

5 Project description

This chapter describes the project, including the route alignment, corridor width, main project elements, ancillary facilities and design standards.

The project description presented in this environmental impact statement (EIS) represents the preferred tender design. Sufficient flexibility has been provided in the design to allow for refinement during detailed design, to respond to submissions received during the exhibition of the EIS, and / or to minimise environmental impacts. The final design may therefore vary from the project described in this chapter. The project options and alternatives are discussed in **Chapter 4** (Project development and alternatives)

Table 5-1 sets out the Secretary's Environmental Assessment Requirements (SEARs) as they relate to the project description, and where in the EIS these have been addressed.

Table 5-1 SEARs – project description

SEAR	Where addressed
A detailed description of the proposal, including: Proposed route.	The proposed route is detailed in Section 5.1 to Section 5.7 and is shown on Figure 5-1 to Figure 5-8.
Design of the tunnels, interchanges (including tunnel portals and entry and exit ramps), and potential future connections to Stage 3 of WestConnex and other proposals such as southern Sydney connection*, and road user, pedestrian and cyclist facilities, and lighting.	The main alignment tunnels, including the tunnel portals, tunnel gradients and lane configurations are described in Section 5.5. Future connections of the project to the future M4-M5 Link, future Southern extension and future Sydney Gateway are detailed in Section 5.5 to Section 5.7 and shown on Figure 5-2 to Figure 5-8. The St Peters interchange is discussed in Section 5.6. Pedestrian and cycling facilities, within the western surface works area and as part of the local road upgrades are detailed in Section 5.4.2 and Section 5.7.9 respectively and summarised in Section 5.8.6. Additional detail regarding pedestrian and cyclist facilities and lighting is provided in Chapter 9 (Traffic and Transport) and Chapter 14 (Visual impacts and urban design) respectively. Roadside furniture and lighting to be provided as part of the project are discussed in Section 5.8.6
Surface road upgrade works, including road widening, intersection treatment and grade separation works, property access, parking, pedestrian and cyclist facilities (including appropriate locations for overbridges) and public transport facilities, and integration with the M5 East Motorway.	Surface road upgrade works at the western end of the project (the western surface works) and the local road upgrades around the proposed St Peters interchange are detailed in Section 5.4 and Section 5.7 respectively. Property access is summarised in Section 5.10 and detailed in Chapter 13 (Land use and property). New intersections to be constructed and existing intersections to be modified / upgraded as part of the local road upgrades are summarised in Section 5.7. Pedestrian and cycling facilities, within the western surface works area and as part of the local road upgrades are detailed in Section 5.4.2 and Section 5.7.9 respectively and summarised in Section 5.8.6. Changes to bus infrastructure are described in Section 5.7.10 and Section 5.8.6.

SEAR	Where addressed
Ancillary infrastructure and operational facilities, such as operational and maintenance facilities, ventilation structures and systems, and fire and emergency services and infrastructure for the proposal, including (if required) additional infrastructure (such as tolling infrastructure) for the M5 East Motorway.	Operational ancillary infrastructure, including operational management control systems, tunnel ventilation systems and facilities, drainage and water treatment facilities, noise attenuation, utilities and roadside furniture and lighting are detailed in Section 5.8 .
Location and operational requirements of construction ancillary facilities and access.	The location and operational requirements of construction ancillary facilities (herein referred to as construction compounds), and their access requirements are described in Section 6.6.4 (Construction works). More detail regarding access to construction compounds is provided in Section 9.3.1 (Traffic and transport)
Land use changes as a result of the proposal and the acquisition of privately owned, Council and Crown lands, and impacts to Council and Crown lands.	Property access and acquisition is summarised in Section 5.10 Additional detail regarding land use changes and property acquisition is provided in Chapter 13 (Land use and property).
Relationship and / or integration with existing public and freight transport services.	The provision of access for heavy vehicles and changes to bus infrastructure part of the local road upgrades are described in Section 5.7.8 and Section 5.7.10 respectively. Additional detail regarding the relationship of the project with public and freight transport services is provided in Chapter 3 (Strategic need and justification), Chapter 4 (Project development and alternatives) and Chapter 9 (Traffic and transport).

