunnel underpass connecting The Crescent (northbound) to The Crescent (eastbound).	Option 2 would result in a notable improvement in intersection performance. However, it would be subject to considerable environmental and constructability constraints. The tunnel would need to dive below existing drainage infrastructure (e.g. Whites Creek and the drainage channel from the Rozelle Rail Yards) and may also impact on existing utility infrastructure. Due to the proximity to Rozelle Bay and surrounding fill material, the underpass would likely require construction as a tanked tunnel to prevent the inflow of groundwater and to retain its structural integrity. Tunnelling would also be required in poor ground conditions and would be likely to encounter contaminated soil and groundwater. Furthermore, to achieve the required grades, the tunnel underpass would require portals in close proximity to the intersections with both Johnston Street and James Craig Road resulting in safety concerns. The underpass itself would also extend for over 160 metres and therefore require tunnel safety facilities including ventilation and fire prevention.
The Crescent overpass (option 3)	An overpass consisting of two lanes connecting The Crescent (northbound) to The Crescent (eastbound).	Option 3 would result in the improved intersection performance realised by option 2. This option does potentially introduce new environmental impacts such as visual impacts and elevated traffic noise. However, the environmental and constructability constraints are more manageable than option 2. Option 3 would also provide sufficient capacity for additional traffic generation predicted should other proposed projects, including the proposed Western Harbour Tunnel project, receive development approval. Traffic using the overpass will not be able to turn right from The Crescent onto James Craig Road. Only a limited number of traffic movement would be impacted, and alternative traffic routes are available.

The Crescent overpass (option 3) provides improved intersection performance over the EIS arrangement (option 1). This improved performance for The Crescent/City West Link and The Crescent/Johnston Street intersections meets a key objective of the detailed design process and aligns with the aims of the proposed modification. The Traffic and Transport Assessment provided in Appendix B and summarised in **section 6.2** provides a detailed comparison of The Crescent overpass and the EIS design.

The improved performance of The Crescent/City West Link and The Crescent/Johnston Street intersections provides wider benefits by helping to alleviate future pressures associated with traffic generation from other proposed developments in the vicinity of the project including the proposed Western Harbour Tunnel project if that development proceeds in the future. It would also avoid the need for the proposed Western Harbour Tunnel project to complete significant upgrades to The Crescent/City West Link intersection that could potentially prolong or recommence construction activities at this location.

Given the significant environmental and constructability constraints, The Crescent underpass (option 2) was discounted. Therefore, for the reasons provided above, The Crescent overpass (option 3) was identified as the preferred option to improve performance for The Crescent/City West Link and The Crescent / Johnston Street and Chapman Road intersections.

4.3.2 Pedestrian and cyclist infrastructure

The inclusion of The Crescent overpass in the design of The Crescent/City West Link intersection means that the proposed green link must be redesigned.

Four main options were considered for pedestrian and cyclist infrastructure connecting the Rozelle Rail Yards with Bicentennial Park and the Rozelle Bay light rail stop. These options were assessed based on urban design principles including safety in design and improving connectivity of surrounding communities, along with the constructability challenges of each option. A summary of the proposed options for pedestrian and cyclist infrastructure is provided in **Table 4-2** and presented in **Figure 4-2**.

Table 4-2 Pedestrian and cyclist infrastructure options

Option	Overview	Discussion
EIS arrangement (option 1)	A land bridge connection between the Rozelle Rail Yards and the eastern side of The Crescent. An at-grade connection was included from the east side of The Crescent via Chapman Road to Bicentennial Park. Option 1 also included pedestrian bridge connection from the land bridge to the Rozelle Bay light rail stop.	Option 1 would not allow the construction of The Crescent overpass as the two structures would conflict with each other due to their horizontal and vertical alignments. In addition, this option would provide a slightly less direct connection between the suburb of Rozelle and public transport infrastructure of the Rozelle Bay light rail stop.

Option	Overview	Discussion
Green link to the west of The Crescent overpass and a shared user path (option 2)	This option includes: • A curved land bridge connection between the Rozelle Rail Yards and the Rozelle Bay light rail stop • An elevated shared user path from the light rail stop which connects to both the west side of The Crescent via a ramp and Bicentennial Park near Chapman Road by crossing The Crescent prior to the Johnston Street junction.	Option 2 provides improved connectivity between Rozelle and the Rozelle Bay light rail stop while also allowing for construction of The Crescent overpass. The location of the shared user path, elevated and to the west of The Crescent, results in safety in design concerns due to a lack of passive surveillance from passing road users and nearby residences. In addition, this design would result in a negative visual impact resulting from the existence of a long elevated structure, including a looping ramp structure close to parkland and Rozelle Bay.
Green link to the west of The Crescent overpass and a hairpin shared user path (option 3)	This option includes: • A curved land bridge connection between the Rozelle Rail Yards and the Rozelle Bay light rail stop • An elevated horseshoe shaped user path bridge and hairpin ramp connecting the Rozelle Bay light rail stop with the east side of The Crescent and via Chapman Road to Bicentennial Park.	Option 3 would provide improved connectivity between Rozelle and the Rozelle Bay light rail stop while also allowing for construction of The Crescent overpass. The alignment of the shared user path would however mean that pedestrians and cyclists would need to travel a long distance between the Rozelle Rail Yards and the active transport infrastructure in Bicentennial Park.
Green link to the west of The Crescent overpass and an eastern shared user path (option 4)	This option included • A curved land bridge connection between the Rozelle Rail Yards and the Rozelle Bay light rail stop • A separate elevated shared user path horseshoe bridge connecting Rozelle Rail Yards to the east of The Crescent and an at grade shared user path via Chapman Road to Bicentennial Park.	Option 4 would provide improved connectivity between Rozelle and the Rozelle Bay light rail stop while also allowing for construction of The Crescent overpass. The alignment of the land bridge and shared user path would minimise the distance required to connect between the Rozelle Rail Yards and the Rozelle Bay light rail stop. Option 4 would also result in improved passive safety outcomes for users of the shared user path. Option 4 results in the shared user path bridge being slightly longer than the shared user path bridge proposed by option 1. The extension of the shared user path bridge is necessary to facilitate the construction and operation of The Crescent overpass.

