# Appendix H

## Traffic assessment issues analysis and response

EMM
creating opportunities

# Memo

| | |
|---|---|
| **To:** | Thomas Frankham |
| **From:** | Ody Murlianto |
| **Subject:** | **Hunter Valley Operations Continuation Project EIS Review** |
| **Our ref:** | PS204979-SYD-PAM-MEM-002 |
| **Date:** | **13 October 2023** |

## 1. Introduction

This memorandum has been prepared to provide a response to submissions received from Transport for NSW (dated 16 February 2023) and Muswellbrook Shire Council (dated 27 February 2023) relating to the Traffic and Transport Impact Assessment (TTIA) prepared for the Hunter Valley Operations Continuation Project EIS; and concerns received from the Hunter Valley Gliding Club (HVGC) regarding the access driveway requirements on Comleroi Road.

This memo aims to further investigate and analyse a number of enquiries which require technical assessment and include the following agreed scope:

1. Collect updated traffic data (Automatic Traffic Counts) and summarise the result at the locations listed below, as discussed with Transport for NSW and HVO. These surveys were conducted to obtain the Annual Average Daily Traffic (AADT) volumes of the road sections to be used to verify the data used in the TTIA. The locations are depicted in Figure 1.1.
   - Golden Highway, south of Comleroi Road
   - Golden Highway north of Comleroi Road
   - Golden Highway, south of HVO's Private Driveway
   - Comleroi Road, north of HVO private driveway
2. Undertake turn treatment warrant assessment taking into consideration the turning movement demand (under existing and operational future scenarios) at the Comleroi Road–Golden Highway intersection and assess against *Figure 3.23 of Austroads Guide to Traffic Management Part 6.*

   Additionally, consider the impact of the proposed closure of HVO private access driveway between Comleroi Road and the Golden Highway in the turn treatment warrant assessment.
3. Assess the suitability of the current HVGC access driveway layout with their current operation (vehicle size, ingress/egress movements and sight distance to the road network) and the proposed impact due to the realignment of Lemington Road.
4. Consider potential traffic and transport impact of the proposed Lemington Road revised alignment in the northern section of the project area to avoid Warkworth Sands Woodlands Ecosystem.

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*Figure 1.1 Traffic survey locations conducted in June 2023*

# 2. Responses

## 2.1 Transport for NSW

### 2.1.1 Item 1

> *It is understood that the proposal seeks to extend existing open cut coal mines to the end of 2050. These are known as Hunter Valley Operations North and Hunter Valley Operations South.*

WSP notes this item raised and acknowledges there are no further actions required to address this item.

### 2.1.2 Item 2

> *The proposal seeks to modify the traffic movement along New England Highway and Golden Highway, through the realignment of the Lemington Road.*

WSP notes this item raised and acknowledges there are no further actions required to address this item.

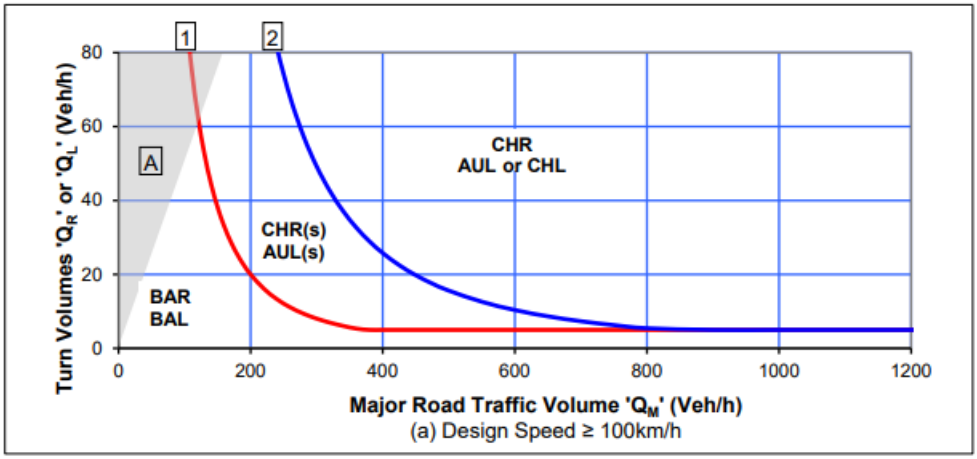
### 2.1.3 Item 3

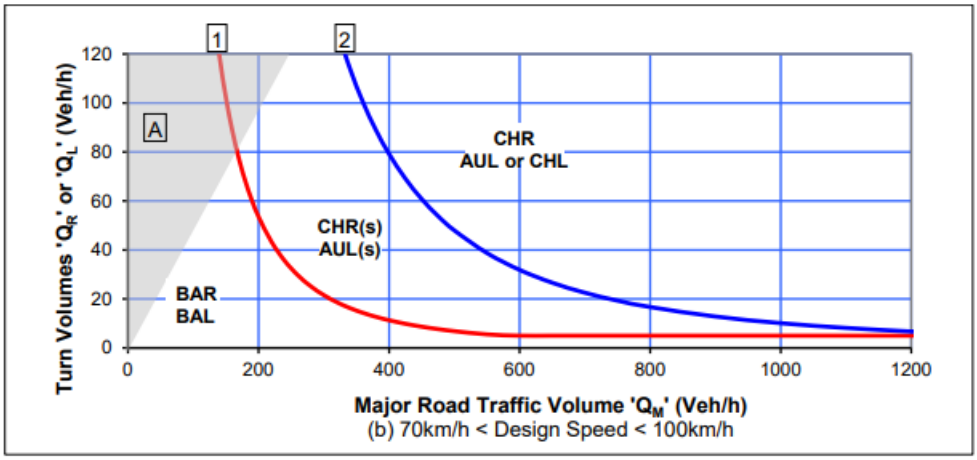
> *In Section 5.2.1 of the submitted TIA, an upgrade of the intersection of the Golden Highway / Comleroi Road to include an CHR and AUL is identified. Further discussion on how these upgrades have been calculated is sought in accordance with Figure 3.25 from Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Management.*

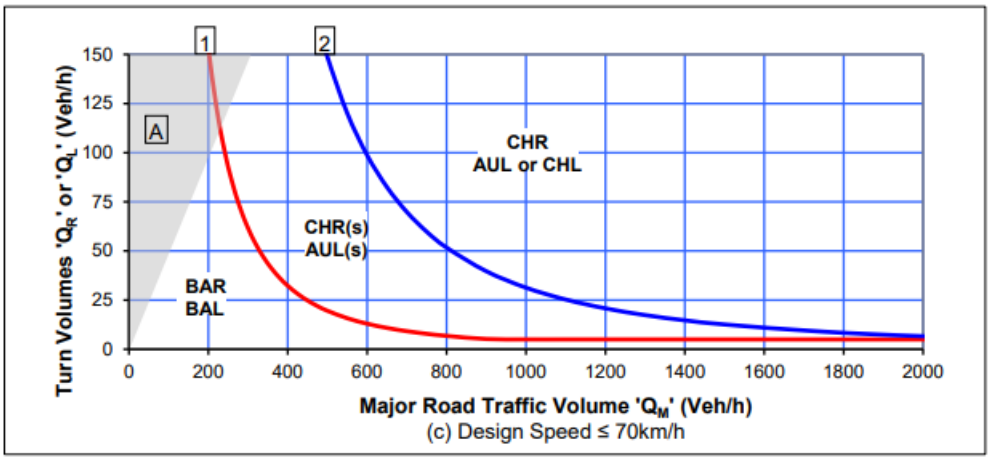
Upgrades to the intersection were determined via a warrant assessment for a Type BA, AU and CH turn treatment. This was done by analysing the traffic volume demands on the minor and major roads at the intersection and assessing these values against the graphs shown in Figure 3.25 from *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Management* (see Figure 2.1 below).

Curves 1 and 2 shown in the diagram are applicable for two-lane two-way roads to depict the boundary between the different treatments (basic and short/regular auxiliary or channelised lanes). For roads with four or more lanes, curve 1 becomes the boundary between a basic and regular auxiliary or channelised lane. Its evaluation mainly focuses on safety performance outcomes, rather than operational. This methodology assesses the need for priority-controlled intersections to provide basic (BA), auxiliary (AU) lane or channelised (CH) lane treatments.

**Figure 3.25: Warrants for turn treatments on major roads at unsignalised intersections**




*Note: the minimum right-turn treatment for multilane roads is a CHR(s).*

*Source: TMR (2016a).*

*Source: Austroads Guide to Traffic Management Part 6*

*Figure 2.1 Warrants for turn treatments on major roads at unsignalised intersections*

### Warrant assessment

As part of the project, HVO proposes to convert the layout of this intersection to consist of auxiliary left turn (AUL) and channelised right turn (CHR). As depicted in Figure 2.2, it currently has a short auxiliary left turn (AULs) measuring approximately 50 metres and basic right (BAR) treatment, which overlaps with the left turn treatment into an access driveway for the United Wambo site.


*Figure 2.2 Comleroi Road–Golden Highway existing intersection layout (MetroMap, April 2021)*

The intersection warrant assessment for the Comleroi Road–Golden Highway is depicted in Table 2.1, overlaid on the turn treatments warrant chart for roads with ≥ 100km/h design speed. The turn demand at the intersection, for both the AM and PM peak periods, have been obtained from the *Traffic and Transport Impact Assessment* submitted to support the EIS. This includes the intersection count undertaken in September 2020 which represent the existing conditions at the site, future scenarios representing 2025, 2035 and 2045 operation of the intersection.

The future year scenarios include considerations of re-routing of trips due to the proposed realignment of Lemington Road. Traffic movements currently using Lemington Road/Golden Highway would travel via Comleroi Road/Golden Highway instead.

The future year scenarios also include a background traffic growth of two per cent per annum applied to traffic on the Golden Highway. This is considered a conservative estimate, considering the latest traffic survey (June 2023) on the Golden Highway indicating an observed background growth of 1.1 per cent per annum compared to the September 2020 data. This is further discussed in Section 2.1.5.

Based on the assessment, it was found that the existing conditions turn demand warrants the intersection to operate with BAL/BAR for the respective left and right turn. As such the current AULs and BAR layout at the intersection is sufficient to service this demand.

In 2025 with HVO, the background growth on the Golden Highway triggers the requirement for the right turn treatment to consist, as a minimum, of a short channelised right turn (CHRs). The left turn requirement would remain at BAL.

In 2035 with HVO, the warrant requires the right turn to operate with CHR and the left turn can remain at BAL.

In 2045 with HVO, the right turn would remain at CHR, and the left turn would be a short auxiliary lane (AULs). This scenario includes considerations in the reduction of right turn demand into Comleroi Road as Ravensworth Operations would conclude its operation in 2039.

The proposed AUL and CHR treatments at Comleroi Road–Golden Highway as part of the Lemington Road realignment therefore would satisfy the warrant requirement at the intersection and suitable for future operations, subject to the appropriate design process.

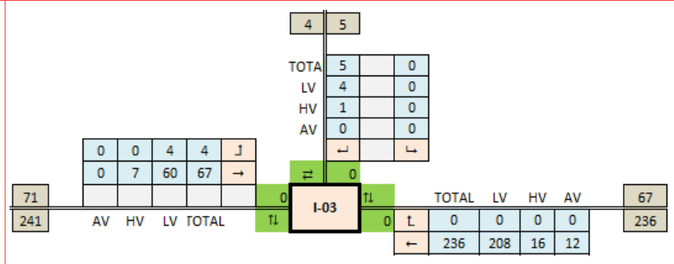
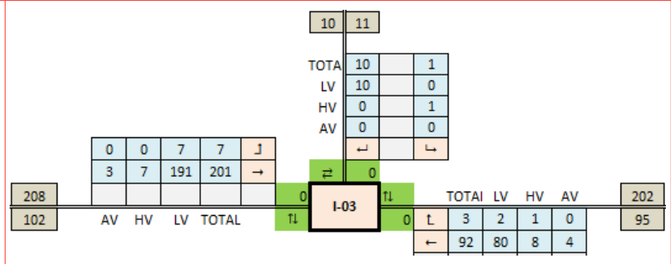
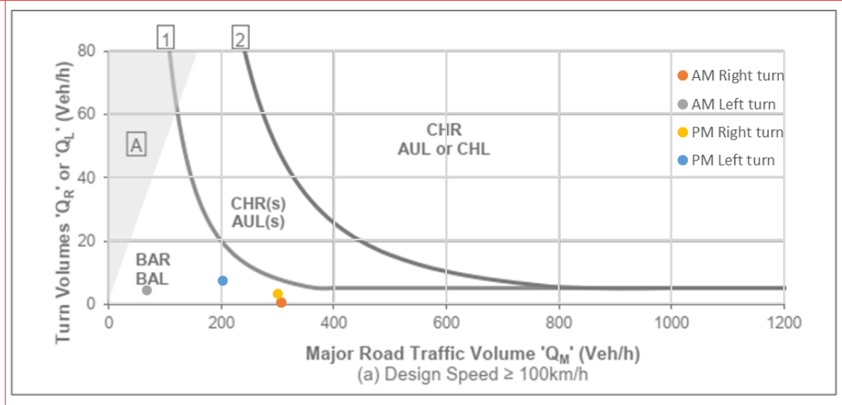
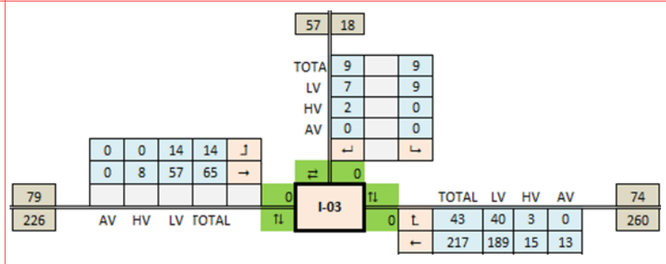
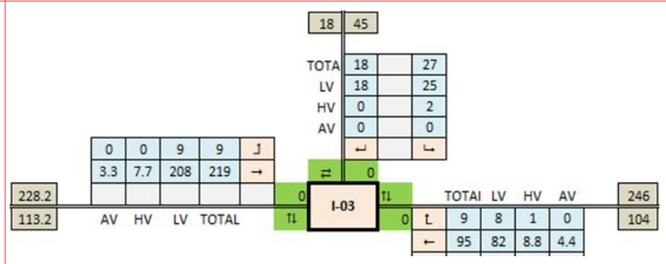
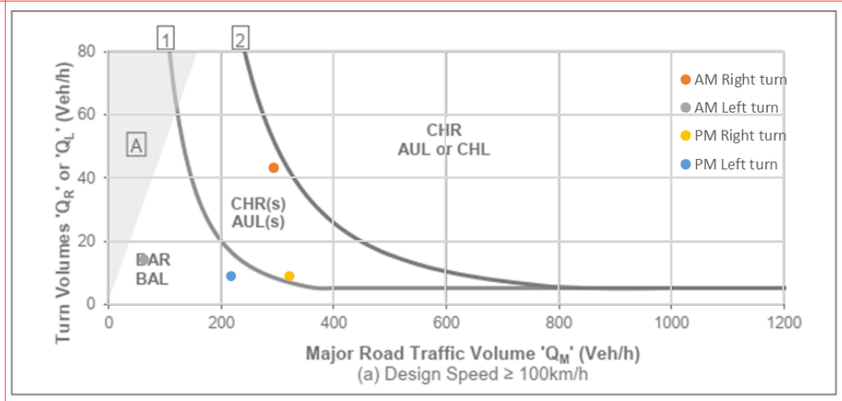
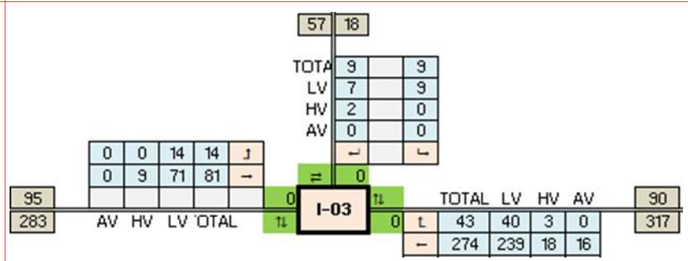
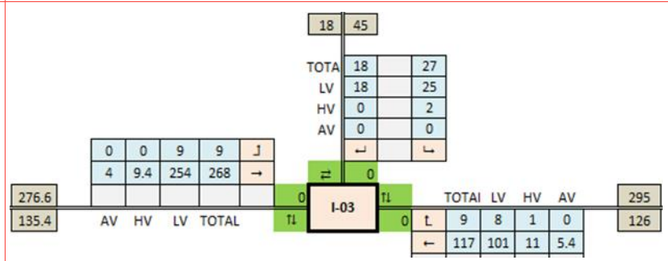
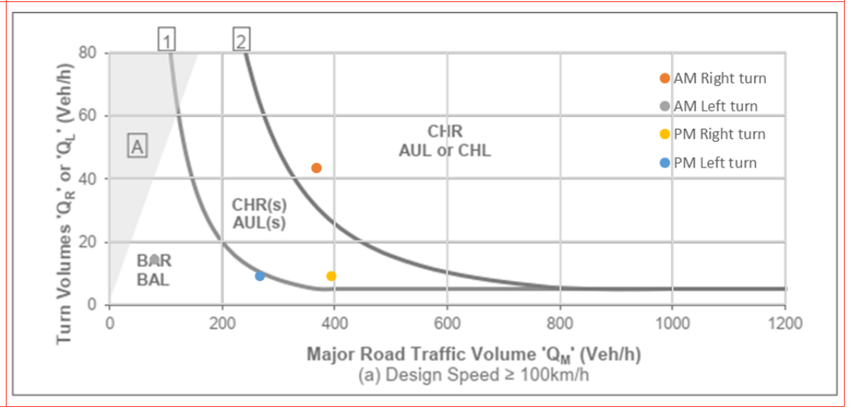
Further to the Lemington Road realignment, the HVO project would also require the closure of the private access driveway with the Lemington Road realignment which currently intersects with Comleroi Road just north of the Hunter Valley Gliding Club (HVGC).