*Southern Sydney connection is referred to throughout this document as the Southern extension

5.1 The project

Roads and Maritime is proposing the construction and operation of the New M5 (the project), which would comprise a new, tolled multi-lane road link between the M5 East Motorway at Kingsgrove and St Peters. The project would also include an interchange at St Peters and connections to the existing road network.

Key components of the project would include:

- The western surface works, comprising:
 - Four new dedicated through lanes (two in each direction) to connect the M5 South West Motorway and King Georges Road to the New M5
 - Two new bypass lanes comprising an eastbound and a westbound ramp connecting the King Georges Road interchange and the M5 East Motorway, bypassing the New M5
 - Realignment of the four existing dedicated at-surface through lanes (two in each direction) along the M5 East Motorway between King Georges Road and the M5 East Motorway tunnel portals
 - Extension of the Kindilan underpass within Beverly Grove Park
- Infrastructure to introduce tolling on the existing M5 East Motorway
- Pavement and linemarking works along the carriageways of the M5 East Motorway to tie-in to the project

- Twin motorway tunnels between the existing M5 East Motorway (between King Georges Road and Bexley Road) and St Peters. Each tunnel would be around nine kilometres in length and would be configured as follows:
 - Between the western portals and Arncliffe, the tunnels would be built to be three lanes wide but marked for two lanes as part of the project. Any change from two lanes to three lanes would be subject to future environmental assessment and approval
 - Between Arncliffe and St Peters, the tunnels would be built to be five lanes wide but marked for two lanes as part of the project. Any change from two lanes to any of three, four or five lanes would be subject to future environmental assessment and approval
 - Stub tunnels at the eastern end of the main alignment tunnels, located north of the Princes Highway at about the intersection of Canal Road and Bakers Lane, St Peters (the future M4-M5 Link stub tunnels). The stub tunnels would allow for a future connection of the main alignment tunnels to the future M4-M5 Link
- Stub tunnels at Arncliffe near the Kogarah Golf Course to provide for a future connection to southern Sydney (the Southern extension stub tunnels)
- Installation of tunnel ventilation systems, including ventilation facilities at Kingsgrove within the existing M5 Motorway corridor road reserve, at Arncliffe at the Kogarah Golf Course and at St Peters within the St Peters interchange, and emergency smoke extraction and fresh air supply at Bexley North, south of the M5 East interchange at Bexley Road and at Arncliffe at the Kogarah Golf Course
- Ventilation tunnels between the main alignment tunnels and ventilation facilities at Kingsgrove, Arncliffe and St Peters
- Works to facilitate closure of the Alexandria Landfill site, including:
 - Capping of the area historically used as a landfill
 - Earthworks and land forming across the site
 - Construction of new leachate, gas and groundwater management systems
 - Demolition and decommissioning of existing, redundant site infrastructure
- A new multi-level interchange at St Peters (the St Peters interchange) which would connect the New M5 and the future M4-M5 Link with:
 - Euston Road at the intersection of Campbell Road
 - Gardeners Road at the intersection with Kent Road
 - Sydney Airport and Port Botany via a new future road, the future 'Sydney Gateway'
- Local road upgrades at St Peters, Alexandria and Mascot, including:
 - Widening of sections of Euston Road, Campbell Street, Bedwin Road, Campbell Road, Bourke Street, Bourke Road and Gardeners Road
 - An extension of Campbell Road to provide a direct connection to Bourke Road, Mascot via a new bridge over the Alexandra Canal
 - An extension of Gardeners Road to provide a connection to the St Peters interchange via a new bridge over the Alexandra Canal
 - A new road (Venice Street) which would provide a new connection between Ricketty Street and Gardeners Road
 - Modifications to existing intersections and construction of new intersections
 - Construction of a pedestrian and cyclist bridge between Sydney Park at St Peters and Mascot
- Ancillary infrastructure and operational facilities for electronic tolling, signage (including electronic signage), ventilation structures and systems, fire and life safety systems, and emergency evacuation and smoke extraction infrastructure

- Five motorway operations complexes (MOC), located at Kingsgrove (MOC1), Bexley (MOC2), Arncliffe (MOC3) and two at St Peters (St Peters (MOC4) and Burrows Road (MOC5))
- A motorway control centre located at St Peters (within MOC5)
- New service utilities and modifications and connections to existing service utilities
- Temporary ancillary construction facilities and temporary works to facilitate construction of the project.