Option 1 was discounted as it would not allow The Crescent overpass to be constructed. Following a comparative assessment of the remaining options, it was decided that option 4 provided the best and most direct connectivity between the Rozelle Rail Yards, public transport infrastructure, nearby parklands and the suburbs of Annandale and Rozelle, while also resulting in the best passive safety (view of the green link from the surrounding neighbourhood) results.

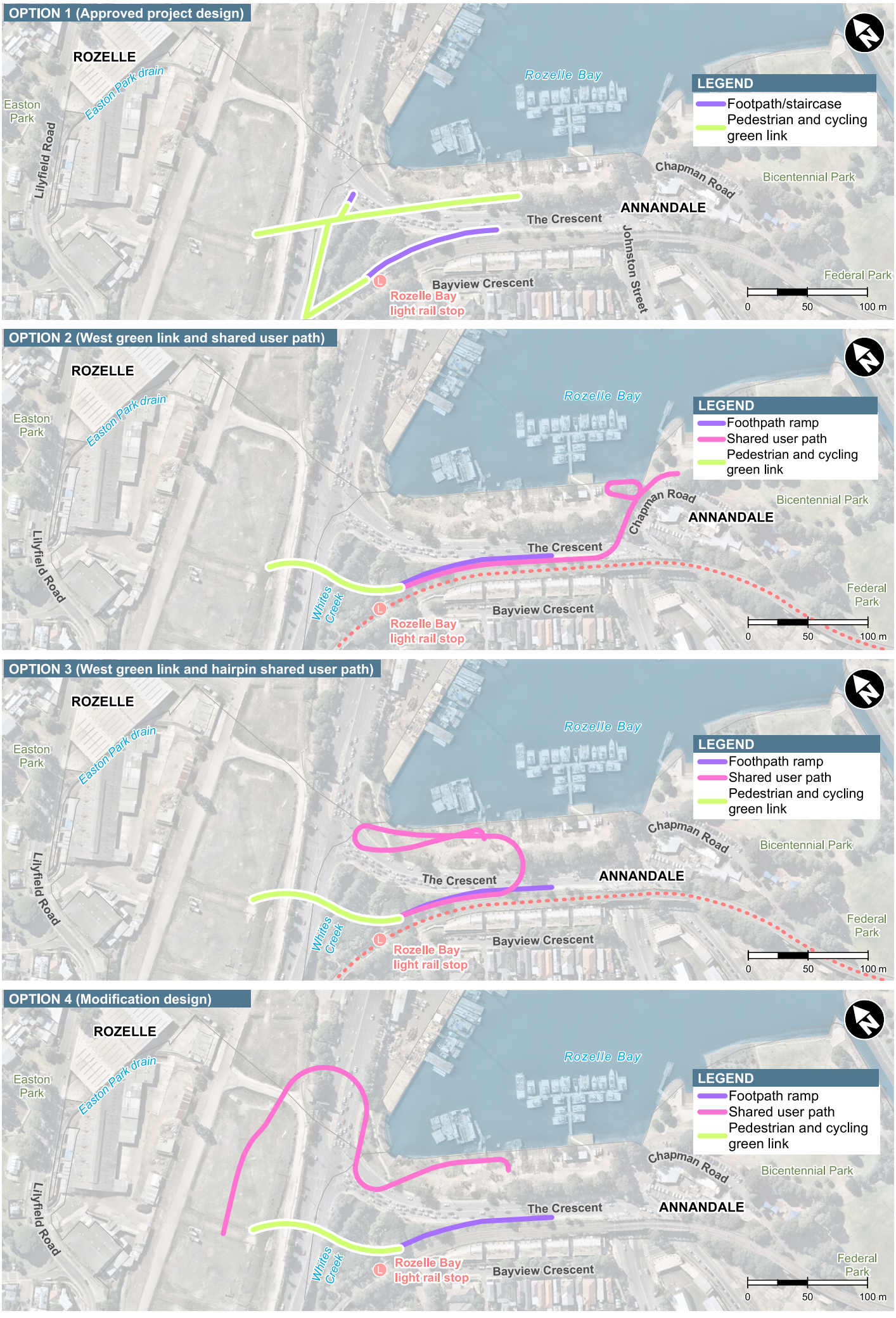

Figure 4-2 Pedestrian and cyclist bridge infrastructure options

4.3.3 The Crescent/Johnston Street/Chapman Road intersection

A number of options were considered regarding the operational layout of The Crescent/Johnston Street/Chapman Road intersection. Options were assessed based on the resultant intersection performance and surrounding property constraints. A summary of the proposed options for The Crescent/Johnston Street/Chapman Road intersection is provided in **Table 4-3** and presented in **Figure 4-3**.

Table 4-3 The Crescent/Johnston Street/Chapman Road intersection options

Option	Overview	Discussion
EIS layout (option 1)	• Two right turn lanes from The Crescent (southbound) to Johnston Street (southbound) • One combined through and left turn lane on The Crescent (southbound) and to Chapman Road (eastbound). • Two northbound lanes on The Crescent north of the intersection.	This signalised intersection option would likely result in inferior intersection performance at The Crescent/Johnston Street by comparison to option 2. Option 1 would not accommodate additional traffic generation from the proposed Western Harbour Tunnel project if that project proceeds in the future by comparison to option 2.
Modification layout (option 2: preferred option)	• Two right turn lanes from The Crescent (southbound) to Johnston Street (southbound) • One combined through and left turn lane on The Crescent (southbound) to Chapman Road • One through lane on The Crescent (southbound) • Two northbound lanes on The Crescent (one lane to The Crescent overpass and one lane to City West Link).	Option 2 results in an improvement in operational traffic performance by comparison to both options 1 and 2, while also facilitating connections to The Crescent overpass and surrounding road network. Furthermore, option 2 can be contained within the existing road reserve and would therefore not require the additional acquisition of any additional property. This option would result in a slightly longer pedestrian movement to cross The Crescent near Johnston Street. The at-grade crossing would be removed from its existing location. Pedestrians would be required to cross at the existing at-grade crossing over Johnston Street to a new at-grade crossing at The Crescent, and then cross Chapman Road at the existing at-grade crossing. This option removes the right-turn movement from Johnston Street onto The Crescent southbound. Only a limited number of traffic movement would be impacted, and alternative traffic routes are available.

