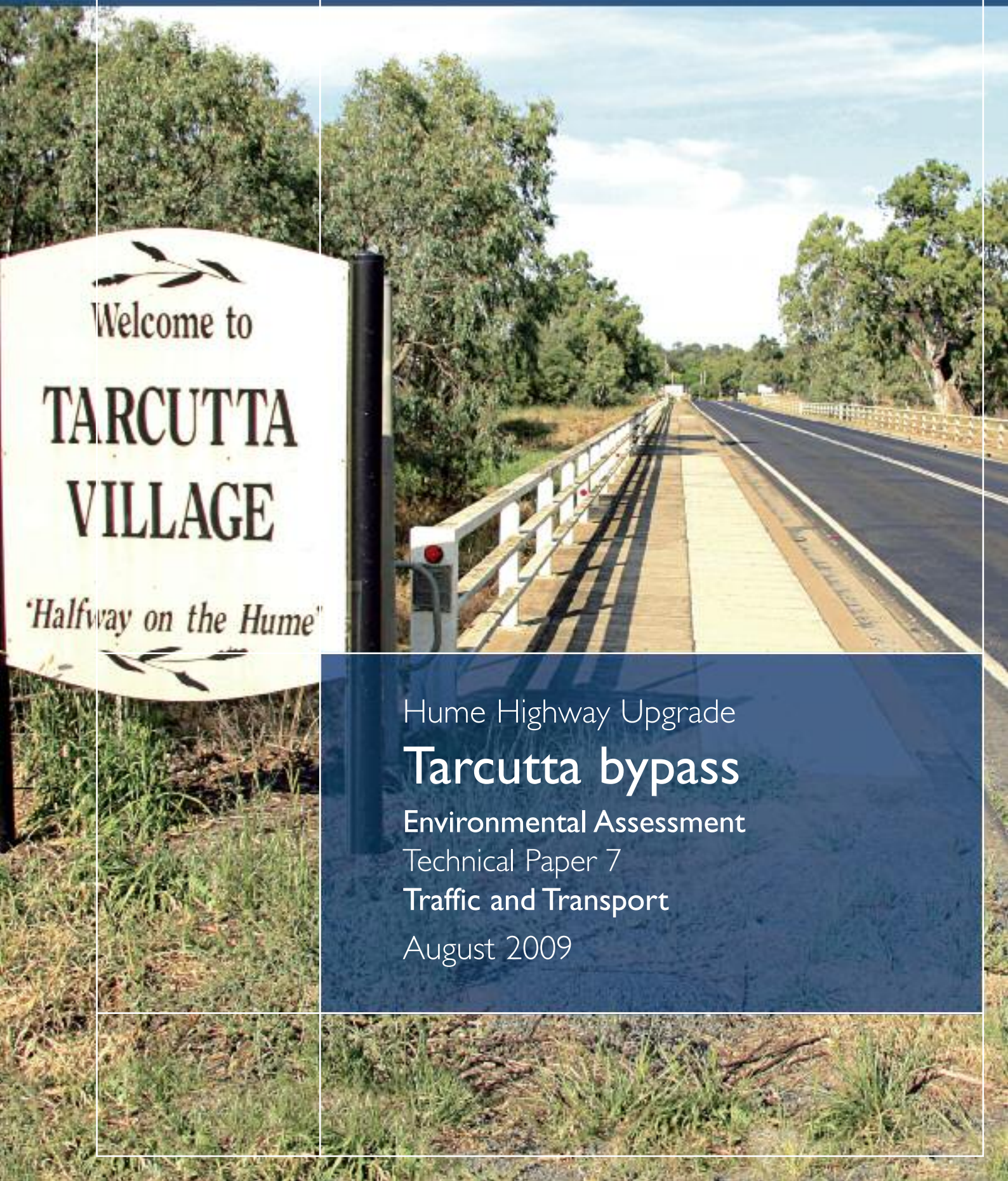
New South Wales Government

RTA



Hume Highway Upgrade

Tarcutta bypass

Environmental Assessment

Technical Paper 7

Traffic and Transport

August 2009

SH2 Hume Highway Tarcutta Bypass
Traffic Study

July 2009

NSW Roads and Traffic Authority

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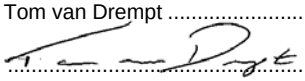
Signed: 

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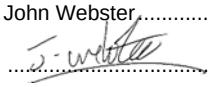
Signed: 

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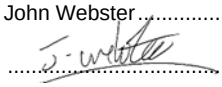
Signed: 

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Executive summary

The Federal and NSW governments have committed to the completion of the upgrading of the Hume Highway to a four lane dual carriageway by 2012. Of the 101 kilometres in NSW yet to be upgraded, 81 kilometres are currently under construction and due for completion in 2009. This will leave only 20 kilometres of single carriageway highway remaining on the Hume Highway, including the sections at Tarcutta, Holbrook and Woomargama, where bypasses are being considered. This report looks in detail at the potential traffic impacts of the proposed Tarcutta bypass.

Tarcutta is a small town with a strategic position, being the mid-point on the Hume Highway between Sydney and Melbourne. Truck facilities have been built in Tarcutta to take advantage of truck changeover/rest requirements.

In order to understand the impact of the proposed bypass, information has been gathered on traffic flows using vehicle counts and travel pattern and time information (using an origin/destination survey). Traffic growth rates have been applied to estimate the increase in travel by the time of opening (2012) and 10 and 20 years after opening.

The traffic counts indicate that the highest volume of light vehicles occurs during business hours and in the early evening throughout the week. The weekday volume of heavy vehicles builds steadily throughout the day from a low at 4 am until the peak is reached between 11 pm and midnight.

Traffic improvements

The completion of the proposed bypass would reduce travel times along the highway from Albury to the junction with the Sturt Highway by approximately two minutes, which would improve the efficiency of freight movements. The proposed bypass would provide additional overtaking opportunities.

The highway performs satisfactorily (Level of Service (LoS) of A to D) at present. Conditions are worse during the night due to the high volume of truck traffic, but are still acceptable. If the proposed bypass was not built, traffic conditions on the highway would just reach unacceptable levels (Level of Service (LoS) of E or F) during the busiest times of the year (e.g. long weekends and school holidays). The construction of the bypass would create sufficient additional capacity to accommodate the weekly peaks, the night time truck peak and the busy times of the year.

Some drivers who currently stop in Tarcutta have indicated in surveys that they would stay on the bypass and stop at another location if the bypass was built. Based on the results of these surveys, if the bypass was built between 50 per cent and 90 per cent of stopping traffic would bypass Tarcutta and find a more convenient location to stop. The exact proportion of stopping traffic which would divert to the bypass is not known. Therefore, high and low scenarios for the amount of stopping traffic which diverts to the bypass has been tested. The proportions have been based on combinations of the stopper survey result and behaviour observed at other highway towns which have been bypassed in the past.

All through traffic and some of the existing stopping traffic are forecast to use the bypass. Excluding traffic that is committed to driving into Tarcutta (residents, people with business in town, etc.), of the vehicles which could potentially use the bypass, the following proportions are forecast to select the bypass rather than travelling through town:

- Low diversion scenario: 85 to 90 per cent of through traffic uses the bypass

- High diversion scenario: 92 to 93 per cent of through traffic uses the bypass.

The following two tables show the forecast traffic on the proposed bypass and existing highway in the year of opening (2012) when all traffic movements are included.

Table 0-1 2012 forecast southbound traffic, north of Tarcutta

Scenario	Vehicle type	North of interchange	Bypass		Existing highway	
		AADT	AADT	Per cent	AADT	Per cent
High diversion to bypass scenario	Light vehicles	1,693	1,042	62	651	38
	Heavy vehicles	1,287	746	58	541	42
Low diversion to bypass scenario	Light vehicles	1,693	974	58	719	42
	Heavy vehicles	1,287	688	53	600	47

Table 0-2 2012 forecast northbound traffic, south of Tarcutta

Scenario	Vehicle type	South of interchange	Bypass		Off-Ramp	
		AADT	AADT	Per cent	AADT	Per cent
High diversion to bypass scenario	Light vehicles*	1,670	1,103	66	567	34
	Heavy vehicles	1,301	907	70	394	30
Low diversion to bypass scenario	Light vehicles*	1,670	1,103	66	567	34
	Heavy vehicles	1,301	846	65	456	35

Note: No northbound light vehicles classified as stopping vehicles, therefore no difference between high and low scenarios

Local access would be maintained to all properties. Both Mates Gully Road and Humula Road would be connected to the new ramps at the southern tie-in, but would have two-way access maintained. Vehicles on Mates Gully Road at Tarcutta would be required to complete a short detour of 500 metres in order to head south. A new local access road would be constructed over the proposed bypass to connect properties west of the new alignment to Tarcutta. Cyclists would be encouraged to continue to use the existing highway through Tarcutta.

The proposed bypass would produce a 2% saving in total VKT and a 22% saving in total VHT.

Crash potential

The current crash rate on the Tarcutta section of the Hume Highway is higher than the typical crash rate for dual carriageway sections of the Hume Highway. The proposed dual carriageway highway has the potential to reduce the occurrence and severity of crashes because it creates separation between the opposing traffic flows. The provision of two lanes in each direction would create safer overtaking opportunities. The likelihood of a crash within the town would be reduced due to the reduced number of vehicles crossing paths.

Using NSW Roads and Traffic Authority's percentage reductions for the various crash types and applying these to the crash types recorded on the highway at Tarcutta, it is anticipated that the bypass would have a crash rate 14 per cent lower than the existing highway. Projecting this reduction over a 20 year timeframe from the time of opening, the construction of the bypass is forecast to result in four less injury crashes and eight less tow-away crashes compared with not building the bypass. If the proposed bypass

experiences the same crash rate as the current dual carriageway sections of the Hume Highway, the reduction in crashes would be even greater.

Construction impacts

Construction of the bypass is expected to take two years. Construction activity is proposed to occur between 6 am and 7 pm Monday to Friday, and between 7 am and 4 pm Saturday. However, some construction activity affecting traffic would occur outside of these hours.

Most of the construction activity would be contained within the site boundary and would not affect traffic or access. The areas of construction at the northern and southern tie-ins would affect traffic. Construction would be staged to minimise disruption.

A construction traffic management plan would be prepared, which would detail how the traffic impacts associated with the construction of the proposed bypass would be managed. The plan would include traffic control plans documenting the proposed changes to traffic conditions and access. Some reductions in road speed limits may be required to protect the safety of construction personnel and the travelling public. Other temporary changes to traffic arrangements would be required to safely guide traffic past the work areas, such as traffic crossovers.

Access to the site compound and batching plant would be via the new northbound ramp at the northern end of the project. Access to the work areas from the highway would be controlled. A temporary internal haul road and a bridge construction road would be built across Tarcutta Creek.

Mates Gully Road and Humula Road would require alternative temporary connection to the Hume Highway at different stages of the construction. During Stage 3 of the southern tie-in works, Mates Gully traffic heading into Tarcutta would be required to make a 1,900 metre diversion.

Construction works along the highway on the northern and southern tie-ins would take into consideration the need for school bus stops, pedestrians and bicycles and the travelling stock route between Mates Gully and Humula Roads.

The construction activities would result in an increase in traffic volumes on the Hume Highway and in Tarcutta. Additional traffic would be associated with the transport of construction materials, the delivery of plant and equipment, staff movement and construction activities outside the site boundary.

1. Introduction

The Roads and Traffic Authority of NSW (RTA) is preparing to submit an application for project approval under Part 3A (Section 75E) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The project comprises a proposed dual carriageway bypass of the town of Tarcutta. Parsons Brinckerhoff (PB) is preparing the environmental assessment of which this Traffic Working Paper is an appendix and documents an assessment of the traffic implications of the project.