The project does not include:

- Ongoing motorway maintenance activities during operation
- Construction / installation of electrical supply networks to connect the project to existing supply locations
- Surveys, test drilling, test excavations, geotechnical investigations or other tests, surveys, sampling or investigation for the purposes of the design or assessment of the project
- Some ongoing landfill works currently underway at or around the Alexandria Landfill site at St Peters. Roads and Maritime is presently operating Alexandria Landfill pursuant to the provisions of the existing environment protection licences and the conditions of consents for the premises. Typical operations include:
 - Sorting through the various stockpiles of waste and materials stored for resource recovery
 - Evaluating opportunities to recycle and/or recover materials for reuse
 - Processing of materials scheduled for reuse
 - Removing and disposing of waste materials assessed to be unsuitable for recycling/reuse, to the landfill, or to another suitably licensed landfill facility in accordance with EPA requirements
 - Stabilisation of a cliff face landslide.

The above listed ongoing landfill works involve dealing with the stockpiles of materials stored across the premises and do not involve any excavation of the land at the site. Where asbestos waste is identified within the stockpiled materials, Roads and Maritime's contractors manage and remove the materials in accordance with the *Work Health and Safety Act 2011*, an asbestos management plan and asbestos removal control plan.

The above listed excluded works are currently permitted under separate existing approvals, are required to comply with NSW Environment Protection Authority (EPA) requirements and / or are subject to separate assessment and approval in accordance with the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). These works would continue as part of the project following determination.

5.2 The completed project

The completed project is shown in overview in **Figure 5-1**. More detailed illustrations of completed project components are provided in **Figure 5-2** to **Figure 5-8**, with descriptions provided in the following sections.

5.3 Project construction and operational footprint

The construction footprint (the area required to construct the project) would include the land required for the construction of the main alignment tunnels, the on and off-ramps, surface road connections (including the St Peters interchange), tie-ins and integration works with existing surface roads, surface support infrastructure and temporary ancillary construction facilities.

The construction footprint is described in **Section 6.3** and shown on **Figure 6-1** to **Figure 6-3**.

Once operational, the project footprint would consist of the land required to accommodate the operation of the western surface works, main alignment tunnels, St Peters interchange, surface support infrastructure (including the motorway operations complexes) and upgraded local roads (including the extension of Campbell Road to connect to Bourke Road and the extension of Gardeners Road to connect to St Peters interchange via a new bridge over the Alexandra Canal). Collectively this is referred to as the operational footprint.

The operational footprint is shown in overview on **Figure 5-1**, and shown in detail in **Figure 5-2** to **Figure 5-8**.

