



Highway Service Centre Hume Highway, Bowning Transport Impact Assessment

Client //	Kurrawa Pty Ltd
Office //	NSW
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Hume Highway, Bowning

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GTA Consultants Office: NSW

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1. Introduction

1.1 Background

It is understood that a planning proposal is to be lodged with Yass Valley Council for a proposed Highway Service Centre (HSC) in Bowning. The site is located on the northern side of the Hume Highway and west of Bowning Road.

The proposal includes construction of heavy vehicle and car refuelling hardstand areas, various retail outlets (including fast food offerings), restaurant dining area, amenities and associated car and truck parking. The proposal also includes 12 separate car fuel pumps accommodating 24 vehicles, plus seven high-flow heavy vehicle fuel pumps. On-site parking for approximately 245 cars plus dedicated spaces for three buses, 20 cars with trailers/ caravans, 33 heavy vehicles, five recharging electric vehicles and one delivery tanker is also proposed. The proposal provides three waiting bays for the two fast-food drive-thru areas. The site layout has also considered the largest design vehicle possibly being a B-Triple truck should the Hume Highway be designated as such.

The proposed layout effectively separates light vehicles from the heavy vehicles, with the drive-thru travelling behind the main structure. Vehicle access is proposed to be located along the Hume Highway.

GTA Consultants was engaged in October 2016 to complete a transport impact assessment for the proposed development.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- i existing traffic conditions surrounding the site
- ii suitability of the proposed parking in terms of supply (quantum) and layout
- iii service vehicle requirements
- iv pedestrian and bicycle requirements
- v the traffic characteristics of the proposed development
- vi suitability of the access arrangements for the site
- vii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- o Yass Valley Council Policy ASS-POL-8 – Off Street Car Parking 2011
- o Yass Valley Council Local Environmental Plan (LEP) 2013
- o Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- o Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- o Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- o Proposed Site Plan, Revision H prepared by Richmond + Ross, dated 12 December 2016
- o other documents and data as referenced in this report.

2. Existing Conditions

The site is located on the northern side of the Hume Highway, west of Bowning Road. The site forms part of a larger landholding, with the proposed HSC site alone having a frontage of approximately 400m to the Hume Highway. The rest of the amalgamated sites provide in excess of 1.1km frontages to the Hume Highway, with the majority to the east of the HSC site itself.

The site is currently vacant and used for the purposes of farming/ grazing land with no substantial dwellings in its vicinity.

The surrounding properties predominantly include rural lands surrounding the Bowning Township. There are a few select homesteads on the surrounding properties.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



Basemap Source: Google Maps

2.1 Adjoining Road

Hume Highway

The Hume Highway (M31), is a classified National Highway and in the vicinity of the site is generally aligned in an east-west direction. It is a two-way road configured with a 2-lane, 40-metre wide carriageway, set within an 85-metre wide road reserve. The Hume Highway has a posted speed limit of 110km/hr.

The Hume Highway is shown in Figure 2.2 and Figure 2.3.

Figure 2.2: Hume Highway (looking east)



Source: Google Maps

Figure 2.3: Hume Highway (looking west)



Source: Google Maps

2.2 Traffic Volumes

RMS AADT (2016) confirms that the M31 Hume Highway to the east (near Yass Valley Way and Lachlan Valley Way) carries approximately 860 vehicles (400 vehicles in the eastbound direction) during the AM peak hour and approximately 1,100 vehicles (550 vehicles in the eastbound direction) during the PM peak hour. This equates to approximately 14,500 vehicles per day two-way. Up to 29% or approximately 4,200 were recorded as being heavy vehicles.

This data has also been relatively consistent over the past three years.

3. Development Proposal

3.1 Land Uses

The proposal includes construction of car refuelling and heavy vehicle hardstand areas, various retail outlets (including fast food offerings), restaurant dining area, amenities and associated car and truck parking. 12 separate car fuel pumps accommodating 24 vehicles, with ample queuing capacity and seven high-flow heavy vehicle fuel pumps in a separate area.

The development schedule is summarised in Table 3.1, with the proposed site layout shown in Figure 3.1.