1.1 Background

The Hume Highway is the main road freight route between Sydney and Melbourne, carrying over 20 million tonnes of road freight every year. It carries interstate and intrastate traffic as well as local traffic in towns.

The Federal and NSW state governments have committed to the completion of the upgrading of the Hume Highway to four lane dual carriageway by 2012. In accordance with the *AusLink (National Land Transport) Act 2005*, the Australian Federal Government has allocated $800 million for the project.

The Hume Highway is 807 kilometres in length from Sydney to Melbourne, with 517 kilometres in NSW and 290 kilometres in Victoria. The entire highway in Victoria is dual carriageway, while in NSW 80 per cent is dual carriageway.

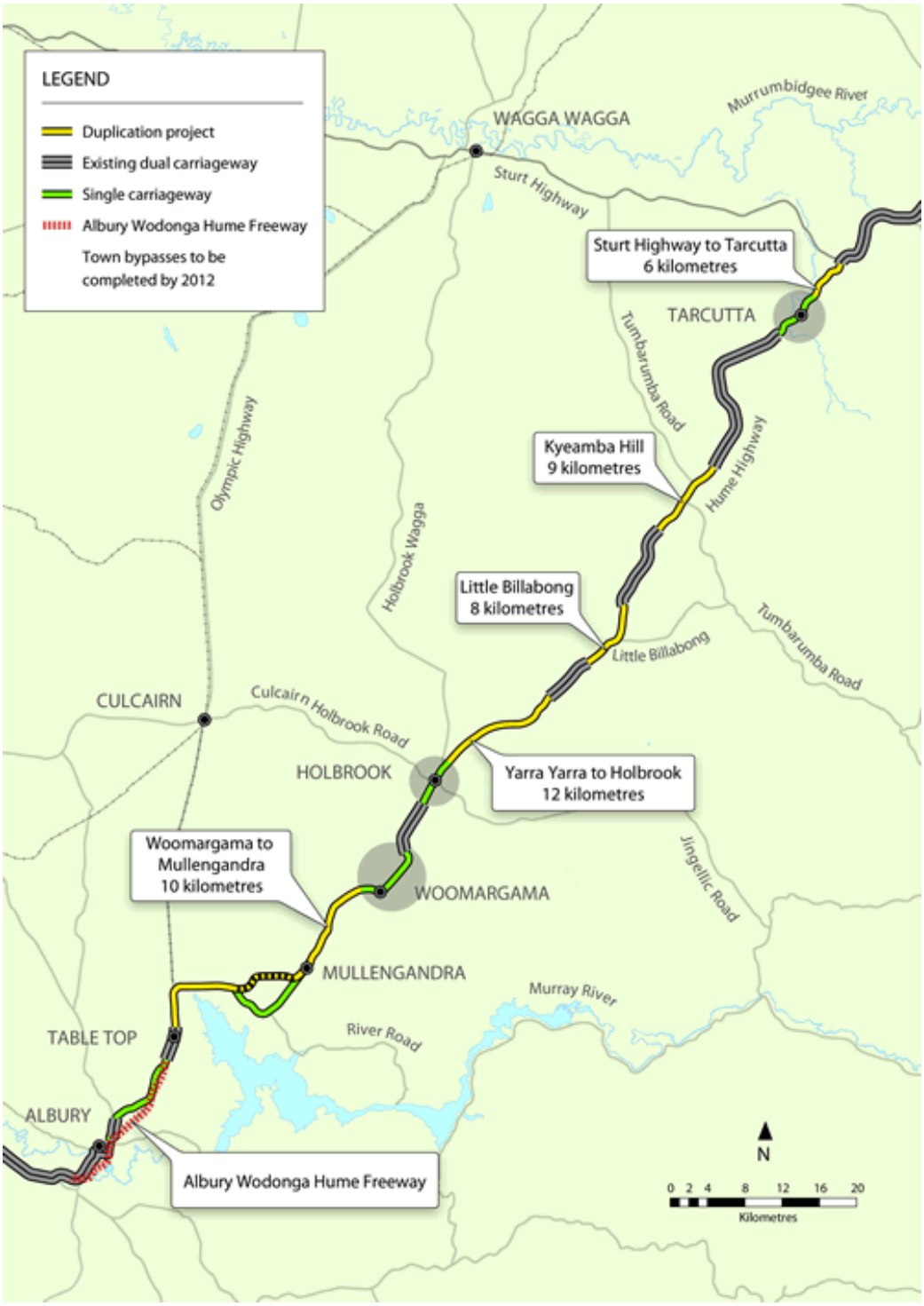
Of the remaining 101 kilometres of single carriageway, the RTA is currently managing the duplication of 81 kilometres of the Hume Highway in southern NSW, due for completion by the end of 2009. This will leave only 20 kilometres of single carriageway road on the Hume Highway, comprising the sections through Tarcutta, Holbrook and Woomargama, where bypasses are being considered. These three bypasses are the subject of current planning, community consultation and environmental assessment.

1.2 Study area

Tarcutta is located on the Hume Highway in southern NSW (near the NSW and Victoria border). Tarcutta is the mid-point between the Sydney and Melbourne, being approximately five hours drive from both cities. This position has made it an important truck stopover and a freight interchange point. Trucks from Sydney and Melbourne can meet at Tarcutta, swap loads and return to their home city.

The two biggest regional cities in NSW are Wagga Wagga and Albury. Wagga Wagga is located on the Sturt Highway to the north of the study area, approximately 53.6 kilometres (46 minutes drive) from Tarcutta. Albury is located on the Hume Highway to the south of the study area, approximately 136 kilometres (1 hour 40 minutes drive) away. The next town of significant size south on the Hume Highway is Holbrook, approximately 71 kilometres from Tarcutta.

A map showing the position of the town and the surrounding area is shown in Figure 1-1.



Source: RTA Website

Figure 1-1 Study area showing current upgrade projects

Tarcutta has a population of 245 (ABS, 2006). The speed limit in town is 50 kilometres per hour (km/h). The land use surrounding the highway within the town is a mixture of residential and commercial/retail. Rural properties surround the town.

A truck stopover is located in the centre of town, on the western side of the highway, with capacity for about 40 trucks. A truck layover area is located on the opposite side of the highway. Another truck layover area is located on the eastern side of the highway opposite Tarcutta shops. A service station is located on the western side of the highway, north of Tarcutta shops.

Mates Gully Road, which connects Tarcutta to the Sturt Highway, provides a more direct connection to Wagga Wagga than using the Hume Highway. Westbrook Road and Oberne Road on the northern side of Tarcutta Creek connect Tarcutta to Oberne, Oberne Creek and Westbrook to the south-east. Humula Road on the southern side of Tarcutta Creek connects Tarcutta to Humula.

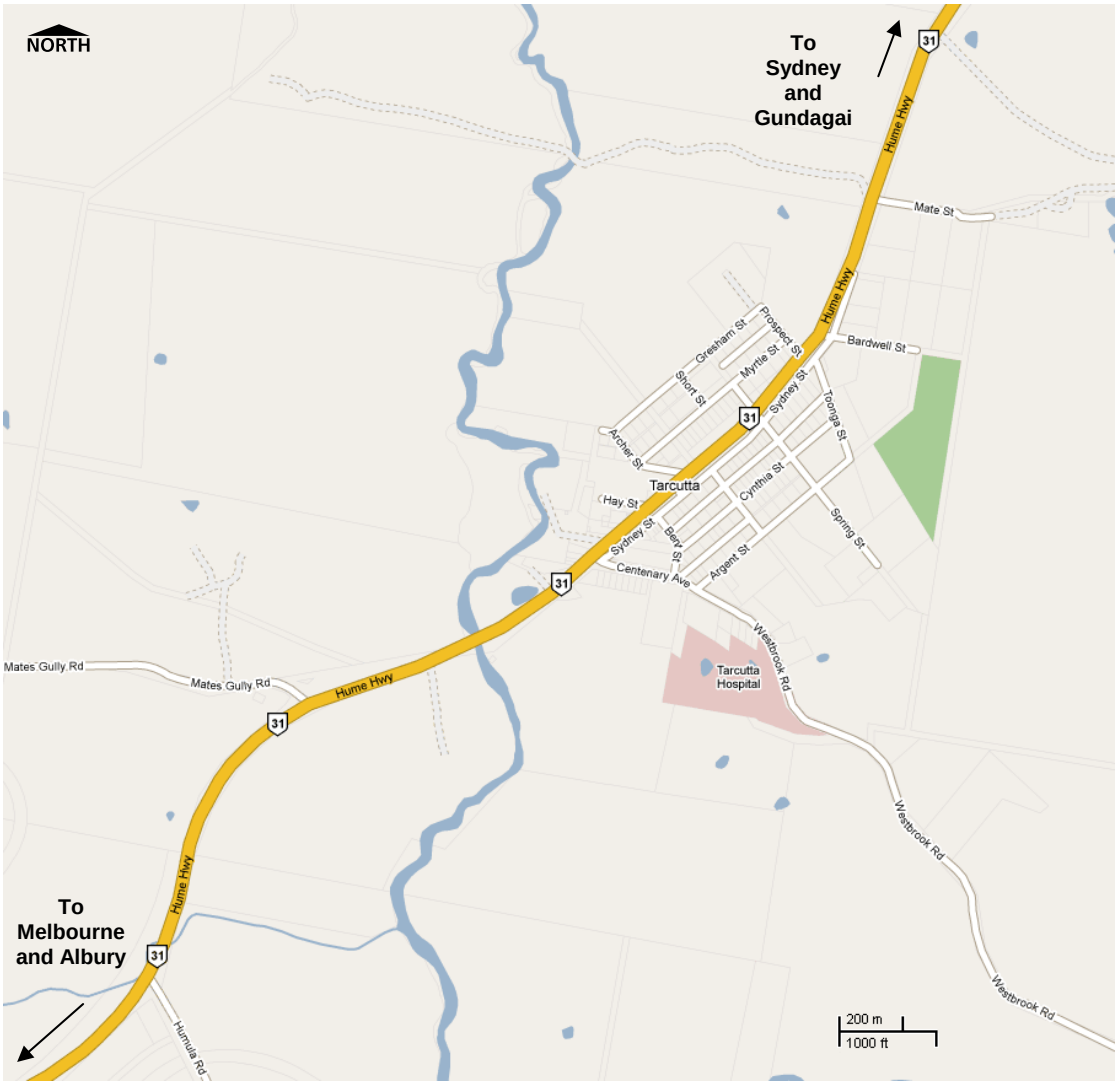


Figure 1-2 Tarcutta town layout

1.3 Report contents

This report assesses the traffic and transport impacts of the proposed bypass, and is structured as follows:

- Section 2 provides information on the study methodology, data used for the traffic assessment and summarises the existing travel information. The information assessed includes traffic volumes, proportions of through traffic, mid-block level of service (LoS) and crash history.
- Section 3 provides information on the project including its objectives and the details of the proposed bypass.
- Section 4 provides an assessment of future changes in travel with the proposed bypass. It also includes a description of the construction impacts.
- Section 5 summarises the outcomes of the assessment.

2. Existing conditions

2.1 Study methodology

This section provides information on the data used for the traffic assessment and the methods of calculation used to provide the results in a consistent format. It describes the sources of the data, the data details and the limitations of the data used.

The study has collected data to answer the following key questions:

- How much traffic uses the Hume Highway and other key roads?
- What is the composition of this traffic in terms of light and heavy vehicles?
- Where is the traffic going to (i.e. does it travel all the way through town, does it turn onto another road or does it have business in town)?
- How much traffic would divert to the new bypass?
- What impact would the bypass have on the crash record?