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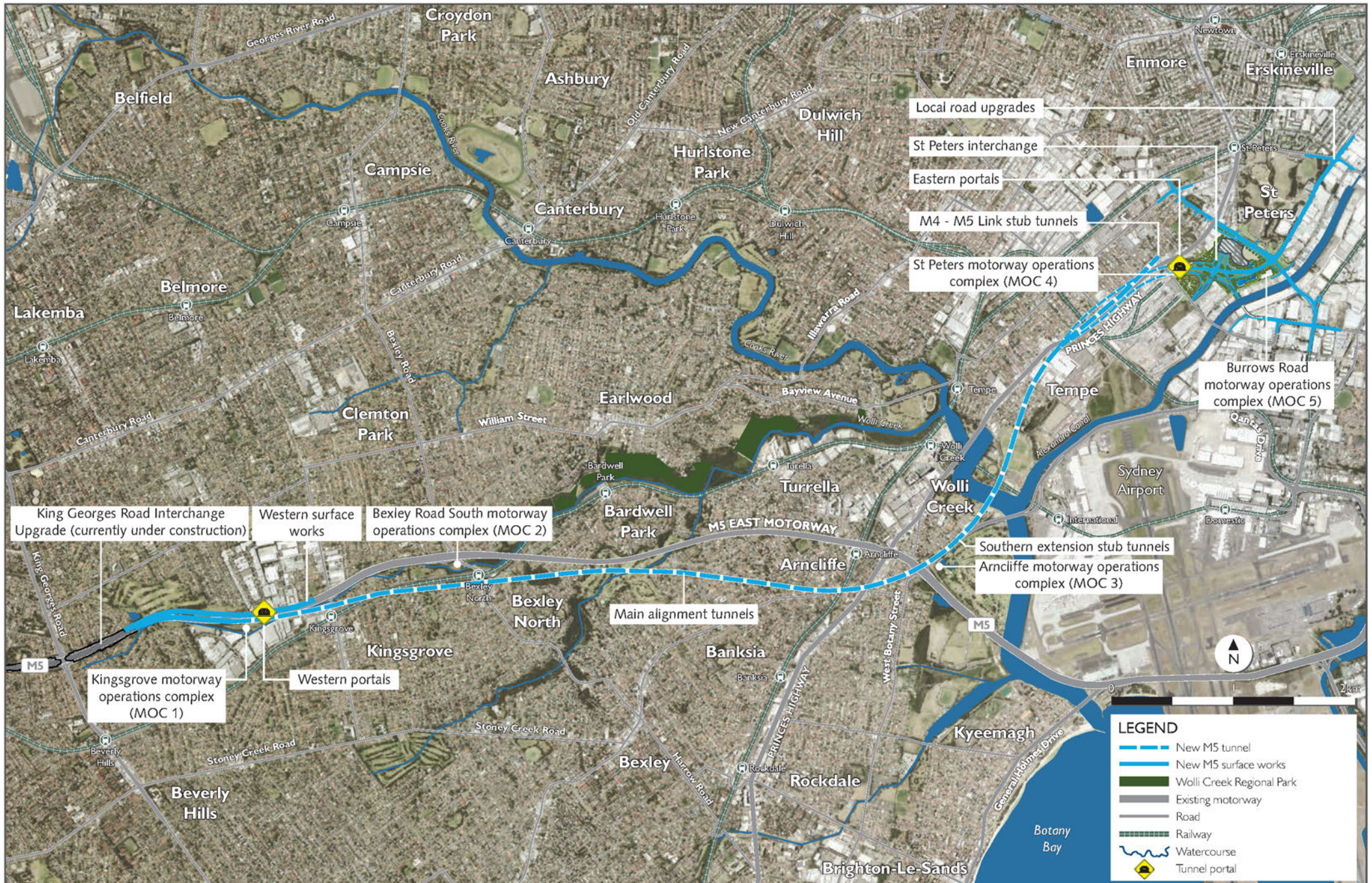


Figure 5-1 Overview of the project

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Figure 5-2 Project operational footprint - map 1

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Figure 5-4 Project operational footprint - map 3

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Figure 5-5 Project operational footprint - map 4