Table 3.1: Development Schedule

Use	Size (GFA)
Convenience Store	260m ²
Truck Dining (restaurant)	176m ² (35 seats)
Retail Tenancies (x4, incl. fast food)	627m ²
Dining Area (fast food)	672m ² (188 seats)
Total	1,735m²

Figure 3.1: Proposed Site Layout



Source: Richmond + Ross, Proposed Site Plan, Revision H, dated 22 December 2016

3.2 Vehicle Access

Access is proposed along the Hume Highway via separated and appropriately designed highway exit ramp (from the west) and highway entry ramp to the east).

The access ramps consider the gradients of the highway in the immediate vicinity, with vehicles entering the HSC at an expansive hardstand area that will, with appropriate on-site signage, allow for seamless separation of light and heavy vehicles.

On-site circulation ensures that entering and exiting vehicles are well separated at all times with no anticipated driver uncertainty and/ or safety concerns. The exit ramp length and speed have been considered in determining the required ramp length.

It is also recognised that the access requirements for the Council owned water pumping station will need to be maintained as part of the access ramp design. Given that the pumping station will be located towards the eastern end of the highway entry ramp, a dedicated access will be provided via the ramp to ensure access is maintained as per current arrangements. This will be via a gravel access road and secure gate. As such, all vehicles requiring access to the pumping station would use the highway exit ramp to enter the proposed HSC in order to then access the highway entry ramp.

3.3 Car Parking Requirements

The car parking provision requirements for different development types are set out in Yass Valley Council's Policy titled "Off Street Car Parking" (policy number ASS-POL-8, dated 9 November 2011).

A review of the car parking requirement rates and floor area schedule results in a parking requirement for the proposal as summarised in Table 3.2.

Table 3.2: Off Street Car Parking Policy (2011) Requirements

Use	Size	Parking Rate	Parking Requirement
HSC/ Convenience Store	260m²	5 spaces per 100m² of convenience store GFA	13 spaces
Truck Dining (restaurant)	176m² (35 seats)	15 spaces/ 100m² GFA or 1 space/ 3 seats, whichever is greater	27 spaces
Retail Tenancies (T1-T4, fast food)	627m² (188 seats)		95 spaces
Total			135 spaces

Based on the above, the proposal is theoretically required to provide a minimum of 135 car parking spaces.

The Off-Street Car Parking policy (ASS-POL-8) also requires disabled parking be provided in accordance with the Building Code of Australia at the rate of 2% of all on-site spaces. Application of this to the proposal results in the requirement for three disabled spaces.

3.4 Adequacy of Parking Supply

The development proposes a total of 245 on-site car parking spaces, including six disabled spaces. The car parking provision exceeds the ASS-POL-8 requirement of 135 spaces though is considered an appropriate quantum having regard to the additional demands placed on HSCs during the well-known seasonal peaks experienced along most National Highways in Australia. In

this instance, the peak season is mostly associated with winter and the associated ski season during school holidays.

In addition, the proposal includes three waiting bays for the two fast-food drive-thru areas and five spaces for recharging electric vehicles. The development also proposes 33 dedicated truck parking spaces with the largest design vehicle being a B-triple as well as 20 cars with trailers/ caravans parking spaces, three bus parking spaces and one delivery tanker space.

Overall, the proposal includes provision of 306 parking spaces and is considered appropriate for the intended uses in such a location. Six disabled spaces have been included as part of the site layout plans and in close proximity to the main building entrances.

Table 3.3: Parking Provision

Use	No. of Spaces
Front of House	28 (incl. 6 disabled)
Back of House (Retail/ Fast Food)	153
Back of House (overflow)	64
Sub-Total	245
Recharging Electric Vehicle Parking	5
Truck Parking	33
Bus Parking	3
Car with Trailer/ Caravan	20
Total	306

3.5 Site Layout Review

The car park layout has been reviewed against the requirements of ASS-POL-8 and the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009). This assessment included a review of the following:

- bay and aisle widths
- entry and exit access ramps
- adjacent structures
- internal circulation
- internal queuing
- parking for persons with disabilities.

The proposed access ramps have been located to ensure that site accessibility is as convenient as possible with minimal impacts on the Hume Highway.

