TRANSPORT

Alternate Access to Little Eveleigh Street Car Park

Feasibility Report

January 2024

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NSW GOVERNMENT

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the lands, waters and seas and their rich contribution to society.

Document review tracking

Version	Date	Prepared by	Reviewed by
0.1	August 2023	Chris Attard	Tara Wilcoxon Rosemary Snowdon
1.0	January 2024	Tara Wilcoxon	Michael Childs Rosemary Snowdon

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1 Purpose of this Report

The Redfern Station Upgrade – New Southern Concourse project ('the Project') is a State Significant Infrastructure project (SSI-10041) which was approved by the NSW Department of Planning, Industry and Environment in December 2020.

Condition D63 of the Approval for the project states that:

The Proponent must investigate, in consultation with the City of Sydney Council, the feasibility of providing access to the Little Eveleigh Street car park via Wilson Street, Redfern (near the intersection of Ivy Street). If the investigation indicates that it is feasible to access the car park via Wilson Street, then this access must be considered in the detailed design of the SSI. A report on the investigation must be submitted to the Planning Secretary for information within six (6) months of commencing construction.

Note: Changes to the approved access arrangements may need to be further assessed under the EP&A Act.

This report acknowledges Transport's previous submission of an Options Report in order to comply with Condition D63 in 2021 (**Appendix A**). As the project has progressed, further consultation with City of Sydney Council (CoS Council), investigation and design shows a new alternate access to the Little Eveleigh Street (LES) offset car park is feasible. This report outlines the new alternate access arrangement which would also provide considerable safety improvements to the LES shared zone.

This report outlines the following:

- The current project
- Background and options for alternative access previously assessed
- Current preferred option
- Conclusions

2 The Project

2.1 Key Features

The key project components include:

- A 6 metre wide pedestrian concourse between LES and Marian Street
- New stair and lift access from the new concourse to Platforms 1 to 10
- New station entrances interfacing LES and Marian Street
- An upgraded station entrance at Marian Street including station services and customer amenities
- A new station entrance at LES including station services and customer amenities
- Formalisation of a shared zone on LES including:
    - safety improvements to streetscape such as landscaping, drainage and pavements
    - relocation of approximately 20 parking spaces (including 18 resident/restricted parking spaces, one accessible parking space and one car share scheme parking space)
    - Utility adjustments
- Upgrade of Marian Street/ Cornwallis Street/ Rosehill Street area
    - Extension of existing shared zone
    - Safety improvements to vehicle, cyclist and pedestrian interactions including widening
    - Improvements to streetscape such as drainage, landscaping and pavements as well as utility adjustments
    - Changes to street parking arrangements including removal of approximately 16 parking spaces.

2.2 Current arrangements

The existing car park (North Eveleigh car park) which, prior to the commencement of construction was accessed via LES. There is also a secondary access via Carriageworks Way (off Wilson Street, Macdonaldtown) which is used infrequently.

The primary users of the existing North Eveleigh car park include:

- Sydney Trains and New South Wales Trainlink train and maintenance staff; and
- Workers working in the rail corridor, including maintenance and various project crews.

It is acknowledged that the North Eveleigh car park is one of very few remaining areas available for operation and maintenance access. During planned trackwork periods the North Eveleigh car park serves as a strategic work planning, preparation and access location for the Redfern, Central and Eveleigh sections of the rail network.

2.3 Current status of the project

The project is currently in the final stages of construction of the LES shared zone. The new southern concourse was operational on 8 October 2023.

The LES offset car park has been constructed as part of the project in a revised location than was assessed within the Environmental Impact Statement (Transport, 2020). The revised location

was situated further away from residential properties on LES and was completed to facilitate the commencement of shared zone construction in January 2022. The LES offset car park was opened for use by residents of LES during construction of the shared zone. For residents to safely access the LES offset car park, the project temporarily opened Wilson Street Reserve. This opening also provided access for construction vehicles entering the North Eveleigh car park, compound area and Sydney Trains staff using the car park while LES was closed to traffic.

3 Background

In the Environmental Impact Statement (Transport, 2020), access to the North Eveleigh car park and LES offset car park was proposed to be provided via LES, which would become a shared zone under the project. The LES shared zone would allow some vehicle access to residential driveways, garages, deliveries, and service vehicles. Condition D63 was included in the final Determination for Transport to investigate removing the vehicles associated with rail construction and operation that were required to access the North Eveleigh car park.

During operation of the project the LES offset car park is approved to be a public car park under Sydney Trains management. North Eveleigh car park will continue to be in use by Sydney Trains operation and maintenance staff.

It is noted that the LES offset car park is within the Redfern North Eveleigh Precinct, and planning for the urban renewal of this precinct is underway. Within the Redfern North Eveleigh Precinct Masterplan, it is proposed to open Wilson Street for access into the development area. In the event that the LES offset car park is affected by the planning process for the North Eveleigh Precinct, any proposed reconfiguration or relocation of the offset parking arrangements would be undertaken in consultation with relevant stakeholders. Any change to the parking would be undertaken in a manner which ensures that the principle of offset parking is provided in perpetuity, and remains within reasonable walking distance of LES.

3.1 Previously Assessed Options and Submission under Condition D63 (2021)

In accordance with Condition D63 and prior to the construction of the LES offset car park, an investigation was conducted into the feasibility of providing alternate access to the LES offset car park via Wilson Street, Redfern (near the intersection of Ivy Street). This investigation assessed the opportunities to reduce vehicle movements through the shared zone on LES.

The following alternative options for access to the car park were assessed in the *Little Eveleigh Street Car Park Access Driveway - Alternate Access Feasibility Report* (July 2021, 'the previous report', **Appendix A**):

- Alternative Option 1 – Access from Wilson Street through current driveway
- Alternative Option 2 – Access Adjacent to Chief Mechanical Engineer's Building
- Alternative Option 3 – Corner of Chief Mechanical Engineer's garden
- Alternative Option 4 – Chief Mechanical Engineer's building entrance

The outcome of the investigation concluded access via Wilson Street was not feasible due to road safety concerns and unacceptable heritage impacts on State Heritage item (Chief Mechanical Engineer's Building and gardens). It was recommended that the approved access through LES is maintained as it complied with relevant road safety requirements and the impacts on nearby heritage items were considered acceptable.

The previous report was submitted to the then Department of Planning, Industry and Environment (DPIE) on 01 September 2021 (DPIE reference: SSI-10041-PA-78). The previous report was accepted by DPIE on 13 September 2021.

3.2 Design Development and Consultation

Throughout detailed design development and ongoing consultation with CoS Council, the project investigated strategies that would minimise the interaction between vehicles, bicycles and pedestrians within the project shared zone on LES.

In investigating strategies to reduce these interactions between vehicles, bicycles and pedestrians, a number of options were further analysed and an operational solution for access into the LES offset car park and North Eveleigh car park was revisited. These options were the subject of a traffic assessment (Little Eveleigh Street Design Modification Impact Assessment, NovoRail 2023). The full suite of options to improve safety on LES (known hereafter as 'the LES safety initiatives') is outlined below.

- Alternative access into North Eveleigh car park and LES offset car park via Wilson St
    - Access into the North Eveleigh car park and LES offset car park via Wilson St Reserve (to be converted into a shared zone) for vehicles 8.8m and under.
    - Vehicles over 8.8m to access North Eveleigh car park via Carriageworks Way.
- Restriction of access to LES, change of traffic flow
    - Installation of a traffic Island in Wilson St to prevent access from Wilson St into Wilson St shared zone
    - Access into LES/North Eveleigh car park/LES offset car park/Ivy lane from Ivy Street through Wilson St. This access facilitates the reverse direction flow on LES
- Provision of Kiss and Ride on North Side of Lawson St
    - The eastbound Kiss and Ride will be in addition to the Kiss and Ride on the south side of Lawson St (westbound) and will reduce the need to perform drop-off movements in LES
- Additional pedestrian crossing on Lawson St & LES Intersection
    - The additional pedestrian crossing will provide a more direct crossing point at Lawson St that aligns with desired lines of Eveleigh St, LES and the newly constructed Kiss and Ride facilities.

By considering all the LES safety initiatives, the opening of Wilson Street Reserve to providealternate access to the LES offset car park and North Eveleigh car park becomes feasible.

The LES safety initiatives are further described in Section 4.2.

4 Alternative Options

4.1 Base Case - Approved Car Park Configuration

The final LES offset car park configuration is provided in Figure 1 for reference as the Base Case. The configuration for the access driveway to and from the LES offset car park would utilise the existing configuration on LES and Ivy Lane. Traffic entering the LES offset car park would do so via LES, and then would exit via Ivy Lane. Adjustments would be made to signage and the bike lane in this location. No changes would be made to Wilson Street Reserve.

Throughout consultation with CoS Council, pedestrian and cyclist safety has been a concern with this option.

