9.3 Bus movements from the Pioneer Avenue compound (C8)

9.3.1 Description of changes

In the environmental impact statement, the indicative number of buses accessing and egressing the Pioneer Avenue compound was identified as four per hour. A more detailed analysis of the workforce numbers and work shift patterns has found that 12 buses per hour would be required at the Pioneer Avenue compound during construction. Additional bus trips would allow greater construction employee transfers and minimise potential construction employee traffic impacts on the surrounding road network.

The route to and from the compound would remain unaltered. Access and egress routes would continue to be examined in consultation with Roads and Maritime and the Transport Management Centre during the development of Traffic Management Plan and Traffic Control Plans to ensure that potential impacts on the surrounding road network and the local community are minimised.

9.3.2 Environmental overview of changes

Changes to the bus movements presented in the environmental impact statement have been reviewed to identify relevant potential environmental impacts for further, more detailed assessment. This review has identified the following issues:

- An increase in the frequency of bus movements may affect the performance of the surrounding road network. Further assessment of construction traffic impacts has therefore been conducted, and is included in **Section 9.3.3**.
- An increase in the frequency of bus movements may change construction traffic noise levels. Further assessment of construction traffic noise has therefore been conducted, and is included in **Section 9.3.4**.

The change in bus movements would not affect other environmental and land use issues.

9.3.3 Construction traffic and transport

The change from four buses per hour to twelve buses per hour to and from the Pioneer Avenue compound (C8) would result in eight additional buses per hour accessing and egressing the site. In total there would be an average of one bus every five minutes. As detailed in Section 5.3.12 of the environmental impact statement, construction working parking and bus transfers at the Pioneer Avenue compound could occur up to 24 hours per day, and seven days per week.

Table 7-17 and Table 7-19 of the Technical Working Paper: Traffic and Transport (Appendix E to the environmental impact statement) indicates that the section of Pennant Hills Road near the Pioneer Avenue compound would experience the following traffic volumes in 2016 (at the anticipated commencement of construction), including other construction traffic from the project:

- For northbound spoil disposal:
  - Around 3,200 to 3,660 vehicles (320 to 340 heavy vehicles) northbound in the AM peak.
  - Around 2,410 to 3,280 vehicles (240 to 320 heavy vehicles) southbound in the AM peak.

- Around 2,940 to 3,640 vehicles (210 to 230 heavy vehicles) northbound in the PM peak.
- Around 2,990 to 3,040 vehicles (360 to 370 heavy vehicles) southbound in the PM peak.

- For southbound spoil disposal:
  - Around 2,300 to 3,560 vehicles (300 to 340 heavy vehicles) northbound in the AM peak.
  - Around 2,380 to 3,280 vehicles (240 to 290 heavy vehicles) southbound in the AM peak.
  - Around 2,910 to 3,640 vehicles (200 to 210 heavy vehicles) northbound in the PM peak.
  - Around 2,980 to 3,010 vehicles (340 to 350 heavy vehicles) southbound in the PM peak.

An additional eight buses in either the AM or the PM peak would represent a negligible increase in total traffic volumes.

Table 7-18 and Table 7-20 of the Technical Working Paper: Traffic and Transport presents the anticipated performance of the Pennant Hills Road / Duffy Road and Pennant Hills Road/ Dartford Road intersections. This data is summarised in **Table 9-9**.

Table 9-9 shows that while the Duffy Road and Dartford Road intersections would be constrained during both the AM and PM peak periods, the addition of a further eight buses in either of these periods is unlikely to lead to a significant change in traffic volumes or intersection performance.

The performance of these intersections without construction is:

- Pennant Hills Road / Duffy Avenue LoS F in both the AM and PM peak.
- Pennant Hills Road / Dartford Road LoS F in the AM peak and LoS C in the PM peak.

This indicates that the poor intersection performance is mainly associated with background traffic growth and is not a result of the project contribution alone.