All traffic that would utilise this private driveway to access Golden Highway (and the reverse) would now use the Comleroi Road-Golden Highway intersection. The amount of daily traffic that utilises this driveway is 610 vehicles per day which equates to approximately 60 vehicles in a peak hour. Table 2.2 illustrates the impact of this change to the warrant assessment.

Overall, this change would result in the CHR requirement on Golden Highway, initially triggered in 2035 with HVO, to be needed earlier in 2025 with HVO. The AULs (as a minimum) is required earlier in 2035 instead of 2045.

The proposed AUL and CHR treatments would still satisfy the warrant requirement at the intersection, with the closure of the private driveway.

*Table 2.1 Comleroi Road–Golden Highway intersection warrant assessment with Lemington Road realignment*

| Scenario | AM Peak | PM Peak | Intersection Warrant Assessment |
|---|---|---|---|
| Existing (2020) |  |  |  |
| 2025 with HVO |  |  |  |
| 2035 with HVO |  |  |  |

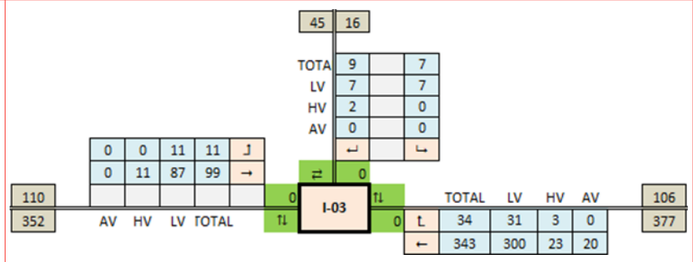
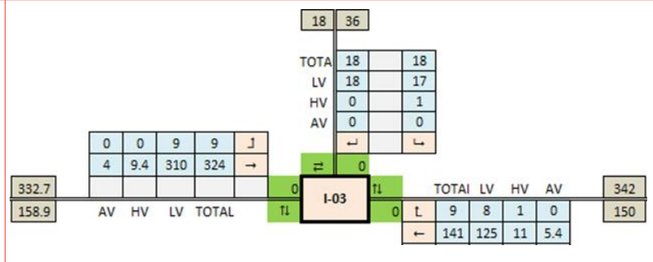
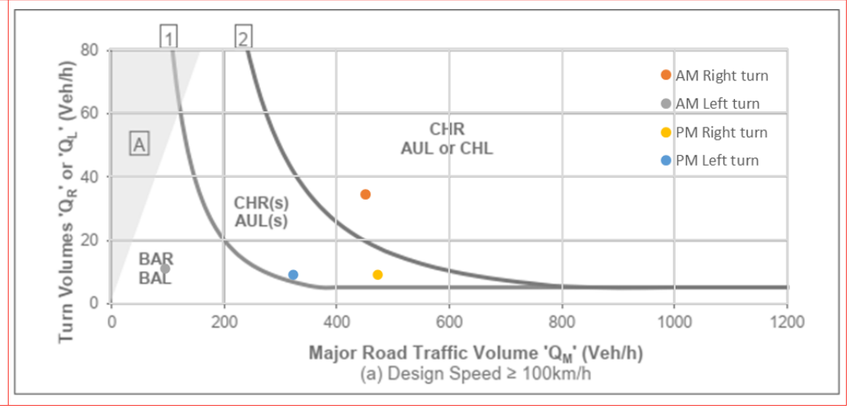
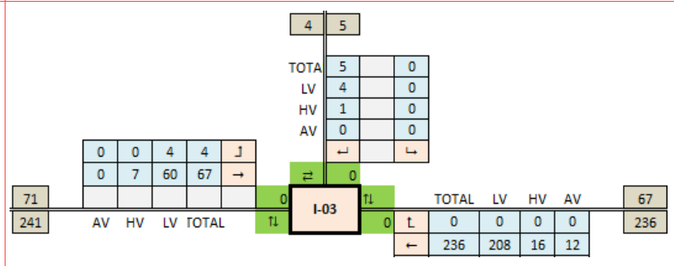
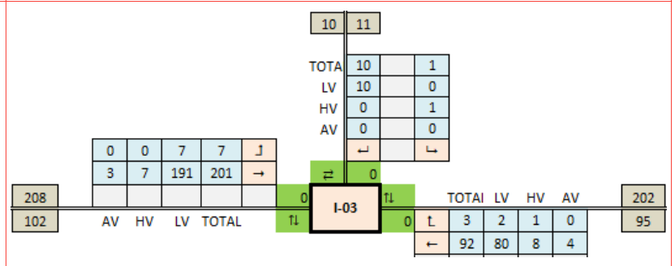
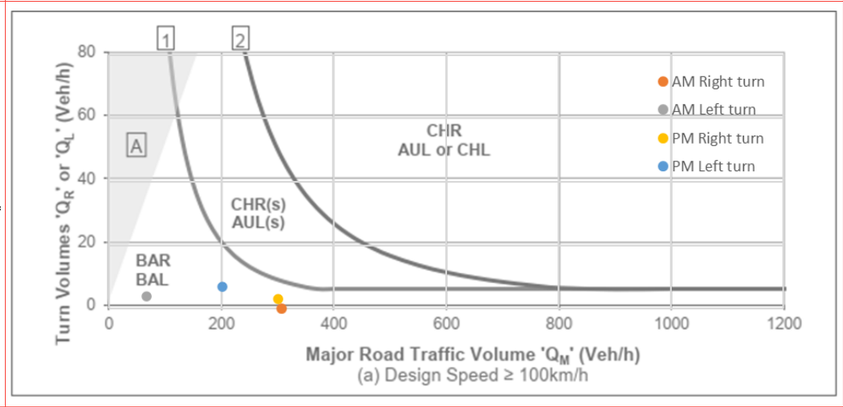
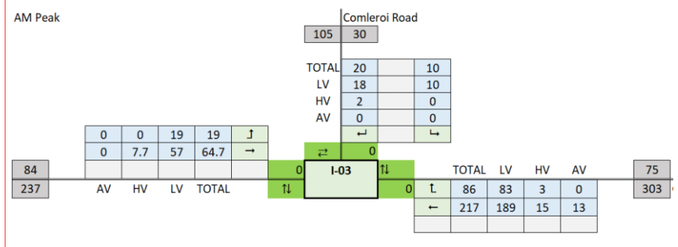
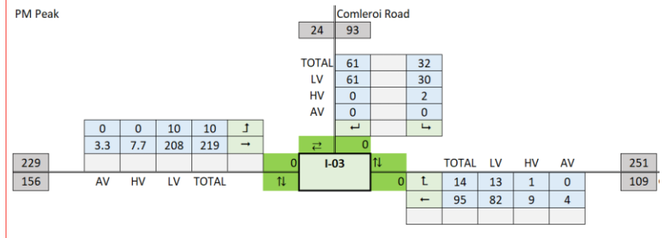
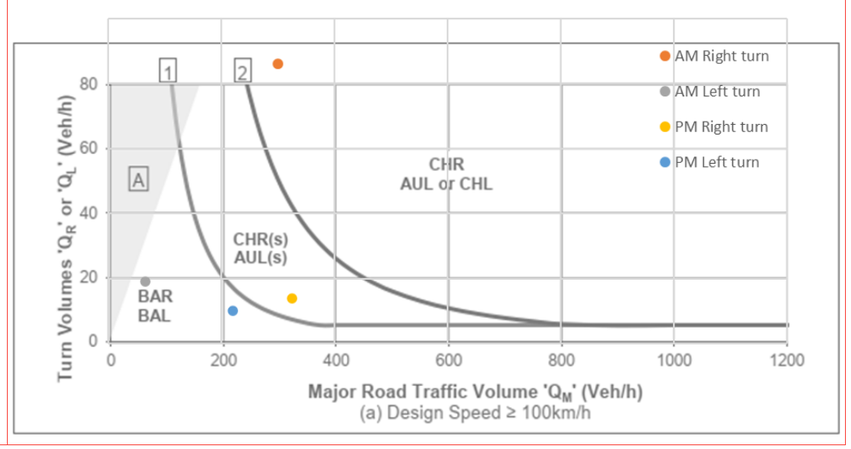
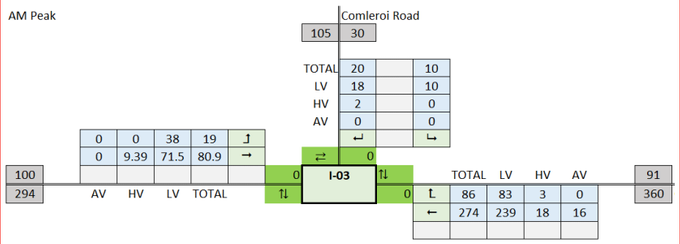
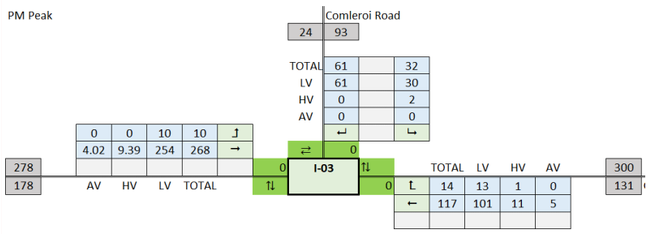
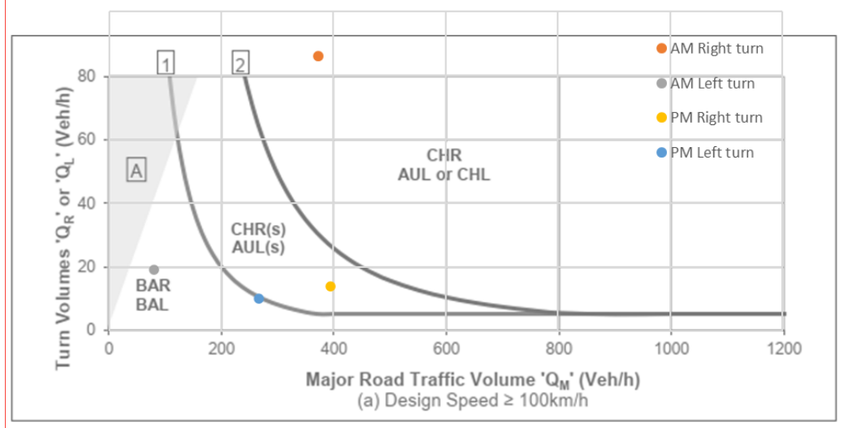
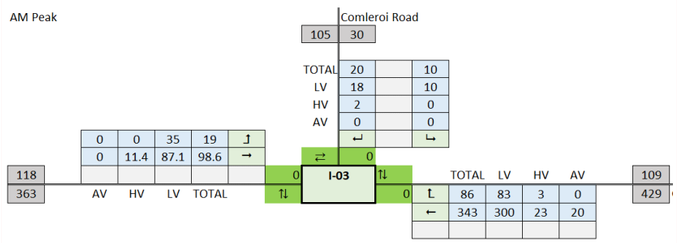
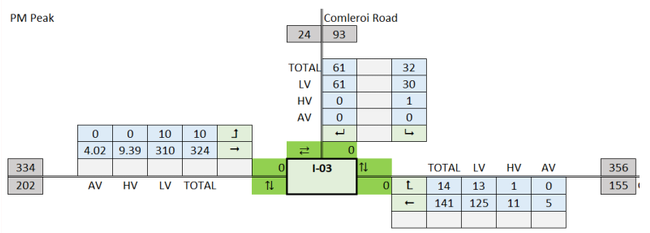
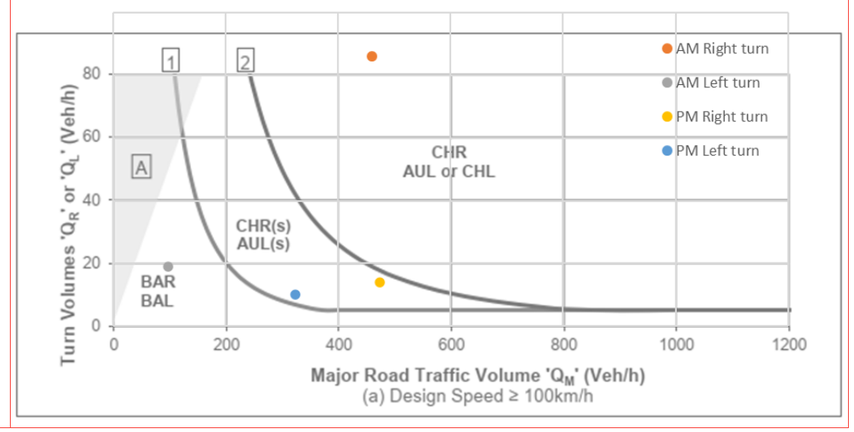
| Scenario | AM Peak | PM Peak | Intersection Warrant Assessment |
|---|---|---|---|
| 2045 with HVO |  |  |  |

*Table 2.2 Comleroi Road–Golden Highway intersection warrant assessment with Lemington Road realignment and HVO private driveway closure*

| Scenario | AM Peak | PM Peak | Intersection Warrant Assessment |
|---|---|---|---|
| Existing (2020) |  |  |  |
| 2025 with HVO |  |  |  |

| Scenario | AM Peak | PM Peak | Intersection Warrant Assessment |
|---|---|---|---|
| 2035 with HVO |  |  |  |
| 2045 with HVO |  |  |  |

### 2.1.4 Item 4

*It is understood that the exact location of this upgrade is dependent upon whether the realignment of the Golden Highway proceeds under the approved 'United Wambo' project to the south. The intersection works should facilitate through-movements along the Golden Highway for PBS Level 3 vehicles.*

This item does not pertain to the Traffic Impact Assessment as part of this Project. It is recommended that this item is considered in the design and included as part of the design criteria to ensure through-movements along the Golden Highway for PBS Level 3 vehicles can be provided.