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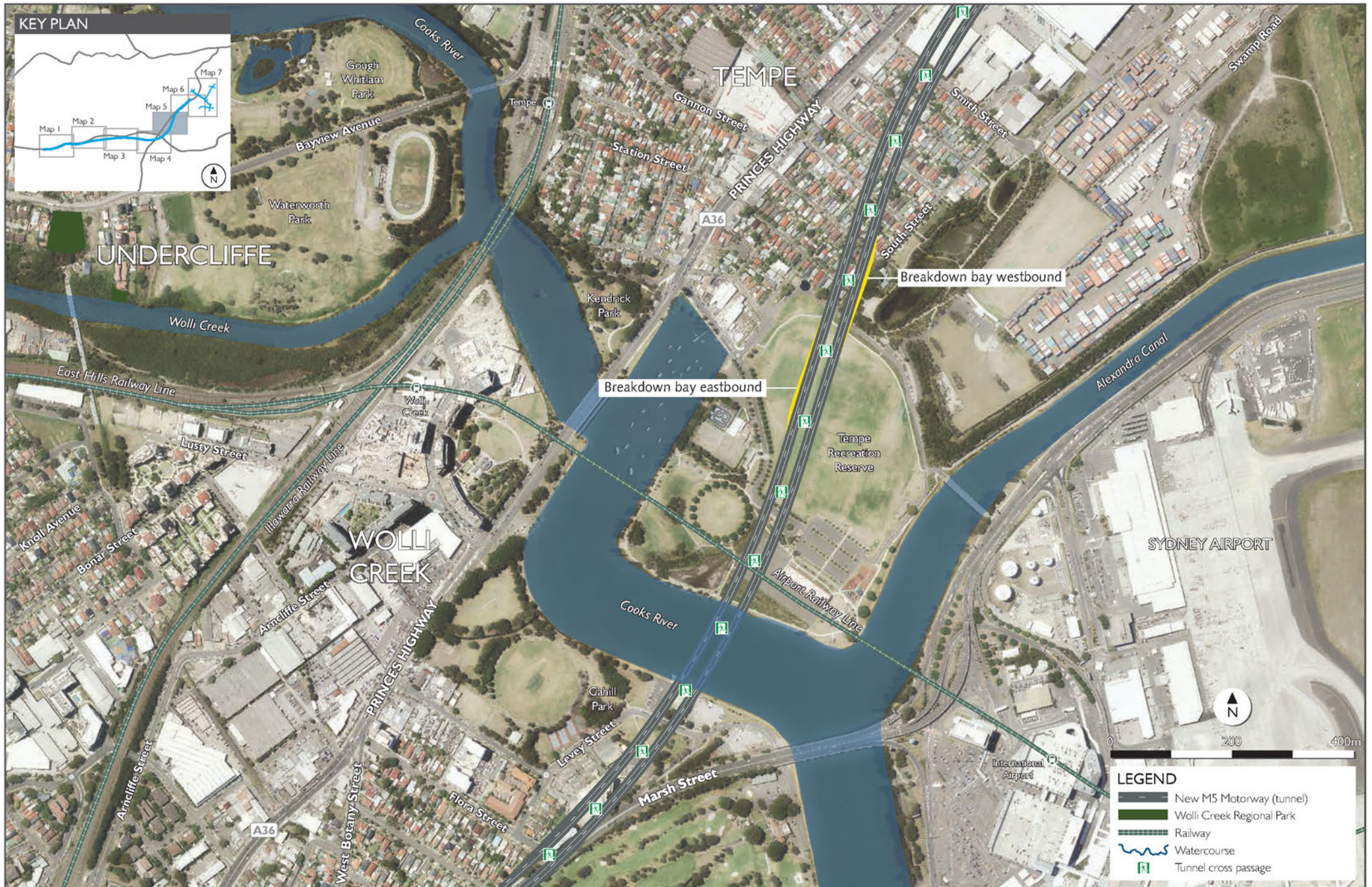


Figure 5-6 Project operational footprint - map 5

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Figure 5-7 Project operational footprint - map 6

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Figure 5-8 Project operational footprint - map 7

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5.4 Western surface works

The western surface works would connect the New M5 and the existing M5 East Motorway to the M5 South West Motorway through works within and around the King Georges Road interchange.

The western surface works would include:

- Construction of four new lanes (two eastbound and two westbound) to connect the M5 South West Motorway and the King Georges Road interchange with the New M5 main alignment tunnels
- Realignment of the M5 East Motorway surface roads between the King Georges Road interchange and the M5 East Motorway tunnel portals. The M5 East Motorway surface roads would be resurfaced, delineated from the New M5 and provided with new signage
- Construction of two new bypass lanes comprising eastbound and westbound ramps to bypass the New M5 and provide a connection between the King Georges Road interchange and the M5 East Motorway
- Construction of a permanent noise barrier along the northern project boundary. The noise barrier would extend from around the King Georges Road interchange to the M5 East Motorway eastbound tunnel portal
- Construction of a permanent noise barrier along the southern project boundary. The noise barrier would extend from around the King Georges Road interchange to the M5 East Motorway westbound tunnel portal
- Extension of the Kindilan underpass within Beverly Grove Park to accommodate the project
- Realignment of and improvements to the shared pedestrian and cyclist path that runs through Beverly Grove Park, parallel to, and north of, the M5 East Motorway
- Reinstatement of the shared pedestrian and cyclist path that runs parallel to and south of the M5 East Motorway
- Cuttings and embankments for surface road works
- Installation of tolling infrastructure for the New M5 and M5 East Motorways
- Landscaping and rehabilitation works
- Extension of two existing box culverts at Kooemba Road
- New operational drainage infrastructure to connect existing stormwater infrastructure to a concrete channel at Kirrang Street.

Further details of the western surface works are provided in **Section 5.4.1** to **Section 5.4.3**.