Figure 4-3 The Crescent, Johnston Street, Chapman Road intersection options

4.3.4 Preferred option

For the reasons provided above:

- The Crescent overpass (option 3) is considered the preferred option for improving the performance of The Crescent and City West Link intersection
- A realigned green link to the west of The Crescent overpass alongside a new elevated eastern shared user path bridge (option 4) is considered the preferred option for providing the best connectivity between the Rozelle Rail Yards, public transport infrastructure, nearby parklands and the suburbs of Annandale and Rozelle
- The Crescent / Johnston Street and Chapman Road layout (option 2) is considered the preferred option for improving the performance of the intersection given the introduction of The Crescent overpass and potential future traffic volumes from the proposed Western Harbour Tunnel project should it proceed in the future.

The delivery of these changes to the approved project would improve intersection performance and optimise active transport connections.

As noted, the improved performance of the two intersections would provide wider benefits by helping to alleviate future pressures associated with traffic generation from other proposed developments in the vicinity of the project. As an additional benefit, delivery of these intersection upgrades as part of the project would help deliver the road infrastructure as efficiently as possible. It would avoid abortive works by allowing the infrastructure required for both current and proposed projects to be designed and delivered in an integrated and efficient manner.

Inclusion of The Crescent overpass would require design changes to the active transport links between Rozelle Rail Yards and Bicentennial Park. However, the proposed design of the active transport links would maintain the overall connectivity proposed within the EIS and CoA for the project.

The preferred options that form the basis of the proposed modification would serve to:

- Avoid conflict with the new overpass while still maintaining the overall connectivity of the active transport links
- Improve intersection performance and Level of Service
- Alleviate pressures associated with traffic generated from future developments
- Improve efficiency of construction activities.

4.4 Detail of the proposed modification

4.4.1 The Crescent overpass

The Crescent overpass would allow vehicles to connect from The Crescent (northbound) to The Crescent (eastbound) without requiring the use of the at-grade signalised intersection at The Crescent/City West Link. This change would remove the at-grade right turn movement. This change would improve the intersection performance and maintain the surrounding road network performance on opening of the project. Furthermore, the proposed The Crescent overpass also provides additional network capacity required to support the operation of other proposed projects in the vicinity, including the proposed Western Harbour Tunnel project, should those projects receive planning approval.

The overpass would allow for vehicles to travel east toward either the City or northern Sydney via the Anzac Bridge, or connect to Victoria Road (northbound). The proposed location of The Crescent overpass is shown in **Figure 4-1**.

The Crescent overpass would:

- Reach an elevation of approximately eight metres above the intersection of City West Link and The Crescent allowing a minimum safe clearance height for heavy vehicles
- Have a maximum gradient of approximately six per cent on the up and down ramps
- Be two lanes wide and be constructed so as to allow for wider traffic lanes and road shoulders ensuring sight lines and safety for vehicle users are maintained.

An elevation figure illustrating The Crescent overpass and its approximate relationship to other existing and proposed infrastructure is provided in **Figure 4-4**.

The overpass would be supported by piers placed to avoid the traffic lanes on City West Link and The Crescent. Each span would be lifted into place outside of standard construction hours to minimise impacts for users of City West Link and The Crescent. Drainage infrastructure and signage would be incorporated into the design of the overpass in line with relevant requirements and standards. Barriers along the sides of the overpass would be provided for traffic safety purposes.

Lighting would be provided as required by relevant Australian Standards including Australian Standard AS/NZS 1158: Lighting for roads and public spaces. Lighting included within the final design of The Crescent overpass would be designed to minimise light spillage on surrounding residences during operation as required by Condition E122.

Works would also be required to enable the tie-in of the new overpass on City West Link (eastbound) and The Crescent (eastbound). These works would consist of minor lane reconfigurations and construction of retaining walls where the overpass starts and ends. The finishes of the retaining walls would be designed in line with the urban design framework for the project.

Traffic volumes anticipated to utilise the proposed overpass along with the forecast road network and intersection performance impacts are provided in **section 6.2** and **Appendix B** of this Modification report.