Table 9-9 Predicted intersection performance (2016)

Intersection/Peak	2016 – With Construction			
	Light Vehicles	Heavy Vehicles	Average Delay (s)	Level of Service
Pennant Hills Road / Duffy Road – northbound spoil disposal				
AM Peak	3,620	770	>100	F
PM Peak	4,950	590	>100	F
Pennant Hills Road / Duffy Road – southbound spoil disposal				
AM Peak	3,620	680	>100	F
PM Peak	4,980	500	88.3	F
Pennant Hills Road / Dartford Road – northbound spoil disposal				
AM Peak	3,460	730	>100	F
PM Peak	4,670	560	66.5	E
Pennant Hills Road / Dartford Road – southbound spoil disposal				
AM Peak	3,470	640	>100	F
PM Peak	4,690	470	51.8	D

9.3.4 Construction traffic noise

The increased frequency of buses accessing and egressing the site has also been considered in relation to potential traffic noise impacts. As identified in the traffic assessment above, this would result in an average of one bus every five minutes. As construction traffic noise is considered over a fifteen minute period, the addition of three buses in any fifteen minute period would not result in an increase in road traffic noise of greater than 2 dB(A). The change in bus numbers is therefore unlikely to generate a noticeable traffic noise impact.

9.3.5 Summary and justification

The assessment of the increased frequency of bus movements at the Pioneer Avenue compound (C8) has shown that there would be no material difference in impacts from those described in the environmental impact statement. Maximising the use of buses to transfer construction workers from the Pioneer Avenue compound to construct sites would minimise the potential impacts of construction worker vehicles on the surrounding road network, particularly in terms of road network capacity and efficiency, and the need for car parking to accommodate those workers (especially in relation to reducing on-street parking by construction workers around each construction compound).

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9.4 Amended construction haulage routes

9.4.1 Description of changes

Based on concerns raised in public submissions and through other community and stakeholder engagement mechanisms (refer to **Chapter 5** of this report), access arrangements to certain construction compounds have been reviewed with the aim of reducing the use of local streets, thereby reducing the potential impacts to the local community in relation to construction traffic, noise and safety.

As a result of this review, changes have been made to the construction haulage routes identified in the environmental impact statement for the southern interchange compound (C5), the Trelawney Street compound (C7) and the northern interchange compound (C9). Due to the complexities of gaining access to these sites, the need for flexibility in spoil disposal sites and the different phases of construction activities at each of these sites during the construction period, a number of construction haulage routes have been identified for each site.

Access and egress routes would continue to be examined in consultation with Roads and Maritime and the Transport Management Centre during the development of Traffic Management Plans and Traffic Control Plans to ensure that potential impacts on the surrounding road network and the local community are minimised where feasible and reasonable.

Southern interchange compound (C5)

The construction haulage routes for the southern interchange compound (C5) identified in the environmental impact statement included an access and egress point at Eaton Road. The inbound route from the north involved a right turn at Aiken Road then via Oakes Road, Eaton Road and Karloon Road.

The review of access arrangements has identified five potential alternatives for the southern interchange compound. Some of these arrangements would still require the use of small sections of local roads and, as such, there would be restrictions on the use of these access arrangements outside of standard construction hours. **Table 9-10** identifies the access arrangements and restrictions to use. Each access arrangement is shown separately on **Figure 9-12** to **Figure 9-16**.

Table 9-10 Southern interchange compound (C5) access arrangements

Access arrangement	Description	Use outside standard construction hours
C5-1	New temporary signalised intersection from Pennant Hills Road about midway between the Hills M2 Motorway and the Eaton Road intersections (refer to **Figure 9-12**). This access arrangement is feasible for haulage of spoil to a northern or a southern disposal site.	Yes
C5-2	Left in, left out access from the Hills M2 Motorway off-ramp (refer to **Figure 9-13**). This access arrangement is feasible for haulage of spoil to a southern disposal site.	Yes
C5-3	Left in, left out access from Pennant Hills Road (refer to **Figure 9-14**). This access arrangement is feasible for haulage of spoil to a southern disposal site.	Yes
C5-4	Left in, left out access from Pennant Hills Road, right-out onto Eaton Road (refer to **Figure 9-15**). This access arrangement is feasible for haulage of spoil to a southern disposal site.	No
C5-5	Left in, right out from Eaton Road via an all movements intersection at Pennant Hills Road / Eaton Road (refer to **Figure 9-16**). This access arrangement is feasible for haulage of spoil to a northern or a southern disposal site.	No

Access arrangement C5-1

Access arrangement C5-1 involves the provision of a new temporary signalised intersection from Pennant Hills Road about midway between the Hills M2 Motorway and the Eaton Road intersections. This new intersection would provide for all traffic movements (left and right in, and left and right out). This arrangement could be used for haulage and disposal of spoil in a northern direction and / or a southern / western direction. This access arrangement is shown on **Figure 9-12**.