The western surface works area would also contain the Kingsgrove motorway operations complex (MOC1), which would include ancillary operational infrastructure including the Kingsgrove ventilation facility, deluge tanks, the main alignment tunnels emergency response system, a maintenance facility and a workshop, offices, storage and car parking. Further details of this ancillary operational infrastructure are provided in **Section 5.8**.

The western surface works for the project is shown in overview on **Figure 5-9** and in detail on **Figure 5-10** to **Figure 5-12**.

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Figure 5-9 Overview of Western surface works

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Figure 5-10 Western surface works - map 1

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Figure 5-11 Western surface works - map 2

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Figure 5-12 Western surface works - map 3

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5.4.1 Bridges

The Kindilan underpass provides pedestrian and cyclist access between the northern and southern sections of Beverly Grove Park. The underpass is located south of Arinya Street, Kingsgrove, underneath two bridges which form part of the main carriageways of the existing M5 East Motorway.

As part of the western surface works, three additional single span bridges would be constructed adjacent to the M5 East Motorway to accommodate the additional surface lanes. These works would result in an extension of the existing Kindilan underpass (**Figure 5-13**).

The extended underpass would match the structural form of the existing underpass and would continue to have a width of about 12 metres. Noise barriers along the top of the existing underpass would be removed and replaced with new noise barriers along both sides of the extended underpass (refer to **Section 5.8.4** for additional detail on noise barriers).

The extended Kindilan underpass would include three large voids between carriageways, allowing sunlight into the underpass. The urban design of the Kindilan underpass extension is detailed further in **Chapter 14** (Visual impacts and urban design).

5.4.2 Pedestrian and cyclist provisions

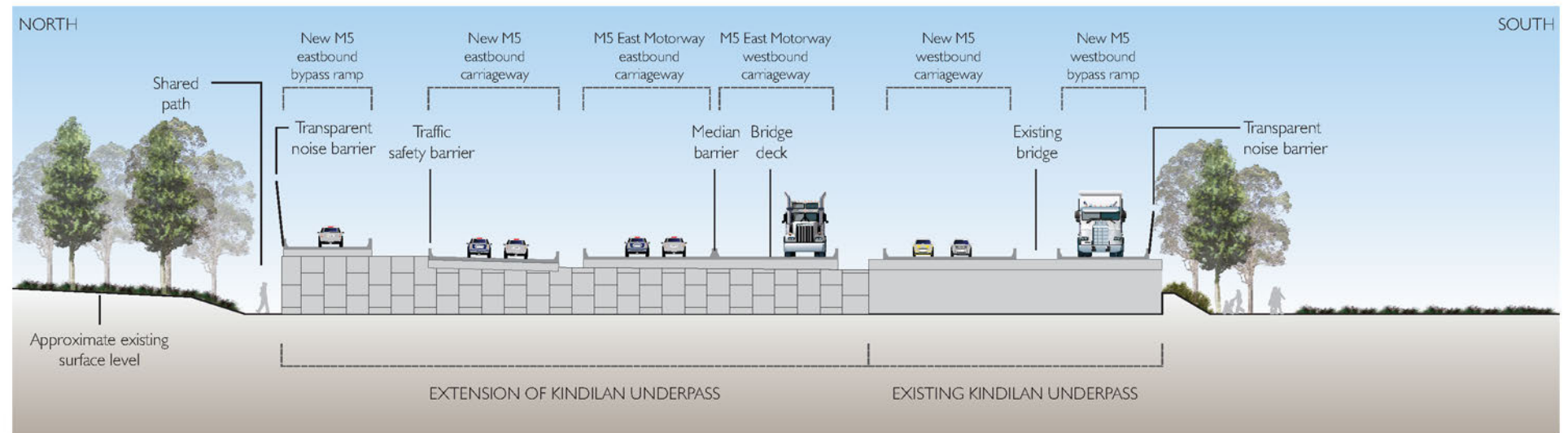
The shared pedestrian and cycle paths within Beverly Grove Park would be realigned to the north and south of the western surface works to accommodate the ancillary construction facilities (refer to **Figure 5-10** to **Figure 5-12** and **Section 6.5.3**).