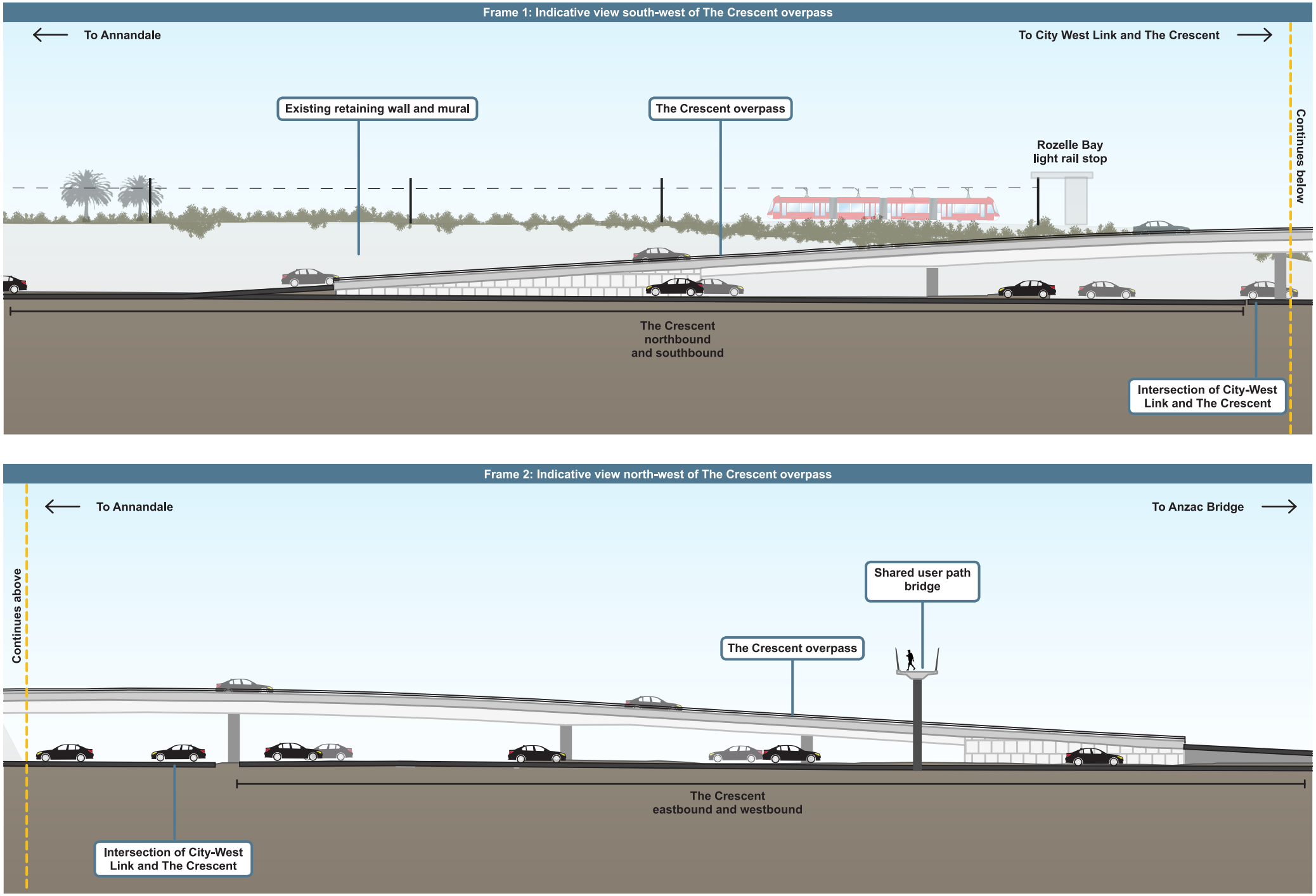

Figure 4-4 Elevation: Indicative view of The Crescent overpass

4.4.2 The Crescent/Johnston Street/Chapman Road intersection

To enable efficient use of the proposed The Crescent overpass, the intersection of The Crescent, Johnston Street and Chapman Road would be upgraded. This would increase the capacity of the intersection and improve road network performance. The upgrade would provide for the following traffic movements (refer to **Figure 4-5**):

- For traffic travelling northbound along Johnston Street:
  - Two dedicated left turning traffic lanes into the northbound carriageways of The Crescent
  - One dedicated through traffic lane into Chapman Road
  - Removal of the existing right turn movement from Johnston Street to The Crescent (southbound)
  - The stop lines and signals of the existing signalised intersection with Johnston Street/The Crescent/Chapman Road on Johnston Street would be moved approximately 40 metres to the south along Johnston Street
- For traffic travelling northbound along The Crescent:
  - One dedicated left turning traffic lane into the southbound carriageways of Johnston Street
  - Two dedicated through traffic lanes continuing along The Crescent. At the new signalised intersection of The Crescent/Johnston Street, vehicles would proceed northbound continuing on The Crescent in an 'S' shape
  - The upgraded intersection would not permit direct right turn movements into Chapman Road noting that these right turns are not permitted currently
- For traffic travelling southbound along The Crescent:
  - Two dedicated traffic lanes turning right into the southbound carriageways of Johnston Street
  - One dedicated through traffic lane continuing along The Crescent (southbound)
  - One shared through left turn traffic lane, allowing for through movements along The Crescent, and left turn movements into Chapman Road
- For traffic travelling westbound along Chapman Road:
  - One shared through/left/right turn traffic lane allowing for through movements onto the southbound carriageway of Johnston Street or left turn and right turn movements onto the southbound and northbound carriageways of The Crescent.

During construction four parking spaces on the northern side of Chapman Road would be temporarily removed (refer to **Plate 4-2**). However, at the end of construction these four parking spaces would be reinstated in the vicinity of the existing location. As a result, there would be no permanent loss of parking on the northern side of Chapman Road.

The proposed The Crescent/Johnston Street/Chapman Road intersection upgrade would also result in the loss of two permanent on-street parking spaces at the very northern end of the northbound carriageway of Johnston Street. This is as a result of the relocation of the traffic lights further south on Johnston Street and the need to provide safe clearance on the northbound approach to these traffic lights.

The pedestrian movements around this intersection would also be changed. The existing pedestrian crossing from the northern end of Johnston Street to Chapman Road would be moved from the north western side of the intersection to the south eastern side. A new pedestrian crossing across Johnston Street close to the pedestrian access to Bayview Crescent and the TAFE facility would be installed. Two new pedestrian crossings and footpaths heading north from the TAFE facility would link Johnston Street to Chapman Road. These crossings and footpaths are shown in **Figure 4-5**.