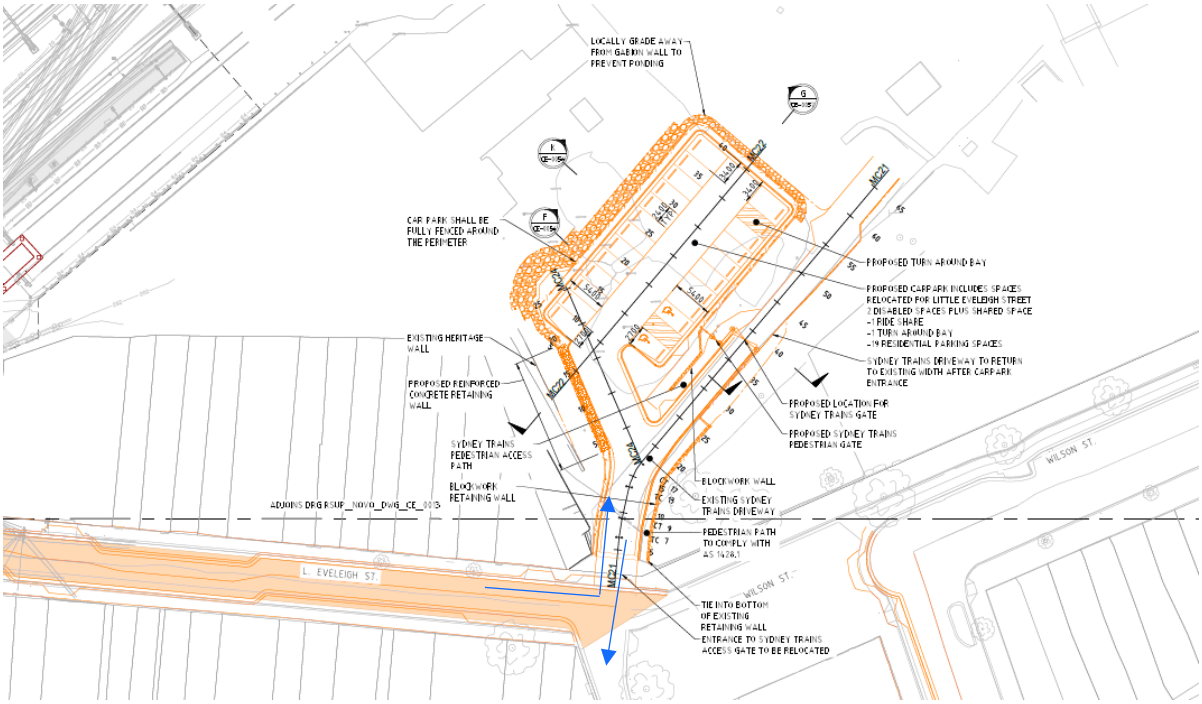


Figure 1: Original configuration: Access via LES and exit via Ivy Lane

4.2 Preferred Option – Access for light vehicles via Wilson Street Reserve with an operational solution for access for vehicles over 8.8m

Through implementation of the LES safety initiatives, it becomes feasible to open Wilson Street Reserve for passenger vehicle access to LES offset car park and North Eveleigh car park. The LES safety initiatives are shown in Figure 2 and described in further detail.

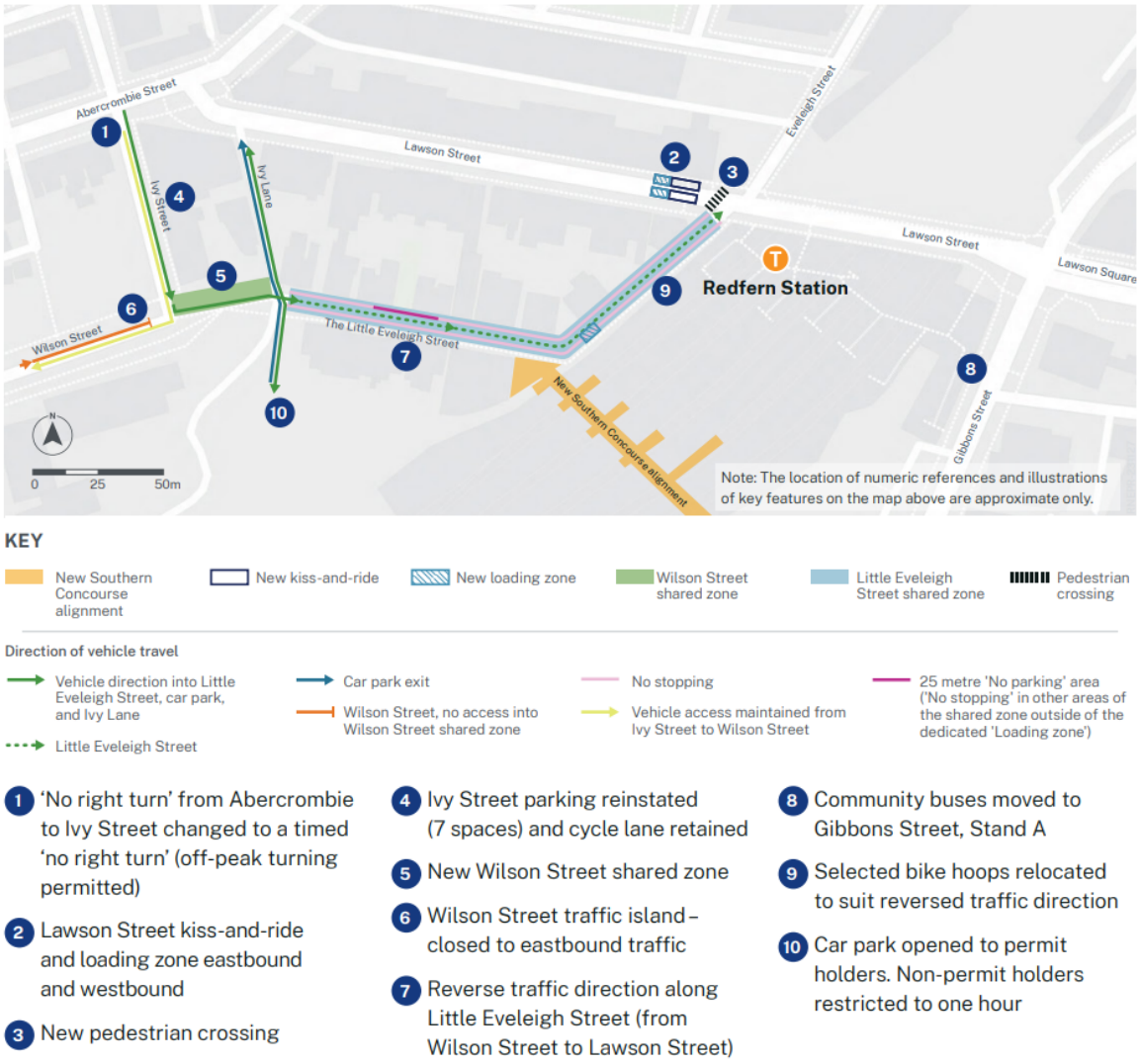


Figure 2 LES safety initiatives

4.2.1 LES and Wilson Street changes

4.2.1.1 Alternative access into North Eveleigh Carpark via Wilson Street

A permanent opening of Wilson Street Reserve and conversion to a shared zone aims to remove vehicles from LES that would have previously used the street for access to the LES offset carpark, North Eveleigh car park and Ivy Lane. Providing entry only from Wilson Street will require traffic that currently access the car park through LES to reroute to access from Ivy Street leading to a reduction of vehicles on LES. For vehicles over 8.8m that cannot access via Wilson Street due to their size and swept paths, an operational solution has been developed for them to access via Carriageworks Way and enter the North Eveleigh Carpark from the southwest. The traffic arrangement is shown in Figure 2 and the traffic volume changes are shown in Figure 3 & 4.

Swept path analysis was also undertaken to assess the following movements:

- Passenger vehicles (up to 5.2 metres) with 300mm clearance envelopes on both sides for the movements from Wilson Street to Ivy Lane and LES.
- Service vehicles (up to 8.8 metres) with 500mm clearance envelopes on both sides for the movements from Wilson Street to Ivy Lane and LES.
- Passenger vehicles (up to 5.2 metres) with 300mm clearance envelopes on both sides for the movements from LES to Lawson Street (left and right turns).

- Service vehicles (up to 8.8 metres) with 500mm clearance envelopes on both sides for the movements from LES to Lawson Street (left and right turns).

The swept path analysis demonstrated that all vehicle movements for passenger vehicles (up to 5.2m) and services vehicles (up to 8.8m) are suitable with the exception of the left turn from LES into Lawson Street for 8.8m service vehicles (this left turn will be restricted to vehicles under 6m).
All movements can be made within the existing road reserves which results in no property adjustments or impacts to any street trees or the adjacent heritage items which were constraints of the previous report's Option 1.

4.2.1.2 Change of traffic flow direction of LES and restriction of access

The opening of Wilson Street Reserve and conversion to a shared zone prompts the reverse direction of traffic flow on LES. The previous report's Option 1 did not consider the reversal of operational traffic flow. The convergence of vehicles coming from varied directions was the source of safety concerns at the Wilson Street/Ivy Street and LES intersection in the previous report. By reversing the traffic direction, the Wilson Street shared zone and LES shared zone all travel west to east, the conflicts at the intersection are reduced. Entry to the shared zone and car parks would be only from Ivy Street and exit either via Ivy Lane or LES. Further, the installation of a traffic Island in Wilson Street will prevent access from Wilson Street into the new Wilson Street shared zone for access to LES car park, North Eveleigh car park and LES.

4.2.2 Lawson Street changes

4.2.2.1 Provision of Kiss and Ride on North Side of Lawson Street

After the opening of the station entrance on LES, it is expected that the demand for Kiss and Ride on LES would increase. To discourage any possible Kiss and Ride movements through Wilson Street and LES, the provision of an eastbound Kiss and Ride facility will be in addition to the Kiss and Ride on the south side of Lawson Street (westbound direction) of the approved project. The aim is to reduce the need to perform drop-off movements in LES at the station entry. The provision of a formal Kiss and Ride facility may increase the demand for Kiss and Ride or attract the Kiss and Ride that currently occurs informally at other locations. The capacity of Lawson Street is expected to be around 900 vehicles per hour per lane (1800 in both directions). Given that the existing traffic volume on Lawson Street during peak hour is only 600 vehicles for two directions combined during the busiest peak period, there is expected to be enough capacity to accommodate the potential increase in vehicles due to the proposed Kiss and Ride.

4.2.2.2 Additional pedestrian crossing on Lawson St & LES Intersection

To ensure safety and direct crossing movements on Lawson Street, the additional pedestrian crossing will align with desired lines of Eveleigh St, LES and the newly constructed Kiss and Ride facilities.