The proposed car park layout design allows for good access to the fuel pumps with adequate on-site queuing available and maintaining a path of travel to other on-site parking spaces.

The separation of light and heavy vehicle areas is typical for such facilities and ensures safety is maintained for all users while keeping a good level of internal circulation and overall site efficiency.

The dedicated heavy vehicle area to the rear of the site provides four fuel pumps and parking for up to 33 heavy vehicles. The fill point is located in the north-west corner of the site, with a tanker able to stand in the area without impeding other heavy vehicle access.

The drive-thru areas for the two associated tenancies have a queuing capacity of at least three vehicles per lane before entering the adjacent internal circulation road. A passing lane would also allow through vehicles to pass should any overflow occur in peak periods.

Overall, the proposed site layout is laid out in a clear and simple manner with good separation of the uses. The proposed site access ramps are in a location where good sightlines in both directions will be available. The following comments are made on review of the proposed site layout plans:

- The proposed site layout is considered appropriate and allows for good separation of on-site uses.
- All vehicle types would be able to safely enter the site, access the fuel pumps and other on-site uses and exit.
- Swept paths confirm the design is sound, with only detailed components requiring adjustment.
- A loading area is proposed at the rear of the convenience store with appropriate access by vehicles up to LRVs.
- The fuel storage tanks would be filled from a central remote filling point, typically by a 19m semi-trailer or B-Double but can accommodate up to B-Triple.
- Parking would be provided according to relevant Australian Standards (AS/NZS 2890.1: 2004 Parking facilities – Off-street parking). The site will generally be regarded as a Class 3 of Class 3A facility. In general, parking spaces are likely best designed as 5.4m long and 2.6m wide with 6.2m wide aisles.
- Heavy vehicles are easily separated from light vehicles at the highway exit ramp. They can refuel and then proceed to the formal angled parking spaces to the rear or circulate around the rear to exit. No conflicts with light vehicles are present.
- Light vehicles would be able to refuel and exit, or park/ recirculate to access on-site parking or drive-thru to use the other site facilities.
- Car with trailer and caravan parking are accommodated with dimensions to be confirmed as part of detailed design.
- Pedestrian desire lines from the bus/ truck facilities are clearly marked and minimise conflict between pedestrians and vehicles.

Detailed swept paths for a variety of vehicle types have been completed as part of the design development.

4. Loading Facilities

4.1 Loading Requirements

Based on the ASS-POL-8 – Off Street Car Parking (2011) requirements, the parking for delivery/ service vehicles would be provided based on the discretion of Council at the time of assessment taking into account the type of delivery or service vehicles appropriate to the HSC, the practicalities of each site, the likelihood for oversize vehicles, and any other factors specific to the proposed development.

Other requirements include:

- Delivery bays would be provided with sufficient manoeuvring area to enable vehicles to conveniently turn within the site so as to ensure that they enter and exit the site in a forward direction.
- Delivery bays shall be located to ensure minimal conflict with other vehicles and pedestrians.
- The developer is to submit details of the maximum size and configuration of delivery or service vehicles expected to access the site, along with expected frequencies for delivery etc.

A dedicated back-of-house loading dock and garbage collection area is proposed immediately adjacent to the rear of the main building. The two loading bays have been designed to accommodate up to 12.5m large rigid vehicles. All service vehicles would be able to reverse independently into each space and exit in a forward direction.

19m articulated trucks may also require access having regard to the sites location on the Hume Highway and the potential need to have such vehicles service the site. These specifics can be determined as part of detailed design development. The requirements will be based on the outcomes of the discussion/ liaison with the Council upon the applicant's submission of details on the maximum size and configuration of service vehicles expected to access the site, as well as the expected delivery frequencies etc.

The fuel storage tanks would be filled from a central remote filling point, typically by 19m semi-trailers or 25m-26m B-Doubles.

5. Traffic Impact Assessment

5.1 Traffic Assessment

The proposed HSC, broadly comprising the fuel pumps, convenience store, restaurant and dining area, and fast food outlets, would not generate any additional, or 'new' vehicle trips, rather simply accommodating vehicles already on the Hume Highway passing the site.