The assessment has used existing data and data. The assessment methodology is summarised as follows:

- Forecast future traffic volumes by applying growth rates to existing traffic volumes.
- Estimate the proportion of traffic that has the potential to divert onto the proposed bypass.
- Determine the performance of the road network in the future.
- Estimate the impact of the bypass on the number and severity of crashes.

2.2 Traffic volume data

Data from the RTA has been used to establish patterns and trends of traffic on the highway (Appendix A). Additional traffic volume counts have been collected to provide up-to date traffic volume data in Tarcutta. The additional traffic counts were taken for a period of five days and were annualised using the RTA data to be representative of traffic volumes for the whole year. These counts have also been used to estimate the future traffic volumes with and without the bypass.

2.2.1 RTA permanent and sample data

The RTA undertakes regular traffic surveys around the state road network to monitor traffic conditions. The surveys include:

- Sample counts — counts for a short duration (for example one or two weeks).
- Permanent counts — continuously counting at selected locations.

Permanent count locations are also called 'pattern' counts as the seasonal, weekly and hourly patterns of traffic are assumed to be representative of the traffic network around them. These patterns can be assumed to apply for nearby sample locations provided the roads perform a similar function.

Some vehicle counts are taken using equipment that counts the number of axles passing. This is then divided by two to obtain an 'axle pair' count. This type of count does not take into consideration trucks and trailers with more than two axles per vehicle.

Other vehicle counts count the axle spacing, speed and time between axles, which allows vehicles to be classified into a set of pre-determined categories, including light vehicles, light vehicles with trailers, small trucks and buses, large rigid trucks and buses, semi-trailers and B-Doubles.

The following traffic volume counts were available from the RTA for the 2006 calendar year:

- Permanent count (axle pairs — both directions combined) on the Hume Highway, Holbrook, 1.9 kilometres north of MR331 Young Street (north of the Wagga Wagga to Holbrook Road) (station number 95.002).
- Permanent count (classified vehicles — separated into northbound and southbound) at the same location as the axle pair count above.
- Sample counts (axle pairs) on the Hume Highway:
  - South of SH14 Sturt Highway (station number 95.029).
  - At Tarcutta railway crossing (station number 95.423).

The sample counts have been converted to an average annual daily traffic (AADT) figure by the RTA.

Data from the classified vehicle count on the Hume Highway was not complete due to occasional failure of the counting equipment. Data was available from this counting station for the following periods:

- Northbound — 16 months from 7 February 2006 to 3 May 2007 (missing 19 weeks).
- Southbound — 13 months from 7 February 2006 to 16 February 2007 (missing one week).

The gaps in this data have been filled by factoring the available daily data by the patterns from the permanent count at the same location to obtain AADT classified into vehicles. The adjusted RTA classified vehicle counts for 2006 are included in Appendix A.

2.2.2 Seasonal variation

The adjusted classified vehicle count on the Hume Highway north of Holbrook was analysed to determine whether there is a seasonal pattern to light and heavy vehicles. The analysis showed:

- The volume of light vehicles increases during the school holidays.
- The volume of heavy vehicles remains more constant.

- Traffic volumes on the Easter and New Years Day public holidays, the June and October long weekends and at the start and finish of the summer school holidays are higher than daily average volumes.

The analysis showed that AADT volumes are a reasonable approximation of the typical conditions on the highway.

The spike in volumes during holidays increases congestion on these days. This impact is assessed by ranking the recorded hourly volumes throughout the year from highest to lowest. A design hourly volume is selected that caters for the needs of traffic for the majority of the time. Designing for the highest recorded volume would be an over-commitment of public funds as for the rest of the year the additional capacity would not be needed.

Other studies on the Hume Highway (Booz Allen Hamilton *Hume Highway Demand Modelling*, June 2004) have assessed the design hourly volume based on the 50th highest (H_{50}) hourly traffic volumes. The traffic counts at the RTA permanent traffic counting site on the Hume Highway north of Holbrook (Site 95.002) indicate that H_{50} represents approximately 15 per cent of the AADT, which is a suitable level for assessment according to accepted traffic engineering practice (American Association of State Highway and Transportation Officials *A Policy on Geometric Design of Highways and Streets*, 2004).

2.2.3 Temporal variation

The following observations have been made from the adjusted RTA classified vehicle count on the Hume Highway north of Holbrook:

- Weekday heavy vehicle volumes are 175 per cent higher than weekend volumes.
- Weekend light vehicle volumes are 12 per cent higher than weekdays.
- Light vehicles show a typical non-metropolitan pattern of a peak around midday and higher volumes during business hours and early evening.
- Heavy vehicles are highest during the middle of the night — volumes drop from a peak at midnight to a low at around 4 am before building back up steadily throughout the day.
- In terms of how traffic changes throughout the week, light and heavy vehicles show opposite trends. Light vehicles are highest on the weekends, Monday and Friday, whereas heavy vehicles are highest on Tuesday to Thursday. The pattern of travel throughout the week is shown in Figure 2-1.

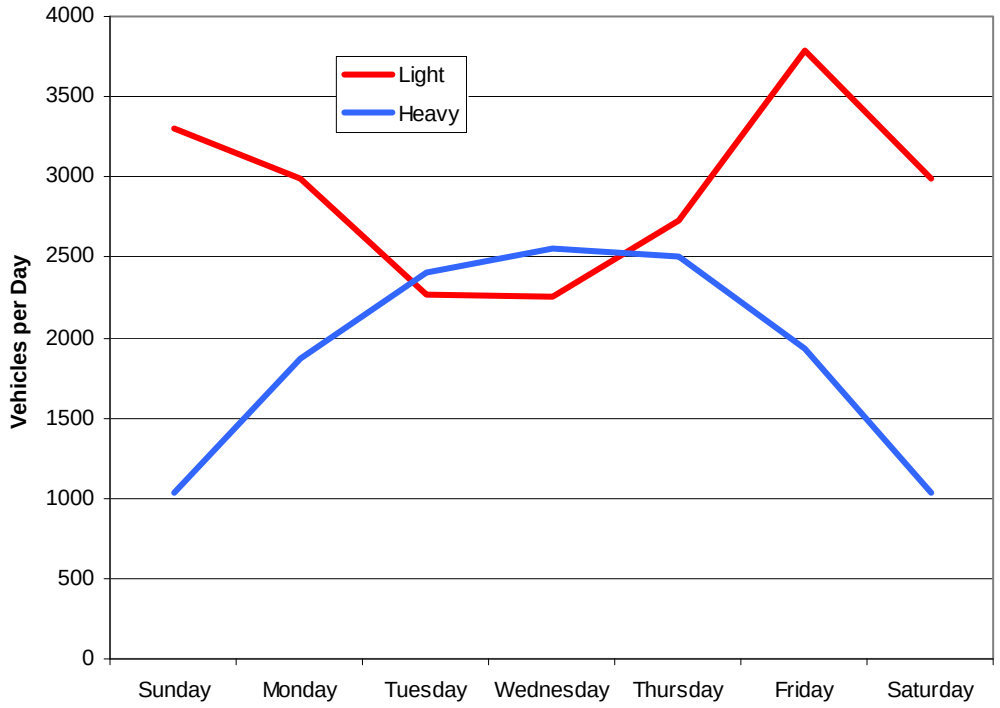


Figure 2-1 Change in daily light and heavy vehicle volumes throughout the week

Source: 2006 RTA classified count data at Holbrook 1.9-kilometres north of MR331 Young Street (north of the Wagga Wagga to Holbrook Road).

Due to the truck stop, Tarcutta experiences a large amount of activity during the evening and night.

2.2.4 Additional traffic volume survey

Additional traffic volume information was gathered to obtain up-to-date hourly traffic data. This count also enabled cross-checking of the number plate origin/destination survey (see Section 2.4) used to assess travel patterns. The data from these counts were annualised using data from the classified vehicle survey on the Hume Highway north of Holbrook. The details of the additional survey undertaken are as follows:

- Classified tube counts commissioned by PB from Friday 5 to Wednesday 10 December 2008.
- Located on the Hume Highway at the northern (south of Mate Street, 100 metres north of truck parking area) and southern Tarcutta town limits — see Figure 2-2.
- Northbound and southbound lanes.

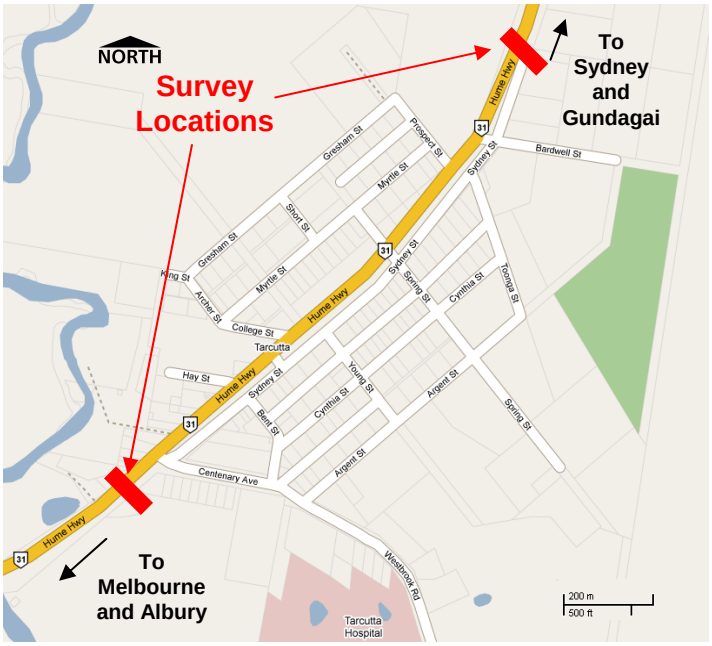


Figure 2-2 Tarcutta additional vehicle count locations

2.3 Existing traffic volume

Traffic volumes surveyed at the north and south ends of Tarcutta have been annualised to obtain indicative annual average numbers for 2008.

Table 2-1 AADT north of Tarcutta

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday (AAWT)	1,239	1,675	2,913	1,405	1,640	3,046
Weekend (AAWE)	1,350	692	2,042	1,524	562	2,085
Weekly (AADT)	1,270	1,201	2,471	1,439	1,135	2,574

Table 2-2 AADT south of Tarcutta

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday (AAWT)	1,483	1,375	2,858	1,468	1,382	2,850
Weekend (AAWE)	1,529	642	2,170	1,635	579	2,214
Weekly (AADT)	1,496	1,165	2,661	1,516	1,153	2,668

The volumes at the sites north and south of the town show similar patterns, with the site south of the town being slightly higher.

The change in traffic volumes throughout the day for the highway south of Tarcutta are shown in Figure 2-3. Northbound and southbound volumes have similar patterns. Both show that the bulk of light vehicle traffic occurs during the middle of the day, while truck traffic builds steadily from a low at 4 am to a peak at midnight. This is when the truck facilities in Tarcutta are the busiest. The pattern north of Tarcutta is similar.