The spacing of safe crossings is a compromise between improved pedestrian efficiency and safety (close spacing) and the disruptions to vehicles.

4.2.3 Safety Improvements

4.2.3.1 Reduction in vehicle volumes and resultant safety improvements

With the opening of the Wilson St reserve as a shared zone and the reversal of LES traffic flow, all vehicle movements will access LES, Ivy Lane, LES offset carpark and North Eveleigh carpark via Ivy Street and the Wilson St shared zone.

The Lawson St eastbound and westbound Kiss & Ride with associated pedestrian crossing provides ease of use facilities providing drop off/pick up access to the station.

As a result of these changes the LES traffic analysis (NovoRail, 2023) has forecast vehicle volumes within LES to reduce from approximately 750 per day to approximately 50 per day as shown in Figures 3 and 4. This reduction in vehicle movements within LES shared zone results in safety improvements through increasing sightlines and minimising interactions between vehicles, cyclists and pedestrians.

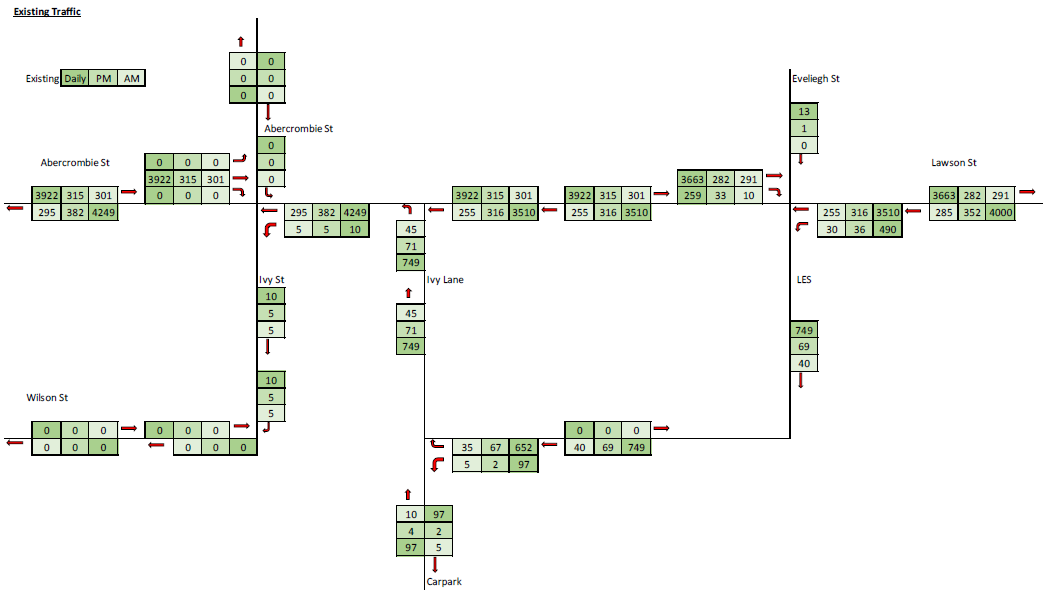


Figure 3 Existing traffic flow data analysis March 2020 (NovoRail, 2023)

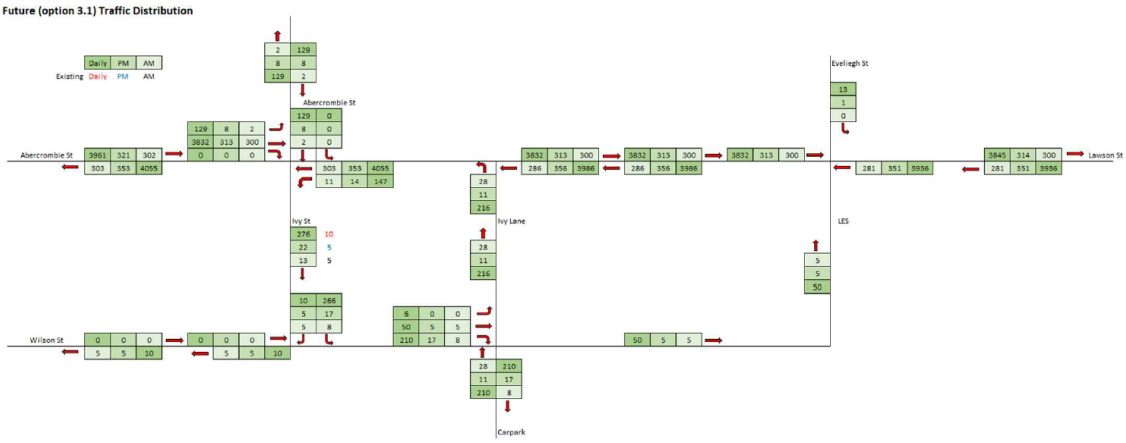


Figure 4 Forecast traffic flow data analysis post implementation of safety measures within the report (NovoRail, 2023)

5 Conclusion

In accordance with condition D63 of the SSI Conditions of Approval for the Redfern Station Upgrade - New Southern Concourse Project, an investigation was undertaken to determine if there is a feasible alternative for car park users to access the LES car park during operation. The findings of this report demonstrate that the alternative options proposed in conjunction with an operational solution for all vehicles over 8.8 metres long to access the North Eveleigh Carpark via Carriage works way are suitable within given safety requirements and site heritage constraints. The proposed LES safety initiatives would reduce the vehicle volume on LES from 750 cars per day to 50 cars per day.

Appendix A - Little Eveleigh Street Car Park Access Driveway - Alternate Access Feasibility Report (July 2021)

Little Eveleigh Street Car Park Access Driveway

Alternate Access Feasibility Report

Ref: 6618761

Contents

Quality Information

Document	Redfern Station Upgrade – New Southern Concourse
Ref	6618761
Date	August 2021
Proponent name	Transport for NSW
Address	7 Harvest Street, Macquarie Park NSW 2113
Prepared by	Alex Daisy Gibson / Shani Archer
Reviewed by	Tanya Cotes, Tara Wilcoxon, Chris Attard, Emma Brindley-Hawke, Eddie Wu, Tamasin Soehardi, Jacky Komadina

Revision History

	Revision Date	Details	Authorised	
			Name/Position	Signature
1.0	13 August 2021	Issue for consultation	Eddie Wu	
2.0	27 August 2021	Issue to DPIE	Eddie Wu	

1 Background

1.1 Purpose of this Report

The Redfern Station Upgrade – New Southern Concourse project ('the project') is a State Significant Infrastructure project (SSI-10041) which was approved by the NSW Department of Planning, Industry and Environment in December 2020.

Condition D63 of the Approval for the project states that:

> *The Proponent must investigate, in consultation with the City of Sydney Council, the feasibility of providing access to the Little Eveleigh Street car park via Wilson Street, Redfern (near the intersection of Ivy Street). If the investigation indicates that it is feasible to access the car park via Wilson Street, then this access must be considered in the detailed design of the SSI. A report on the investigation must be submitted to the Planning Secretary for information within six (6) months of commencing construction.*
>
> *Note: Changes to the approved access arrangements may need to be further assessed under the EP&A Act.*

The Little Eveleigh Street Car Park proposed for construction as part of the project, will be a public car park for use by residents in City of Sydney. Access to the Little Eveleigh Street Car Park is proposed to be provided via Little Eveleigh Street, which would become a shared zone under the project.

As the location of the Little Eveleigh Street Car Park is within the Redfern North Eveleigh Precinct, and planning for the urban renewal of this precinct is underway, the location of the car park may be an interim measure. In the event that the Little Eveleigh Street Car Park is affected by the planning process for the Precinct, any proposed reconfiguration or relocation of the offset parking arrangements would be undertaken in consultation with relevant stakeholders and in a manner which ensures that the principle of offset parking is provided in perpetuity, and remains within reasonable walking distance of Little Eveleigh Street.

An investigation was conducted into the feasibility of providing alternate access to the new Little Eveleigh Street Car Park in order to assess opportunities to reduce vehicle movements through the future shared zone on Little Eveleigh Street. The purpose of this report is to present the outcomes of the investigation and explain the feasibility of each alternative option in relation to the swept path analysis, heritage impacts, ease of construction, and traffic movements on surrounding streets.

This report outlines the following:

- The current project
- Options for alternative access
- Constraints and opportunities
- Other external factors influencing constraints
- The viability of the alternative access options.

1.2 Consultation

Consultation with the City of Sydney Council has been undertaken as per Condition D63.

2 The Project

2.1 Project Context

In 2019, the NSW Government announced the Redfern Station Upgrade project with an aim to improve accessibility and increase capacity at one of the busiest stations on the rail network. The key Project components include

- A 6 metre wide pedestrian concourse between Little Eveleigh Street and Marian Street
- New stair and lift access from the new concourse to Platforms 1 to 10
- New station entrances interfacing Little Eveleigh Street and Marian Street
- An upgraded station entrance at Marian Street including station services and customer amenities
- A new station entrance at Little Eveleigh Street including station services and customer amenities
    - Formalisation of a shared zone on Little Eveleigh Street including:
    - safety improvements to streetscape such as landscaping, lighting, drainage and pavements
    - relocation of approximately 20 parking spaces (including 18 resident/restricted parking spaces, one accessible parking space and one car share scheme parking space) and buffer zone
    - Utility adjustments
- Upgrade of Marian Street/ Cornwallis Street/ Rosehill Street area
    - Extension of existing shared zone including part of Rosehill Street
    - Safety improvements to vehicle, cyclist and pedestrian interactions including widening
    - Improvements to streetscape such as lighting, drainage, landscaping and pavements as well as utility adjustments
    - Changes to street parking arrangements including removal of approximately 16 parking spaces.