### 2.1.5 Item 5

*In Section 2.2.1 of the submitted TIA, a discussion is present upon the data collected during the COVID-19 lockdown. It is recommended that an analysis be given with any recent available traffic volumes to determine appropriate baseline data.*

#### New England Highway

Traffic data on the **New England Highway** was verified using Transport for NSW's permanent traffic counter installed near Rixs Creek (Station ID 6153). In the TTIA report, a discussion was made comparing traffic volumes during survey vs pre-covid which only indicates slight reduction. This is reproduced in Table 2.3 below.

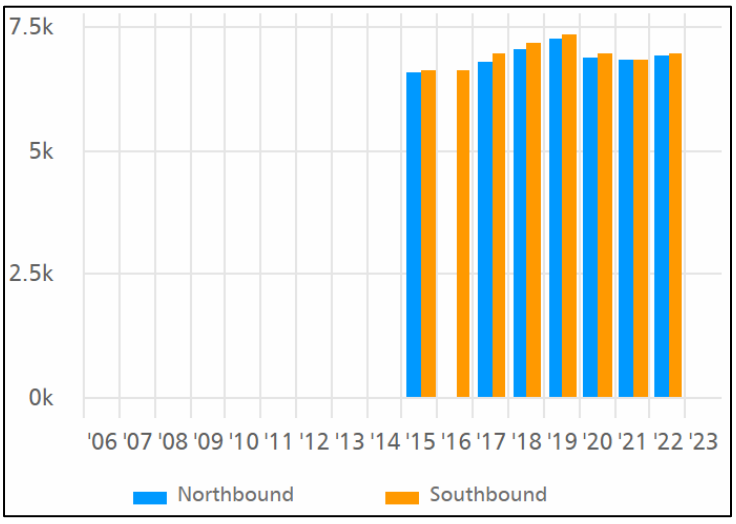
*Table 2.3 Traffic volume comparison to assess COVID-19 impact*

| Source | Date of survey | 7-day average traffic volume (vehicles per day) |
|---|---|---|
| Transport for NSW Traffic Volume Viewer Station ID 6153: New England Highway south-east of Lemington Road | September 2019 | 15,083 |
| | September 2020 | 14,492 |
| | *March 2022* | *13,915* |
| Automatic tube counts New England Highway south-east of Lemington Road | September 2020 | 14,525 |

TfNSW's Traffic Volume Viewer ID 6153 collected data on the New England Highway up until March 2022. The AADT in 2022, up until it stops operating, was **13,915** vehicles per day, which is lower than those surveyed in September 2020.

As shown in Figure 2.3, the traffic demand on the New England Highway has not grown since 2020. The traffic growth observed in the years prior to COVID-19 pandemic has not been observed in recent years.

As such, the traffic data collected in September 2020, as reported in the TTIA, is considered appropriate to be used as baseline assessment.




*Source: Transport for NSW Traffic Volume Viewer*

*Figure 2.3 New England Highway (ID 6153) traffic volume pattern (vehicles per day)*

### Golden Highway

As described in the introduction chapter, one-week Automatic Tube Counts were undertaken on the **Golden Highway,** between 23 June 2023 to 30 June 2023, to obtain the latest Annual Average Daily Traffic (AADT) volumes at different parts of the Golden Highway. The survey locations include:

- Golden Highway, south of Comleroi Road
- Golden Highway north of Comleroi Road
- Golden Highway, south of HVO's Private Driveway

While the most relevant location to verify against the data used in the TTIA is south of Comleroi Road, additional survey locations were requested by HVO to potentially inform other parts of the project.

Table 2.4 depicts the AADT of the Golden Highway (south of Comleroi Road) as surveyed in September 2020 and June 2023, and additional survey locations north of Comleroi Road and south of HVO South private driveway.

*Table 2.4 Golden Highway surveyed traffic volumes*

| Location | Date of survey | 7-day average traffic volume (vehicles per day) |
|---|---|---|
| Golden Highway, south of Comleroi Road (reported in TTIA) | September 2020 | 3,578 |
| Golden Highway, south of Comleroi Road | June 2023 | 3,658 |
| Golden Highway, north of Comleroi Road | June 2023 | 3,180 |
| Golden Highway, south of HVO South entry (private driveway) | June 2023 | 5,551 |

The table above indicates that the AADT of the Golden Highway south of Comleroi Road was surveyed at 3,578 vpd in 2020. The latest traffic count at the same location indicates an AADT of 3,658 vpd. This indicates an increase of 80 vehicles or 1.1 per cent per annum if calculated cumulatively.

The TTIA assumes a background growth rate of 2 per cent per annum on the Golden Highway to estimate future year demand. As such, the assumed background growth is higher than the observed background traffic growth.

Therefore, it is considered that:

- the traffic data collected in September 2020, as reported in the TTIA is appropriate to be used as baseline assessment, and
- that future year scenario analysis reported in the TTIA have considered a conservative background growth of the Golden Highway.

### Comleroi Road north of HVO Private Access Driveway

The survey in June 2023 also included tube counts on Comleroi Road, north of the HVO Private Access Driveway to verify the data collected at the same location in September 2020.

The traffic counts conducted in September 2020 indicated an AADT of 842 vehicles per day, while the survey conducted in June 2023 indicated an AADT of 836.

As such, it is considered that the data used and reported in the TTIA is consistent with the current traffic condition.

### 2.1.6 Item 6

*Delays at intersections I-02, I-05 & I-08 indicate that drivers may be inclined to take less than satisfactory gaps. Existing crash data gives evidence towards fatigue related crashes. TfNSW seeks further discussion on how HVO development operations can assist in making these intersections safer and maintain efficiency.*

As discussed in a meeting with TfNSW (dated 8 June 2023), HVO have a fatigue management plan and policies which includes regular refresher training with the workforce. HVO will commit to reviewing the fatigue management plan to emphasise the risk of fatigue in decision making during driving including awareness of traffic at intersections. This update will include ongoing refresher updates for the workforce for the duration of the project.

### 2.1.7 Item 7

*Part of Lemington Road / Comleroi Road offers restricted vehicle access up to 25/26m B-Double and PBS Level 2A access. Comleroi Road and Lemington Road also form part of the NSW Oversize Overmass Load Carrying Vehicles network.*

These roads would continue to accommodate the specific restricted, oversize and overmass vehicle types subject to road design checks and any swept path/bridge/pavement/structural requirements, which do not pertain to the Traffic Impact Assessment as part of this Project.

### 2.1.8 Item 8

*With the realignment of Lemington Road, Council will need to consider the design of the road and target level of freight access.*

This item does not pertain to the Traffic Impact Assessment as part of this Project. It is recommended that this item is considered in the design and included as part of the design criteria.

## 2.1.9 Item 9

*Additional commentary is sought as to why the 6-7am peak was used noting that slightly higher traffic volumes were identified between 5-6am. Is this the time that the employee shifts start and finish?*

The 6am-7am peak period was used for the assessment as this was found to be the peak traffic activity for HVO and on the Golden Highway. See images below.

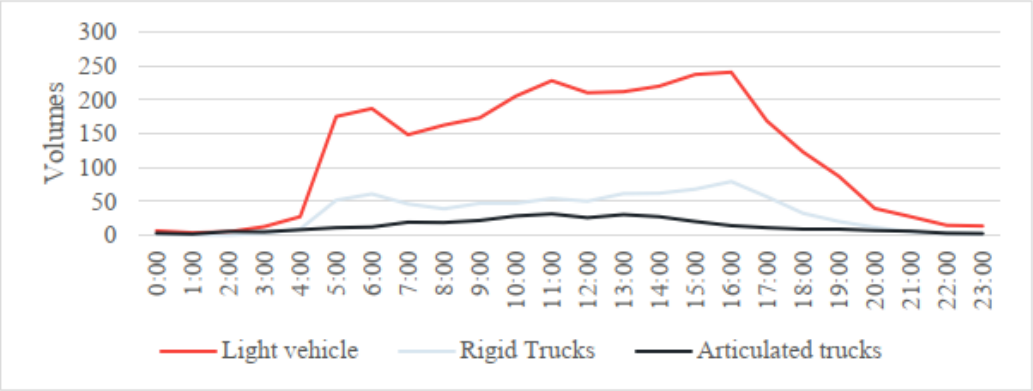



Figure 3.4 Golden Highway east of Lemington Road – heavy vehicle volumes (total)

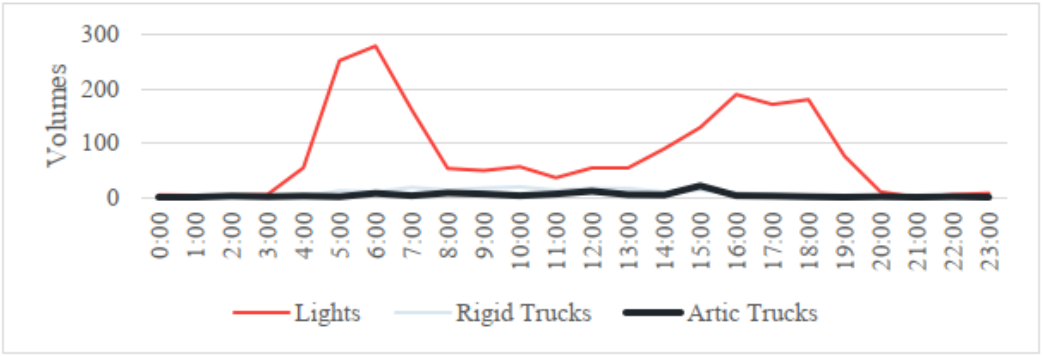



Figure 3.8 Lemington Road south of New England Highway – heavy vehicle volumes (total)

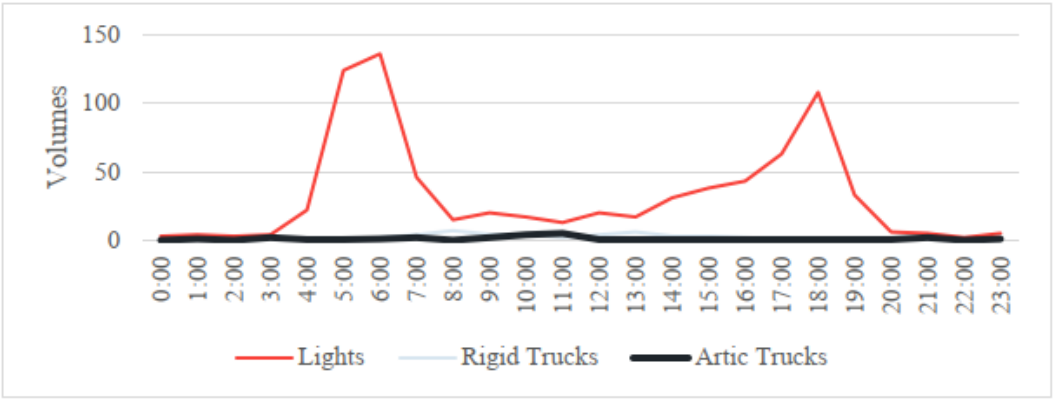



Figure 3.12 Comleroi Road – heavy vehicle volumes (total)

A 5am-6am peak was found on the New England Highway only. Additionally, the intersection surveys across the study area covered periods from 6am onwards, which was decided given the information available at the time. As a result, the peak periods were also validated from these surveys, indicating a peak period between 6am and 7am.

## 2.2 Muswellbrook Shire Council

### 2.2.1 Item 1

*A portion of Liddell Station Road is proposed to be closed as part the Project to enable the extension of the HVLP product coal stockpile. Clarification is required, including a figure showing, that there will be no impacts to Council local roads within the Muswellbrook LGA.*

This item is further clarified in Section 5.1 of the Submission Report (EMM, 2023).

### 2.2.2 Item 2

*Traffic generation and distribution – Section 19.3.2 of the EIS and Section 5 of the TIA states that "workforce numbers will remain approximately as approve...in terms of traffic generation, the Project is not expected to change vehicle movements associated with the operation of HVO". It is difficult to interpret traffic distribution i.e., how many vehicles will enter and leave the site over a given time period without reading the previous EIS's for the existing mine. The Proponent should briefly include this information within the current application for transparency and better communication with the community given the age of the previous approvals.*

Section 3 of the TIA provides explanation of the existing conditions relating to the approved HVO North site. Within this section, Section 3.3 documented the Origin-Destination survey for Lemington Road which outlines the existing traffic generated from HVO and Ravensworth Operation sites and the corresponding distributions throughout the day, AM peak and PM peak. The location of the O-D survey sites are depicted in Figure 2.4.


*Figure 2.4 Origin-Destination Survey Locations*

The tables detail the number of vehicles originating from and arriving to six key locations (Golden Highway (west), Golden Highway (east), New England Highway (west), New England Highway (east), HVO North MIA & HVCPP, Ravensworth Operations). An example of the output, summarising the O-D survey between 6am-7pm is shown in Table 2.5. Additionally, heavy vehicle distribution is also provided Section 3.4 of the TIA.

*Table 2.5 Origin-Destination light vehicle survey result – 6am-7pm daily traffic*

| Destination / Origin | Origin total volumes | 1W – Golden Highway (west) | 1E – Golden Highway (east) | 2W – New England Highway (west) | 2E – New England Highway (east) | 3 – HVO North MIA & HVCPP | 4 – Ravensworth Operations |
|---|---|---|---|---|---|---|---|
| **Destination Total Volume** | **1,780** | **82** | **154** | **138** | **729** | **359** | **318** |
| **1W – Golden Highway (west)** | **67** | 0% | 0% | 0% | 2% | 0% | 1% |
| **1E – Golden Highway (east)** | **132** | 0% | 0% | 1% | 1% | 4% | 1% |
| **2W – New England Highway (west)** | **110** | 0% | 1% | 0% | 0% | 2% | 2% |
| **2E – New England Highway (east)** | **512** | 3% | 0% | 0% | 1% | 11% | 13% |
| **3 – HVO North MIA & HVCPP** | **518** | 1% | 6% | 4% | 17% | 2% | 0% |
| **4 – Ravensworth Operations** | **441** | 0% | 1% | 2% | 21% | 0% | 0% |

This reveals HVO North (off Lemington Road) traffic generation as shown in Table 2.6 depicting the daily and the overall network peak volumes in the AM (6:00-7:00) and PM (16:00-17:00).