Traffic estimates for the proposal have been sourced from the RMS Guide to Traffic Generating Developments (2002). The Guide provides the following formula for the evening peak two-way (in/ out) traffic generation for service stations with convenience stores:

- evening peak hour vehicle trips = $0.04 A(S) + 0.3 A(F)$
or
 - evening peak hour vehicle trips = $0.66 A(F)$
 - average vehicle trips (9pm-12 midnight) = $0.6 A(F)$
- where
- $A(S)$ = area of site (m^2)
- $A(F)$ = gross floor area of convenience store (m^2).

The Guide also provides traffic generation rates for restaurants, given at five vehicle trips per $100m^2$ GFA during the evening peak.

Furthermore, the Guide provides estimates of traffic generation for drive-thru food outlets. Given the location and GFA, the traffic generation rates for a KFC restaurant have been assumed to be an appropriate estimate of traffic for this use. The average of the RMS survey results is 100 vehicle trips during any peak hour. Assuming McDonalds, this estimate increases to 180 vehicle trips.

The following aspects are considered key to better understanding of the proposal's likely combined traffic activity:

- The anticipated site traffic activity has been assessed based on the convenience store area (fuel retail) rather than the total site area, given the RMS rates are largely based on urban locations where site areas are not required to accommodate large truck parking areas.
- The traffic rates for a KFC and McDonalds restaurants have been assumed to be an appropriate estimate of traffic activity for this use. This is also conservatively high as it does not consider the site's location, where the rates tend to be lower than those in urban locations.
- The use of the retail/ drive-thru food outlets at such facilities tends to be somewhat ancillary to the service station function.
- The Hume Highway currently provides other HSCs that will continue to attract highway users themselves – the closest being the Caltex at Yass 37km (22-minute drive) to the east.

A summary of the traffic activity is summarised in Table 5.1.

Table 5.1: Anticipated Peak Hour Traffic

Land Use	GFA	No. of Vehicle Trips
Convenience Store	260m ²	172
Truck Dining Tenancy(Restaurant)	176m ²	10
Tenancy 1(assumed KFC)	240m ²	100
Tenancy 4 (assumed McDonalds)	229m ²	180
Tenancy 2 & 3 (Restaurant)	158m ²	10
Total		472 trips

Table 5.1 indicates that the site could theoretically realise up to 472 vehicle trips in any peak hour. In reality, this is not going to occur for several reasons, as discussed in the following sections.

Taking into consideration the above, discounted traffic for a typical weekday/ weekend peak period is necessary to understand what the true traffic volumes would likely be. Assuming a 50% discount to account for the highway environment and the existing highway traffic volumes, the proposal could realistically see up to 240 vehicle trips in any peak hour, with up to 70 of these trips being heavy vehicles.

Drawing up to 120 vehicles off the existing Hume Highway traffic of 550 vehicles in any peak hour equates to 22%. This may be conservatively high, with a ratio of 15-20% more feasible. This would equate to more like 100 vehicles entering the site during any peak hour.

5.2 Highway Safety

The site's location lends itself to good sightlines along the Hume Highway, with adequate setbacks and separation of driveways from any adjacent crossovers west of the entry ramp.

The access design has been prepared in accordance with Austroads Part 4C Section 11 and the RMS Supplements to Austroads Guidelines. This includes the following key design principles:

- highway gradients considered and based on survey data
- posted speed 110km/h
- design speed 120km/h
- design vehicle 36m B-Triple
- 40km/h speed at the end of the off-ramp (i.e. within the site).