Greater numbers of pedestrians are predicted to use Little Eveleigh Street upon the completion of the shared zone and new station entrance.

Key elements of the project, as documented in the Environmental Impact Statement (EIS) are provided in Figure 1.

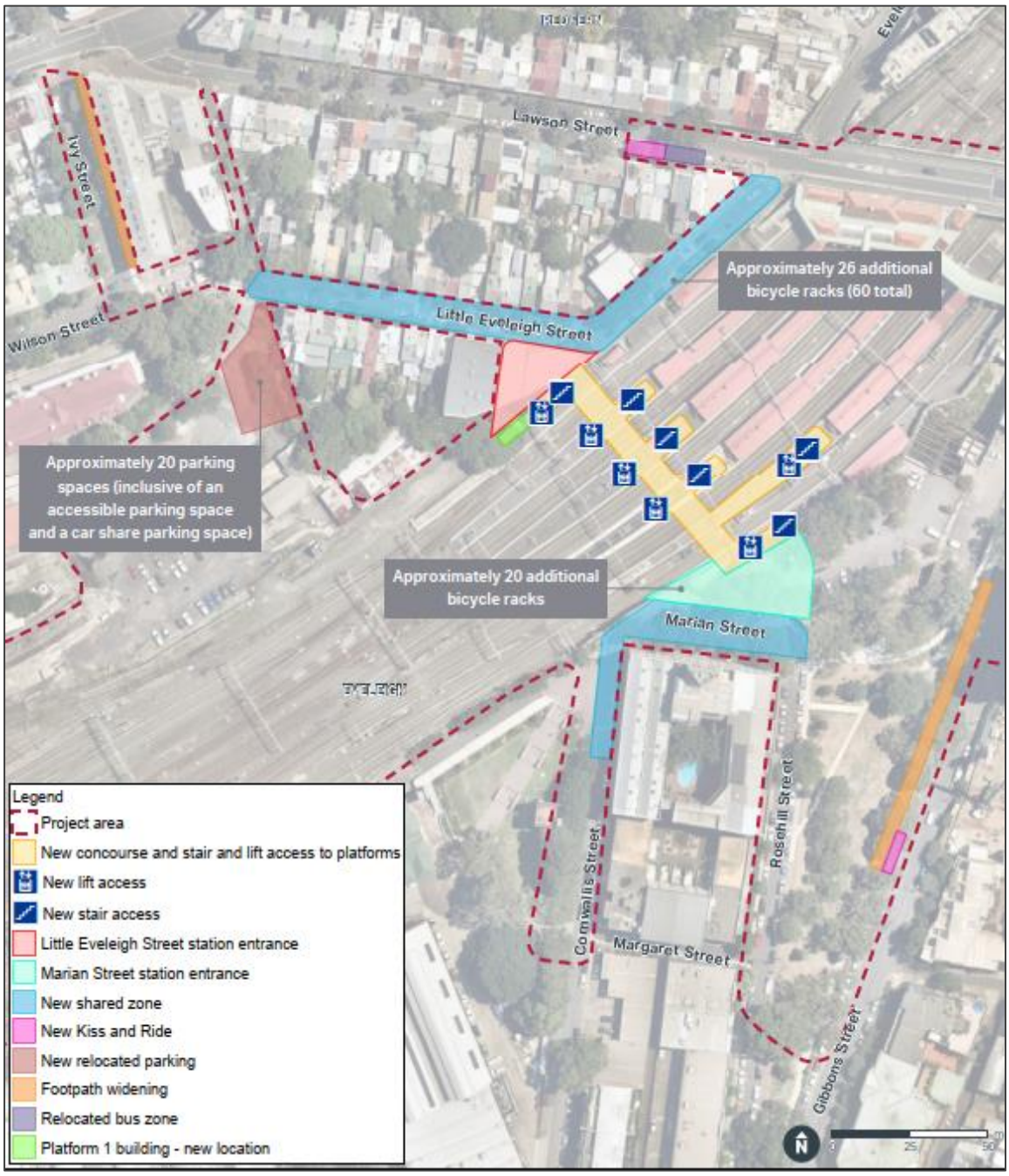


Figure 1: Key project features (as per the EIS)

3 Car Parking Arrangements

Currently there is an existing car park (North Eveleigh Car Park) off Little Eveleigh Street which is accessed primarily via Little Eveleigh Street. There is also a secondary access via Carriageworks Way (off Wilson Street, Macdonaldtown) which is used infrequently.

The primary users of the existing North Eveleigh Car Park include:

- Sydney Trains and New South Wales Trainlink train and maintenance staff; and
- Workers working in the rail corridor, including maintenance and various project crews.

It is acknowledged that the North Eveleigh Car Park is one of very few remaining areas available for operation and maintenance access. During planned trackwork periods the car park serves as a strategic work planning, preparation and access location for the Redfern, Central and Eveleigh sections of the rail network.

The alignment of the existing North Eveleigh Car Park and the proposed Little Eveleigh Street Car Park is shown in Figure 2.

When construction of the Redfern Station Upgrade project is complete, the Little Eveleigh Street Car Park will be accessed by local residents, businesses, visitors and the general public; whilst access to the North Eveleigh Car Park by project and maintenance crews will be maintained. Public access to the North Eveleigh Car Park will be restricted using security gates and fencing.

Under the Redfern Station Upgrade project, Little Eveleigh Street will become a shared zone with a reduced speed limit of 10km/h. Drivers are unlikely to travel along Little Eveleigh Street unless they have a specific requirement to use this road (for example to access a residential garage or the Little Eveleigh Street Car Park).

Figure 2: Approximate location of current and proposed car parks off Little Eveleigh Street

4 Alternative Options

4.1 Background

The following presents the option which was identified as part of the approved project, along with four alternative options that were developed by the Redfern Project team for this feasibility assessment.

4.2 Car Park Configuration – Base Case

The configuration for the access driveway to and from the Little Eveleigh Street Car Park would utilise generally the existing configuration on Little Eveleigh Street, Wilson Street and Ivy Lane. Traffic entering the Little Eveleigh Street Car Park would do so via Little Eveleigh Street, and then would exit via Ivy Lane. Adjustments would be made to signage and the bike lane in this location.

The intent is to replicate the existing parking conditions on Little Eveleigh Street, and make provisions for 20 standard parking spots, 2 accessible parking spots (allow for one deleted from Rosehill Street, Redfern) and 1 carshare spot. The parking restrictions will also be similar to Little Eveleigh Street.

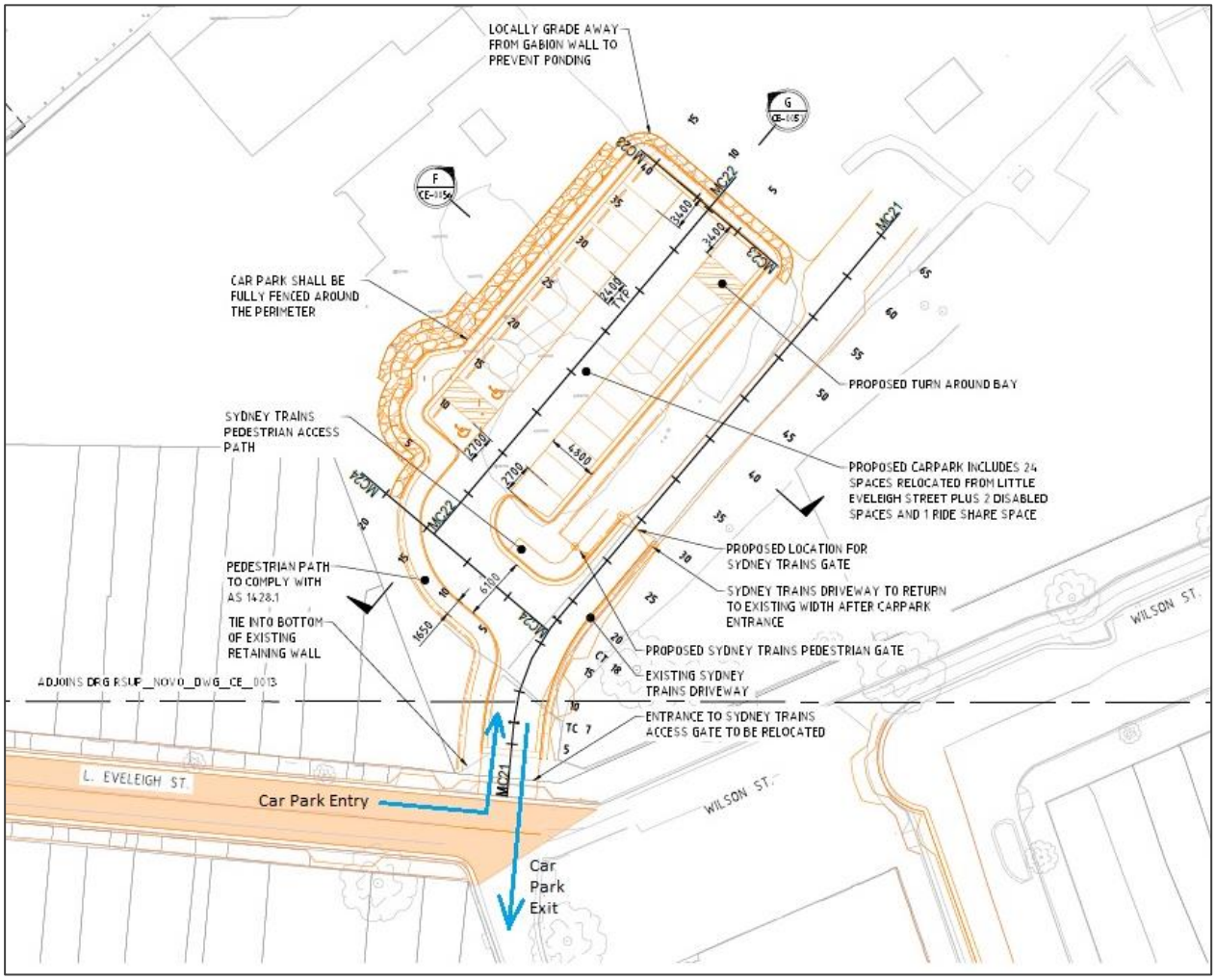


Figure 3: Original configuration: Two-way access via Little Eveleigh Street

4.3 Alternative Option 1 – Access from Wilson Street through current driveway

This option would utilise the existing driveway as a vehicle route from Wilson Street to provide access to the Little Eveleigh Street and North Eveleigh Carparks. Figure 4 below shows the proposed path through the Wilson Street Reserve.