*Table 2.6 HVO North traffic generation*

| HVO North | Light Vehicles | | Heavy Vehicles | | Total | |
|---|---|---|---|---|---|---|
| | Inbound | Outbound | Inbound | Outbound | Inbound | Outbound |
| Daily | 359 | 518 | 57 | 58 | 416 | 576 |
| AM peak (6-7 AM) | 122 | 32 | 8 | 0 | 130 | 32 |
| PM peak (4-5 PM) | 9 | 112 | 2 | 2 | 11 | 114 |

Network diagram showing traffic movements during peak hours have also been recorded for the intersections in the study area to gauge the current demand. This includes trips at HVO north access (off Lemington Road) as described above, and those using Liddell Station Road and the north-western section of the study area. This is attached in Appendix A.

The operation of **HVO South** is accessed off Comleroi Road. A mid-block survey was undertaken in September 2020 on Comleroi Road east of the Hunter Valley Gliding Club. HVO South is the only traffic generator using this section of Comleroi Road, thus the northbound and southbound trips captured in the survey present the inbound and outbound trips to HVO South. These are shown in Table 2.7 depicting the daily and the overall network peak volumes in the AM (6:00-7:00) and PM (16:00-17:00). The location was resurveyed in 2023 which indicate an AADT of 836 vehicles per day which indicate generally no change in operations.

*Table 2.7 HVO South traffic generation*

| Mid-block counts on Comleroi Road | Light Vehicles | | Heavy Vehicles | | Total | |
|---|---|---|---|---|---|---|
| | Northbound | Southbound | Northbound | Southbound | Northbound | Southbound |
| Daily | 379 | 399 | 33 | 31 | 412 | 430 |
| AM peak (6-7 AM) | 71 | 65 | 1 | 2 | 72 | 67 |
| PM peak (4-5 PM) | 7 | 36 | 1 | 1 | 8 | 37 |

## 2.3 Hunter Valley Gliding Club

### 2.3.1 Item 1

*Comleroi Road provides access to the HVGC and the HVO South operations. It is an unmarked, sealed two-way, two-lane road, approximately 7-8 metres across with approximately 3.5 metres travel lands in each direction. While the increase is not shown explicitly in the traffic data in the EIS, the realignment will materially and significantly increase traffic on Comleroi Road, perhaps in the order of 50%. During peak traffic flows such as shift change in adjacent mines, queues of traffic will be expected to form from the intersection with the Golden Highway. While there will be some loss of amenity because of increased noise, the most concerning impact is on safety. The driveway to the HVGC facilities and Warkworth Airfield is relatively narrow and visually unobtrusive. It requires vehicles to all but stop in the travel lane before turning. This is especially so for club members' vehicles towing glider trailers which are typically nine metres in length. Appropriate traffic management measures will be required to avoid creating a hazard as other drivers have limited visual cues that there is an exit and vehicles may be slowing and stopping.*

The Hunter Valley Gliding Club (HVGC) provided some feedback on the EIS potential increase of traffic demand with traffic previously using Lemington Road to travel to the Golden Highway to be directed to Comleroi Road with the realignment.

In its correspondence, the HVGC has noted that the driveway to the HVGC facilities and Warkworth Airfield is relatively narrow and visually unobtrusive, which requires vehicles (some with glider trailers attached) to significantly reduce its speed in the travel lane before turning into the driveway. This may be exacerbated with the current Comleroi Road posted speed limit of 100 km/h.

The latest aerial imagery from Nearmap (dated 9 May 2023) is depicted in Figure 2.5. It is noted that the existing driveway to HVGC is:

- approximately 3.8 metres wide (only suitable for one vehicles width).
- approximately 21 metres long before it reaches the gate (suitable for the length of a car towing a glider trailer).
- has minimal signage at the approach to the gate.
- has minimal road widening at the opposite side of the driveway to provide room for concurrent left turn in and right turn out movements for vehicles towing glider trailers.

Further discussions between HVO with the Hunter Valley Gliding Club noted an anecdotal traffic generation observation of six movements per month of vehicles consisting of a car and trailer combination. The Gliding Club generally operates with minimal number of staff daily and can be assumed to generate approximately six movements daily at its peak.


*Source: Nearmap, May 2023,*

*Figure 2.5 HVGC existing access driveway*

### Glider Trailer Vehicle Specification

Transport for NSW, pursuant to the Road Transport (Vehicle Registration) Regulation 2017 provides the following exemption which details the following conditions for glider trailers:

**a)** The glider trailer's Rear Overhang shall not exceed 5.0 metres.

**b)** The width of the glider trailer's body shall not exceed 2.0 metres.

**c)** The glider trailer's overall width, including its wheels and mudguards, shall not exceed 2.5 metres.

**d)** The glider trailer's overall length shall not exceed 12.5 metres.

**e)** The overall length of the towing vehicle and glider trailer combination shall not exceed 19 metres.

**f)** Except for its rear overhang, the glider trailer must comply in all other respects with the vehicle standards applicable to a light trailer in Road Transport (Vehicle Registration) Regulation 2017 and/or Vehicle Standards Bulletin 1, as appropriate.

**g)** The glider trailer may only be used for transporting a glider and any glider accessories associated with gliding, or for empty travel.

**h)** The driver of any vehicle towing a glider trailer must carry a copy of this Exemption, and present it, upon request, to any Authorised Officer of the Roads and Maritime Services or NSW Police Force.

Based on the above maximum dimensions, the design vehicle of a B99 car towing a glider trailer is depicted in Figure 2.6 below. The total length of the vehicle is 19 metres with the trailer extending 12.5 metres long.

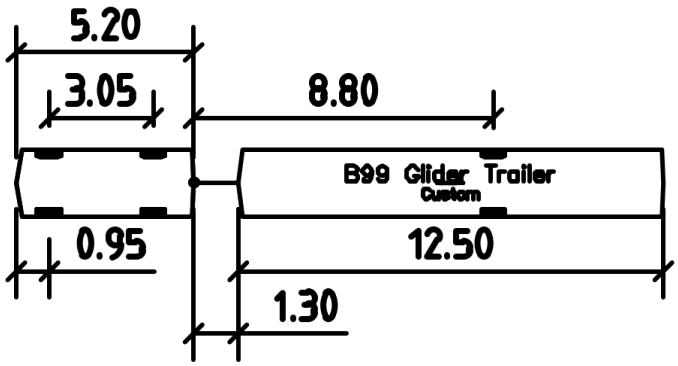



*Figure 2.6 B99 with glider trailer vehicle profile*

### Traffic volumes on Comleroi Road

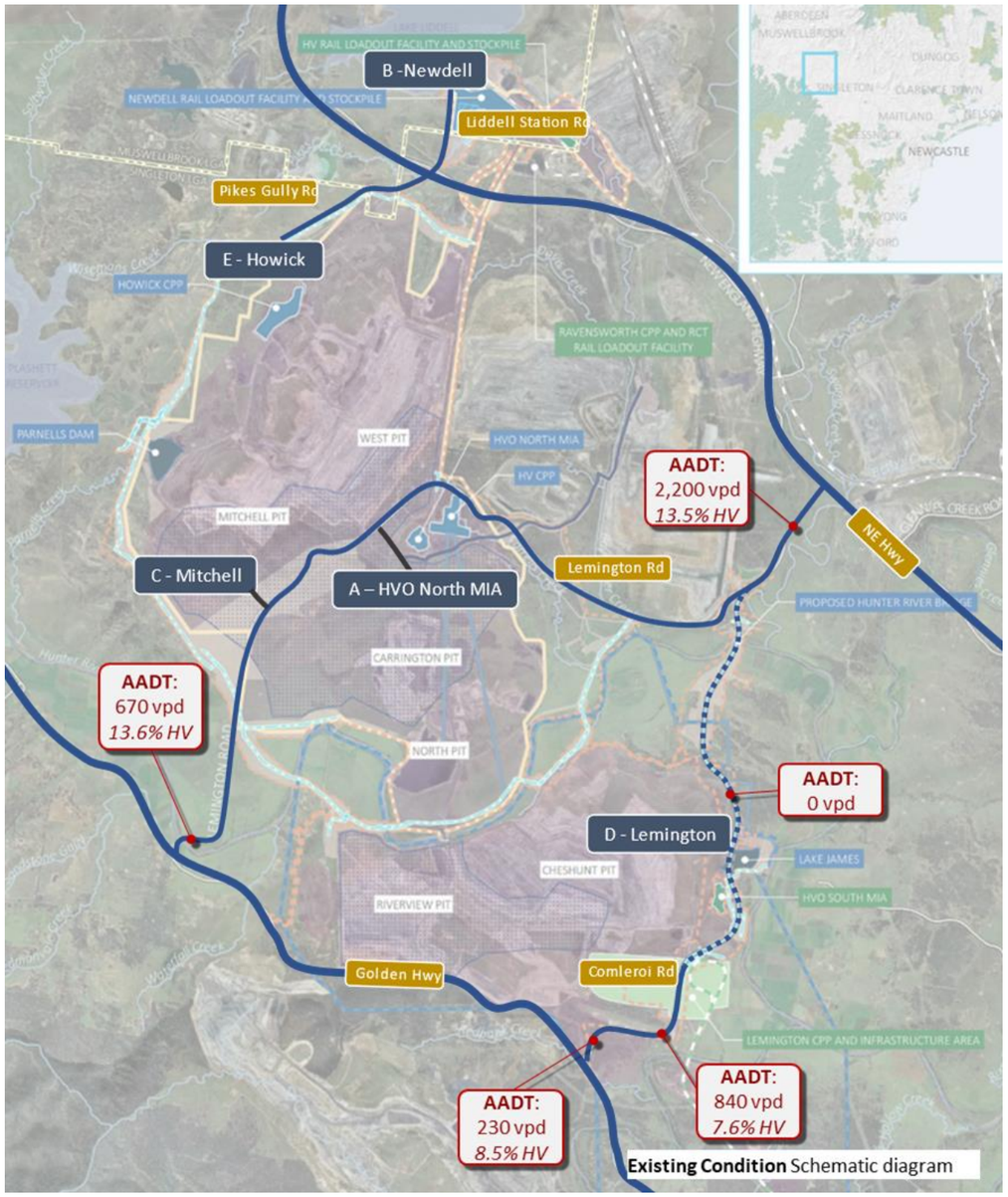
Figure 2.7 provides a summary of the traffic volumes on Comleroi Road and Lemington Road under existing conditions and with the realignment of Lemington Road, and closure of the private driveway access north of the HVGC. This driveway links between Comleroi Road (east of HVGC site) to the Golden Highway (west of Long Point Road West). This driveway provides access to a large proportion of HVO South and reduces the number of trips using Comleroi Road outside of the HVGC access point.

The impact of the Lemington Road realignment would mean that current trips on Lemington Road into/out of the Golden Highway would be detoured using Comleroi Road. This would mean the AADT of Comleroi Road outside of the HVGC may increase from 230 vehicles per day (as surveyed in September 2020) to potentially 900 vehicles per day. Additionally, with the closure of the private driveway access, the AADT of Comleroi Road outside of the HVGC may increase to 1510 vehicles per day.

Based on detailed analysis at the Golden Highway/Comleroi Road depicted in Table 2.1 above, the Lemington Road realignment and HVO private driveway access closure accounts for 145 vehicles per hour at the worst, in the AM peak. This is equivalent to approximately 12 vehicles every 5 minutes, which is still considered very low demand and not likely to result in adverse operational impact.

To confirm that the operation of HVO South has not changed since September 2020, a tube count survey was conducted on Comleroi Road north of HVO private driveway in June 2023 and compared to the survey at the same location from September 2020.

The survey conducted in June 2023 indicate a current AADT of 836 vehicles per day, which is consistent with the traffic data collected in September 2020, indicating an AADT of 840 vehicles per day.



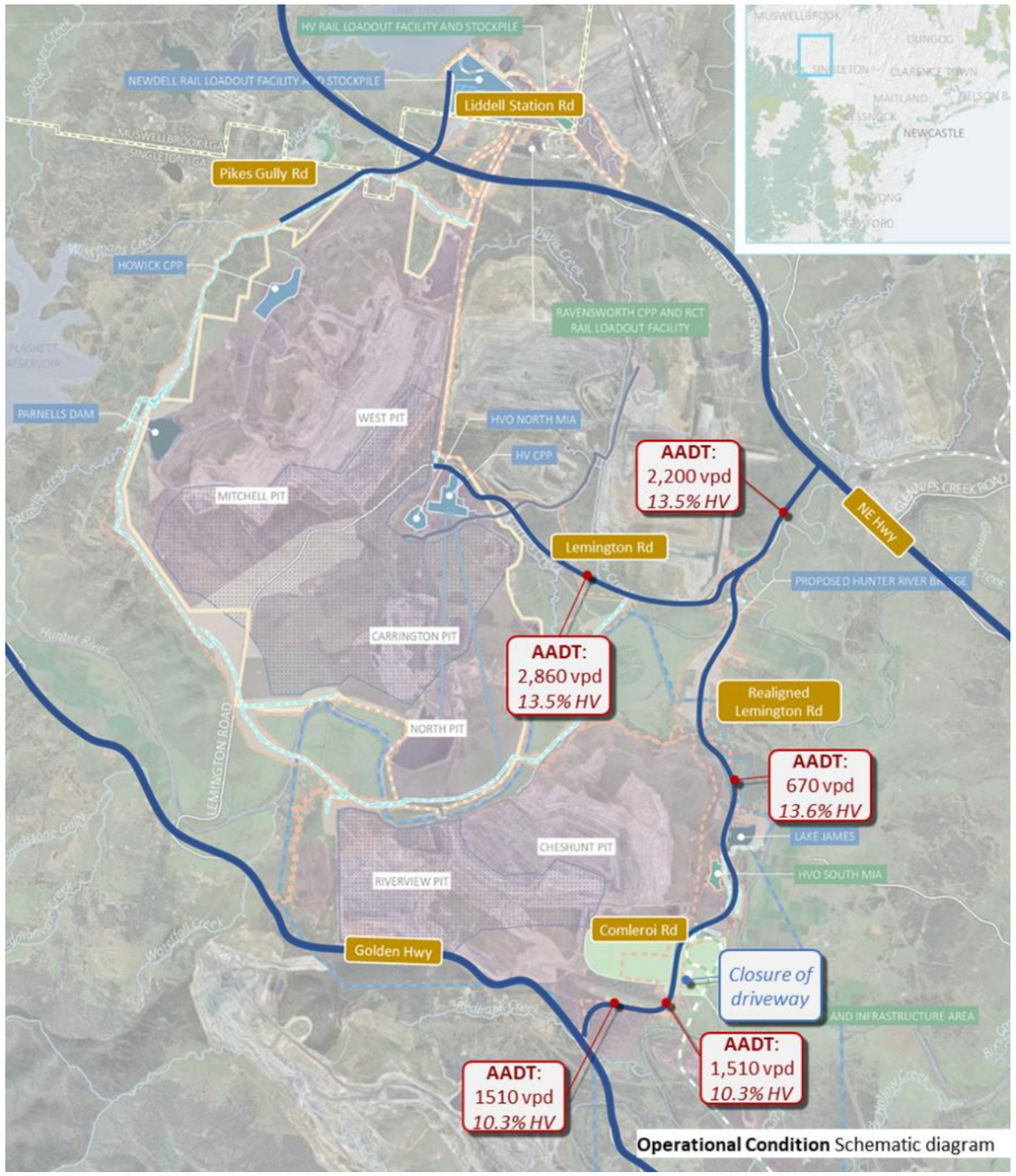




*Figure 2.7 Traffic volume estimates under existing conditions and with Lemington Road realignment*

### Potential modifications to HVGC access driveway

To address HVGC's concerns for safety and access at their access driveway, a number of modifications have been considered to improve access and visibility of the access driveway at its approaches. These include:

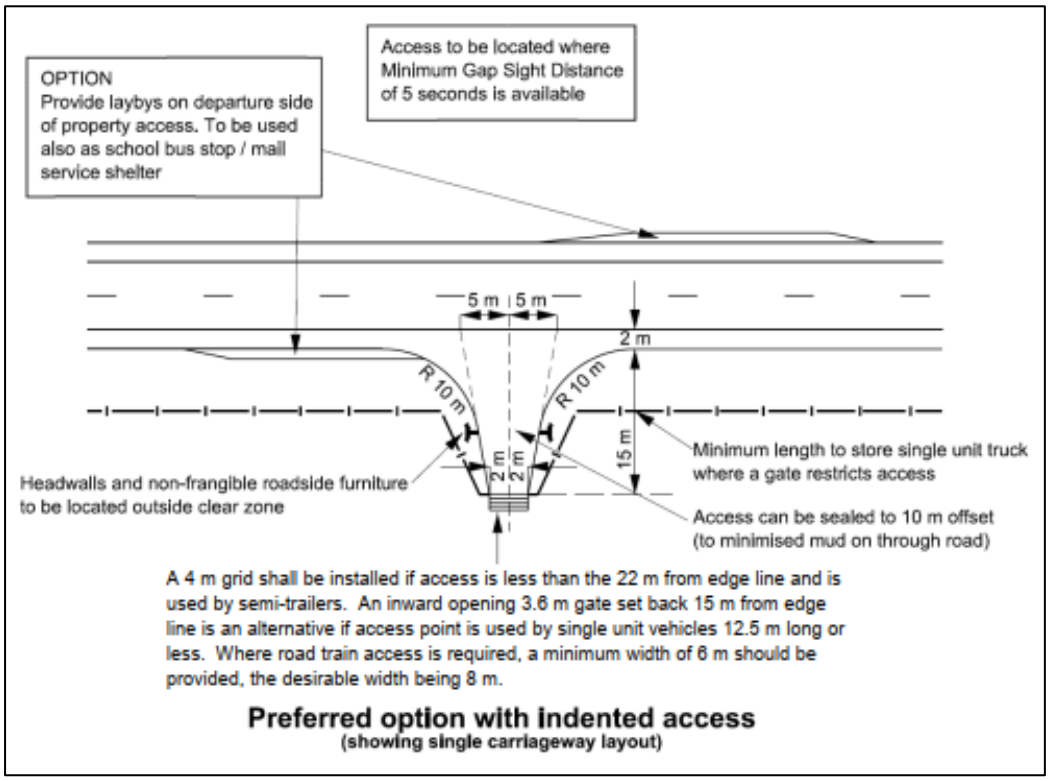
- Widening the existing HVGC driveway to allow two-way traffic. Given the limited daily operation of HVGC, it is assumed that the club generates approximately 6 movements (combined inbound and outbound) daily at its peak. Additionally, HVGC has indicated an anecdotal observation of six movements per month of vehicles consisting of a car and trailer combination. While this demand is low, this treatment would further minimise potential queuing on Comleroi Road resulting from sharing the same driveway for inbound and outbound traffic movements.

  The access gate location is to be approximately 22 metres away from the shoulder line marking to ensure that the entire length of a car towing a glider trailer can be accommodated away from the road carriageway to ensure safety. HVGC club member are able to pull in entirely off Comleroi Road to lock/unlock the gates as necessary.

- Increase the footprint of the intersection to accommodate concurrent inbound and outbound traffic movements. This is particularly important for the left turn inbound and right turn outbound movements, given that most trips into/out of the HVGC via the Golden Highway are serviced by these movements.

- Provide "Hunter Valley Gliding Club" signage at the access gate to face eastbound and westbound, and at the approaches to the access gate at an appropriate distance to inform road users of the location of the access gate.

This widening would be consistent with *Austroads' Guide to Road Design Part 4*'s guideline for access driveway design (with indented access) on a rural road as shown in Figure 2.8, and bespoke to the type of vehicles using the HVGC facilities.




*Source:* *Austroads Guide to Road Design Part 4: Intersections and Crossings-General*

*Figure 2.8 Design guide for a driveway on a rural road*

This proposed treatment is also consistent with AS2890.1:2004 (Australian Standards for Off-Street Parking). The HVGC site can be considered as Class of Parking 1 land use (employee, generally all-day parking) given the length of stay by visitors to the club. Based on Table 3.1 of AS2890.1 (refer to Figure 2.9) a Class 1 facility with <25 car parking spaces and abutting a Local Road is recommended to have a Category 1 driveway.

**TABLE 3.1**

**SELECTION OF ACCESS FACILITY CATEGORY**

| Class of parking facility (see Table 1.1) | Frontage road type | Access facility category | | | | |
|---|---|---|---|---|---|---|
| | | Number of parking spaces (Note 1) | | | | |
| | | <25 | 25 to 100 | 101 to 300 | 301 to 600 | >600 |
| 1,1A | Arterial | 1 | 2 | 3 | 4 | 5 |
| | Local | 1 | 1 | 2 | 3 | 4 |
| 2 | Arterial | 2 | 2 | 3 | 4 | 5 |
| | Local | 1 | 2 | 3 | 4 | 4 |
| 3,3A | Arterial | 2 | 3 | 4 | 4 | 5 |
| | Local | 1 | 2 | 3 | 4 | 4 |

NOTES:

1 When a car park has multiple access points, each access should be designed for the number of parking spaces effectively served by that access.

2 This Table does not imply that certain types of development are necessarily suitable for location on any particular frontage road type. In particular, access to arterial roads should be limited as far as practicable, and in some circumstances it may be preferable to allow left-turn-only movements into and out of the access driveway.

*Figure 2.9 Table 3.1 of AS2890.1:2004*

Table 3.2 describes Category 1 driveway as being 3.0 – 5.5 metres combined driveway. The proposed improvement to the HVGC access driveway would provide a two-way combined access width.

**TABLE 3.2**

**ACCESS DRIVEWAY WIDTHS**

metres

| Category | Entry width | Exit width | Separation of driveways |
|---|---|---|---|
| 1 | 3.0 to 5.5 | (Combined) (see Note) | N/A |
| 2 | 6.0 to 9.0 | (Combined) (see Note) | N/A |
| 3 | 6.0 | 4.0 to 6.0 | 1 to 3 |
| 4 | 6.0 to 8.0 | 6.0 to 8.0 | 1 to 3 |
| 5 | To be provided as an intersection, not an access driveway, see Clause 3.1.1. | | |

NOTE: Driveways are normally combined, but if separate, both entry and exit widths should be 3.0 m min.

A driveway is to be considered as an intersection if it fulfils the criteria for Category 5 driveway. An intersection design option (e.g. a BAL/BAR treatment) would have added safety benefits to allow through traffic on Comleroi Road to overtake turning vehicles into the HVGC. However not necessary, given the low demand the HVGC generates (6 movements per day) and low traffic volume on Comleroi Road (approximately 1,500 daily traffic, or an estimated 145 vehicles/hour in peak period) with HVO Continuation project.

The schematic designs is shown in Figure 2.10. The scaled drawings and turning path assessments are attached in Appendix B. These design are subject to the appropriate detailed design and approvals.

The turning path assessment has considered the concurrent inbound and outbound movements from either direction of Comleroi Road to the driveway of the Glider Club. These includes vehicles towing a glider trailer as per Transport for NSW vehicle specification and 14.5 metres long rigid bus to consider the movements for coaches.

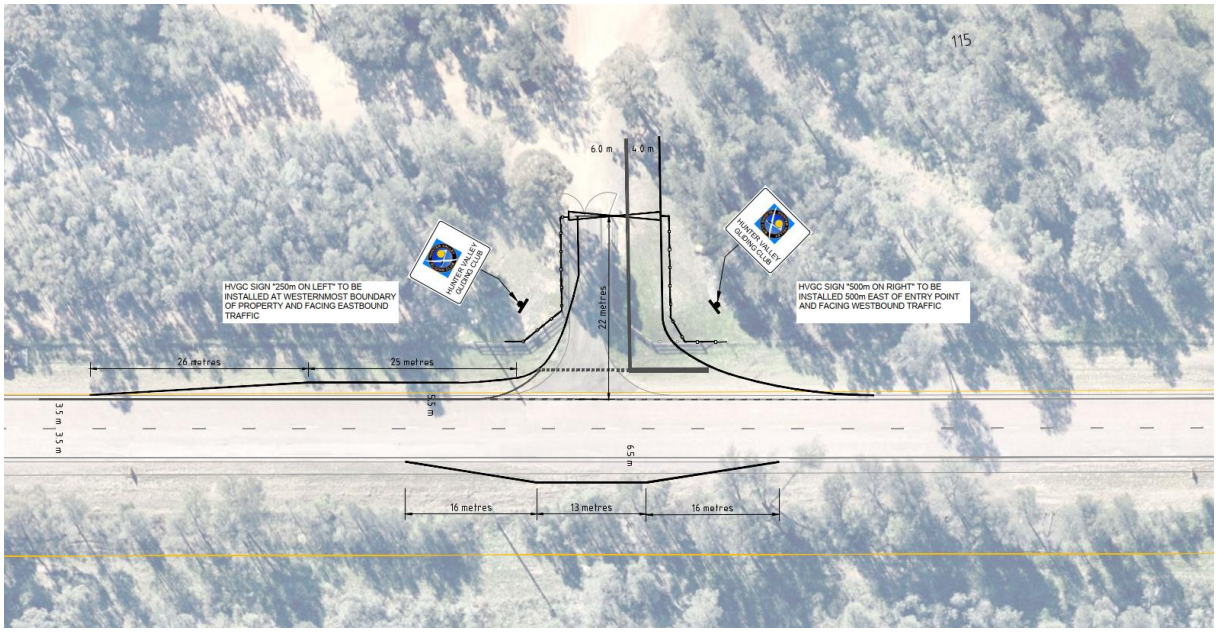



*Figure 2.10 HGVC Driveway treatment schematic design*

## 2.4 Warkworth Sands Woodlands Ecosystem

The Hunter Valley Operations (HVO) Continuation Project (the Project) environmental impact statement (EIS) and development applications (DAs) were lodged with the NSW Department of Planning and Environment (DPE) in January 2023.

Since lodgement, an opportunity has been identified to modify the proposed Lemington Road alignment to minimise impact to Warkworth Sands Woodland (WSW). To facilitate this Project change, an Amendment Report is required to be submitted to DPE to modify DA SSD 11826681 for HVO North.

The revised (shown in blue line) and previously proposed (shown in red line) alignments are shown in Figure 2.11. WSW avoided by the revised alignment is further discussed within the revised Biodiversity Development Assessment Report (Umwelt 2023) appended to the HVO North Amendment Report (EMM 2023).

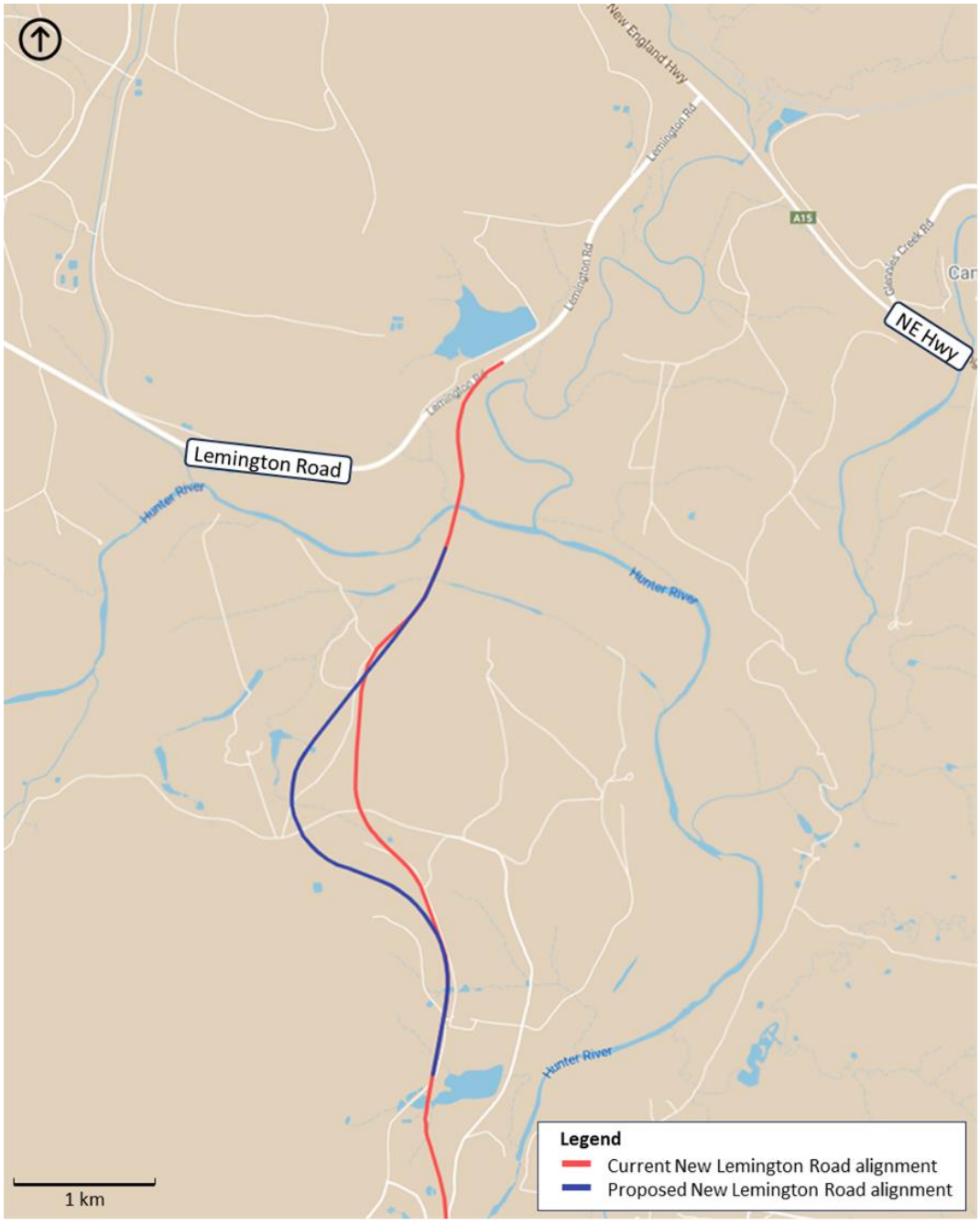



*Figure 2.11 Lemington Road revised road alignment to avoid WSW*

The new features of the new alignment are described as follows and are subject to further detailed design:

- The new alignment adds about 580m to the relocation.
- Designed to Austroads for 110km/hr (and sign posted to 100km/hr) criteria, consistent with the existing condition and current design of Lemington Road realignment.
- Maintains cross section design in the current design of the Lemington Road realignment.
- Does not impact proposed improvements to creek crossings along Lemington Road (i.e. across Hunter River) proposed in the current alignment. Creek crossing across the Hunter River is currently only serviced by the Moses Crossing, which can be inundated during heavy rainfall events.
- There are two low traffic property accesses proposed, one to service a property along existing Archerfield Road (to the west), the other is an access point to the TransGrid transmission line (to the east).

  These will be designed as access driveways to the appropriate Austroads requirement (*Guide to Road Design Part 4: Intersections and Crossings*) to ensure accessibility and safety of the driveways.