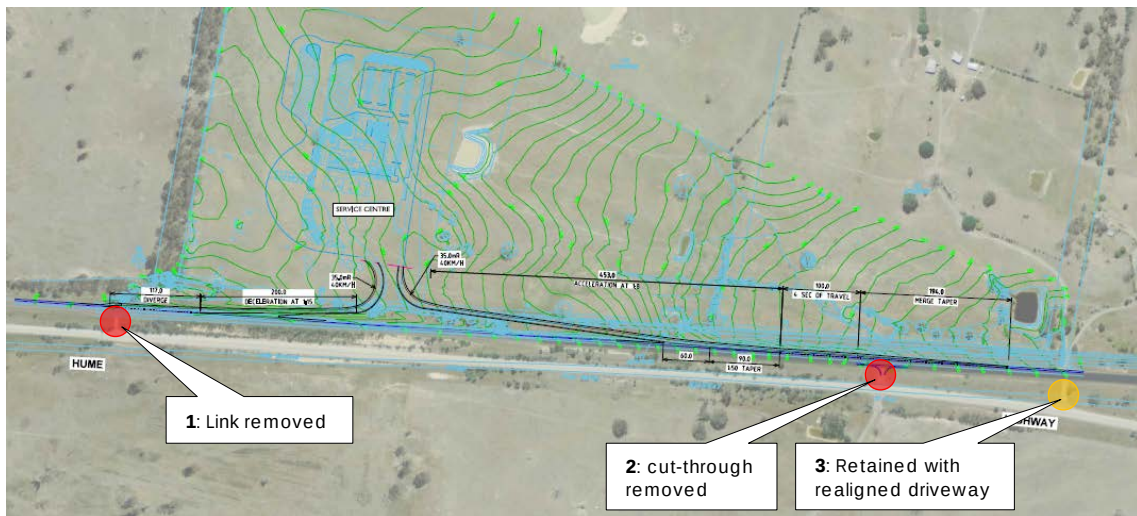
A key component of the site access arrangements is to ensure Highway safety is maintained for all users at all times. This includes consideration for existing users and layouts together with avoiding introducing any such opportunity for westbound Highway traffic to attempt to crossover the Highway and access the HSC from the eastbound lanes.

Key to this is the presence and location of Highway 'cut-throughs' that currently provide access for select public roads and private properties in the vicinity, or merely rarely used tracks that link each Highway carriageway.

The access design has considered these to ensure a safe environment is maintained, with the proposed minor modifications detailed as follows and illustrated in Figure 5.1.

- close one mostly disused Highway 'cut-through' that once linked the two Highway carriageways and located close to the western boundary of the site (refer Location 1)
- close one Highway 'cut-through' that currently provides access to the rural properties south of the Highway (refer location 2)
- retain the Highway 'cut-through' and realign the existing private property access to the south of the Highway to maintain the same level of accessibility (refer Location 3).

Figure 5.1: Highway 'cut-through' Proposed Modifications



The opportunity for westbound Highway traffic to attempt to crossover the Highway in order to access the HSC from the eastbound lanes also needs to be removed.

These proposed modifications will result in lengthy diversions of approximately 4km, thus presenting a significant deterrent for westbound vehicles to crossover the Highway and access the HSC. The resultant diversion is shown in Figure 5.2 noting that the red line (to turnaround and enter the HSC) represents approximately 1.8km and the blue line (after exiting the HSC) approximately 2.2km.

Figure 5.2: Westbound Highway Traffic Diversion Route



Basemap Source: Google Maps

Overall, the proposed site access arrangements and Highway modifications are designed in accordance with relevant Austroads design requirements and represent a good design outcome able to maintain a high level of safety for all Highway users.

6. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The proposal generates an ASS-POL-8 parking requirement of 135 spaces, for those uses with nominated rates.
- ii The development proposes a total of 245 on-site car parking spaces, including six disabled spaces.
- iii While the parking provision is in excess of the requirement by 110 spaces, the additional parking is expected to accommodate the well-known seasonal peaks experienced along most National Highways in Australia. In this instance, the peak season is mostly associated with winter and, for this particular site, people returning from ski holidays and the like during the snow season.
- iv The proposed parking layout is consistent with the dimensional requirements as set out in the Australian/New Zealand Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009).
- v The site is expected to accommodate up to 240 vehicle trips in any peak hour, with up to 70 of these trips being heavy vehicles.
- vi Assuming a draw off ratio of 15-20% of existing Hume Highway traffic, the site could be expected to attract 100 vehicles in any peak hour.
- vii The proposed site would not generate any additional or 'new' vehicle trips, rather simply providing key Highway services for vehicles already on the Hume Highway passing the site.
- viii The site layout and access arrangements are considered appropriate and able to accommodate the anticipated vehicle movements.
- ix The access design and proposed Highway modifications maintain landowner access and remove safety risks given the resultant lengthy diversion should westbound Highway traffic attempt to crossover the Highway to access the HSC.

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