

Appendix A

Design development

A. Design development

A.1 Stop configurations

UNSW High Street stop

Through ongoing consultation with the UNSW as part of the detailed design development of the approved Project, a series of benefits were identified based which could be achieved through an improved design for the UNSW High Street stop. These included:

- Passenger safety for people alighting from the light rail in the morning peak. Due to the large number of people accessing the UNSW at this stop in the morning there was a concern with the amount of passenger storage on the northern side of the stop, with potential safety issues from passengers crossing the light rail and/or High Street rather than having to queue to walk along the platform at the signalised crossing.
- Compatibility/integration with the future UNSW Masterplan, in particular with regard to UNSW land required along High Street.
- Potential electromagnetic interference to sensitive equipment on the UNSW, in particular within the Lowy Cancer Research Centre, as a result of light rail operations.

The alternative design proposed during included shifting the entire UNSW High Street stop to the northern side of High Street, which would remove the eastbound traffic lane, but would provide a wider platform for alighting passengers (by combining the proposed outbound (towards Randwick) platform with the existing northern footpath). Additional safety measures for the revised design would include providing a wider than standard side platform (6 metres) for city-bound commuters, with a fence along the edge of this platform to stop people from crossing High Street directly (refer to Figure 3.5).

In assessing alternative configurations for the revised UNSW High Street stop arrangement, the retention of an eastbound traffic lane directly adjacent to the westbound lane proved unfeasible with the proposed wider platforms. Additionally, the revised arrangement was identified to result in a scenario whereby westbound light rail vehicles and the eastbound traffic lanes would pass each other in a counter-flow direction, creating confusion and potential safety conflicts for vehicles and pedestrians crossing the corridor.

The preferred design was therefore to provide two separate platforms, including a six metre platform for city-bound passengers, and a single traffic lane for westbound traffic. The refined design for the preferred UNSW High Street stop is provided in section 3.2.3 of this report.

Randwick terminus stop

Previous decisions for the location of the Randwick terminus used bus interchange priority as the deciding factor, where a location within High Cross Park was considered to provide the best transport outcome. However, as identified in the CSELR EIS, the High Cross Park terminus proposal has significant impacts on the park including reduction of open space, removal of trees and impacts to the heritage character of the park. These impacts continue to be a concern to stakeholders and the community.

In addition, further refinement of customer movements identified that whilst a large proportion of customers would continue to interchange from buses to light rail, this was not significantly greater than customers who were using the light rail to access the Prince of Wales Hospital, medical offices or the commercial town centre of Randwick. The revised location provides a more balanced solution for interchanging and destination customers.

Based on the ongoing concerns of stakeholders and refinement of customer movements, further options analysis was undertaken including involvement with key stakeholders, including Randwick City Council and NSW Health Infrastructure.

Option assessment

Initially, it was determined that a revised Randwick terminus stop location could be provided in High Street, however this would require the removal of one lane of traffic (either eastbound or westbound) between Clara Street and Avoca Street to accommodate the stop and light rail tracks.

An options assessment was therefore undertaken to determine the optimum traffic arrangement for the remaining traffic lane. The options assessment included the assumption that the UNSW High Street stop would be reconfigured as part of the overall modification (refer Chapter 3 of this report) and that as part of this change the westbound traffic lane between Wansey Road and Botany Street would be removed. For completeness and to provide a comparative assessment of potential impacts, the options assessment also considered retaining the Randwick stop in High Cross Park, as per the approved project (Option 1).

Three alternative traffic arrangement designs were investigated for the proposed modification along High Street between Wansey Road and Avoca Street. These options included the following:

- Option 1 – modification to the UNSW High Street stop with no change to the approved location of the Randwick terminus stop in High Cross Park.
- Option 2 – modification to the UNSW High Street stop with the Randwick terminus stop relocated to the eastern end of High Street. One lane of traffic (eastbound) would be provided along High Street between Clara Street and Avoca Street.
- Option 3 – modification to the UNSW High Street stop with the Randwick terminus stop relocated to the eastern end of High Street. One lane of traffic (westbound) would be provided along High Street between Clara Street and Avoca Street.

An indicative illustration of each of the identified options is shown in Figure A.1 to Figure A.3 below.