At the commencement of construction, the shared path to the north of the M5 East Motorway would be temporarily realigned to follow the northern boundary of Beverly Grove Park. At completion of construction the shared path would be relocated within Beverly Grove Park.

The shared path within the southern portion of Beverly Grove Park would be closed for about three years during construction of the project and would be reinstated at the completion of construction.

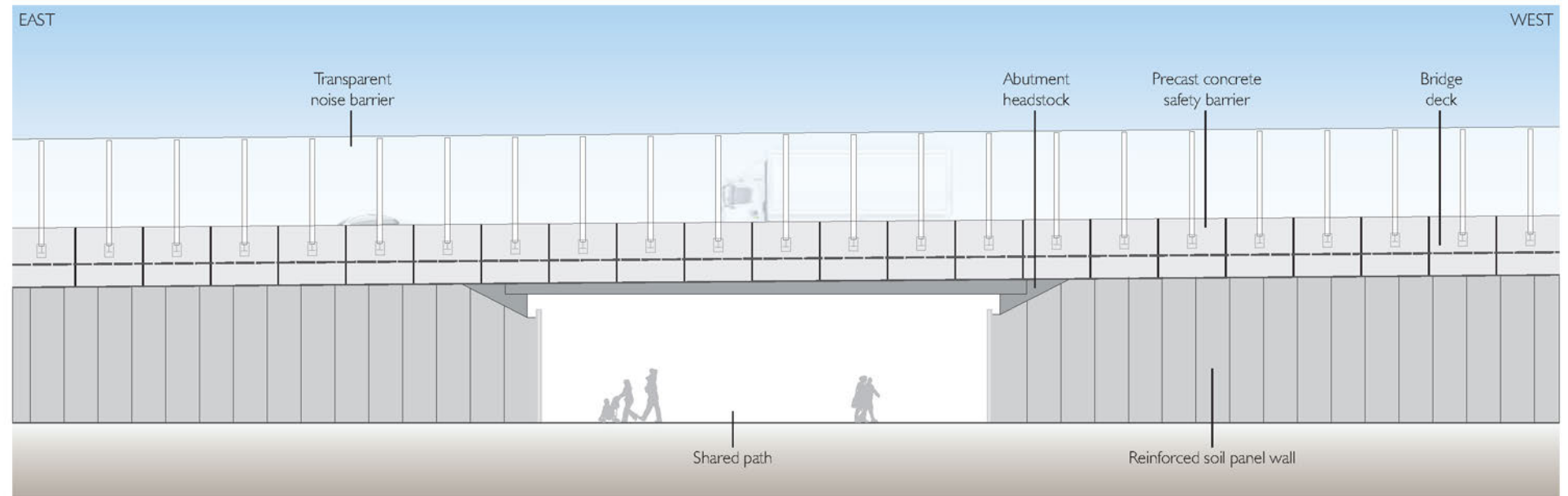
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KINDILAN UNDERPASS - ELEVATION



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KINDILAN UNDERPASS - SECTION



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Figure 5-13 Indicative elevation and cross section: Kindilan underpass

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5.4.3 Lane configuration

The western surface works would provide for the integration of the project with the M5 East Motorway and tie-in to the King Georges Road interchange and the M5 South West Motorway.

The western surface works would include:

- Six new lanes. Four of these new lanes would connect to the New M5, and two of the new lanes would bypass the New M5 to connect to the M5 East Motorway
- The realignment of the four existing lanes on the M5 East Motorway to accommodate the project.

The arrangement of the lanes at this location and their function (from north to south) include:

- One new eastbound ramp to bypass the New M5 and connect the King Georges Road interchange and M5 South West Motorway to the M5 East Motorway eastbound tunnel portal
- Two new eastbound lanes to connect the King Georges Road interchange and the M5 South West Motorway to the New M5 eastbound tunnel portal
- Realignment of two existing eastbound lanes to maintain the connection from the King Georges Road interchange and the M5 South West Motorway to the M5 East Motorway eastbound tunnel portal
- Realignment of two existing westbound lanes to maintain the connection from the M5 East Motorway westbound tunnel portal to the King Georges Road interchange and the M5 South West Motorway
- Two new westbound lanes to connect the New M5 westbound tunnel portal to the King Georges Road interchange and M5 South West Motorway
- One new westbound ramp to bypass the New M5 and connect the M5 East Motorway westbound tunnel portal to the King Georges Road interchange and M5 South West Motorway.