Plate 4-1 Existing Johnston Street/The Crescent intersection

Plate 4-2 Parking spaces to be relocated on Chapman Road

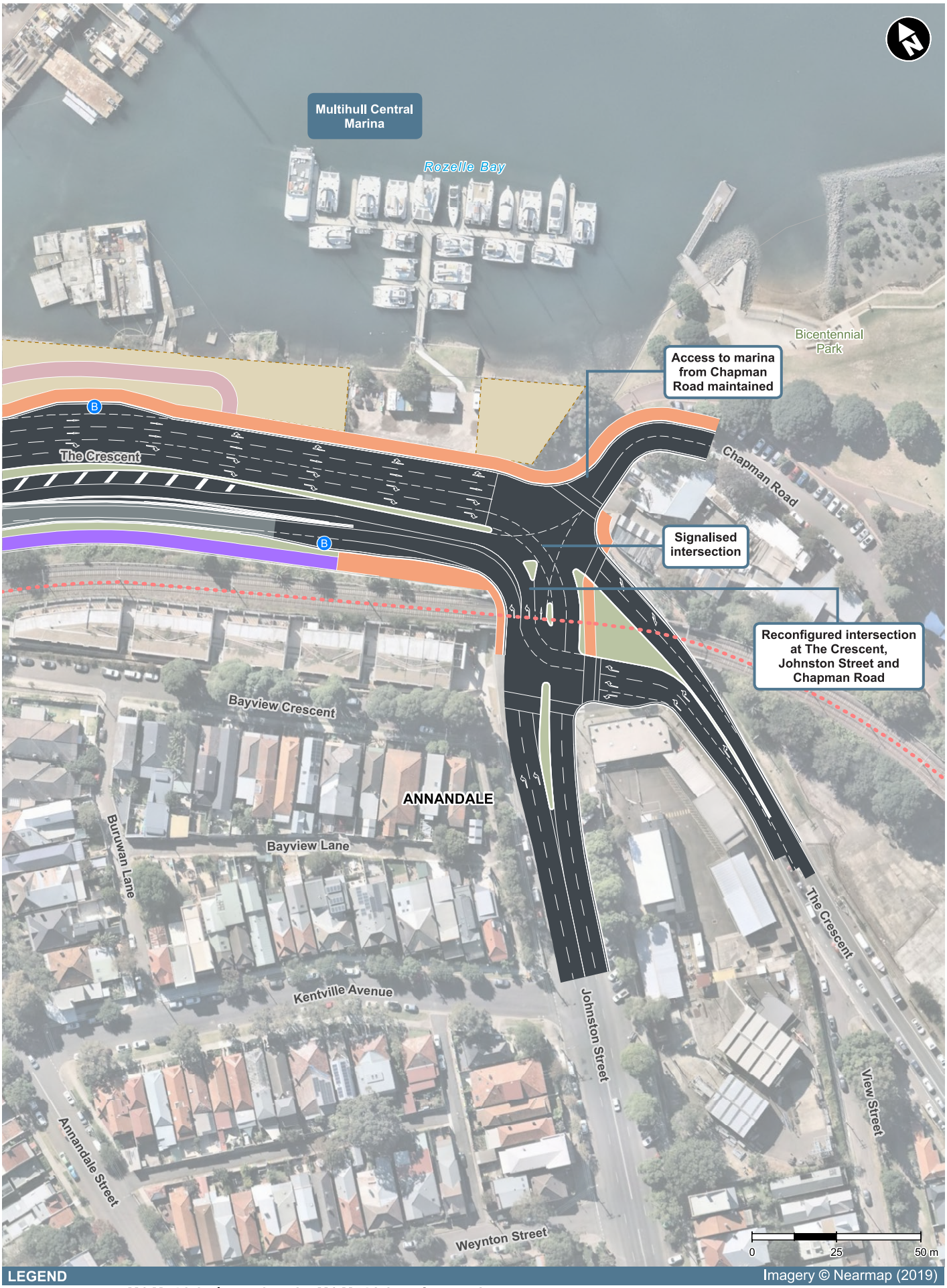

Figure 4-5 The Crescent/Johnston Street/Chapman Road intersection

4.4.3 Pedestrian and cycling green link

The introduction of The Crescent overpass means that the approved green link must be realigned from the east of The Crescent/City West Link intersection, to the west of the intersection. As previously approved, the northern bridge abutment will remain at the ventilation facility within Rozelle Rail Yards; however, as part of the proposed modification, the southern abutment would be relocated to connect to the Rozelle Bay light rail stop. This green link would provide a direct connection between the suburb of Annandale and the Rozelle Bay light rail stop and the new parkland at Rozelle Rail Yards and the suburb of Rozelle. The proposed location of the green link is shown in **Figure 4-1**.

The realigned green link would be approximately 115 metres long and indicatively comprise of two spans over the junction of The Crescent and City West Link. It would be approximately 15 metres wide and include two planting zones (one either side of the bridge) and a central shared user path. This is consistent with the built form and dimensions of the land bridge as described in the EIS and as required by Conditions E120 and E121.

Vegetation planted on the realigned green link would be consistent with the requirement of Condition E120 which requires a diverse range of vegetation including a mix of shrubs and large established vegetation. The Urban Design and Landscape Plan (UDLP) will include criteria for the final selection of vegetation and landscaping established on the green link.

Vegetation would not be included on approximately the southern 30 metres of the green link as the structure needs to provide a ramp down to the Rozelle Bay light rail stop platform. Including vegetation in this part of the green link would require the use of steps rather than a ramp which would not provide the same level of access. To include vegetation on this part of the green link and provide a ramp would require the structure to be lower to the ground and therefore it would not provide adequate height clearance for vehicles travelling underneath.

An elevation figure illustrating the green link including its connections to the ventilation facility and the Rozelle Bay light rail stop and its approximate relationship to other existing and proposed infrastructure is provided in **Figure 4-6**.

A new shared user path ramp from the land bridge and light rail stop would descend to the at-grade footpath on the western side of The Crescent. The ramp would be supported by piers and would not be attached to the existing light rail corridor retaining wall. The ramp would be located between The Crescent overpass and the existing light rail corridor.

Relocating the green link provides a direct link for pedestrians and cyclists between Lilyfield Road, through the Rozelle Rail Yards and over City West Link to the existing Rozelle Bay light rail stop. The vertical alignment of the green link has been set to align with ventilation facility building to the north and the light rail stop to the south. The urban design and landscaping associated with the green link will be refined as part of the development of the UDLP for the project. Indicatively this would include, but not be limited to, consideration of finishing and materials, landscaping and vegetation, fences and lighting.

Final design components would be confirmed during development of the UDLP for the project.

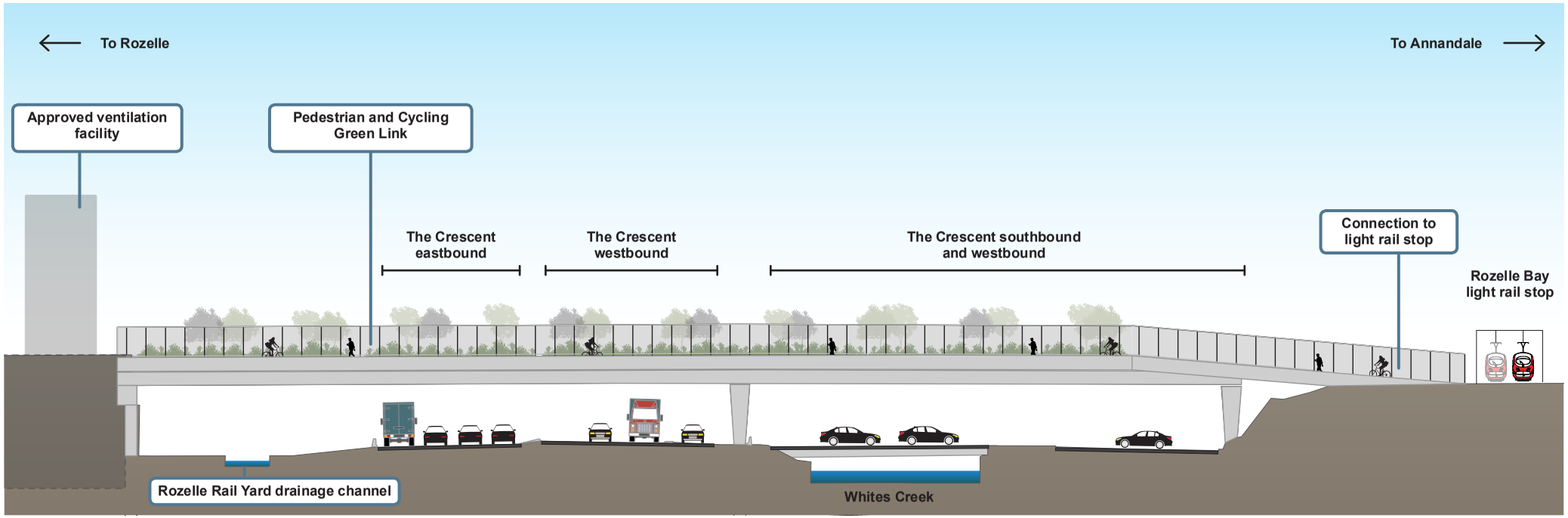

Figure 4-6 Elevation: Indicative view of Rozelle Rail Yards Pedestrian and Cycling Green Link