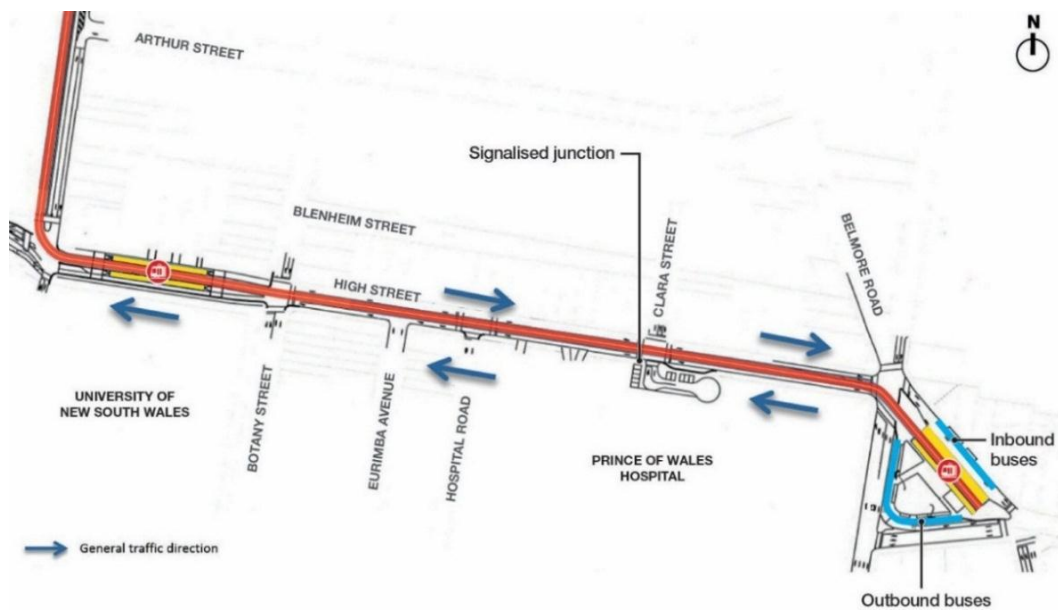


Figure A.1 Alternative design Option 1



Figure A.2 Alternative design Option 2

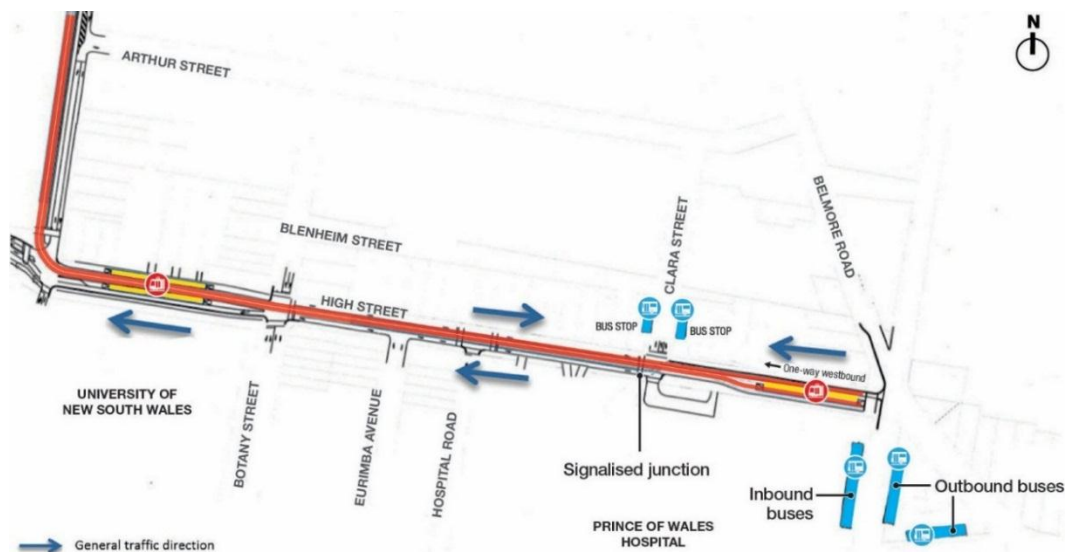


Figure A.3 Alternative design Option 3

A summary of the assessment of the three options is presented below:

- *Stakeholder views* – both the Randwick City Council and the NSW Health Infrastructure have expressed a preference for a stop in High Street (Option 2 and 3) (refer to Chapter 4 for details).
- *Interchange functionality* – Option 1 provides only a marginally better interchange function than Option 2 or Option 3.
- *Impact to heritage and planted trees* – Option 2 and Option 3 would result in a significantly reduced impact to the trees in High Cross Park, which include heritage listed trees and socially important trees.
- *Traffic operation* – Option 2 and Option 3 both result in a reduced traffic capacity on High Street than Option 1 due to the removal of a lane of traffic. Option 3 also presented a series of road safety issues at Clara Street, including the potential for general traffic confusion resulting from traffic travelling in a westbound direction on an ‘eastbound’ street lane. Option 2 and Option 3 would also result in less impacts to the operation of the Belmore Road and Avoca Street intersection as LRVs would no longer be required to cross this intersection.
- *Land use impacts* – Option 2 and Option 3 would allow for enhanced integration with the Prince of Wales Hospital Masterplan. Additionally, with respect to the concerns raised regarding the approved Project’s impact on High Cross Park, the reduced land take and impact to trees within the park would retain the amenity of this park as an important public space for the community to continue to use.
- *Social and economic impacts* – Option 2 and Option 3 would provide better access to the Randwick town centre. The movement of the Randwick terminus stop away from High Cross Park would also provide improved amenity to residents within the local vicinity, including reduction in potential noise and vibration impacts to these properties.
- *Safety* – Option 3 would require passengers accessing the light rail stop from anywhere other than a bus to have to cross at least one busy road to do so.

A summary comparison of the assessed options is presented in Table A.1 below.