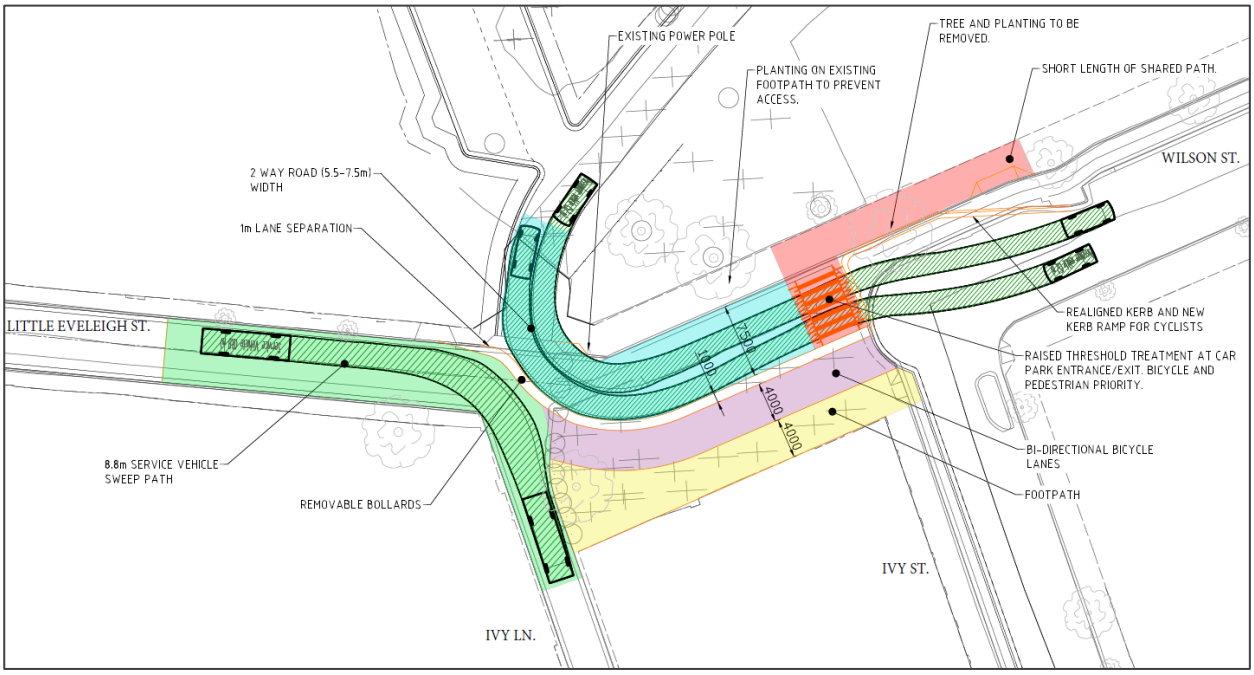


Figure 4: Option 1: Two-way access through Wilson Street Reserve

Captured below are key design elements, impacts and constraints associated with this option.

4.3.1 Design

The design consists of a new two-way road through the Wilson Street Reserve to allow for car park entry/exit via Wilson Street, with physical separation using bollards between Little Eveleigh Street and Wilson Street Reserve traffic.

The alignment has been designed to avoid additional impacts to the landscaping and curtilage of the heritage listed Chief Mechanical Engineers Building adjacent to the current driveway.

4.3.2 Impacts and Constraints

Separation of traffic on Little Eveleigh Street and Wilson Street Reserve is necessary due to conflicts that would exist between motorists, pedestrians and cyclists crossing in this location.

Little Eveleigh Street is one-way and entry to the car park would require travelling in the opposing direction. This would be an unpredictable traffic movement, likely unfamiliar to most users of Little Eveleigh Street, potentially leading to conflicts. As such, road safety assessments and swept path analysis for this option show that without the separation, it is deemed unsafe and not viable. Without the separation, this option would also create a direct path between Little Eveleigh Street and Wilson Street. This could increase traffic down Little Eveleigh Street with vehicular traffic using the route as a short cut.

If the new access road and separation is introduced, there would be insufficient space for vehicles larger than an 8.8m rigid truck (such as rubbish trucks and emergency vehicles) to continue along Little Eveleigh Street and onto Ivy Lane. Vehicles larger than 8.8m may collide with utility poles, buildings or the proposed separation bollards. Manoeuvres such as 3-point

turn (or more) would be required to navigate the bend from Little Eveleigh Street into Ivy Lane and would be highly undesirable in a shared zone. Note that removable bollards could be used for separation and to facilitate larger vehicle manoeuvres, however operation would be complex.

A further potential conflict point is also introduced between the Wilson Street vehicle entry/exit point and the existing shared path on Wilson Street. Pedestrians and cyclists have priority on a shared path, and this would be an additional conflict point with vehicles compared to the existing design. The existing Wilson Street bicycle path would need to be terminated and converted into a shared path with pedestrians. This would create further conflict between pedestrians and cyclists as the shared path is narrowed. Further, the relocated footpath and bicycle path through Wilson Street Reserve requires travelling along/crossing a portion of Ivy Lane to access Little Eveleigh Street. Motorists view of cyclists and pedestrians in Ivy Lane would be restricted when travelling along Little Eveleigh Street.

The other constraint with Option 1 is that the exit movement from the car park is in close proximity to an existing utility pole. There is a high potential this utility pole will be struck by vehicles exiting the car park given the tight radius and the pole may require relocation. The width of the car park entry/exit is also too narrow, and opposing vehicles may collide head-on with limited space to avoid a crash and limited visibility due to the tight radius of the curve.

4.3.3 Conclusion

This option is deemed unsuitable due to issues with additional conflict points, the swept path, risk to nearby infrastructure and safety concerns regarding visibility of oncoming traffic due to the tight turn radius. This option was not considered further.

4.4 Alternative Option 2 – Access Adjacent to Chief Mechanical Engineer's Building

Option 2 accesses the existing access road through the garden adjacent to the Chief Mechanical engineer's building.

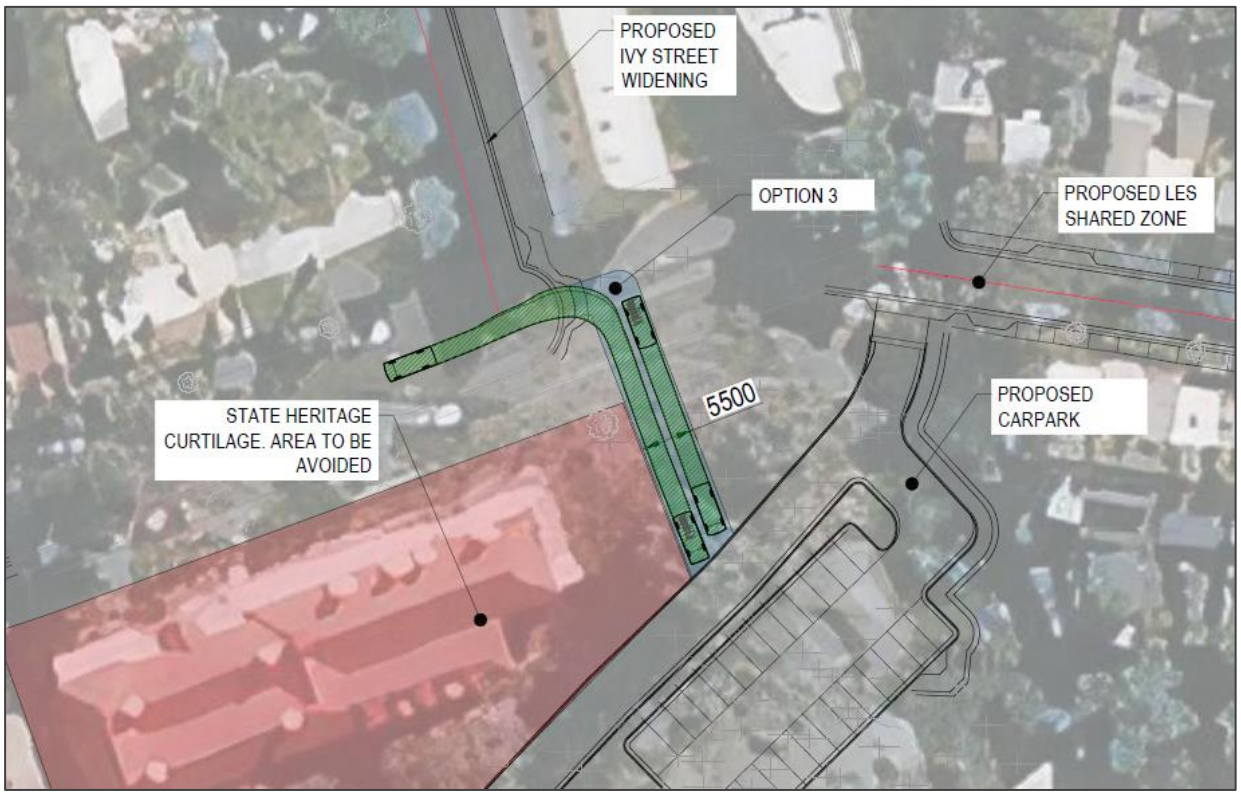


Figure 5: Option 2: Two-way access adjacent to Chief Mechanical Engineer's Building.