All new lanes would be about 3.5 metres wide. Indicative cross section of the lane configuration, lane widths and medians between carriageways at the western surface works area are shown on **Figure 5-14** to **Figure 5-16**.

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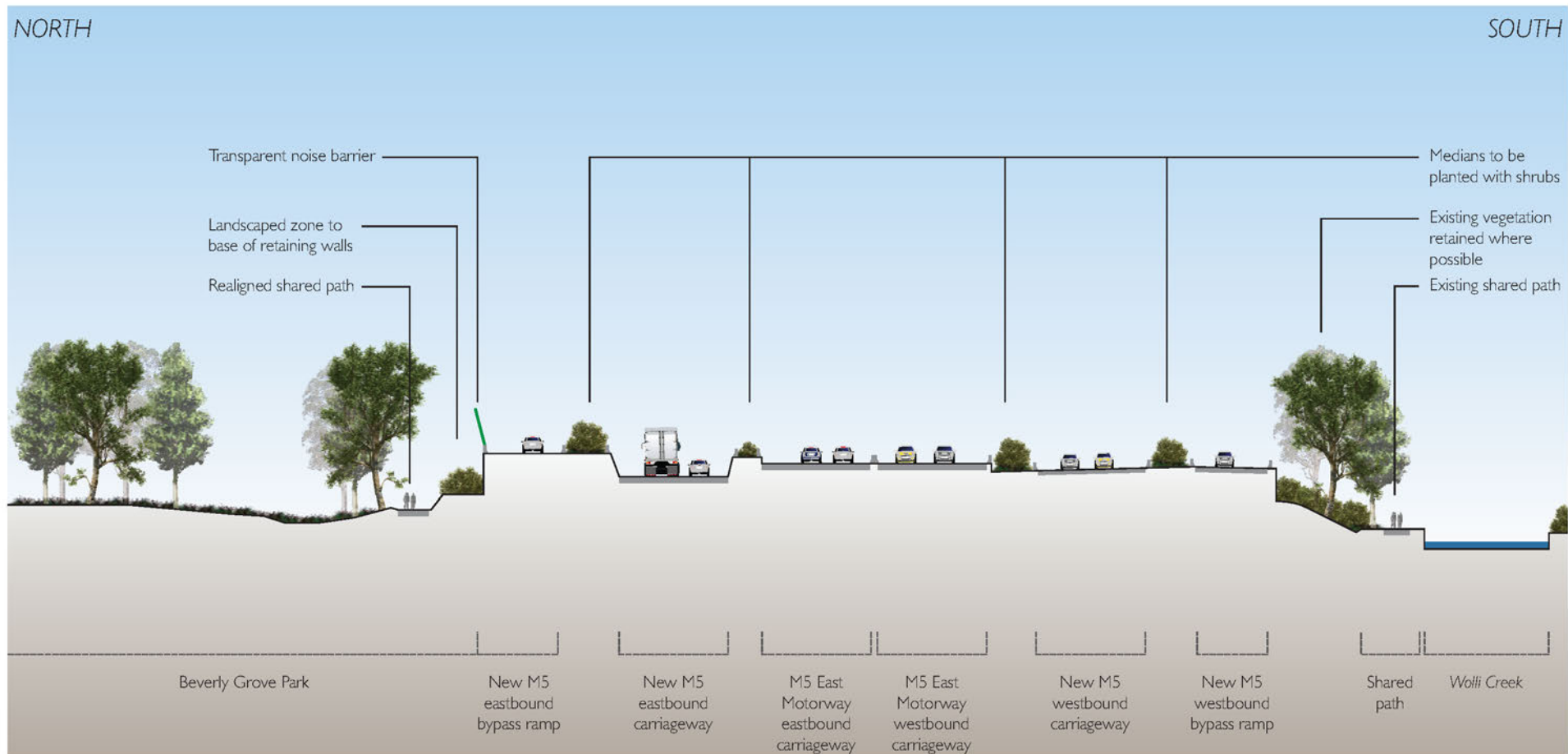


Figure 5-14 Indicative cross section - western surface works - near Kindilan underpass

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