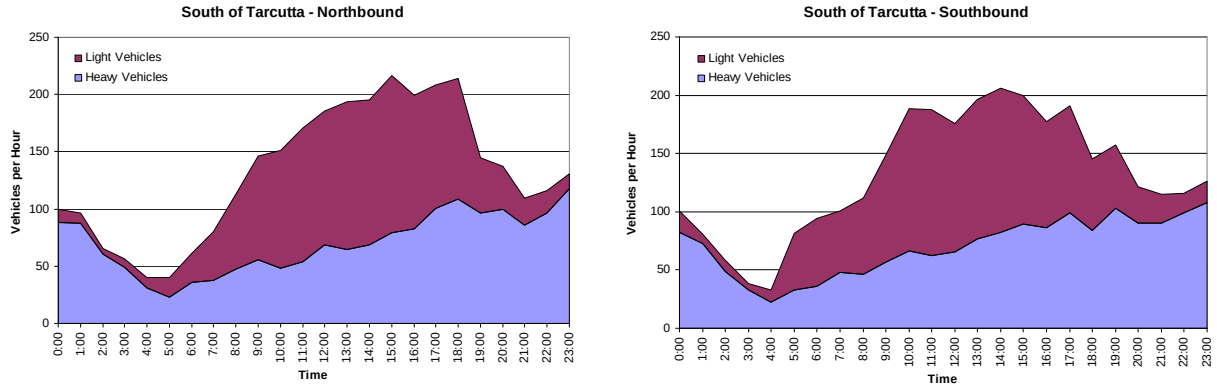


Figure 2-3 Hourly change in traffic volume on Hume Highway south of Tarcutta

The peak traffic time for all vehicles was found to be between 3 pm and 4 pm on weekdays and weekends. The peak truck volume occurred between 11 pm and midnight. In general, the reason for this peak time as the peak is that trucks passing Tarcutta at this time have left Melbourne or Sydney after the evening peak and will arrive at their destination before the start of the morning peak and can deliver their goods ready for the working day. Light vehicle volumes remain high between 1 pm and 4 pm.

Table 2-3 Peak hour traffic volumes south of Tarcutta

	Northbound			Southbound		
	Light vehicles	**Heavy vehicles**	**Total vehicles**	**Light vehicles**	**Heavy vehicles**	**Total vehicles**
Weekday midday peak	137	52	190	110	68	178
Weekday night time truck peak	13	116	129	18	104	122
Weekend	155	23	177	138	33	170
Weekly	142	44	186	118	58	176

Refer to Appendix B for detailed information on traffic volumes at both sites (north and south of Tarcutta).

Traffic data for the sample count sites was only available for 2003. Volumes are in axle pairs:

- South of SH14 Sturt Highway (station number 95.029): 8,635 axle pairs (2003).
- At Tarcutta railway crossing (station number 95.423): 8,790 axle pairs (2003).

Using historic traffic growth rates and an axle pair to vehicle conversion of 1.9 for all vehicles, the estimated traffic volume for 2008 in vehicles for these two sites is:

- South of SH14 Sturt Highway (station number 95.029): 4,948 vehicles (2008).
- At Tarcutta railway crossing (station number 95.423): 5,224 vehicles (2008).

The surveyed volumes are 108 per cent and 102 per cent of these volumes respectively, indicating that the counts roughly match allowing for some additional town-related traffic at the survey locations closer to town.

2.4 Travel pattern data

A survey was undertaken to obtain data on the amount of traffic that:

- Stops in town
- Turns onto local or regional roads
- Travels straight through town without stopping.

This information was used to estimate the proportion of traffic that could potentially use the bypass in the future.

Due to the significant truck activity during the night and the relatively small size of the town, surveys were targeted at the major activity. An origin/destination survey was undertaken during the night from 6 pm on 8 December 2008 to 6 am on 9 December 2008. The licence plates on all vehicles were matched using video cameras set up to capture vehicles on the highway and entering and leaving the truck parking areas. The video camera used special equipment for reading licence plates at night.

The survey was undertaken at the same locations as the classified vehicle counts, (i.e. at the northern and southern edges of the town) as previously shown in Figure 2-2.

Vehicles recorded as they entered and left the town on the Hume Highway. Traffic using Westbrook Road was not recorded in the survey. Vehicles not matched were assumed to be traffic that stayed in town, originated from town or travelled out via Westbrook Road, and therefore, would not be candidates for the proposed bypass. This proportion includes any errors in number plate recording.

Traffic volumes counted were classified into light vehicles (having two axles) and heavy vehicles (having three or more axles). Light and medium rigid trucks with two axles were recorded as light vehicles.

The annualised traffic counts matched the number of vehicles included in the number plate survey. The numbers of light vehicles recorded during the 12 hour period matched the traffic count by 84 per cent, while heavy vehicles matched 99 per cent. Overall there was a 95 per cent match between vehicle numbers.

2.4.1 Travel times

Travel time surveys were undertaken indirectly through the licence plate origin/destination surveys. Vehicles were recorded at locations north and south of town, allowing travel times to be estimated. Plots of the distribution of travel time for light and heavy vehicles in both directions are included in Appendix C. The travel times of vehicles that stopped in town was estimated by analysing plots of the spread of travel times and comparing this to the sign-posted speed limits.

Northbound data showed that 80 per cent of vehicles had a travel time of three minutes or less. Travel times longer than three minutes occurred much less frequently and were widely distributed. Given that Tarcutta has no traffic signals to delay through vehicles, this indicates that the travel time for vehicles travelling through town without stopping is less than three minutes.

Vehicles with a travel time between three and 10 minutes (about three per cent of total flow) would have stopped for only a small amount of time, and it is unlikely that they would have had substantial business in Tarcutta. Reasons for stopping for such a short time could include changing drivers or checking loads, which could be done at other highway rest locations. Vehicles with travel times longer than 10 minutes were assumed to have stopped for a sufficient length of time to be considered as stopped trips.

In the southbound direction, 75 per cent had travel times less than three minutes and five per cent had a travel time between three and 10 minutes.

The distance between the two survey points was 1,400 metres. The data indicates an average travel speed of between 28 and 56 km/h for most through travelling vehicles. The most frequent travel time was two minutes in both directions indicating a travel speed of 42 km/h. This matches the signposted speed limit of 50 km/h. A small number of vehicles were recorded with travel times indicating that they were travelling above the speed limit. These records could indicate a data error, vehicle mismatch or a speeding vehicle.

2.4.2 Travel patterns

The importance of Tarcutta's truck facilities is demonstrated by the 12 hour night time vehicle counts. A sketch showing the location of the truck facilities and the surveyed vehicle volumes is shown in Figure 2-4.

The truck stop was recently built to cater for the demand in heavy vehicles and to formalise truck parking spaces on the western side of the Hume Highway. The truck stop can accommodate about 40 trucks and has toilets and change rooms with shower facilities.

One of the truck layover areas on the eastern side of the highway is adjacent to a block of public toilets, which is used by truck drivers.

Approximately 30 per cent of the trucks entering Tarcutta from both directions stop at one of the four truck facilities. About 12 per cent of light vehicles entering Tarcutta also use these facilities.

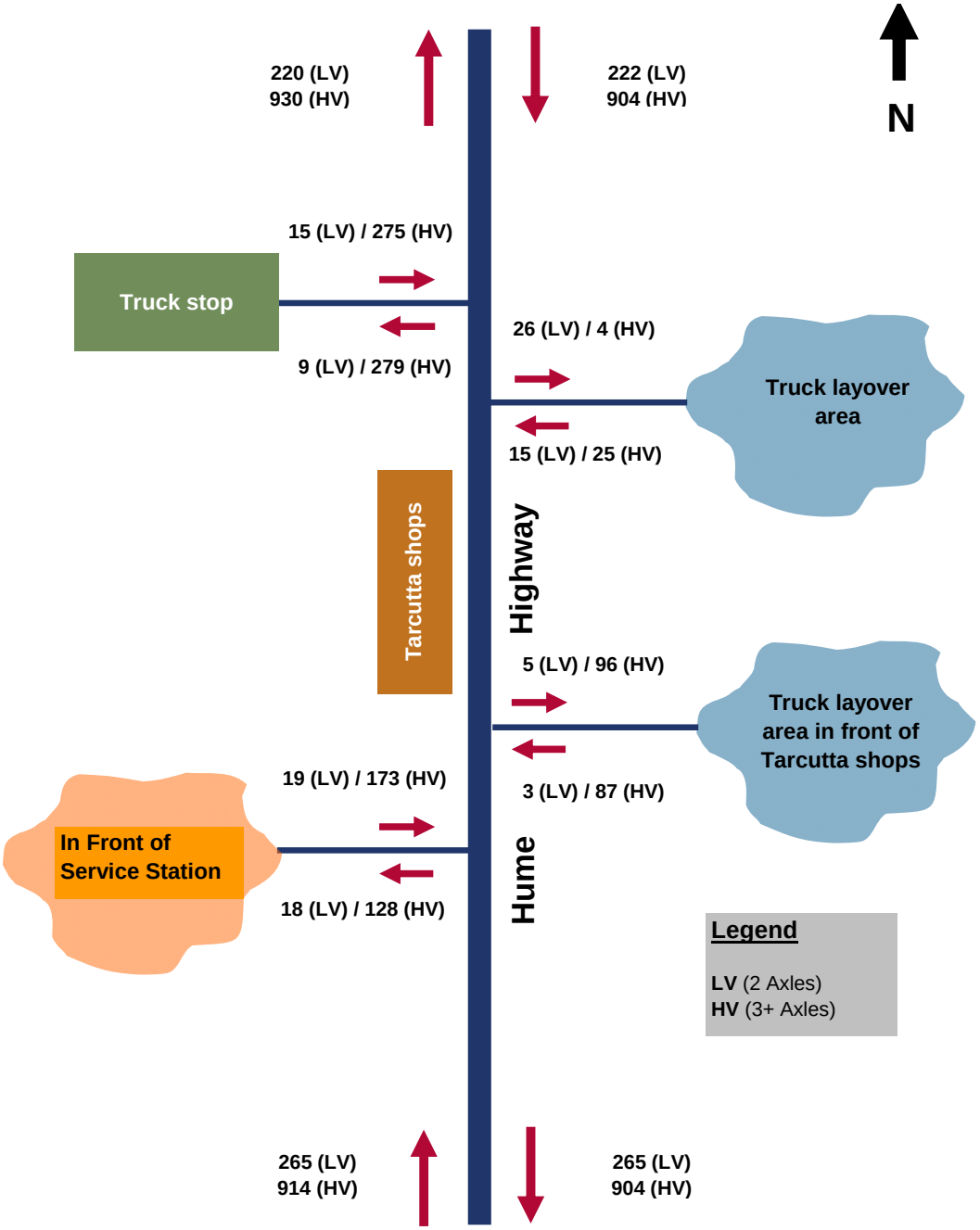


Figure 2-4 Traffic using truck facilities in Tarcutta

Source: video survey taken between 6 pm and 6 am on 8 and 9 December 2008.

The results of the licence plate survey have been summarised in Figure 2-5. The traffic movements are described as follows:

- Vehicle movements on Hume Highway = total vehicles entering town on the Hume Highway.
- Vehicle movements stopping not observed = vehicles registered entering town, but not recorded leaving town again within the 12 hour survey period (for example residents returning home), vehicles using an unsurveyed road or errors in the survey process.

- Vehicle movements on Hume Highway leaving via Hume Highway = through vehicles either travelling straight through without stopping for a substantial amount of time (travel times less than 10 minutes) or stopping in town and then continuing on their way.
- U-turn vehicle movements on Hume Highway = vehicles that entered the town, completed their business and went back out on the same road as they entered.