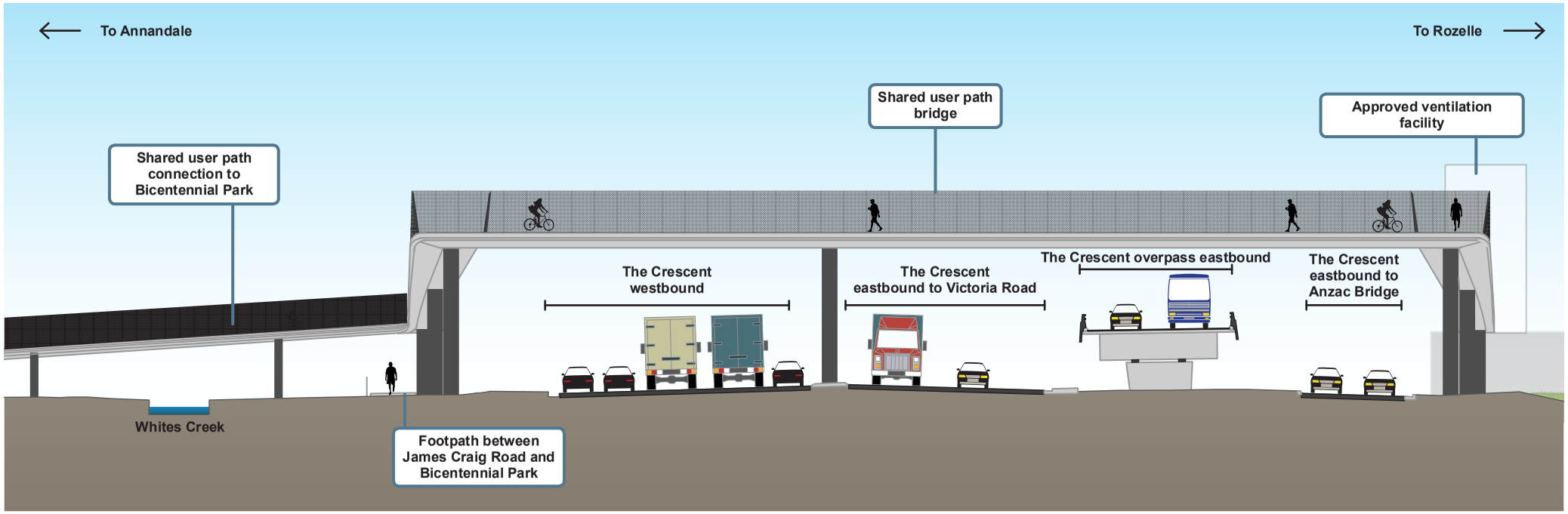

Figure 4-7 Elevation: Indicative view of the shared user path bridge

4.4.4 Shared user path bridge

Connectivity from the Rozelle Rail Yards to the Rozelle Bay foreshore and Bicentennial Park would be provided by a shared user path bridge that spans The Crescent between the City West Link intersection and the James Craig Road intersection. This shared user path bridge would be located to the east of the green link to ensure it can provide safe height clearance above the new overpass and would provide north/south pedestrian and cyclist connectivity between the suburb of Rozelle, the Rozelle Bay foreshore and Bicentennial Park.

The shared user path bridge would be supported by piers and have a width of about 4.5 metres. The northern part of the bridge would be located close to the ventilation facility within Rozelle Rail Yards and the northern entrance to the green link. The southern part of the bridge would link to the at grade shared user path on the eastern side of The Crescent that leads to Bicentennial Park.

The proposed location of the shared user path is shown in **Figure 4-1**. An elevation figure illustrating the length of shared user path bridge including its connections to the Rozelle Rail Yards and the shared user path along The Crescent is provided in **Figure 4-7**.

The shared user path bridge would provide the active transport connectivity described in the EIS and as required by Condition E120, specifically, from Rozelle Rail Yards to an at-grade connection to the park adjacent to Chapman Road (Bicentennial Park). The northern end of the shared user path bridge would also link to the Rozelle Rail Yards and the green link which provides access to Rozelle Bay light rail stop and the suburb of Annandale.

4.4.5 The Crescent construction ancillary facility (C6a)

The modification proposes to allow use of the minor construction ancillary facility, established in accordance with Condition C24 of the CoA, as a construction ancillary facility (refer to **Figure 4-8**). The proposed construction ancillary facility (C6a) is located on the south side of The Crescent to the west of James Craig Road and adjacent to Rozelle Bay. The proposed modification would allow use of the site for a limited number of additional purposes which are not permitted by Condition C24 including:

- Light vehicle parking for workers (around 9 spaces) and
- Material laydown areas and a limited number of associated vehicle movements (small delivery vans and rigid trucks).

These additional purposes would support the various construction activities at the C6 civil site.

An assessment of the potential construction impacts related to additional uses of this site is provided in **Chapter 6** of this report.