To assess the change in travel time that would occur with the realignment of Lemington Road, the Traffic Impact Assessment adopted following nodes (as shown in Figure 2.12) have been selected:

- **Node A**: Lemington Road/Golden Highway
- **Node B**: Lemington Road/new Lemington Road alignment
- **Node C**: Comleroi Road/Golden Highway.


*Figure 2.12 Travel distance between nodes*

Table 2.8 summarises the estimate of travel time between the nodes shown above comparing the existing and current Lemington Road realignment design using a range of travel speed currently observed between 85–95 km/h and the travel speed with the allowable posted speed limit of 100 km/h.

The lower travel speed observed between 85-95 km/h was observed in the existing conditions as parts of the existing Lemington Road uses Moses Crossing (across the Hunter River) which encompasses a narrow bridge and constrained horizontal curves.

*Table 2.8 Travel time estimate between nodes*

| Route | Existing | | With realignment | | |
|---|---|---|---|---|---|
| | Distance (km) | Travel time at 85–95 km/h (minutes) | Distance (km) | Travel time at 85–95 km/h (minutes) | Travel time at 100 km/h (minutes) |
| A to B | 17 | 10.7 to 12 | 20.7 | 13 to 14.6 | 12.4 |
| B to C | 26.2 | 16.5 to 18.5 | 11.5 | 7.3 to 8.1 | 6.9 |

The additional 580 metres travel distance due to the realignment would increase the travel time by approximately 20-25 seconds, depending on travel speed, affecting trips from either east or west on the Golden Highway. This calculation is depicted in Table 2.9.

*Table 2.9 Travel time for 580 metres travel distance at various speeds*

| 580 metres | 100 km/h | 95 km/h | 85 km/h |
|---|---|---|---|
| Travel time (seconds) | 20.9 | 22.0 | 24.6 |

In terms of overall travel time, this would add approximately up to 5% of travel time from the current Lemington Road realignment, thus considered a minor impact.

The revised Lemington Road alignment would therefore:

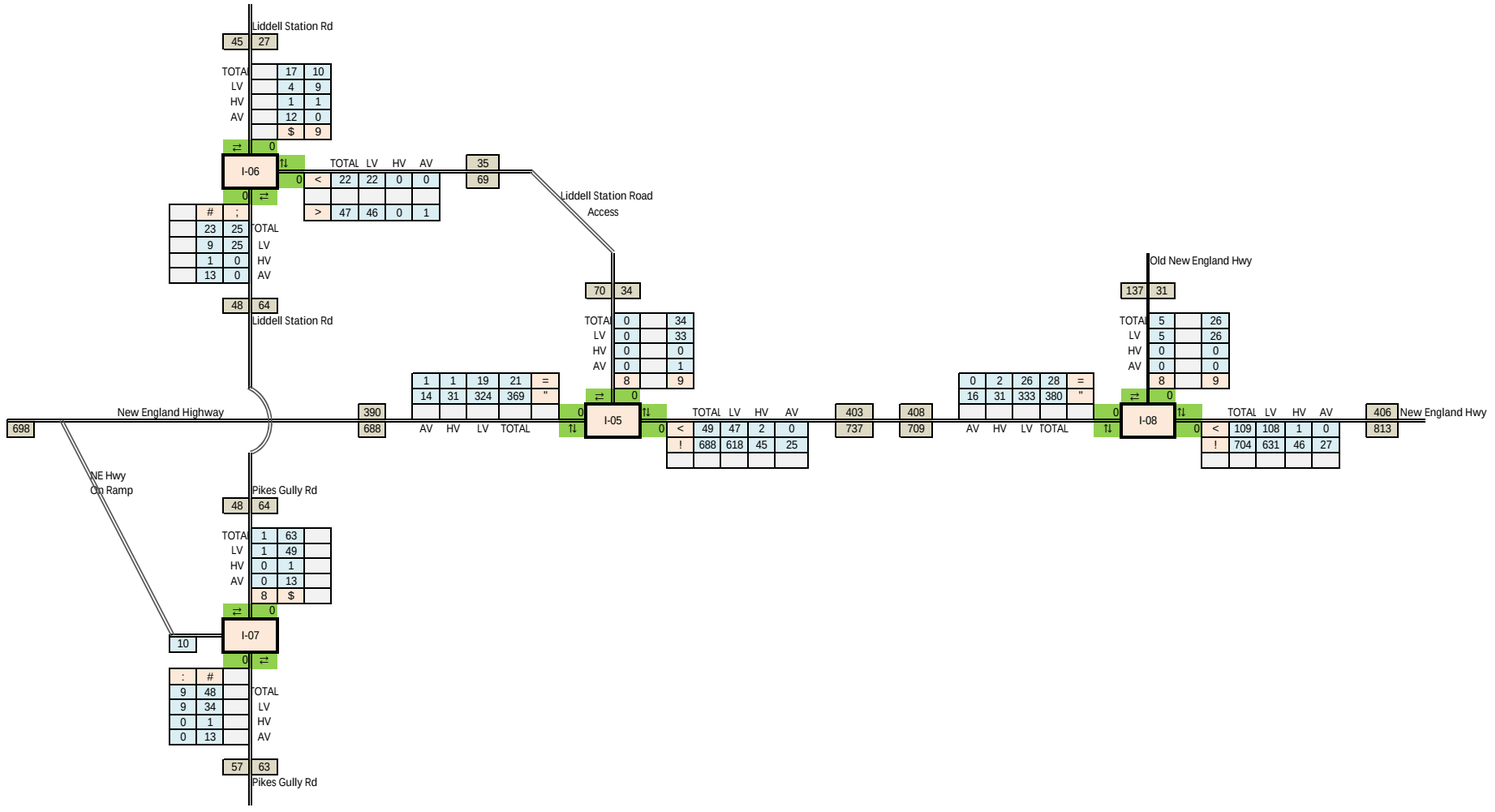
- Not alter the traffic route to travel between places than those already considered in the submitted EIS.
- Not alter traffic generation from HVO site.
- Not impact the improved reliability benefits realised through the improvements of creek crossings with the Lemington Road realignment works.
- Has minor impact to travel time with an estimated increase of 20-25 seconds to the trip through Lemington Road, equivalent to approximately 5% or the current Lemington Road realignment travel time.

Thus overall, the revised alignment presents no change to the EIS or RTS assessment outcomes above.

# Appendix A Existing traffic volume network diagram

# Existing AM Peak

AM Peak: 6:00-7:00




I-05: New England Hwy/Liddell Stn Access

| | Northern Approac | | | Eastern Approach | | | Western Approac | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 33 | | 0 | | 618 | 47 | 19 | 324 | |
| HV | 0 | | 0 | | 45 | 2 | 1 | 31 | |
| AV | 1 | | 0 | | 25 | 0 | 1 | 14 | |
| TOTA | 34 | | 0 | | 688 | 49 | 21 | 369 | |

North East West

I-06: Liddell Stn/ Access Rd

| | Northern Approac | | | Eastern Approach | | | Southern Approac | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 9 | 4 | | 46 | | 22 | | 9 | 25 |
| HV | 1 | 1 | | 0 | | 0 | | 1 | 0 |
| AV | 0 | 12 | | 1 | | 0 | | 13 | 0 |
| TOTA | 10 | 17 | | 47 | | 22 | 0 | 23 | 25 |

North East South

I-07: Pikes Gully/On-Ramp

| | Northern Approac | | | Southern Approach | | |
|---|---|---|---|---|---|---|
| | L | T | R | L | T | R |
| LV | | 49 | 1 | 9 | 34 | |
| HV | | 1 | 0 | 0 | 1 | |
| AV | | 13 | 0 | 0 | 13 | |
| TOTAL | | 63 | 1 | 9 | 48 | |

North South

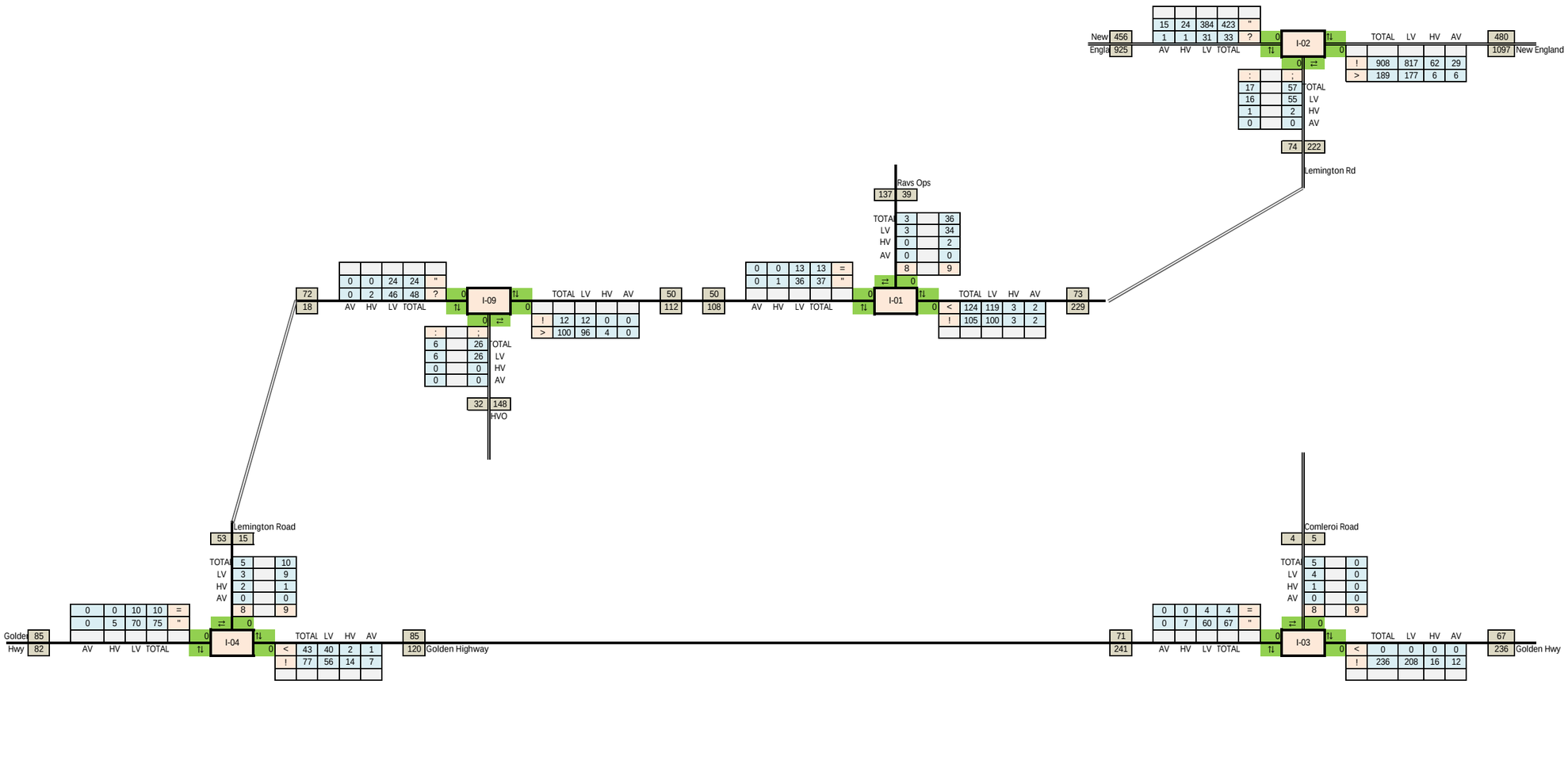
I-08: New England/ Old NE Hwy

| | Northern Approac | | | Eastern Approach | | | Western Approac | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 26 | | 5 | | 631 | 108 | 26 | 333 | |
| HV | 0 | | 0 | | 46 | 1 | 2 | 31 | |
| AV | 0 | | 0 | | 27 | 0 | 0 | 16 | |
| TOTA | 26 | | 5 | | 704 | 109 | 28 | 380 | |

North East West

# Existing AM Peak

AM Peak: 6:00-7:00




I-01: Lemington/ Rav-Ops

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 34 | | 3 | | 100 | 119 | 13 | 36 | |
| HV | 2 | | 0 | | 3 | 3 | 0 | 1 | |
| AV | 0 | | 0 | | 2 | 2 | 0 | 0 | |
| TOTA | 36 | 0 | 3 | 0 | 105 | 124 | 13 | 37 | 0 |

| North | East | West |
|---|---|---|
| | | |

I-02: Lemington/ NE Hwy

| | Eastern Approach | | | Southern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 177 | 817 | | 16 | | 55 | | 384 | 31 |
| HV | 6 | 62 | | 1 | | 2 | | 24 | 1 |
| AV | 6 | 29 | | 0 | | 0 | | 15 | 1 |
| TOTA | 189 | 908 | 0 | 17 | 0 | 57 | 0 | 423 | 33 |

| East | South | West |
|---|---|---|
| | | |

I-03: Comleroi/ Golden Hwy

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 0 | | 4 | | 208 | 0 | 4 | 60 | |
| HV | 0 | | 1 | | 16 | 0 | 0 | 7 | |
| AV | 0 | | 0 | | 12 | 0 | 0 | 0 | |
| TOTA | 0 | 0 | 5 | 0 | 236 | 0 | 4 | 67 | 0 |

| North | East | West |
|---|---|---|
| | | |

I-04: Lemington Rd/ Golden Hwy

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 9 | | 3 | | 56 | 40 | 10 | 70 | |
| HV | 1 | | 2 | | 14 | 2 | 0 | 5 | |
| AV | 0 | | 0 | | 7 | 1 | 0 | 0 | |
| TOTA | 10 | 0 | 5 | 0 | 77 | 43 | 10 | 75 | 0 |

| North | East | West |
|---|---|---|
| | | |

I-09: HVO/ Lemington Rd

| | Eastern Approach | | | Southern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 96 | 12 | | 6 | | 26 | | 24 | 46 |
| HV | 4 | 0 | | 0 | | 0 | | 0 | 2 |
| AV | 0 | 0 | | 0 | | 0 | | 0 | 0 |
| TOTA | 100 | 12 | 0 | 6 | 0 | 26 | 0 | 24 | 48 |