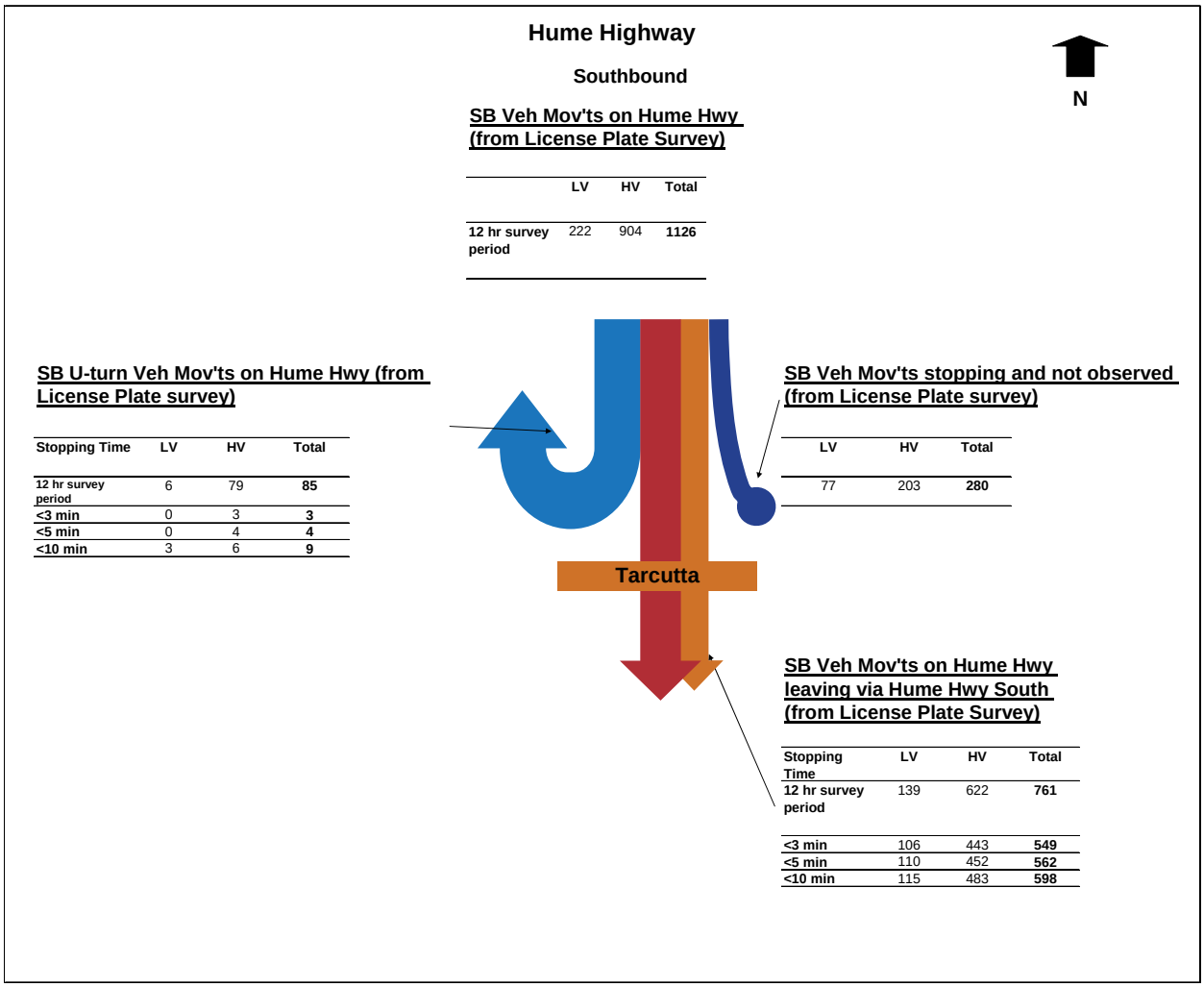


Figure 2-5 Destination of trips entering Tarcutta on Hume Highway - southbound

A large proportion of the U-turning traffic stays for a long period of time, especially heavy vehicles. This confirms the anecdotal evidence that trucks from Sydney and Melbourne meet at Tarcutta, swap loads and then travel back to their home city.

Light vehicles have a different pattern. The majority are either travelling through or ending their trip in town. Of the 139 who continued through town, 115 drove straight through or stopped for a very short time. Seventy-seven light vehicles stopped for longer than 12 hours (i.e. completed their journey in Tarcutta), used an unsurveyed road or were data errors.

These patterns are repeated in the northbound direction, shown in Figure 2-6, with a higher proportion of through traffic.

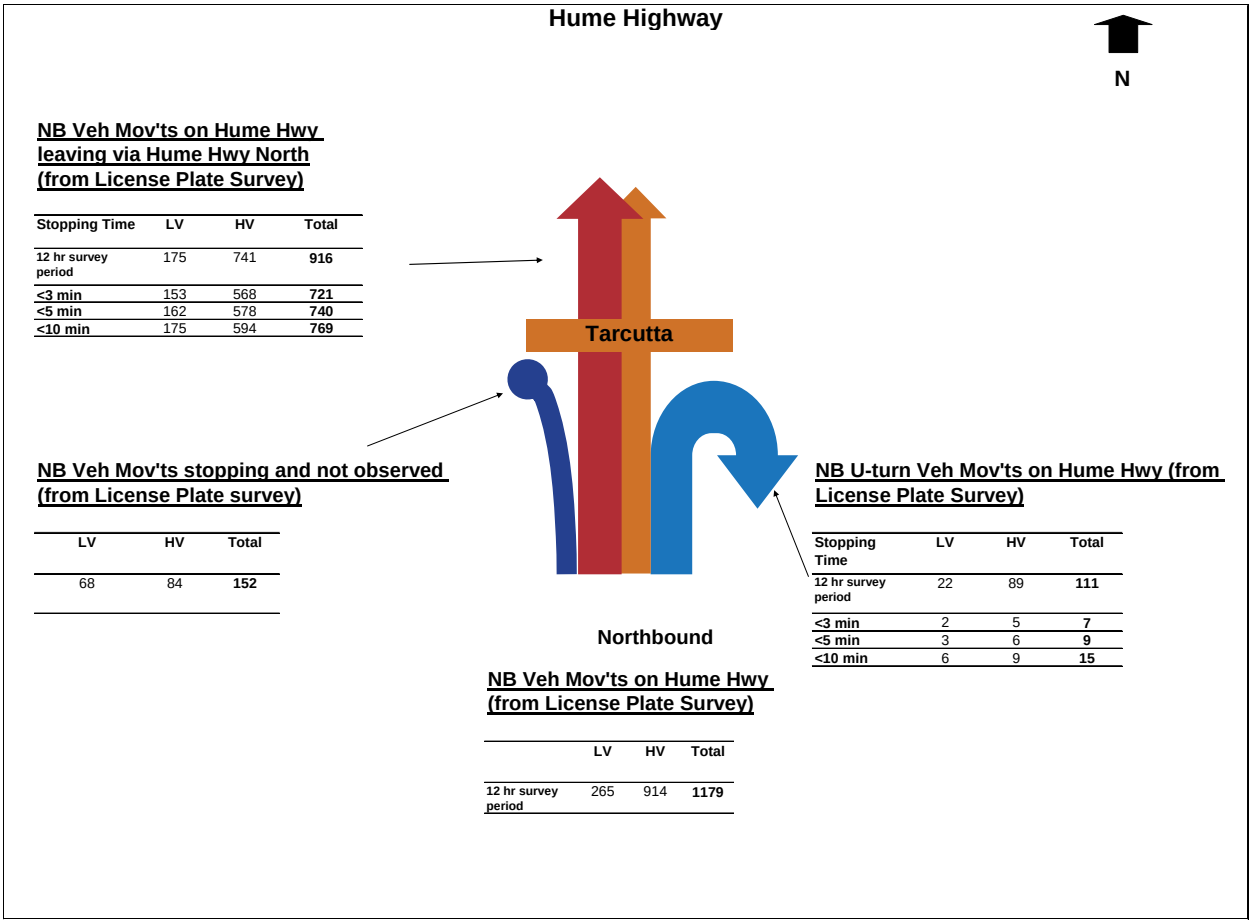


Figure 2-6 Destination of trips entering Tarcutta on Hume Highway - northbound

The proportions of vehicles making each movement are shown in Table 2-4.

Table 2-4 Proportion of stopping, through and U-turn vehicles

Traffic movement	Northbound		Southbound	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Straight through town – no stopping for a substantial length of time	66 per cent	65 per cent	52 per cent	53 per cent
Through town with stop for any length up to 12 hours	0 per cent	16 per cent	11 per cent	15 per cent
Stopped in town for longer than 12 hours, used unsurveyed road or data errors	26 per cent	9 per cent	35 per cent	22 per cent
Came into town, completed their business and went back out ('U-turn')	8 per cent	10 per cent	3 per cent	9 per cent

The number of light vehicles which were only counted once was 145. This included residents leaving or returning home, vehicles using unsurveyed roads and data errors. When increased to represent a 24 hour volume this number of vehicles is higher than anticipated.

Traffic counts on the Westbrook end of Westbrook Road in 1986 and 1994 indicate a daily traffic volume of around 180 vehicles per day. At the Tarcutta end of Westbrook Road, volumes are likely to be higher due to Tarcutta Hospital and increased dwellings. The remaining traffic classified as 'staying' are unexplained or data errors.

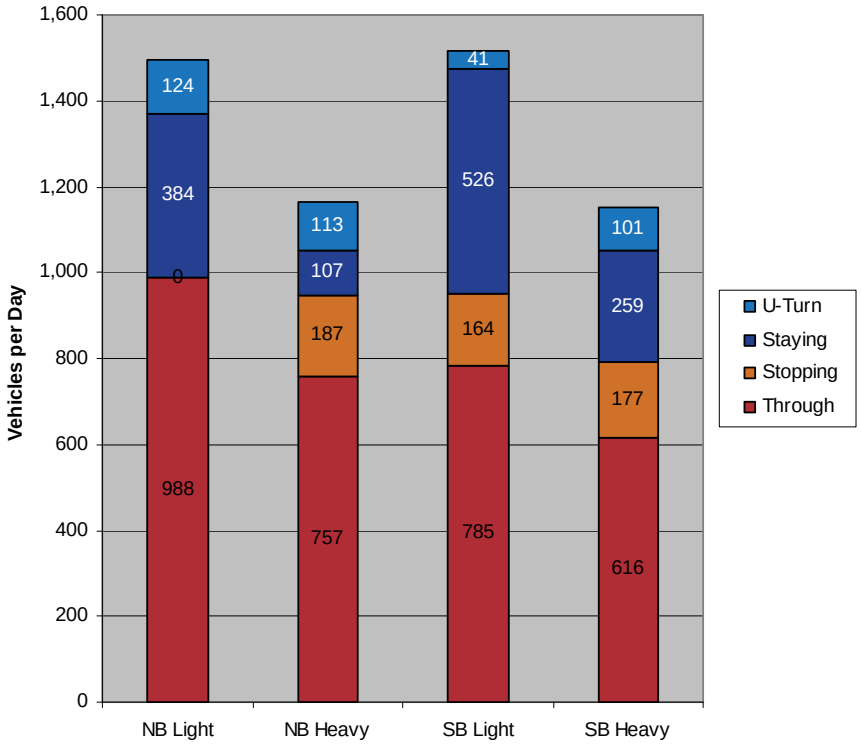


Figure 2-7 Composition of existing traffic on Hume Highway entering Tarcutta

These proportions will be considered when estimating how much traffic would divert to the proposed bypass. It has been assumed that the travel patterns measured during the night are equally applicable during the day.

2.5 Road network performance

The amount of congestion is related to the volume of traffic, the characteristics of the road and the composition of the traffic stream. The mid-block LoS is a qualitative measure used to describe the potential for delay during traffic operation, usually in peak demand situations. Mid-block LoS is designated by assigning the letters A-F, with LoS A representing the best and F the worst. LoS ratings of E and F are commonly considered unacceptable. The LoS are described in Austroads *Guide to Traffic Engineering Practice Part 2 Roadway Capacity, 1988* as follows:

- LoS A is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
- LoS B is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is a little less than with LoS A.
- LoS C is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.

- LoS D is close to the limit of stable flow and is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
- LoS E occurs when traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause break-down.
- LoS F is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow break-down occurs, and queuing and delays result.