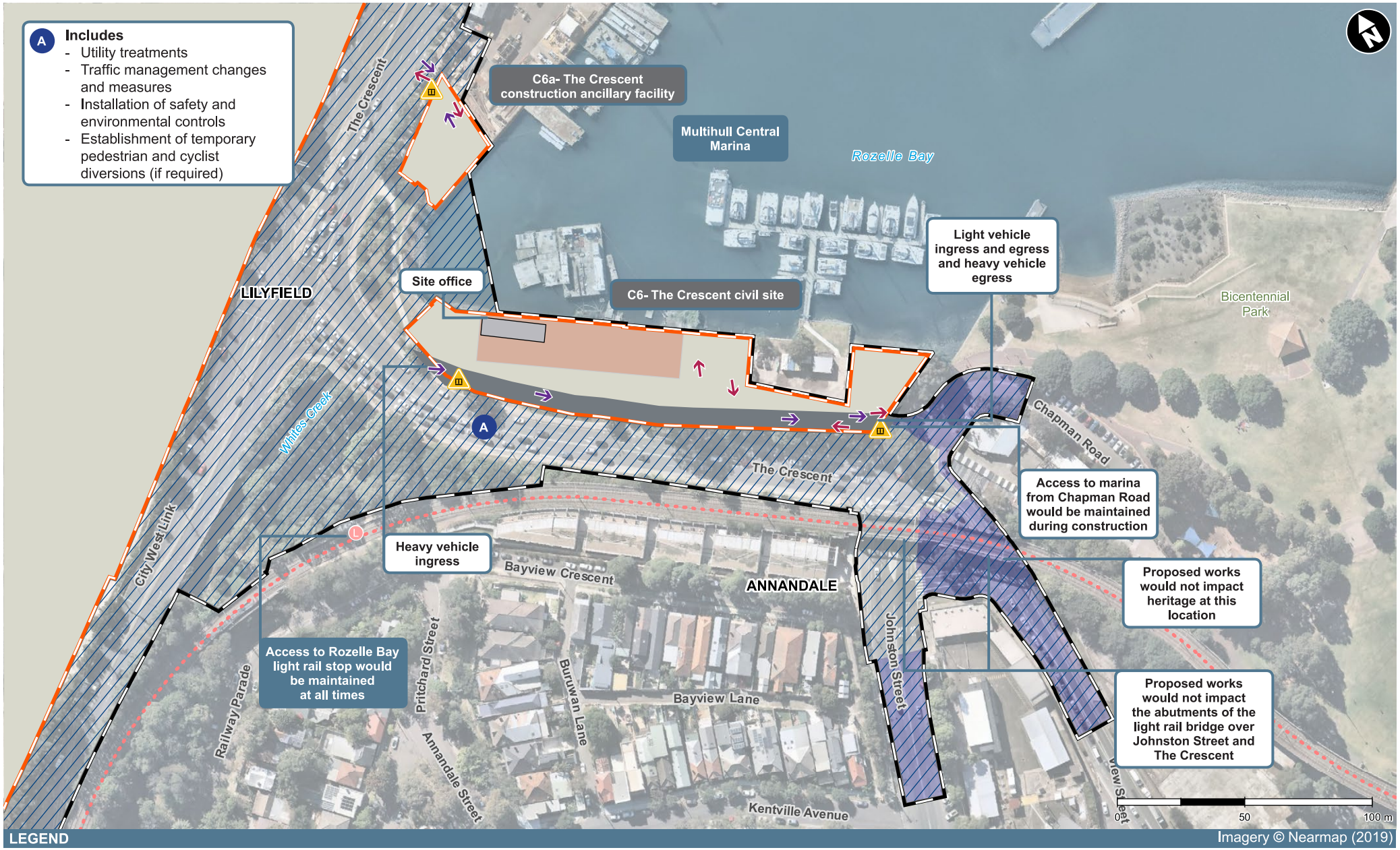

Figure 4-8 Proposed modification during construction – The Crescent civil site (C6) and construction ancillary facility (C6a)

4.4.6 Anzac Bridge approach roads

The approach to Anzac Bridge from the west which is used by eastbound traffic is proposed to be reconfigured. Three lanes from Iron Cove Link / M4 would merge to two lanes, while two lanes from Victoria Road would merge to one lane and then would merge with two lanes from The Crescent. These lanes then would continue as four lanes on Anzac Bridge. This differs from the EIS, which had three lanes from Iron Cove Link / M4, one lane from The Crescent and one lane from Victoria Road merging into four lanes on Anzac Bridge. The proposed layout eliminates the zipper merge proposed in the EIS design (refer to **Figure 4-9**).