Captured below are key design elements, impacts and safety risks associated with this option.

4.4.1 Design

The design consists of a new two-way road through the Wilson Street Reserve, to allow for car park entry/exit to the North Eveleigh Car Park via Wilson Street. It joins the existing driveway through the garden adjacent to the Chief Mechanical Engineer's building, creating separate entries from Wilson and Little Eveleigh Street. The road alignment would be outside the heritage curtilage and aim to remove as few trees as possible.

To prevent this route from becoming a link between Little Eveleigh Street and Wilson Street it would need to be gated, which would restrict movements to authorised users only. There is insufficient turning radius to allow access to the new Little Eveleigh Street Car Park from the new driveway. This option would allow the project to create separate delineated entrances to the Little Eveleigh Street Car Park and the North Eveleigh Car Park. This would improve safety in the Sydney Trains portion of the area, as it intuitively guides the public from inadvertently accessing the North Eveleigh Car Park which interfaces with the rail corridor.

4.4.2 Impacts and Constraints

The main constraint for this option is the Chief Mechanical Engineers Building which is a State Heritage Register item and the adjacent garden's importance to the heritage significance. The alignment of the access road would sit outside the heritage curtilage for the Chief Mechanical Engineer's Building, but the garden that it passes through is of high heritage value to the building. Trees in this area also contribute to the heritage landscape and this option is likely to impact both trees in the vicinity as well as the landscape quality.

Similar to Option 1, this option also introduces a conflict point between the Wilson Street vehicle entry/exit and pedestrian and cyclist access. The existing Wilson Street bicycle path would require termination and convert into a shared path. This option also has increased impacts on pedestrian and cyclist routes as there would be two separate driveways (one to each car park) conflicting with the shared path instead of one. Further, this option has the

potential to create a link between the two streets if the new driveway is left ungated. This has the potential to increase traffic through the Little Eveleigh Street shared zone.

The constructability of this option is also a significant constraint as there is a considerable level difference between the Wilson Street reserve and the existing driveway. The grade of the new driveway would be difficult to achieve and would require retaining structures to be built, further impacting the heritage significance of the Chief Mechanical Engineer's Building.

4.4.3 Conclusion

This option is deemed not viable due to road safety considerations and significant impact to heritage landscaping associated with the Chief Mechanical Engineer's building. This option was not considered further.

4.5 Alternative Option 3 – Corner of Chief Mechanical Engineer's garden

Option 3 follows a similar path to Option 1 through the Wilson Street Reserve but unlike option one, it does not use the existing driveway, but accesses the car park through the garden of the Chief Mechanical Engineer's Building. The intent behind using the corner of the garden is to minimise the impact on heritage values while rectifying the swept path and utility clashes present in Option 1. Unlike Option 2, this option has sufficient turning radius to allow access to both the North Eveleigh Car Park and Little Eveleigh Carpark, allowing the existing driveway to be removed.

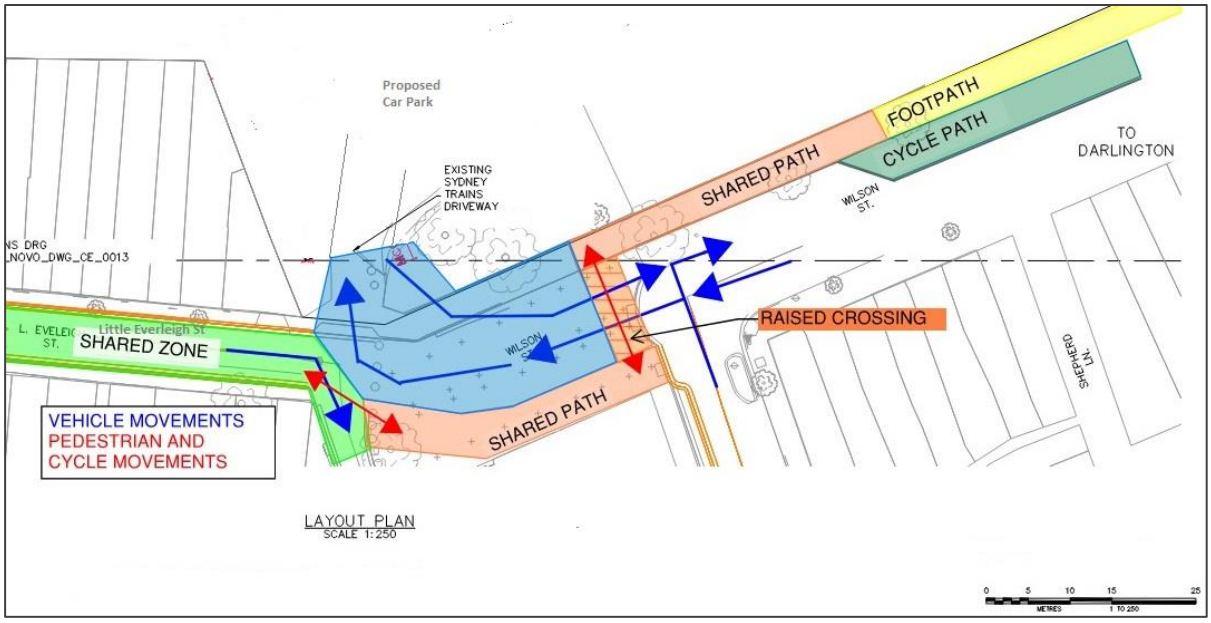


Figure 6: Option 3: Two-way access via Wilson Street, using land within the grounds of the Chief Mechanical Engineers Building

Captured below are key design elements, impacts and safety risks associated with this option.

4.5.1 Design

The design consists of a new two-way access impacting the corner of the Chief Mechanical Engineers Building garden and the Wilson Street Reserve to allow for car park entry/exit to the North Eveleigh Car Park via Wilson Street. It joins the existing driveway through the garden adjacent to the Chief Mechanical Engineer's building. The road alignment would aim to impact the garden as little as possible, though some tree relocation may be required depending on the protection zone for the trees in this area.

The existing bicycle lane would need to be converted into a shared zone approaching a new pedestrian crossing, with a requirement for cyclists to dismount and crossover. To prevent this route from becoming a desired line of travel between Little Eveleigh Street and Wilson Street, separation would be required between Little Eveleigh Street and the new driveway, but should provide sufficient room for vehicles over 8.8m to travel down Little Eveleigh Street and onto Ivy Lane.

4.5.2 Issues and Constraints

The driveway and vehicle path travels through the Wilson Street Reserve with designated pedestrian and cyclist travel paths between the shared zone on Little Eveleigh Street and the additional shared zone created in the Wilson Street Reserve. This attempts to minimise the risk of pedestrians exiting Little Eveleigh Street out onto the driveway and the flow of traffic.

When compared with the existing entrance, the more predictable vehicle movements in this option may decrease likelihood of collisions between vehicles, bicycles and pedestrians, provided the access is used as intended. However this option introduces an additional conflict point between vehicles and bicycles or pedestrians where the new driveway crosses the pedestrian crossing. In addition to this conflict point, motorists' view of cyclists and pedestrians in Ivy Lane would be restricted when travelling along Little Eveleigh Street, which may lead to higher likelihood of collisions between vehicles and pedestrians. There is also a risk of increased pedestrian and cyclist collisions in the narrowed shared zone where the existing bike path would need to be terminated.

There are heritage and environmental impacts associated with this option as it would affect landscaping in the garden adjacent the Chief Mechanical Engineer's Building, with potential tree removal required. There are several constructability issues with this option including known asbestos and services running through the corner of the Chief Mechanical Engineer's building garden that would require relocation.

Access to the Little Eveleigh Street Car Park through Wilson Street, and Egress through Ivy Lane was also considered as a variation of this option to further reduce the impact on the Chief Mechanical Engineer's Building. A traffic assessment determined similar findings to the two lane option through the corner of the garden. This variation also created additional conflict due to the potential for reversed traffic flow in the driveway. Traffic exiting the driveway in a reverse arrangement is unusual and significantly less predictable than a standard arrangement. With this unpredictability, there is an increased risk of a collision between pedestrians and cyclists with vehicles.

4.5.3 Conclusion

This option reduces the impact to the garden adjacent the Chief Mechanical Engineer's Building compared with other options considered in this report. This option provides more predictable and conventional vehicle movements within the vicinity of the access driveway. In addition swept path analysis indicates that this option should provide sufficient room for vehicles over 8.8m travelling at low speeds. This option was considered further in a multi criteria analysis.

4.6 Alternative Option 4 – Chief Mechanical Engineer's building entrance

4.6.1 Introduction

Option 4 would use the existing driveway at the Chief Mechanical Engineer's building, situated off Wilson Street. The driveway would be extended from the back of the building down into the existing North Eveleigh Car Park. This solution would only be suitable for Sydney Trains access to the North Eveleigh Car Park, with the Little Eveleigh Street Car Park to retain the

current access driveway off Little Eveleigh Street. While this option would not directly change the access arrangements to the Little Eveleigh Street Car Park, it would substantially reduce traffic through the shared zone on Little Eveleigh Street.