This Austroads Guide has been used to estimate the volume to road capacity ratio, which is used to classify the LoS. The following characteristics have been assumed for these calculations:

- Level terrain.
- Approximately equal volumes of traffic in each direction.
- 3.3 metre wide lanes with wide shoulders.
- Twenty per cent with sight distance less than 450 metres.
- Thirty-three per cent trucks for weekday peak, 88 per cent trucks during the night time truck peak and 43 per cent trucks during the highest hourly volumes.

Table 2-5 Road LoS at peak times

Annual highest hourly volumes	Northbound	Southbound	Volume/ capacity ratio	LoS
H_{50}	337	433	0.42	D
Weekday peak hour	190	178	0.19	B
Weekday night time truck peak	129	122	0.18	B

Traffic conditions on the highway through Tarcutta are acceptable (LoS D or better). Conditions are worse during the night due to the high volume of truck traffic, but are still acceptable.

2.6 Crash history

Crash records were provided by the RTA for the two 5-year periods from 1997 to 2002 and from 2002 to 2006. These records and the estimated traffic volume were used to calculate an average crash rate per 100 million vehicle kilometres travelled (100 MVKT[1]). These were compared to average rates for the NSW road network from the *Road Environment Study Update 22 - Rural Road Crash Rates by Road Stereotype* (RTA, 2004).

[1] Vehicle Kilometres Travelled (VKT) a measure of exposure to a crash event. One VKT is equivalent to one vehicle travelling a distance of one kilometre or alternatively, two vehicles travelling for a distance of half a kilometre. The reported crash rate was per 100 million vehicle kilometres travelled.

Crash records were provided by the RTA for the five year period from 2002 to 2006 which indicate:

- There were 12 crashes, four of which involved trucks, which occurred on the stretch of highway through Tarcutta.
- Four crashes involved injury, but none were fatal. This is similar to crash statistics for the 1997 to 2002 period during which there were 11 crashes, four of which involved injuries and one a fatality.
- The primary crash types were 'off-road on curve' (50 per cent), 'off-road on straight' (17 per cent) and 'rear-end' (17 per cent).
- Speed was one of main contributing factors to the recorded crashes, accounting for 58.3 per cent of total crashes. Sixty-seven per cent of crashes occurred within the 100 km/h speed zone (i.e. outside the village).
- Fifty per cent of crashes happened during the dawn and dusk periods (7 am-8 am and 5 pm-7 pm). This indicates that light contrast could be a contributing factor in some crashes.
- The day with the highest number of crashes was Friday with 41.7 per cent of total cashes.
- The crash rate was 30.1 crashes per 100 MVKT. It is noted that this is marginally lower than the state-wide crash rate[2] of 32.8 per 100 MVKT for rural 2-lane undivided roads in NSW.
- Crash rates on the undivided sections elsewhere on the Hume Highway in this region were approximately 15 per cent higher than on divided sections. The severity of crashes on the undivided sections of the Hume Highway was approximately 85 per cent higher than on the divided sections.

Table 2-6 compares crash data on the single carriageway section of the highway around Tarcutta for the five years from 2002 to 2006 with divided carriageway sections of the highway between the Sturt and Olympic Highways and typical two-lane rural main roads.

Table 2-6 Crash rate comparison 2002 - 2006

Location	Rate per 100 MVKT			
	Fatal	Injury	Tow-away	Total
Single carriageway section, Tarcutta	0.0	10.0	20.1	30.1
Divided carriageway sections, Sturt Highway to Olympic Highway	1.1	7.9	15.6	24.6
Typical 2-lane rural main roads	1.4	14.2	17.2	32.8

Source: RTA (2008)

Note: 1. Crash data between October 1997 and September 2002 from Hume Highway Strategic Planning Study Final Report

[2] Source: Road Environment Study Update 22 - Rural Road Crash Rates By Road Stereotype, RTA, 2004

The crash rate comparison indicates that the highway around Tarcutta experiences slightly more crashes than the divided carriageway sections of the Hume Highway between the Sturt Highway and the Olympic Highway, and a similar amount to the typical crash rates for two lane rural main roads. It is noted, that the crash rate on the single carriageway section around Tarcutta is calculated from a relatively low number of total crashes.

3. Bypass projects

The proposed bypass of Tarcutta, as well as those of Holbrook and Woomargama, represents the final stages of the upgrading of the Hume Highway to dual carriageway between Melbourne and Sydney. This chapter provides information on the proposed project including its objectives and details of the proposed bypass.

3.1 Project objectives

The proposed bypass would potentially have travel benefits for both the local community and interstate traffic. These include:

- Increased infrastructure handling capacity and efficiency.
- Improved safety and security.
- Improved transport productivity on its nationally strategic and export-oriented freight corridors.
- Improved reliability of travel on interstate and inter-regional corridors.
- Are consistent with viable and long-term economic and social outcomes, and with the obligation to current and future generations to sustain the environment.

3.2 Proposed design

The proposed design of the bypass has been developed through stages of analysis and community consultation. The community consultation to date has covered issues such as route alignment and interchange location. The proposed design described below was recommended from the preferred option reports and preliminary environmental assessment.

The preferred western option is 5.9 kilometres long and would have a travel time of approximately three and a half minutes. The bypass would have the following connections and impacts on the local road network:

- Northern end:
  - Southbound off-load slip-lane to existing highway.
  - Northbound on-ramp from existing highway over the new bypass.
- Southern end:
  - Southbound on-load slip-lane from existing highway.
  - Northbound off-ramp to existing highway under the new bypass.
- Mates Gully Road connects to northbound off-ramp:
  - No change in access from Tarcutta to Mates Gully Road.
  - Small detour for southbound traffic from Mates Gully Road.
  - No access from highway north of bypass to Mates Gully Road — traffic continues to use existing road.

- Access to Humula Road connects to southbound on-ramp:
  - No change in access from Tarcutta to Humula Road.
  - No access from highway north of bypass to Humula Road — traffic continues to use existing road.
- Local access crossing point between northern end of bypass and Tarcutta Creek.

The proposed alignment is shown in Figure 3-1.

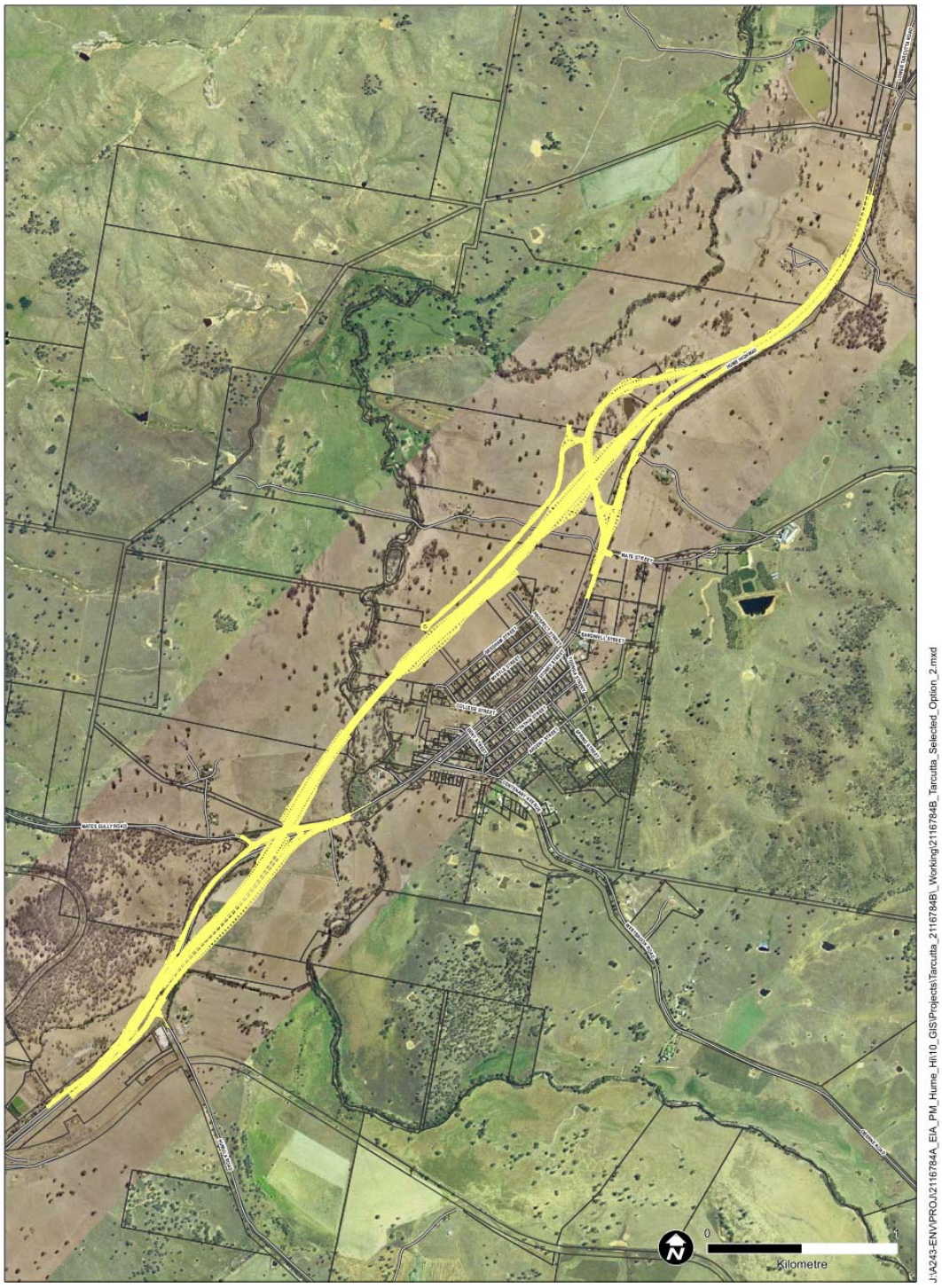


Figure 3-1 Proposed Tarcutta bypass

4. Traffic impact

This chapter includes the assessment of traffic volumes, proportions of through traffic, travel times, mid-block LoS and crashes. It also includes a description of the construction impacts.

4.1 Traffic forecasts

4.1.1 Historic trends

RTA AADT traffic volume data was obtained for various years from 1982 to 2006 to determine the historic trends of traffic on the Hume Highway. Two locations were used in the analysis.

- South of SH14 Sturt Highway (station number 95.029).
- North of Holbrook approximately 1.9 kilometres north of MR331 Young Street (north of Wagga Wagga to Holbrook Road) (station number 95.002).

The data between 1982 and 1997 showed a high growth rate of between four and six per cent per annum.

The more recent growth between 1997 and 2006 showed a linear growth in traffic for the two sites:

- South of SH14 Sturt Highway: 2.1 per cent growth per annum.
- North of Holbrook: 3.4 per cent growth per annum.

Factors that could be affecting the growth include:

- Improvement of the Hume Highway reducing travel times and encouraging more intercity travel.
- Reduced travel times making road freight more cost effective.
- Increasing levels of car ownership.
- Increasing populations, especially in Canberra, Sydney and Melbourne.
- Low-cost airfares between capital cities restraining the growth of light vehicles.

4.1.2 Forecasts

Forecasts of growth in traffic on the Hume Highway are available from several sources including:

Future traffic volumes on the Hume Highway, south of the Sturt Highway were forecast in the *Hume Highway Strategic Planning Study Final Report* (Connell Wagner, June 2004). The maximum growth rate forecast between 2006 and 2021 was 2.8 per cent per annum (linear).

The *Hume Highway Demand Modelling Report* (Booz Allen Hamilton, June 2004) assessed the potential growth in road and rail freight between the Sturt Highway/Hume Highway interchange and Albury. This report assumed a 3.4 per cent per annum average annual growth rate for non-bulk freight between Sydney and Melbourne of 3.4 per cent per annum, split between road and rail. It forecast a growth in total traffic on the Hume Highway of between 2.4 per cent and 2.8 per cent per annum from 2006 to 2021 depending on the policy option for stimulating rail versus road freight.