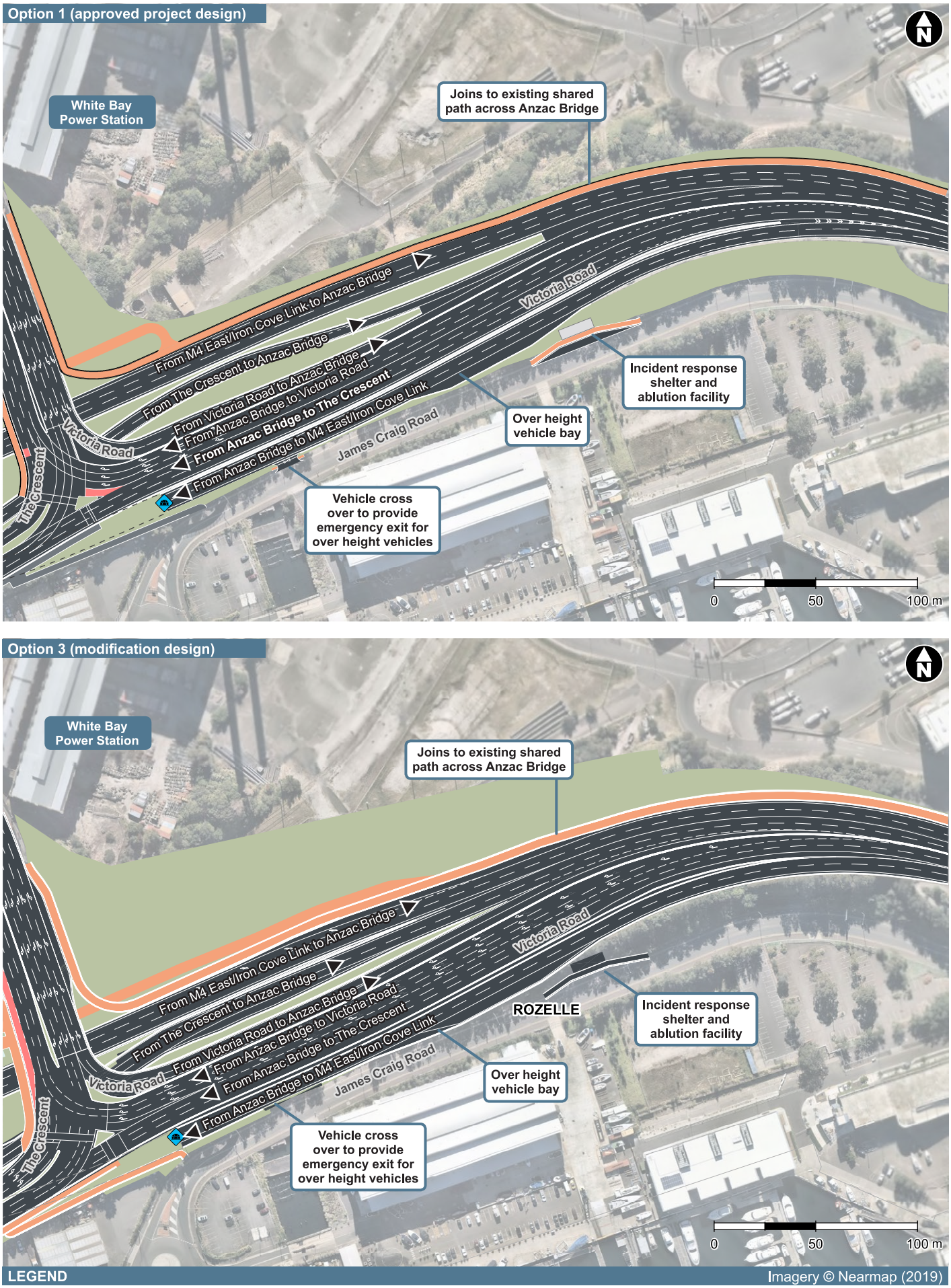

Figure 4-9 Approach to Anzac Bridge layout in EIS and proposed modification

4.5 Construction

4.5.1 Construction activities

The construction activities for the proposed modification include site establishment and enabling works, and surface civil, road and building works. These activities are summarised in **Table 4-4** and where required detailed further in this chapter.

Table 4-4 Indicative construction activities

Component	Typical activities
Site establishment and enabling works	• Traffic management measures • Install safety and environmental controls • Establish temporary noise attenuation measures • Heritage conservation works (if required) • Establish temporary pedestrian and cyclist diversions.
Surface earthworks and structures	• Install stabilisation and excavation support (retention systems) such as sheet pile walls, diaphragm walls and secant pile walls (where required) • Construct required retaining structures • Excavate new road levels.
Bridge works	• Construct piers and abutments • Construct headstocks • Construct bridge decks, slabs and girders.
Drainage	• Connect drainage to existing network • Adjustments to existing drainage infrastructure where impacted • Demolish and remove redundant drainage.
Pavement	• Lay select layers and base • Lay road pavement surfacing • Construct pavement drainage.
Finishing works	• Line mark to new road surfaces • Erect directional and other signage and other roadside furniture • Carry out earthworks at disturbed areas to establish the finished landform • Carry out landscaping • Site demobilisation and preparation of the site for a future use.

4.5.2 Construction equipment

Indicative construction equipment would include:

- Articulated dump truck
- Concrete cutter
- Crawler crane
- Excavators c/w attachments
- Jumbo drill rig
- Mobile crane (50T to 200T)
- Piling rig
- Asphalt paver
- Concrete pump/boom
- Diesel generator
- Concrete agitator truck
- Road profiler
- Vibratory roller

4.5.3 Construction hours

The modification would be undertaken as a mix of both standard and out of hours construction works in accordance with the CoA. Condition E68 defines standard construction hours as:

- Monday to Friday 7 am to 6 pm
- Saturday 8 am to 1 pm
- No work on Sundays or public holidays.

Condition E69 allows works to be undertaken between 1:00 pm and 6:00 pm on Saturdays. Daytime works for this modification would be undertaken during these hours.

To ensure worker safety or to minimise traffic disruptions, a number of works would be required to be undertaken outside of standard construction hours. Out of hours works (or night works) include works outside of the approved hours under Conditions E68 and E69 outlined above. Works required to be undertaken as night works would include:

- Construction of bridges
- Delivery of precast units and other materials
- Road tie-in works
- Traffic management, set-up and traffic switches
- Erection of traffic signs (where the erection is in proximity to traffic)
- Pavement and temporary median works
- Asphalt works and line marking.
- Use of construction sites to support out of hours works.

Where out of hours works is required, works would be subject to an Environmental Protection Licence (EPL) or the Out of Hours Work Protocol for the project as required by Conditions E73, E75 and E77 of the CoA. The Noise and Vibration Management Plan provides a process for identification of mitigation measures for residual impacts including but not limited to respite periods and coordination of out of hours works.

4.5.4 Construction program

An indicative program of works for the proposed modification is provided in Table 4-5Error! Reference source not found.. The construction program shows construction activities commencing in Q1 2020 and continuing through to the end of Q2 2023.

Table 4-5 Indicative program of works – proposed modification

Works area	Year															
	2020				2021				2022				2023			
Site establishment and enabling works					■	■	■	■	■							
The Crescent Overpass construction										■	■	■	■			
Green link and shared user path bridge construction							■	■	■	■						
The Crescent/Johnston Street/Chapman Road intersection upgrade							■	■	■	■						
Finishing works											■	■	■	■		
Anzac Bridge approach roads	■	■	■	■	■	■	■	■			■	■	■			

4.6 Operation

Operation of the proposed modification would include the ongoing use and maintenance of The Crescent overpass, The Crescent, Johnston Street and Chapman Road intersection and pedestrian and cyclist infrastructure. This would include required pavement upgrades undertaken in line with Roads and Maritime standard road maintenance policies.

As outlined in the EIS, traffic, locational, directional, warning and variable message signs would be incorporated on surface roads at approaches to the tunnels and project intersections. Directional signage would be installed in accordance with the Austroads and the Roads and Maritime standards, with a focus on providing clear and unambiguous direction to motorists. Indicatively variable message signs would be mounted on gantries along roads and would be used to advise motorists of traffic conditions. In addition, integrated speed and lane-use signs would be installed and would display the regulatory speed limit and wayfinding information relevant for the proposed modification.

4.7 Conditions of Approval

The proposed modification would require some of the CoA to be amended as some of the proposed changes would not be consistent with the existing project approval. **Chapter 7** (Conditions of approval) provides a review of the relevant conditions in relation to the modification and details the changes that are proposed.