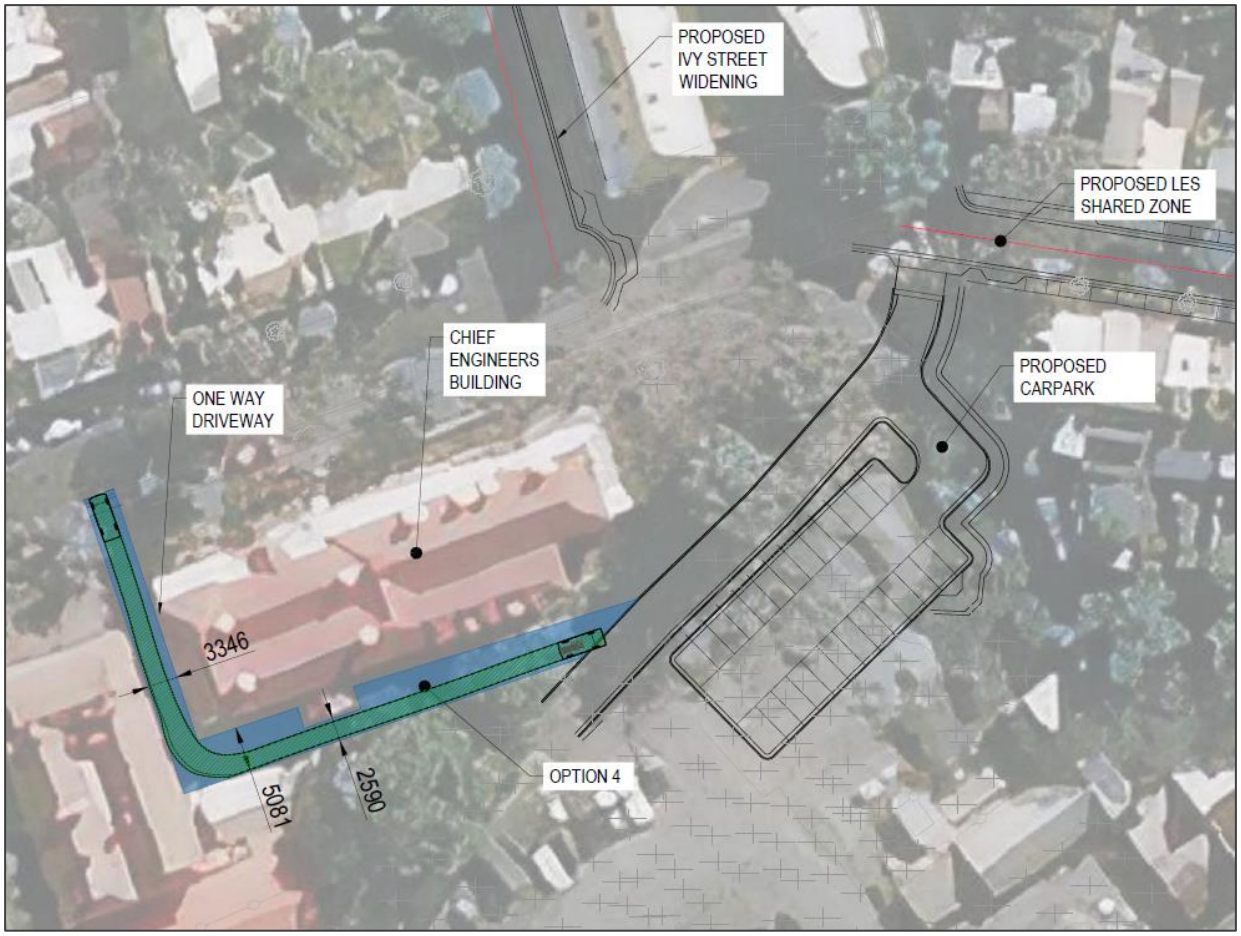


Figure 7: Option 4: One-way access through the back of the Chief Mechanical Engineer's building, for access to the North Eveleigh Car Park only

Captured below are key design elements, impacts and safety risks associated with this option.

4.6.2 Design

The design consists of a new one-way road through the existing driveway entrance for the Chief Mechanical Engineer's Building including an extension to join up to the North Eveleigh Car Park. This would need to be a gated access and "Entry Only" off Wilson Street and it would be for Sydney Trains and NSW Trainlink use only. Exit would be via the existing driveway off Little Eveleigh Street, and exit towards Ivy Lane. More importantly, it would not change public access to Little Eveleigh Street Car Park.

4.6.3 Constraints

Option 4 would involve an extension to the existing driveway which would require extensive leveling works. This would likely impact heritage fabric and landscaping in the vicinity of the Chief Mechanical Engineers Building. This would also be a limiting factor to any adaptive reuse projects on this building in the future.

This alignment would not be wide enough for two standard vehicles to comfortably pass each other. There is a reasonable likelihood of collision and/or damage to the Chief Mechanical Engineer's building. Widening the alignment would cause unacceptable impacts to the heritage fabric of the building.

There is a significant conflict point at the corner of the Chief Mechanical Engineers Building. A blind corner would be introduced requiring a mirror to be installed on the corner of the Chief Mechanical Engineer's building.

Similar to Option 1 and 2, this option also introduces a conflict point at the Wilson Street vehicle entry/exit point as the driveway entry would cross the shared path in this location. Pedestrian and cyclist priority is proposed, but this remains a new conflict point with vehicles that does not currently exist.

4.6.4 Conclusion

This option is unsuitable as an entrance to the Little Eveleigh Street Car Park due to the narrow width of the drive, the proximity and impact to State heritage listed Chief Mechanical Engineer's building, the blind corner at the back of the building and the lack of room to maneuver. This option was not considered further

4.7 Preferred option

Option 1, Option 2 and Option 4 were discounted during the development phase as not being feasible because none of these options provide a safer alternative.

A multi-criteria assessment (MCA) was undertaken in July 2021 to consider the remaining options for accessing the Little Eveleigh Street Car Park (the Base Case and Option 3).

The MCA considered the following criteria:

- Safety and risk
- Design and constructability
- Program impacts
- Traffic impacts
- Environmental impact (including heritage)
- Impact to the community.

The findings of the MCA was that although Option 3 would present a marginal safety improvement if car park users use the area as intended, it would also have significant impacts on heritage fabric and the landscape associated with the Chief Mechanical's Engineer's Building. The original design assessed in the EIS utilising access to the car parks through Little Eveleigh Street does not directly impact on these heritage values and complies with relevant road safety requirements (having passed a road safety audit with no unacceptable risks associated with the design).

The original design is therefore the preferred option to access the Little Eveleigh Street Car Park and the North Eveleigh Car Park.

5 Conclusion

In accordance with condition D63 of the SSI Conditions of Approval for the Redfern Station Upgrade - New Southern Concourse Project, this investigation was undertaken to determine if there is a feasible alternative for car park users to access the Little Eveleigh Street Car Park during operation. The findings of this report demonstrate that the alternative options proposed are not suitable within given safety requirements and site heritage constraints.

5.1 Recommendations

This investigation considered a variety of options for access to the new Little Eveleigh Street Car Park from Wilson Street as detailed herein. However, none of the options considered can be implemented due to road safety concerns and unacceptable heritage impacts.

It is recommended that the current proposed access through Little Eveleigh Street is maintained as it complies with relevant road safety requirements and the impacts on nearby heritage items are considered acceptable. Lighting and privacy impacts will also be taken into consideration when constructing the entrance to the Little Eveleigh Street Car Park. The project will aim to eliminate unwanted light spill as much as possible while still providing the necessary levels of lighting required to navigate the area safely at night, and investigate ways to mitigate privacy impacts, such as installing CCTV at entrances to improve safety, but ensuring that the CCTV cameras are directed away from residences.

Appendix A – Summary of Road Safety Audit

Car Park Access Comparison - Design Safety Assessment

1 Introduction

This memorandum documents the safety findings for four alternative car park access options.

This is not a road safety audit and no action is required to be taken based on the findings. A formal road safety audit will be required at a later date.

2 Assessment Process

A desktop road safety assessment (not an independent road safety audit) was undertaken to identify road safety risks associated with the new Little Eveleigh Street car park and pathway designs. Table 1 and Table 2 below show the definition of frequency and severity of risk respectively, whilst Table 3 shows the matrix of defined risk levels. Table 4 presents suggested treatment approach and indicative timeframes.

Table 1: How often is the problem likely to lead to a crash?

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 2: What is the likely severity of the resulting crash type?

Severity	Description	Examples
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on freeway Car runs into crowded bus stop Bus and petrol tanker collide Collapse of a bridge or tunnel
Serious	Likely death or serious injury	High or medium-speed vehicle/vehicle collision High or medium-speed collision with a fixed roadside object Pedestrian or cyclist struck by a car
Minor	Likely minor injury	Some low-speed vehicle collisions Cyclists falls from bicycle at low speed Left-turn rear-end crash in a slip lane
Limited	Likely trivial injury or property damage only	Some low speed vehicle collisions Pedestrian walks into object (no head injury) Car reverses into post

Table 3: The resulting level of risk

		Frequency			
		Frequent	Probable	Occasional	Improbable
Severity	Catastrophic	Intolerable	Intolerable	Intolerable	High
	Serious	Intolerable	Intolerable	High	Medium
	Minor	Intolerable	High	Medium	Low
	Limited	High	Medium	Low	Low

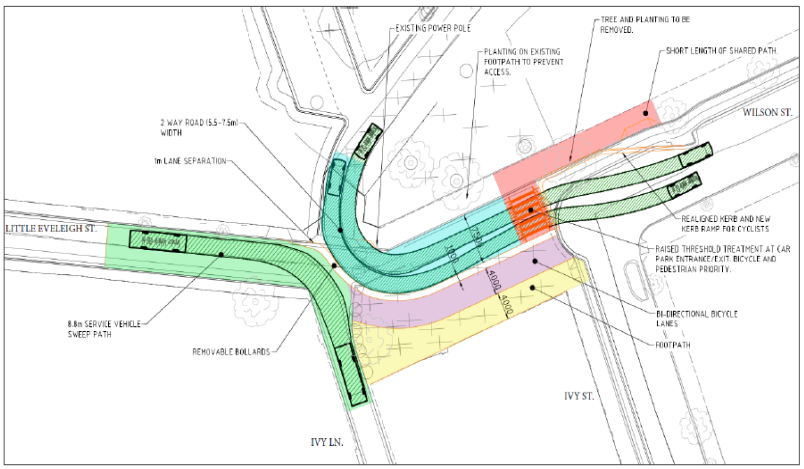
Table 4: Suggested treatment approach and indicative timeframe