The Bureau of Transport and Regional Economics' *Working Paper 66* (2006) projected an average annual growth in traffic on the Gundagai to Holbrook section of the highway between the years of 1999 and 2025 of 1.47 per cent, with lower growth for light vehicles than heavy vehicles.

All three studies were produced before 2008, when the price of petrol rose sharply, only to drop again. Increasing fuel prices could reduce the amount of light vehicle traffic and push more freight traffic from road to rail. The studies above also do not take into consideration the recent global economic downturn, which could reduce the growth in total freight between Melbourne and Sydney. If gross domestic product reduces, the need for truck transport would reduce also.

This study will look at long-term growth (i.e. greater than 10 years from the present). It is considered that by this time the effects of the global economic downturn will have dissipated, and that a move to more fuel efficient vehicles will allow people to continue travelling by vehicles rather than switching modes or stopping travelling altogether. The growth rate of 2.8 per cent per annum is recommended for the estimation of future traffic volumes. Changes in these assumptions may change the future traffic volume forecasts.

The study has looked at three design years. As the upgrading of the Hume Highway is due for completion in 2012, traffic forecasts have been made for this year. The future years of 2022 and 2032 were chosen to assess the impacts 10 and 20 years from the date of opening.

4.2 Future travel changes

A bypass of Tarcutta would change travel patterns by moving some of the traffic travelling along the highway through town onto the proposed bypass.

4.2.1 Travel times

To determine whether through traffic will use the bypass, the travel times through town and on the bypass are compared.

The travel time along the highway, if the proposed bypass is not undertaken, will depend on the volume of traffic and the amount of turning traffic that could delay through traffic. The level of congestion is estimated in Section 4.3.1. For the purposes of comparison, the existing travel time on the highway is used.

The average travel time for the 1,400 metre section surveyed was approximately two minutes. The proposed bypass covers a longer length than the 1,400 metre surveyed through the town. The travel time on the remaining sections to the north and south of the town has been estimated using the sign-posted speed limit of either 50 km/h or 100 km/h. Based on this calculation, the travel time for the 6.1 kilometre section is approximately five and a half minutes.

The travel time on the bypass has been estimated as about three and a half minutes using the design speed limit of 110 km/h and the length of 5.9 kilometres. Therefore the bypass would create a travel time saving of approximately two minutes.

4.2.2 Local access

The proposed bypass maintains most local access with little impact. Vehicles on Mates Gully Road would be required to complete a detour of 500 metres in order to head south. Humula Road would connect to the new southbound on-ramp, with two-way access provided north of Humula Road. A junction between the northbound off-ramp (and Mates Gully Road) and southbound on-ramp (and Humula Road) would allow southbound traffic from Mates Gully Road and northbound traffic from Humula Road to switch to the correct side of the road before connecting back to the existing highway

Access for both Humula Road and Mates Gully Road to the north would continue to be via the existing highway through Tarcutta.

A local access road over the bypass would be provided with access from Gresham Street. During construction this road would serve as the access to the concrete batching plant.

4.2.3 Travel patterns

The proposed bypass would provide a shorter travel time than travelling through town. Therefore, it has been assumed that the traffic movements that would have a quicker travel time on the bypass would divert onto the bypass. It is also possible that some of the through vehicles that stopped for a short amount of time may divert to the bypass because it may be easier to keep moving and stop at a more convenient location.

The exact amount of stopping traffic that would switch onto the bypass is not known. An upper and lower bound for how much of the stopping traffic would divert to the bypass has been applied. This represents the likely range of traffic change which would be influenced by other factors such as the convenience of alternative stopping locations; driver's stopping patterns for fuel and food, etc. For this assessment:

- Traffic travelling straight through without stopping has been assigned to the bypass where it provides the quickest route.
- Traffic stopping in town has been split using the method described below.
- Traffic staying in town uses the ramps to get into town.
- U-turning traffic uses the ramps to get into and back out of town.

These traffic components were calculated in Section 2.4.2.

For each scenario, different diversion factors are assumed for light and heavy vehicles. This is because light and heavy vehicles are influenced by different factors (e.g. heavy vehicles have guidelines about taking rests and are likely to be set in a pattern whereas light vehicles are freer to use the most convenient stop).

The assumptions are based on the results of two studies. The work undertaken for the economic analysis report for the Tarcutta Bypass (*Economic impact study of highway related businesses - Hume Hwy, Phase 1 Tarcutta*, Parolin, University of New South Wales, May 2009) included a survey of light and heavy vehicle drivers conducted in Tarcutta at various locations. They were questioned on their reason for travel; origin and destination; previous stop location; length of stop and expenditure patterns. The survey was conducted during day-time hours. It is noted that the sample size for heavy vehicles was small. The results of the survey are shown in Table 4-1.

Table 4-1 Economic analysis stopper survey

Type of vehicle	Will you stop in Tarcutta after the bypass opens?			Total
	Yes	No	Unsure	
Light vehicle	116	173	38	327
	35.5 per cent	52.9 per cent	11.6 per cent	100.0 per cent
Heavy vehicle	34	15	2	51
	66.7 per cent	29.4 per cent	3.9 per cent	100.0 per cent
Total	150	188	40	378
	39.7 per cent	49.7 per cent	10.6 per cent	100.0 per cent

The results show:

- 52.9 per cent of through stopping motorist survey respondents travelling in light vehicles indicated they would not stop in Tarcutta after the bypass opens.
- 29.4 per cent of through stopping motorist survey respondents travelling in heavy vehicles indicated they would not stop in Tarcutta after the bypass opens; 66.7 per cent indicated they would stop continue to stop in Tarcutta after the bypass opens.
- The sample size for heavy vehicles is small (13.5 per cent of all motorists surveyed) in Tarcutta and was collected primarily during day-time hours (although some surveys were collected between 6 pm-10 pm.

The second study is the post-opening report on the Karuah bypass of the Pacific Highway *The Economic and Social Impacts of the Karuah Bypass – The 1 year Report* (Rowe and Phibbs, University of Sydney, November 2005). The traffic analysis for this study showed that there was a large drop in traffic stopping in Karuah after the opening of the bypass, with 90 per cent of traffic diverting to the proposed bypass.

The results of these two surveys have been used to provide the upper and lower bounds for the forecasts. The assumptions are:

Low diversion scenario forecasts:

- For light vehicles the results of Parolin's stopper survey for people who said that they would no longer stop in town when the bypass is built have been used (53 per cent diversion of stopping traffic to the bypass).

- For heavy vehicles it has been assumed that there would be no change to the proportion of trucks that stop.

High diversion scenario forecasts:

- For light vehicles the results from the bypass of Karuah have been assumed to apply for Tarcutta (i.e. that when the bypass is built there would be a 90 per cent reduction in stopping traffic). The diversion proportion has been applied to stopping traffic only, not the total number of vehicles. As the proportion of staying and U-turn traffic was higher than the remaining proportion on the existing highway.
- For heavy vehicles the results of Parolin's stopper survey for truck drivers who said that they would no longer stop in town when the bypass is built have been used (29 per cent diversion of stopping traffic to the bypass).

Based on the assumptions made above, traffic movements during each of the design years (2012, 2022 and 2032) have been assigned to the bypass, the existing highway and the relevant ramps. The following traffic has been assumed to use the bypass between the northern and southern interchanges:

- Hume Highway northbound and southbound traffic that does not stop
- Hume Highway northbound and southbound traffic that used to stop but is forecast to choose a different stopping location once the bypass is built.

Traffic movements that would continue to use the existing highway include:

- Hume Highway northbound and southbound traffic that continues to stop in Tarcutta
- Traffic staying in Tarcutta (e.g. residents, motel guests, traffic using side roads)
- Traffic coming into Tarcutta to do business and then leaving via the same road they came in.

Considering the small size of Tarcutta, the proportion of through traffic is relatively low. This is due to Tarcutta's strategic position between Sydney and Melbourne and its importance as a truck stop.

Although the travel pattern survey data was collected during the 12 hour night time period and the stopper survey was undertaken during the daylight hours, it has been assumed that combining the results of both surveys would be valid for the whole day. While light traffic makes up a larger proportion of the traffic stream during the day, the proportion of light vehicles stopping versus travelling through was roughly the same as for heavy vehicles during the night.

4.2.4 Traffic volume

If the Hume Highway stays in its current condition, traffic volumes will continue to increase as will traffic congestion. The 2008 volumes have been factored up using the 2.8 per cent per annum growth factor discussed in Section 4.1.2 for the design years of 2012, 2022 and 2032.

Table 4-2 Future AADT volumes south of Tarcutta with no bypass

Year	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
2012	1,670	1,301	2,972	1,693	1,287	2,980
2022	2,202	1,715	3,917	2,231	1,697	3,928
2032	2,902	2,261	5,163	2,940	2,236	5,177

Detailed forecast future traffic volumes are included in Appendix D.

If the highway was upgraded with the construction of the dual carriageway bypass, the traffic volume would be shared between the highway and the bypass. The bypass would create additional capacity for future growth. The forecast volumes on the existing highway with the bypass constructed for the southbound and northbound directions are shown in Tables 4-3 and 4-4 respectively.

Table 4-3 Future southbound AADT volumes north of Tarcutta with bypass

Year	Scenario	Vehicle type	North of interchange	Bypass		Existing highway	
			Total AADT	AADT	Per cent	AADT	Per cent
2012	High diversion to bypass scenario	Light	1,693	1,042	62	651	38
		Heavy	1,287	746	58	541	42
	Low diversion to bypass scenario	Light	1,693	974	58	719	42
		Heavy	1,287	688	53	600	47
2022	High diversion to bypass scenario	Light	2,231	1,373	62	858	38
		Heavy	1,697	983	58	713	42
	Low diversion to bypass scenario	Light	2,231	1,283	58	948	42
		Heavy	1,697	907	53	790	47
2032	High diversion to bypass scenario	Light	2,940	1,810	62	1,131	38
		Heavy	2,236	1,296	58	940	42
	Low diversion to bypass scenario	Light	2,940	1,691	58	1,249	42
		Heavy	2,236	1,195	53	1,041	47

Table 4-4 Future northbound AADT volumes south of Tarcutta with bypass

Year	Scenario	Vehicle type	South of interchange	Bypass		Existing highway	
			Total AADT	AADT	Per cent	AADT	Per cent
2012	High diversion to bypass scenario	Light	1,670	1,103	66	567	34
		Heavy	1,301	907	70	394	30
	Low diversion to bypass scenario	Light	1,670	1,103	66	567	34
		Heavy	1,301	846	65	456	35
2022	High diversion to bypass scenario	Light	2,202	1,454	66	748	34
		Heavy	1,715	1,196	70	519	30
	Low diversion to bypass scenario	Light	2,202	1,454	66	748	34
		Heavy	1,715	1,115	65	601	35
2032	High diversion to bypass scenario	Light	2,902	1,916	66	986	34
		Heavy	2,261	1,576	70	685	30
	Low diversion to bypass scenario	Light	2,902	1,916	66	986	34
		Heavy	2,261	1,469	65	792	35

For the high diversion scenario, 64 per cent of all vehicles use the bypass, while for the low diversion scenario 62 per cent of light vehicles and 59 per cent of heavy vehicles use the bypass. The difference between the scenarios is the amount of stopping traffic which switches to the bypass.

Excluding traffic which is committed to driving in to Tarcutta (residents, people with business in town, etc.), of the vehicles which could potentially use the bypass, the following proportions are forecast to select the bypass rather than travelling through town:

- Low diversion scenario: 85 to 90 per cent of through traffic uses the bypass; and
- High diversion scenario: 92 to 93 per cent of through traffic uses the bypass.