Table A.1 Summary of assessed options

Issue	Option 1	Option 2	Option 3
Stakeholder views	0	+	+
Interchange functionality	0	0	0
Impact to heritage and planted trees	0	++	++
Traffic operation	0	–	– –
Land use impacts	0	++	++
Social and economic impacts	0	+	+
Safety	0	0	–

+ / ++ Option would provide a beneficial/significantly beneficial outcome compared to the approved Project
0 Option would provide a neutral or comparable outcome compared to the approved Project
– / – – Option would provide a somewhat negative/negative outcome compared to the approved Project

Preferred option

Option 2 was identified as the preferred option for the following reasons:

- reduced impacts to High Cross Park
- enhanced ability to incorporate the design with the public domain
- improved access to the hospital precinct and Randwick town centre
- improved traffic safety for eastbound traffic (than Option 3)
- reduced impact on the Belmore Road and Avoca Street intersection (than Option 1).

The preferred option for the proposed Randwick terminus arrangement is described further in section 3.2.1 of this modification report.

A.2 Afternoon peak period bus stop options

In conjunction with the proposed relocation of the Randwick terminus stop, two scenarios for improved positioning of the afternoon peak period bus interchange were considered to better integrate with the revised stop location. The identified scenarios included:

- an afternoon peak bus stop on Belmore Road between Short Street and Avoca Street, on the eastern side of Belmore Road (refer to Figure A.2)
- an afternoon peak bus stops at High Cross Park on Avoca Street and Cuthill Street (approved Project arrangement), with a morning peak bus stop on the western side of Avoca Street, to the south of High Street (refer to Figure A.3).
- A common morning peak bus stop on the western side of Avoca Street, to the south of High Street, was included as part of the overall design for all options (refer to Figure A.2).

In consideration of the proposed options, the Belmore Road bus stop option was considered to be the preferred location for the afternoon peak period bus stop for the following reasons:

- *Proximity and convenience to Randwick town centre* – locating the proposed bus stop along Belmore Road would provide improved convenience for bus passengers accessing the town centre. The location would also provide an acceptable distance (approximately 75 metres) for light rail/bus interchange for customers.
- *No impact on High Cross Park* – With the preferred location of the Randwick terminus in High Street, the provision of outbound bus stops within High Cross Park (Option 2) would require the removal of trees and parkland at this location, reducing some of the benefits achieved by moving the stop location.
- *Additional capacity* – The Belmore Road bus stop would provide capacity for six buses compared to five for the High Cross Park option.
- *Improved night time security* – the location of the bus stop within the Randwick town centre would benefit from proximity to activities such as shops, cafes, restaurants.

A more detailed description of the proposed modification is provided in Chapter 3 of this modification report.

A.3 Arthur Street rear access lane

As part of the proposed modification to the UNSW High Street stop, the proposed removal of the eastbound traffic lane along High Street for general traffic between Wansey Road and Botany Street would result in the loss of vehicle access to four properties along High Street. These properties are:

- 36 High Street (Creston College)
- 38 High Street (Kenvale College Hospitality and Event Management)
- 42 and 44 High Street (residential apartment buildings with shared access)
- 46 High Street (residential apartment building).

In order to retain access to these properties, a series of revised access scenarios were identified to provide access to these properties via a new access lane from Arthur Street. Opportunities to provide alternative access to the impacted High Street residents were limited due to a range of constraints including the need to maintain access to all properties, the need to minimise impacts to existing residences and current property ownership. The alternative access scenarios identified considered included:

- provision of an alternative rear access lane from Arthur Street using an existing driveway between 10 Arthur Street and 12 Arthur Street to provide access to all affected properties
- provision of an alternative rear access lane from Arthur Street using an existing driveway between 10 Arthur Street and 12 Arthur Street to provide access to the 34, 42 and 44 High Street, with an additional access lane provided from Botany Street to access 46 High Street
- provision of an alternative rear access lane from Arthur Street using an existing driveway between 10 Arthur Street and 12 Arthur Street to provide access to the 34, 42 and 44 High Street and provide no vehicle access to 46 High Street.

The scenario which provided access to all of the properties utilising access from both Arthur Street and Botany Street was not preferred as this option would involve the demolition of a residential property to create the access between Botany Street and 46 High Street. Additionally, this option would still require an access to be constructed from Arthur Street to access the remaining properties.

The scenario that would not provide vehicle access to 46 High Street was also discounted as this property would lose overall vehicle access as a result of the Project. To compensate for this, alternate parking would need to be provided within the proposed access lane, resulting in increased land take, and potential safety and security issues in having an off-site parking area.

The preferred option was considered to be the provision of an alternative rear access lane from Arthur Street using an existing driveway between 10 and 12 Arthur Street to provide access to all affected properties. This would result in both a minimal amount of impact on land take, would not require the demolition of any residential building (however would require the relocation of an existing shed and other structure currently utilised by the adjoining childcare centre) and would maintain access to all affected properties. This option would also provide appropriate access for required activities such as central garbage collection.

The indicative layout for the proposed access lane from Arthur Street is described in greater detail in section 3.2.3 and an indicative layout of the proposed access lane is shown in Figure 3.8 of this modification report.