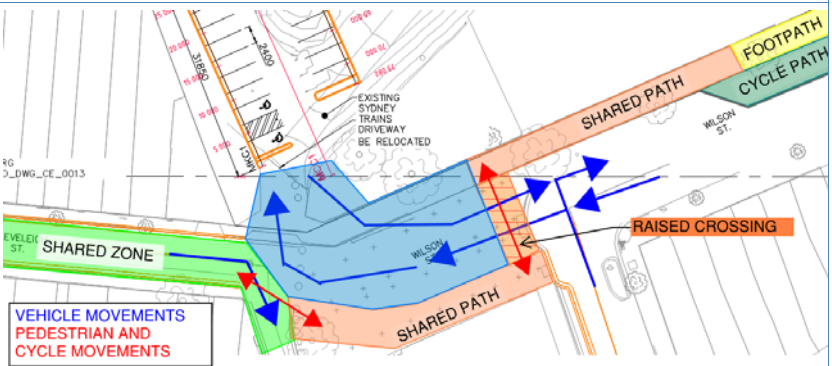
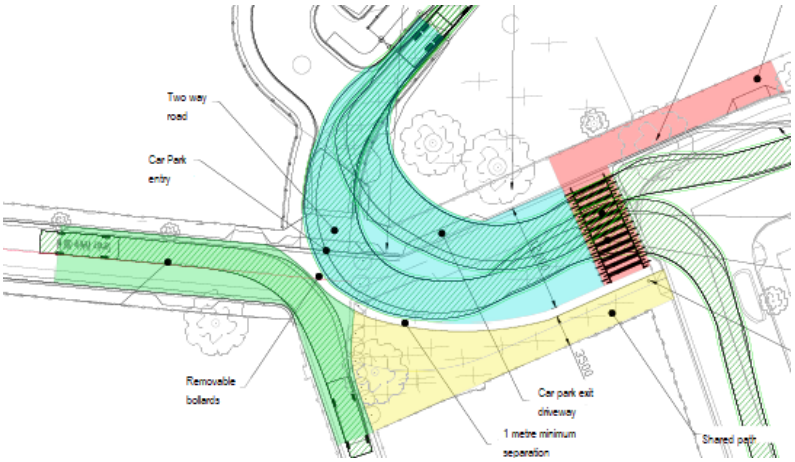
Risk rating	Suggested treatment approach
Intolerable	Must be corrected
High	Should be corrected or the risk significantly reduced, even if the treatment costs is high
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high
Low	Should be corrected or the risk reduced, if the treatment cost is low

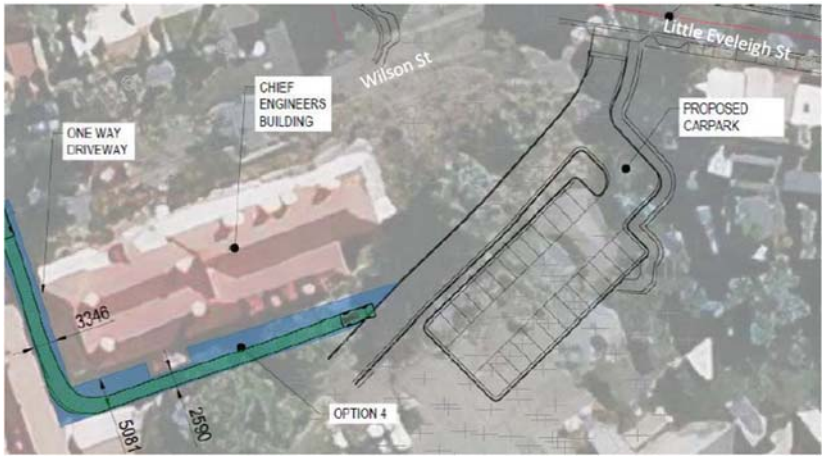
3 Options

Table 5 presents the car park access options and a description of each configuration.

Table 5: Design options (note that colours in figures relate to different components and not to risk ratings)

No.	Description	Image
1	The proposed off street car park is accessed via Wilson St Reserve only from Wilson St or Ivy St - Wilson Street Reserve modified to provide a dedicated driveway and separate footpath and bi-directional bicycle lanes. - A raised threshold treatment (crossing) is provided at the entrance to Wilson St Reserve	

No.	Description	Image
2	The proposed off street car park is accessed via Wilson St Reserve from Wilson St or Ivy St, or from Little Eveleigh St - Entry and exit is adjacent to the Chief Mechanical Engineer's Office, through the garden - A raised threshold treatment (crossing) is provided at the entrance to Wilson St Reserve, which may reduce the footpath / bicycle lane to 3m (1.5m each) from the current design.	
3	The proposed off street car park is accessed via Wilson St Reserve from Wilson St or Ivy St - Wilson Street Reserve modified to provide a dedicated driveway and shared path - Existing utility pole retained between the entry and exit lanes to the car park (driveway crossing widened) - A raised threshold treatment (crossing) is provided at the entrance to Wilson St Reserve	 

No.	Description	Image
4	The proposed off street car park is accessed via Wilson St (entry only) or from Little Eveleigh St - Entry is adjacent to the Chief Mechanical Engineer's Office, west of Ivy Street (one-way only) - Alternate entry and exit are provided in Little Eveleigh Street	

4 Assessment Findings

These findings identify safety risks which differ between the options. It does not constitute a full road safety audit for any of the options.

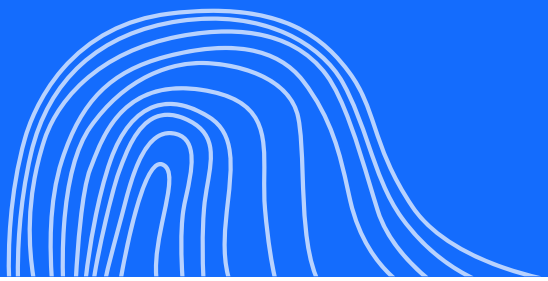
Table 6: Road safety assessment findings

Item	Description of risk to road safety	Option	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level
1	Pedestrians and cyclists travelling between Wilson St and Little Eveleigh St are required to cross the new raised threshold.	1	This is a conflict point where there may be collisions between vehicles and bicycles or pedestrians. While this is a standard crossing treatment with pedestrian and cyclist priority, it remains a conflict point.	Improbable	Serious	Medium
		2				
		3				
		4	N/A for option 4. No raised threshold proposed.	'	'	'

Item	Description of risk to road safety	Option	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level
2	The connection between the end of the Little Eveleigh St shared zone and the shared path/footpath is offset and requires pedestrian/cyclist movement through a small section of Ivy Lane to access Wilson St and Ivy St.	1	Motorists' view of cyclists and pedestrians in Ivy Lane is restricted when travelling along Little Eveleigh St. This may lead to collisions between vehicles and pedestrians.	Improbable	Serious	Medium
		2	N/A for Option 2	-	-	-
		3	Motorists' view of cyclists and pedestrians in Ivy Lane is restricted when travelling along Little Eveleigh St. This may lead to collisions between vehicles and pedestrians.	Improbable	Serious	Medium
		4	N/A for Option 4	-	-	-
3	The existing Wilson St bicycle path is required to be terminated and narrowed into a shared path with pedestrians.	1	There will be conflict between pedestrians and cyclists as this is a shared and narrowed environment.	Occasional	Limited	Low
		2				
		3				
		4	N/A for Option 4	-	-	-
4	The driveway is located where pedestrians and cyclists move between a shared zone and a fully separated pedestrian and cyclist paths	1	N/A for Option 1 The driveway is separated from pedestrian and cyclist movements	-	-	-
		2	The driveway creates a conflict point which may result in collisions between vehicles, cyclists and pedestrians.	Improbable	Serious	Medium
		3	N/A for Option 3 The driveway is separated from pedestrian and cyclist movements	-	-	-
		4	The driveway creates a conflict point which may result in collisions between vehicles, cyclists and pedestrians.	Improbable	Serious	Medium

Item	Description of risk to road safety	Option	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level
5	The existing utility pole is close to the car park access driveway in Little Eveleigh Street.	1	The narrow access provides for both entry and exit movements and is adjacent to an existing utility pole, which is remaining. Errant entry or exit movements may result in a vehicle striking this pole. This movement is made more difficult given the angle of entry and exit required.	Occasional	Minor	Medium
		2	N/A for option 2 Exit movements along Ivy Lane can easily avoid the pole	-	-	-
		3	The access is split to provide entry and exit on either side of the pole. However, errant vehicles may strike the pole when attempting to enter to exit the car park.	Occasional	Minor	Medium
		4	N/A for option 4 Exit movements along Ivy Lane can easily avoid the pole	-	-	-
6	Angle of entry/exit to the new access is acute.	1	The angle of entry/exit may result in vehicles crossing into the opposing lane. This may result in head on collisions.	Occasional	Serious	High
		2		Occasional	Serious	High
		3	N/A for option 3	-	-	-
		4	N/A for option 4	-	-	-

Item	Description of risk to road safety	Option	Reason why risk to road safety is considered to be an issue	Frequency	Severity	Risk Level
7	The one-way entry road is narrow and has restricted sight lines	1	N/A for option 1	-	-	-
		2	N/A for option 2	-	-	-
		3	N/A for option 3	-	-	-
		4	The restricted sight lines mean vehicles are unable to see any other vehicles or pedestrians that may be on the road. This may lead to a collision between a vehicle and vehicle or pedestrian.	Occasional	Serious	High



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