| East | South | West |
|---|---|---|
| | | |

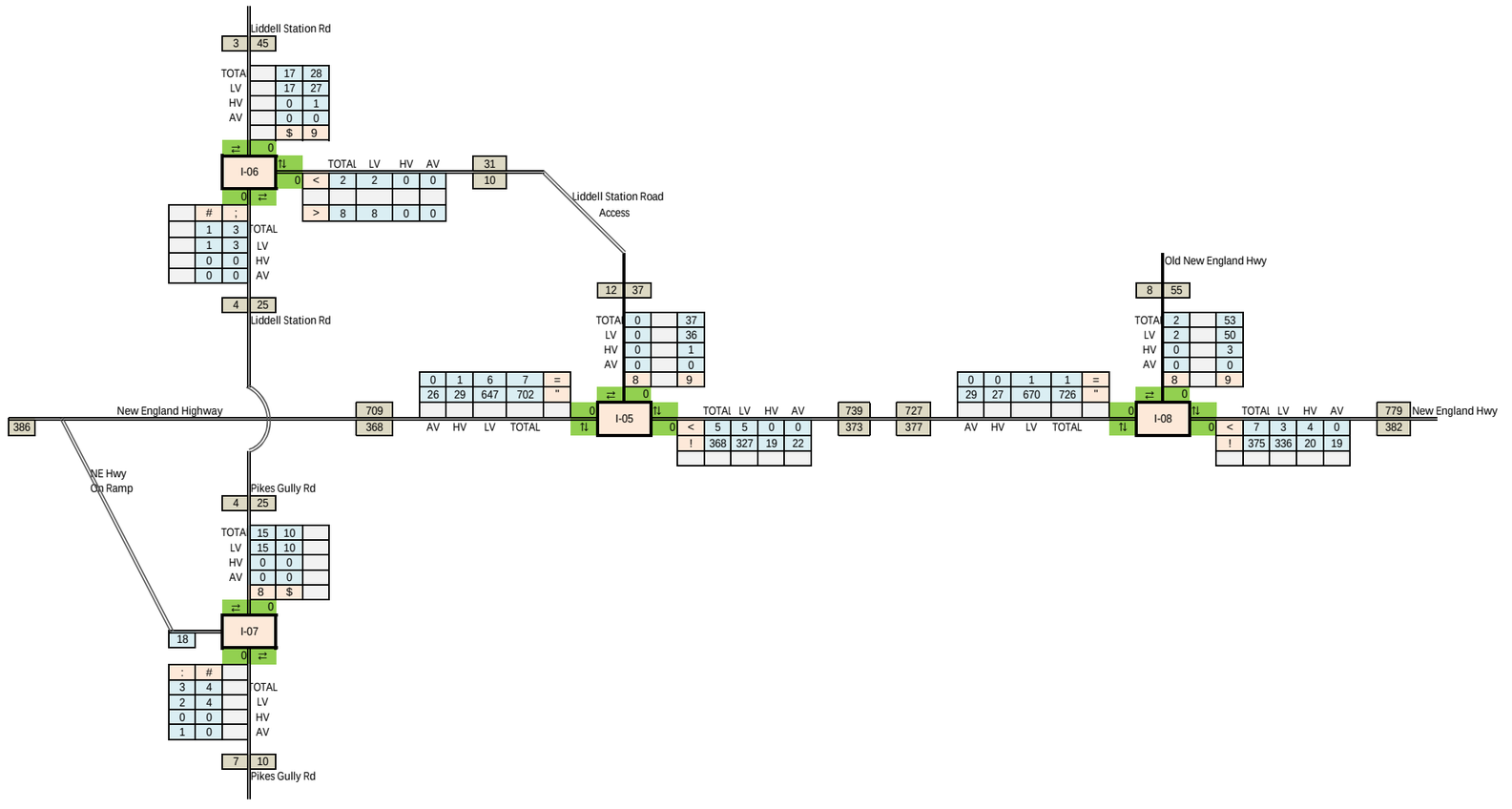
I-10: Lemington/ Realigned Lemington

| | Northern Approach | | | Southern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | | | 219 | | | | | 71 | |
| HV | | | 6 | | | | | 3 | |
| AV | | | 4 | | | | | 0 | |
| TOTAL | 0 | | 229 | 0 | 0 | 0 | 74 | 0 | 0 |

| North | South | West |
|---|---|---|
| | | |

# Existing PM Peak

PM Peak: 16:00-17:00




I-05: New England Hwy/Liddell Stn Access

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 36 | | 0 | | 327 | 5 | 6 | 647 | |
| HV | 1 | | 0 | | 19 | 0 | 1 | 29 | |
| AV | 0 | | 0 | | 22 | 0 | 0 | 26 | |
| TOTAL | 37 | | 0 | | 368 | 5 | 7 | 702 | |

North East West

I-06: Liddell Stn/ Access Rd

| | Northern Approach | | | Eastern Approach | | | Southern Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 27 | 17 | | 8 | | 2 | | 1 | 3 |
| HV | 1 | 0 | | 0 | | 0 | | 0 | 0 |
| AV | 0 | 0 | | 0 | | 0 | | 0 | 0 |
| TOTAL | 28 | 17 | | 8 | | 2 | 0 | 1 | 3 |

North East South

I-07: Pikes Gully/On-Ramp

| | Northern Approach | | | Southern Approach | | |
|---|---|---|---|---|---|---|
| | L | T | R | L | T | R |
| LV | | 10 | 15 | 2 | 4 | |
| HV | | 0 | 0 | 0 | 0 | |
| AV | | 0 | 0 | 1 | 0 | |
| TOTAL | | 10 | 15 | 3 | 4 | |

North South

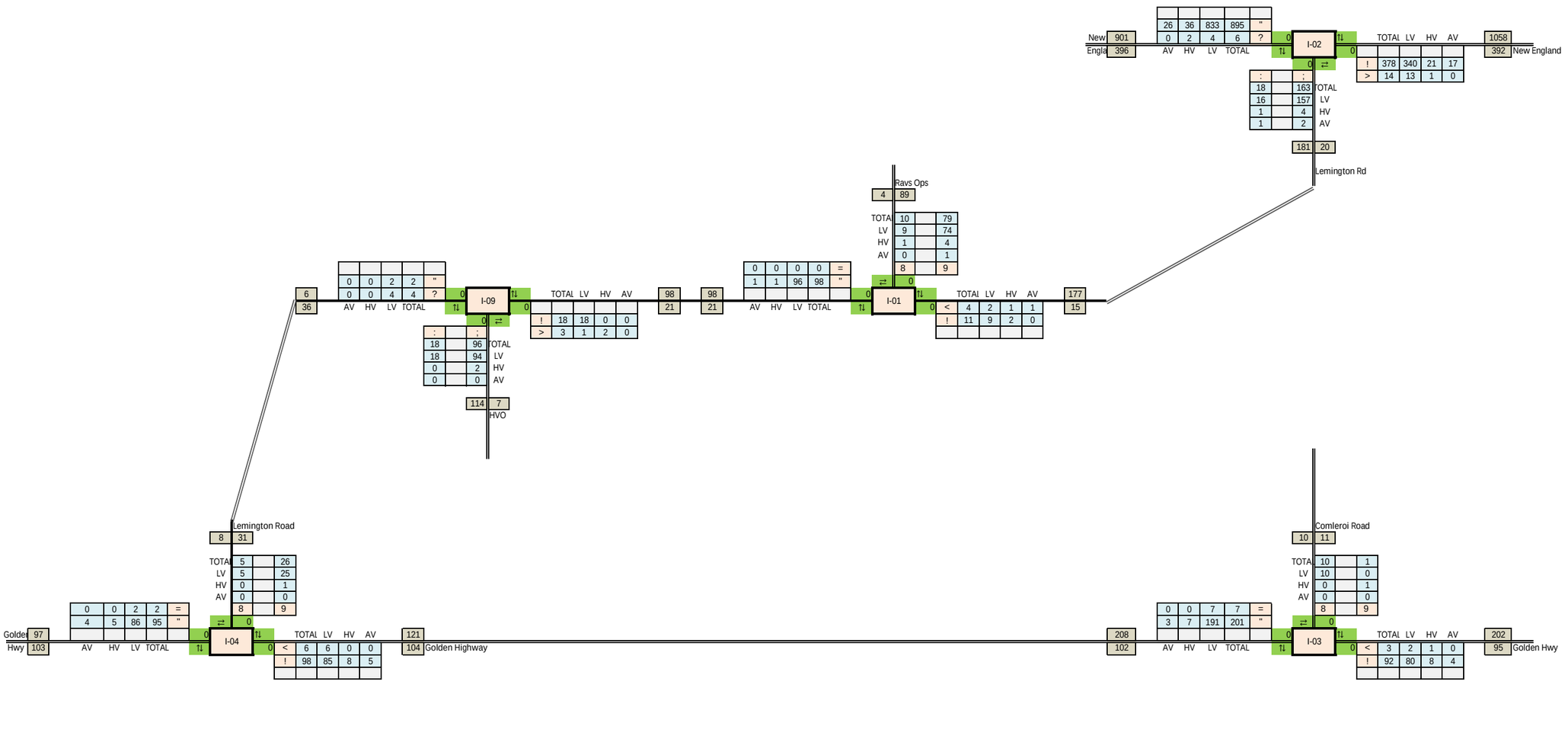
I-08: New England/ Old NE Hwy

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 50 | | 2 | | 336 | 3 | 1 | 670 | |
| HV | 3 | | 0 | | 20 | 4 | 0 | 27 | |
| AV | 0 | | 0 | | 19 | 0 | 0 | 29 | |
| TOTAL | 53 | | 2 | | 375 | 7 | 1 | 726 | |

North East West

Existing PM Peak

PM Peak: 16:00-17:00




I-01: Lemington/ Rav-Ops

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 74 | | 9 | | 9 | 2 | 0 | 96 | |
| HV | 4 | | 1 | | 2 | 1 | 0 | 1 | |
| AV | 1 | | 0 | | 0 | 1 | 0 | 1 | |
| TOTA | 79 | 0 | 10 | 0 | 11 | 4 | 0 | 98 | 0 |

| North | East | West |
|---|---|---|
| | | |

I-02: Lemington/ NE Hwy

| | Eastern Approach | | | Southern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 13 | 340 | | 16 | | 157 | | 833 | 4 |
| HV | 1 | 21 | | 1 | | 4 | | 36 | 2 |
| AV | 0 | 17 | | 1 | | 2 | | 26 | 0 |
| TOTA | 14 | 378 | 0 | 18 | 0 | 163 | 0 | 895 | 6 |

| East | South | West |
|---|---|---|
| | | |

I-03: Comleroi/ Golden Hwy

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 0 | | 10 | | 80 | 2 | 7 | 191 | |
| HV | 1 | | 0 | | 8 | 1 | 0 | 7 | |
| AV | 0 | | 0 | | 4 | 0 | 0 | 3 | |
| TOTA | 1 | 0 | 10 | 0 | 92 | 3 | 7 | 201 | 0 |

| North | East | West |
|---|---|---|
| | | |

I-04: Lemington Rd/ Golden Hwy

| | Northern Approach | | | Eastern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 25 | | 5 | | 85 | 6 | 2 | 86 | |
| HV | 1 | | 0 | | 8 | 0 | 0 | 5 | |
| AV | 0 | | 0 | | 5 | 0 | 0 | 4 | |
| TOTA | 26 | 0 | 5 | 0 | 98 | 6 | 2 | 95 | 0 |

| North | East | West |
|---|---|---|
| | | |

I-09: HVO/ Lemington Rd

| | Eastern Approach | | | Southern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | 1 | 18 | | 18 | | 94 | | 2 | 4 |
| HV | 2 | 0 | | 0 | | 2 | | 0 | 0 |
| AV | 0 | 0 | | 0 | | 0 | | 0 | 0 |
| TOTA | 3 | 18 | 0 | 18 | 0 | 96 | 0 | 2 | 4 |

| East | South | West |
|---|---|---|
| | | |

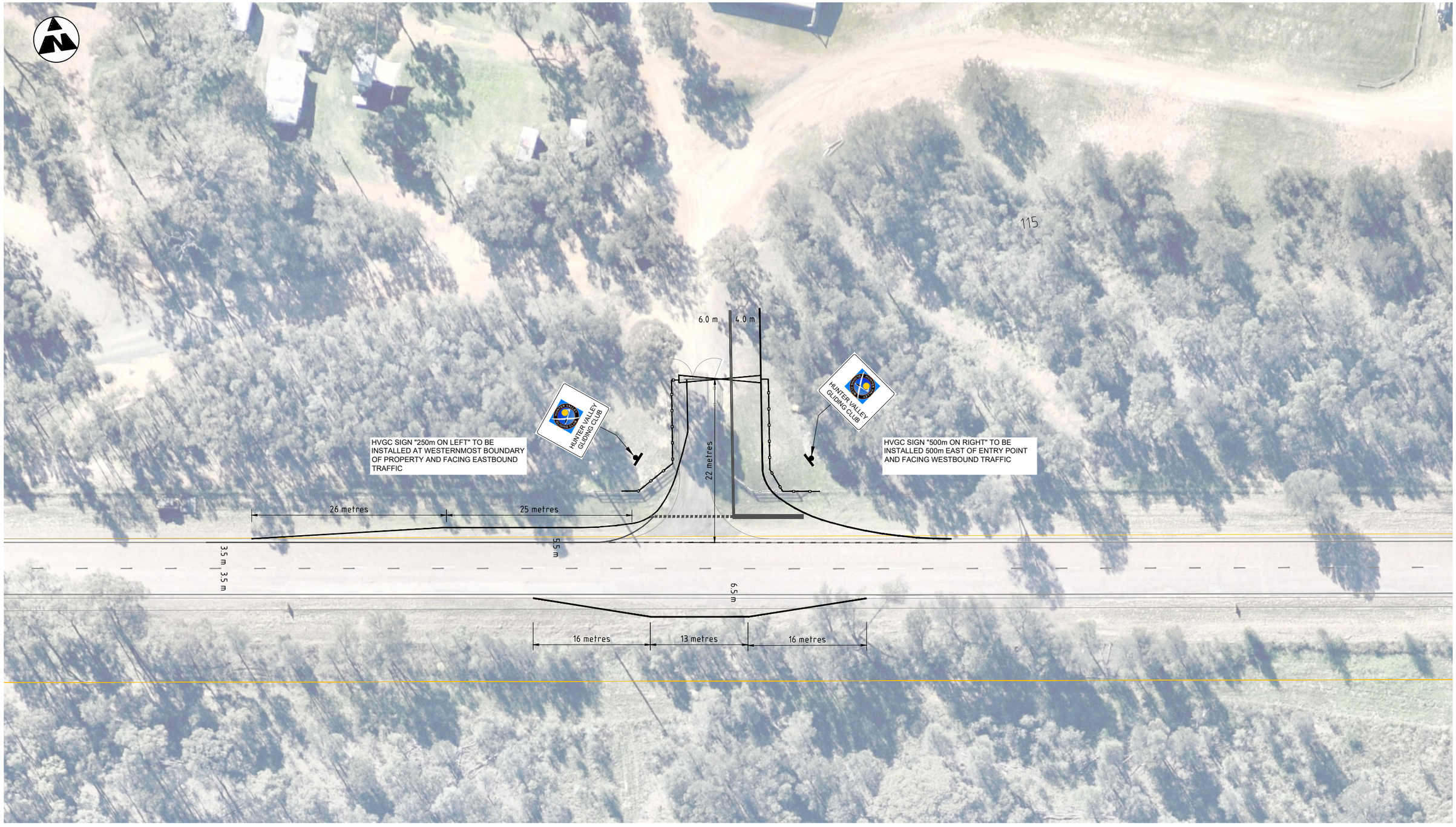
I-10: Lemington/ Realigned Lemington

| | Northern Approach | | | Southern Approach | | | Western Approach | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | L | T | R | L | T | R |
| LV | | | 17 | | | | 173 | | |
| HV | | | 3 | | | | 5 | | |
| AV | | | 0 | | | | 3 | | |
| TOTAL | 0 | 20 | 0 | 0 | 0 | 0 | 181 | 0 | 0 |

| North | South | West |
|---|---|---|
| | | |

# Appendix B Hunter Valley Gliding Club Access Driveway Modification Schematic Design and Turning Path Assessment

PS204979-PaM-GA-0001




| DRAWING CHECK PRINT | | |
|---|---|---|
| Print Date: 11 / 10 / 23 | BY | DATE |
| Drafter | | |
| Project Drafter Check | | |
| Eng. or Des. or Arch. Check | | |
| Engineering/Design Check | | |
| Verification/Approval | | |
| Next Action | | |

## NOTE

1. PROPERTY ACCESS FOR THE HUNTER VALLEY GLIDING CLUB HAS BEEN DESIGNED WITH LOCALISED WIDENING TO ALLOW SUFFICIENT SPACE FOR DESIGN VEHICLES TO UNDERTAKE NON-CONFLICTING CONCURRENT INBOUND AND OUTBOUND MOVEMENTS.
2. HUNTER VALLEY GLIDING CLUB SIGNS ARE PROPOSED AT THE PROPERTY ACCESS AND RESPECTIVE EASTBOUND AND WESTBOUND APPROACHES TO PROVIDE VISUAL CUES FOR DRIVERS TRAVELLING ON COMLEROI ROAD.
3. THIS SKETCH HAS BEEN PREPARED ON AN AERIAL OBTAINED FROM NEARMAP DATED MAY 2022.
4. LOCATION OF PROPERTY BOUNDARIES HAVE BEEN OBTAINED FROM NSW GOVERNMENT'S SPATIAL COLLABORATION PORTAL WEBSITE.