Access arrangement C5-2

Access arrangement C5-2 involves the provision of a left in, left out access from the Hills M2 Motorway off-ramp via a new access road. Spoil disposal trucks to the south or west would be able to perform a u-turn at the Hills M2 Motorway / Pennant Hills Road intersection to travel westbound on the Hills M2 Motorway. This access arrangement is shown on **Figure 9-13**.

Access arrangement C5-3

Access arrangement C5-3 involves the provision of a left in, left out access from Pennant Hills Road. Outside of peak traffic periods, heavy vehicles would be able to turn around at Beecroft Road (around Observatory Park) to travel to a southern / western spoil disposal site. This access arrangement is shown on **Figure 9-14**.

Access arrangement C5-4

Access arrangement C5-4 also involves the provision of a left in, left out access from Pennant Hills Road. This arrangement also includes a right out egress onto Eaton Road to be able to turn right from Eaton Road onto Pennant Hills Road to travel to a southern / western spoil disposal site. The use of Eaton Road would not occur outside of standard construction hours, when all access would be directly from Pennant Hills Road or the Hills M2 Motorway. This access arrangement is shown on **Figure 9-15**.

Access arrangement C5-5

Access arrangement C5-5 involves the provision of a right turn at the existing Pennant Hills Road / Eaton Road intersection. Heavy vehicles would then access the site at the access point identified in the environmental statement (off Eaton Road). Heavy vehicles leaving the site would be able to turn either left or right from Eaton Road onto Pennant Hills Road to utilise either a northern or a southern / western spoil disposal site. The use of Eaton Road would not occur outside of standard construction hours, when all access would be directly from Pennant Hills Road or the Hills M2 Motorway. This access arrangement is shown on **Figure 9-16**.

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Figure 9-12 Southern interchange compound access arrangement C5-1

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Figure 9-13 Southern interchange compound access arrangement C5-2

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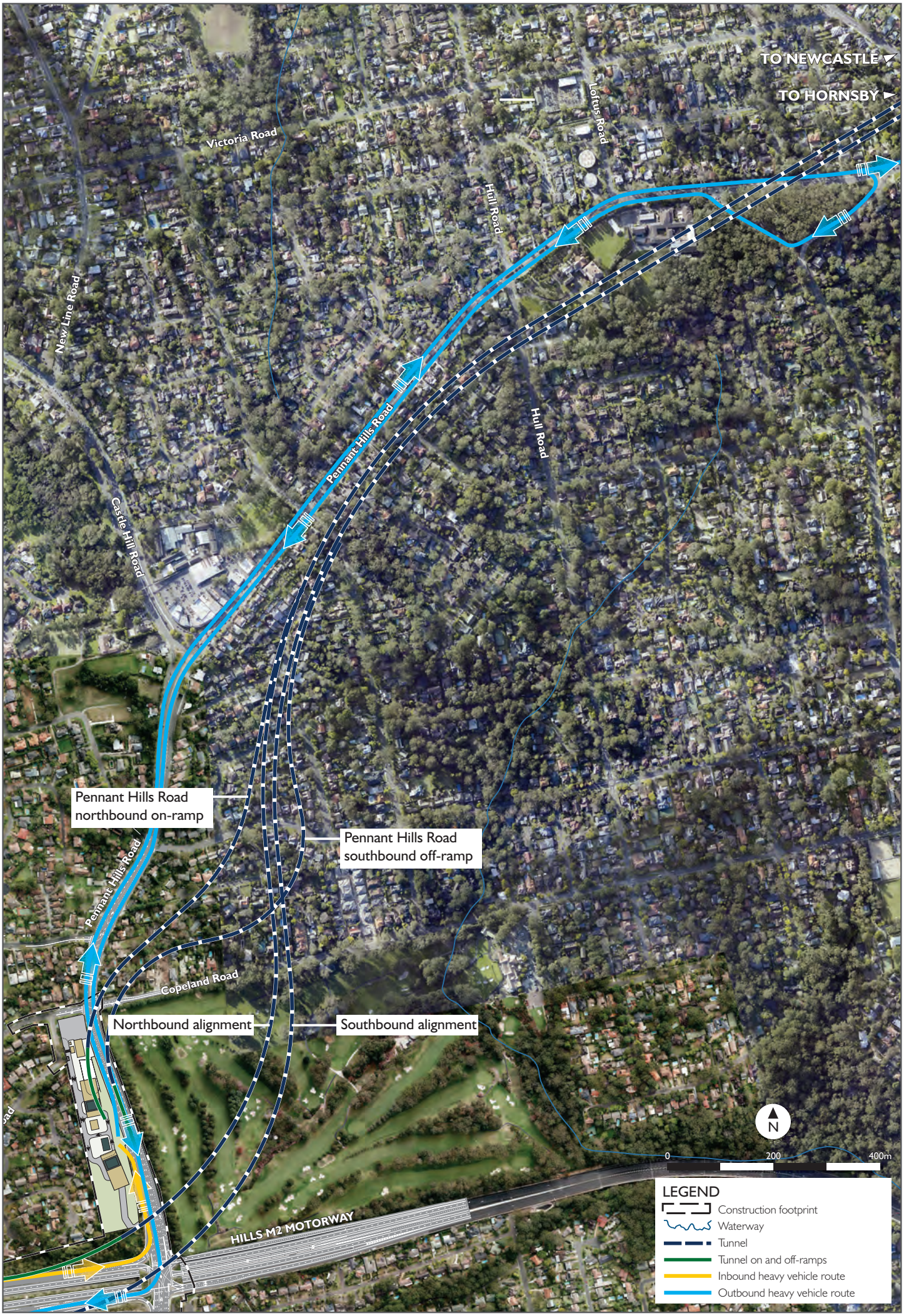