## PLAN

SCALE 1:500

## LEGEND

- EXISTING FEATURES
- EXISTING FENCE
- PROPOSED FEATURES
- PROPOSED FENCE

| REV | DATE | BY | DESCRIPTION | CHK | APPD |
|---|---|---|---|---|---|
| A | 30.06.2023 | O.M. | DRAFT | | |

REFERENCE COORDINATION DRAWINGS

| DESCRIPTION | DRAWING NO. | REV | CHK |
|---|---|---|---|
| | | | |

SURVEY DATUM

HORIZONTAL DATUM: VERTICAL DATUM:

SCALES

0 5 10 15

Full Size 1:500 A3;
SCALE (m)

A3 ORIGINAL
DO NOT SCALE THIS DRAWING

APPROVED

SIGNED:

DATE: RPEQ:



wsp
Level 27, 680 George Street, Sydney
GPO Box 5394, NSW 2001, Australia
Tel: +61 2 9272 5100 Fax: +61 2 9272 5101
wsp.com

CLIENT:

HUNTER VALLEY OPERATIONS

1011 Lemington Road
LIDDELL NSW 2333
Tel: 1800 888 733
www.hvo.com.au

PROJECT:
HUNTER VALLEY OPERATIONS
COMLEROI ROAD, WARKWORTH

TITLE:
ACCESS DRIVEWAY TO GLIDING CLUB
STRATEGIC DESIGN
PLAN
SHEET 01

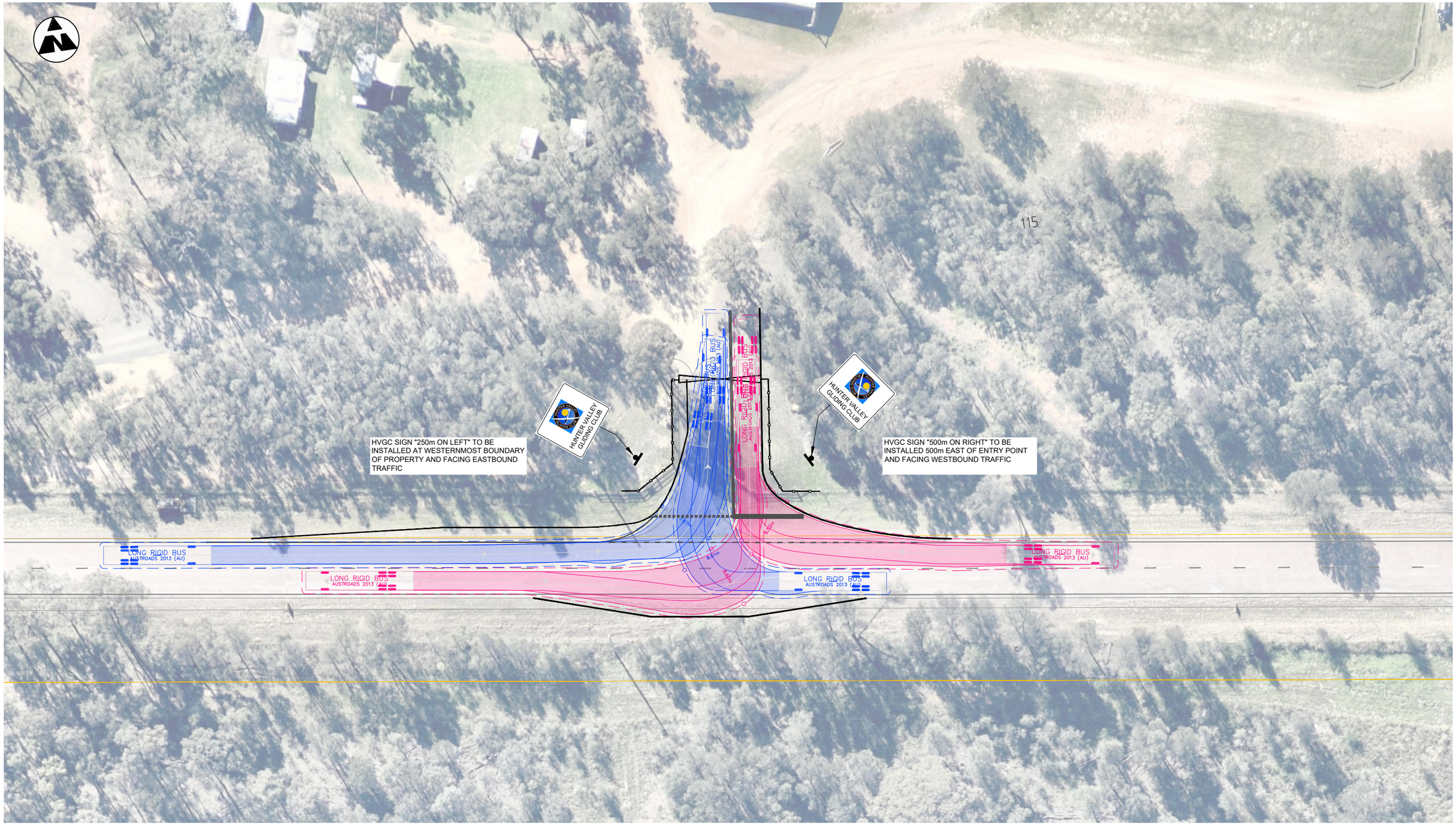
DRAWING STATUS:
GENERAL LAYOUT

| DESIGNED: | CHECKED: | APPROVED: |
|---|---|---|
| O.MURLIANTO | N/A | N/A |
| PROJECT No: | DRAWN: | DATE: |
| PS204979 | O.MURLIANTO | 30.06.2023 |

DRAWING No: PS204979-PaM-GA-0001 REV: A

File name: U:\PROJECTS\AU\30\4XX\204979_HUNTER_VALLEY_OPERA\4_WIP\CAD\SD STRATEGIC DESIGN\PS204979-PAM-GA-0001.DWG, printed on Wednesday, 11 October 2023 4:53:43 PM, by Murlianto, Oldy

PS204979-PaM-TP-0001




| DRAWING CHECK PRINT | | | |
|---|---|---|---|
| Print Date: | 11 / 10 / 23 | BY | DATE |
| Drafter | | | |
| Project Drafter Check | | | |
| Eng. or Des. or Arch. Check | | | |
| Engineering/Design Check | | | |
| Verification/Approval | | | |
| Next Action | | | |

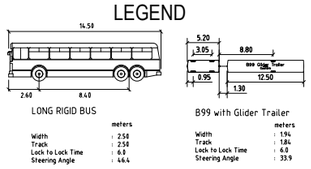
## NOTE

1. THESE TURNING PATH ASSESSMENTS ARE OVERLAID TO SCALE ON AN AERIAL MAP OBTAINED FROM NEARMAP (MAY2022)TO SIMULATE THE MANEOUVRING REQUIREMENT OF THE DESIGN VEHICLE.
2. THE DESIGN TURNING SPEED INTO/ OUT OF THE PROPERTY ACCESS ARE SET AT 5-10 KM/H.
3. 0.5m CLEARANCE HAVE BEEN PROVIDED FOR ALL TURNING PATH ASSESSMENTS PERFORMED.

## PLAN

SCALE 1:500

## LEGEND




| REV | DATE | BY | DESCRIPTION | CHK | APPD |
|---|---|---|---|---|---|
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REFERENCE COORDINATION DRAWINGS

| DESCRIPTION | DRAWING NO. | REV | CHK |
|---|---|---|---|
| | | | |

SURVEY DATUM

HORIZONTAL DATUM: VERTICAL DATUM:

SCALES

0 5 10 15

Full Size 1:500 A3;
SCALE (m)

A3 ORIGINAL
DO NOT SCALE THIS DRAWING

APPROVED

SIGNED:

DATE: RPEQ:



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CLIENT:

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Tel: 1800 888 733
www.hvo.com.au

PROJECT:
HUNTER VALLEY OPERATIONS
COMLEROI ROAD, WARKWORTH

TITLE:
ACCESS DRIVEWAY TO GLIDING CLUB
STRATEGIC DESIGN
PLAN
SHEET 02

DRAWING STATUS:
TURNING PATH ASSESSMENT

| DESIGNED: | CHECKED: | APPROVED: |
|---|---|---|
| O.MURLIANTO | N/A | N/A |
| PROJECT No: | DRAWN: | DATE: |
| PS204979 | O.MURLIANTO | 30.06.2023 |

DRAWING No: PS204979-PaM-TP-0001 REV: A

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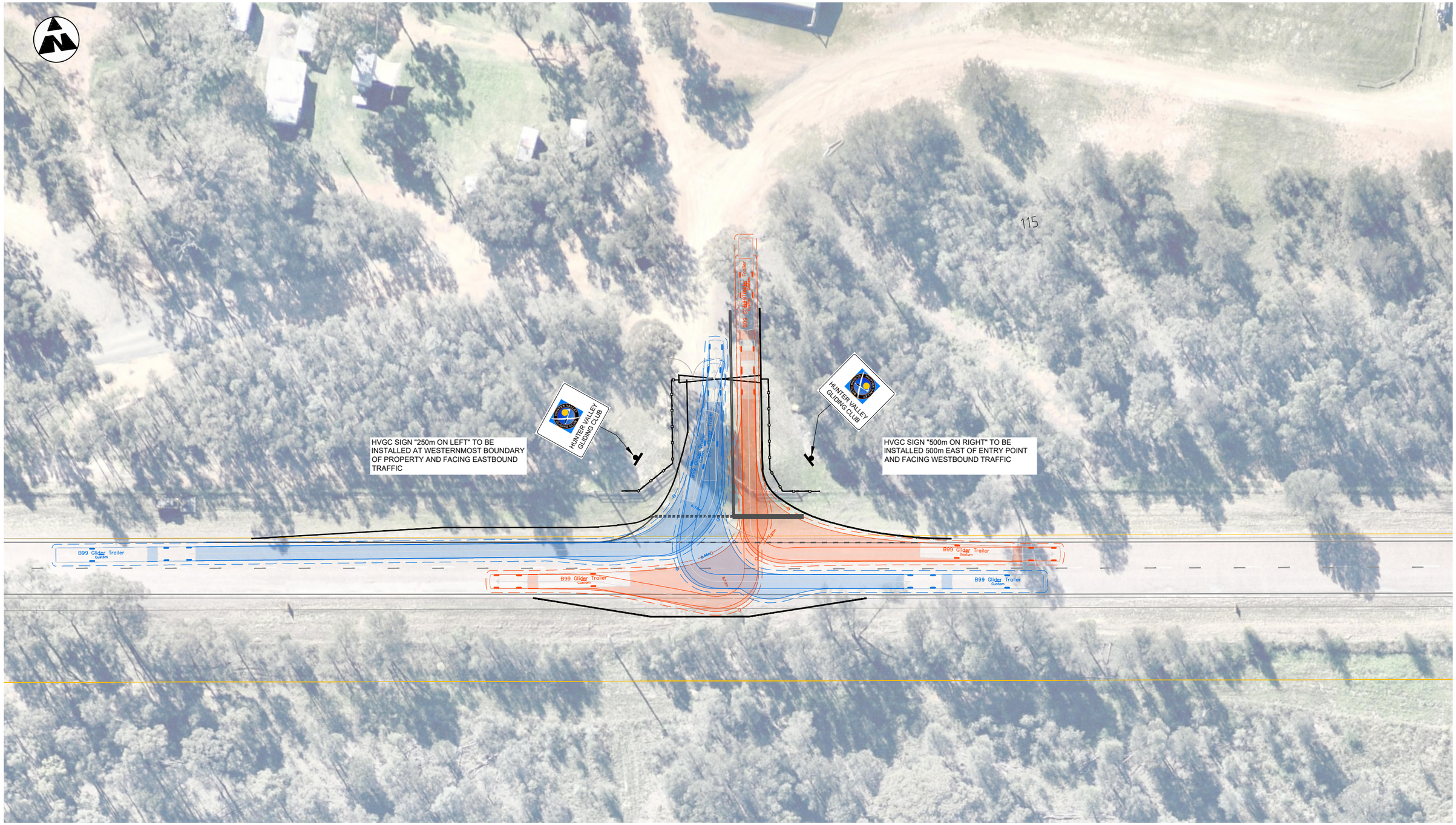
PS204979-PaM-TP-0002



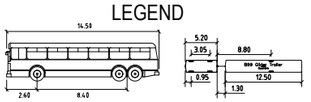

| DRAWING CHECK PRINT | | |
|---|---|---|
| Print Date: 11 / 10 / 23 | BY | DATE |
| Drafter | | |
| Project Drafter Check | | |
| Eng. or Des. or Arch. Check | | |
| Engineering/Design Check | | |
| Verification/Approval | | |
| Next Action | | |

## NOTE

1. THESE TURNING PATH ASSESSMENTS ARE OVERLAID TO SCALE ON AN AERIAL MAP OBTAINED FROM NEARMAP (MAY2022)TO SIMULATE THE MANEOUVRING REQUIREMENT OF THE DESIGN VEHICLE.
2. THE DESIGN TURNING SPEED INTO/ OUT OF THE PROPERTY ACCESS ARE SET AT 5-10 KM/H.
3. 0.5m CLEARANCE HAVE BEEN PROVIDED FOR ALL TURNING PATH ASSESSMENTS PERFORMED.

## PLAN
SCALE 1:500

## LEGEND




| REV | DATE | BY | DESCRIPTION | CHK | APPD |
|---|---|---|---|---|---|
| A | 30.06.2024 | O.M. | DRAFT | | |

REFERENCE COORDINATION DRAWINGS

| DESCRIPTION | DRAWING NO. | REV | CHK |
|---|---|---|---|
| | | | |

SURVEY DATUM

HORIZONTAL DATUM: | VERTICAL DATUM:

SCALES

0 5 10 15
Full Size 1:500 A3;
SCALE (m)

A3 ORIGINAL
DO NOT SCALE THIS DRAWING

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SIGNED:

DATE: | RPEQ:



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Tel: 1800 888 733
www.hvo.com.au

PROJECT:
HUNTER VALLEY OPERATIONS
COMLEROI ROAD, WARKWORTH

TITLE:
ACCESS DRIVEWAY TO GLIDING CLUB
STRATEGIC DESIGN
PLAN
SHEET 03

DRAWING STATUS:
TURNING PATH ASSESSMENT

| DESIGNED: | CHECKED: | APPROVED: |
|---|---|---|
| O.MURLIANTO | N/A | N/A |
| PROJECT No: | DRAWN: | DATE: |
| PS204979 | O.MURLIANTO | 30.06.2023 |

DRAWING No: PS204979-PaM-TP-0002 REV: A

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