Figure 9-14 Southern interchange compound access arrangement C5-3

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Figure 9-15 Southern interchange compound access arrangement C5-4

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Figure 9-16 Southern interchange compound access arrangement C5-5

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Trelawney Street compound (C7)

The construction haulage routes for the Trelawney Street compound (C7) identified in the environmental impact statement included a left in access from Loch Maree Avenue and a left out egress onto Pennant Hills Road. The inbound route involved either a left turn or right turn into Loch Maree Avenue prior to entering the site. The outbound route to travel to a northern spoil disposal site involved a right turn at Phyllis Avenue, a u-turn at the Phyllis Avenue / Central Avenue round-a-bout followed by a left turn onto Pennant Hills Road.

The review of access arrangements has identified two potential alternatives for the Trelawney Street compound. Some of these arrangements would still require the use of small sections of local roads and, as such, there would be restrictions on the use of these arrangements outside of standard construction hours. **Table 9-11** identifies the access arrangements and restriction to use. Each access arrangement is shown separately on **Figure 9-17** and **Figure 9-18**.

Table 9-11 Trelawney Street compound (C7) access arrangements

Access arrangement	Description	Use outside standard construction hours
C7-1	Left in, right out onto Loch Maree Avenue. This would be facilitated by the all movements intersection at Pennant Hills Road / Loch Maree Avenue (refer to **Figure 9-17**). This access arrangement is feasible for haulage of spoil to a northern or a southern disposal site.	No
C7-2	Left in, left out from Pennant Hills Road (refer to **Figure 9-18**). This access arrangement is feasible for haulage of spoil to a northern or a southern disposal site.	Yes

Access arrangement C7-1

Access arrangement C7-1 involves a left in from and right out to from Loch Maree Avenue. This would be facilitated by the use of the all movements Pennant Hills Road / Loch Maree Avenue intersection. This would allow heavy vehicles to travel to either a northern or southern / western spoil disposal site. The use of Loch Maree Avenue would not occur outside of standard construction hours, when all access would be directly from Pennant Hills Road. This access arrangement is shown on **Figure 9-17**.

Access arrangement C7-2

Access arrangement C7-2 involves a left in, left out access from Pennant Hills Road. Heavy vehicles travelling to a southern / western spoil disposal site would continue along Pennant Hills Road to the Hills M2 Motorway. Heavy vehicles travelling to a northern spoil disposal site would be able to turn around at Beecroft Road (around Observatory Park) to travel north along Pennant Hills Road to the M1 Pacific Motorway. This arrangement is shown on **Figure 9-18**.

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