4.3 Transport impact

The proposed bypass would have benefits for travel for vehicles on the existing highway and on the bypass. Through traffic would be given a quicker, high quality road with overtaking opportunities. People in Tarcutta would experience lower traffic volumes and congestion; and find it easier to cross the existing highway.

4.3.1 Road network performance

Traffic volumes on the highway are forecast to increase with or without the upgrade. If the proposed bypass is not built, the existing highway will be required to carry the whole traffic volume with a reduced LoS on the existing highway. Table 4-5 shows the LoS for the 'do nothing' scenario as well as for the scenario with the bypass built. This analysis has used the results from the high diversion scenario to show the maximum likely conditions on the bypass.

By 2022 the conditions on the highway are forecast to have just slipped into the unacceptable range (LoS E or F) during the highest traffic times through the year (e.g. long weekends and school holidays) if the bypass is not built. Traffic conditions for average conditions would remain within the acceptable range.

Table 4-5 Future LoS with and without bypass

	Do nothing		With bypass			
	Hume Highway		Hume Highway		Bypass	
	vol/cap ratio	LoS	vol/cap ratio	LoS	vol/cap ratio	LoS
2008						
50th highest hourly volume (H_{50})	0.42	D	-	-	-	-
Weekday midday peak	0.20	B	-	-	-	-
Weekday night time truck peak	0.20	B	-	-	-	-
2012						
50th highest hourly volume (H_{50})	0.47	D	0.20	B	0.19	A
Weekday midday peak	0.22	B	0.08	A	0.09	A
Weekday night time truck peak	0.22	B	0.08	A	0.08	A
2022						
50th highest hourly volume (H_{50})	0.62	E	0.26	C	0.25	A
Weekday midday peak	0.29	C	0.11	A	0.12	A
Weekday night time truck peak	0.29	C	0.10	A	0.11	A
2032						
50th highest hourly volume (H_{50})	0.87	E	0.34	C	0.33	A
Weekday midday peak	0.40	D	0.15	B	0.16	A
Weekday night time truck peak	0.40	D	0.15	B	0.14	A

With the bypass, traffic volumes would be split between the two roads. The average weekday peak and the night time truck peak would maintain acceptable operating conditions throughout the timeframe assessed.

4.3.2 Travel statistics

The proposed bypass would provide a shorter travel distance and time for through traffic compared to travelling through town. The total distance travelled is represented by the vehicle kilometres travelled (VKT) and the total amount of time spent travelling is represented by the vehicle hours of travel (VHT). A summary of the do nothing and with proposed bypass scenarios for 2012 is shown in Table 4-6. It shows that the bypass would result in a net saving of both distance travelled and time spent travelling. A similar saving is forecast for the other years.

Table 4-6 Travel statistics for 2012

	VKT	VHT
Do Nothing	13,171,127	211,386
With Bypass	12,907,727	165,531
Saving	2 per cent	22 per cent

4.4 Crash potential

With the construction of the dual carriageway bypass, some traffic would be moved from the existing highway to the new road, which is anticipated to have a lower crash rate. This is because the dual carriageway road creates a separation between the two traffic flows. The provision of two lanes each way would create safe overtaking opportunities, also reducing the chance of a head-on collision.

The removal of traffic from the town would also reduce the likelihood of a crash at an intersection as there should be larger gaps in traffic.

The RTA publishes a list of percentage reductions for crashes when different treatments are used (*Accident Reduction Guide, Part 1: Accident Investigation and Prevention*). A 'Duplicate Road' project is estimated to have the following percentage reductions. These have been summarised for the crash types recorded between 2002 and 2006 in Table 4-7.

Table 4-7 Duplication of roadway crash reductions

Crash type	2002-2006 crashes	Per cent reduction
U-turn	1	30
Rear-end	2	30
Off straight; hit object	2	10
Off carriageway; curve	1	10
Off curve, hit object	5	10
Other	1	0

Applying these reductions, the duplication of the highway would result in a 14 per cent reduction in crashes based on the recent crash history.

As traffic volumes, and therefore, the vehicle kilometres of travel are forecast to increase, the total number of crashes is expected to increase as well.

The crash rate for the existing highway through Tarcutta calculated in Section 2.6 was 30.1 crashes per 100 MVKT. Assuming a 14 per cent reduction in this rate, the new bypass is expected to have an accident rate of 25.8 crashes per 100 MVKT.

Using the recorded rate for the existing alignment; the reduced rate for the new bypass and the forecast AADT volumes for 2012, 2022 and 2032, the anticipated reduction in accidents for each of these years is shown in Table 4-8.

Table 4-8 Comparison of forecast future annual crashes

Year	Do nothing	With bypass		Difference
	Existing highway	Existing highway	New bypass	
2012	4.0	1.4	2.1	-0.4
2022	5.2	1.9	2.8	-0.6
2032	6.9	2.5	3.7	-0.7

Across the 20 year period from 2012 to 2032 the proposed bypass is anticipated to save 12 crashes, including four injury crashes.

There is also a possibility that the bypass could take on the crash characteristics of the other divided carriageway sections of the Hume Highway from the Sturt Highway to the Olympic Highway. If this were the case the crash rate could be 24.6 crashes per 100 MVKT. Although this is lower, the crash rate for the other sections of highway does include a component of fatal crashes (1.1 crashes per 100 MVKT).

4.5 Cycle facilities

Due to the large distances between towns and the small population surrounding Tarcutta, the number of cyclists using the bypass would be low. Long distance cyclists may want to stop in the town to rest and use the facilities. The distance through town is 600 metres shorter than proposed bypass. Also, the reduction in traffic through Tarcutta would create safer and more pleasant riding conditions.

Cyclists would be encouraged to continue to use the existing highway through Tarcutta by the erection of signs before the off-ramps at the start of the bypass in each direction.

There is still the chance that cyclists would use the proposed bypass. A road shoulder width of 2.5 metres would provide a 1.5 metre separation between a bicycle and the traffic lane, which is suitable for a vehicle speed of 100 km/h (*Austroads Guide to Traffic Engineering Part 14 Bicycles*, 1999). No value is given for speeds higher than 100km/h. This does not allow for side clearances to obstructions.

4.6 Stock route

Travelling stock reserves provide overnight shelter and containment for livestock herds being moved between properties or from properties to market. A travelling stock route crosses the Hume Highway on its way between Wagga Wagga/Gundagai and Humula/Tumbarumba (see Figure 4-1 for map). The path of the route follows Mates Gully Road then travels along the western side of the Hume Highway before crossing near Humula Road. A stock holding yard (Travelling Stock Reserve) is located on the eastern side of the Hume Highway north of Humula Road.

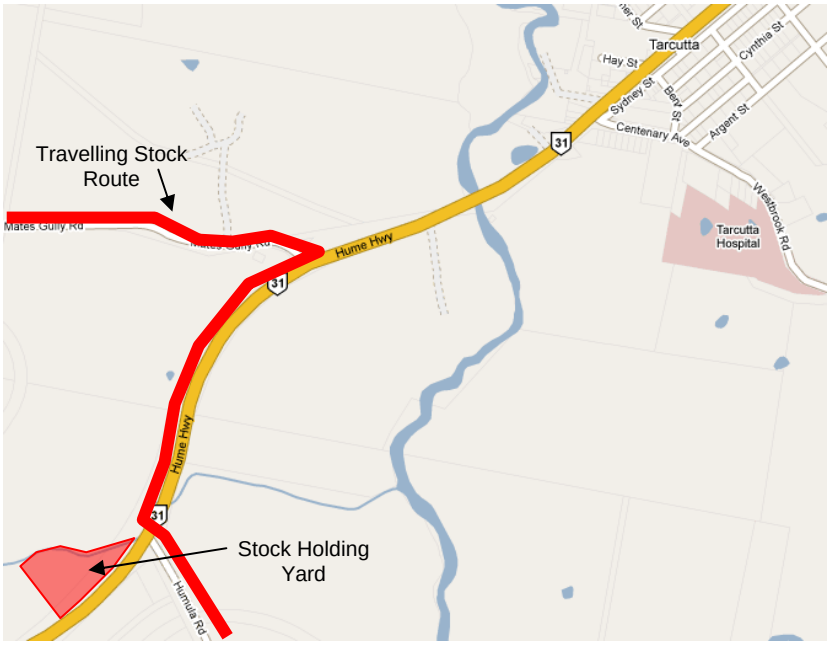


Figure 4-1 Travelling Stock Route between Mates Gully Road and Humula Road

The travelling stock route is used two to three times per year. When it is used, a NSW Police escort is required to ensure traffic safety. There is some delay to highway traffic when stock crosses the highway into the storage yard or into the Humula Road section.

The stock route would be maintained under the proposed bypass arrangement. However, the arrangements have not yet been finalised. The traffic volume using the section of highway coinciding with the travelling stock route would be reduced, meaning less impact during the times when stock is moved.

4.7 Construction impact

Construction of the upgrade is anticipated to take two years. A site compound and concrete batching plant are planned adjacent to the new road alignment with access to the existing highway near the northern tie-in to the existing highway.

4.7.1 Construction times

The proposed hours of construction are between 6 am and 7 pm Monday to Friday, and between 7 am and 4 pm Saturday. Some construction activities may be required outside these hours, but would require prior discussion with and/or notification of local residents and the Department of Environment and Climate Change. Out-of-hours work may be required for:

- Concrete paving.
- Concrete saw cutting.
- Concrete batch plant deliveries.
- Casting of bridge decks.

Approval for out-of-hours work would be required. Traffic control arrangements would need to take into consideration the requirements of heavy vehicles to avoid delaying interstate freight transport.

4.7.2 Staging

The majority of the bypass can be constructed without affecting the movement of traffic on the existing highway. It is only at the northern and southern tie-in points where highway traffic needs to be adjusted to allow construction of the proposed bypass to proceed.

Traffic would be switched between the existing and newly constructed sections of road to facilitate the continual flow of traffic through and around Tarcutta. These works may result in some short-term traffic impacts to users of the existing road network. In particular, temporary roadworks are expected to be required at the intersections of the existing highway with Mate Street, and Humula and Mates Gully roads. Mates Gully Road traffic heading into Tarcutta may be required to make a temporary diversion.

4.7.3 Traffic management

The types of traffic management required during construction includes: introduction of roadwork speed zones, diversion of traffic onto temporary or newly constructed roads, closure of auxiliary overtaking lanes, short-term one lane alternate operations, haulage operations, haulage road crossing and over-dimension vehicle movements.

A construction traffic management plan would be prepared at the beginning of the construction phase. The plan would detail how the traffic impacts associated with the construction of the project would be managed.

Site specific traffic control plans will be developed for both long and short-term works, with the aim to maximise safety for workers and road users. These plans will be based on the relevant sections of the construction traffic management plan. The traffic control plans will be prepared in accordance with the RTA's *Traffic Control at Work Sites* manual, *Australian Standard 1742.3*, and *RTA Specification G10*. The traffic control plans will be developed with the aim to:

- Warn drivers of changes to the usual road conditions.
- Inform drivers about changed conditions.
- Guide drivers through the work site.
- Ensure safety for workers, motorists, pedestrians and cyclists.

Temporary roadwork speed limits may be required to reduce traffic speeds to suitable levels near construction activities for the protection of construction workers and the travelling public. Applications for temporary alterations to road speed limits would be made to the RTA, with notification of approved changes to the NSW Police and local council (if required).

A list of the proposed mitigation measures during construction is provided in Table 4-9.

Table 4-9 Measures for management of construction traffic impacts

Impact	Mitigation
Reduced speeds, traffic delays and disruption	**Design** Traffic impacts to the users of the local and regional road network would be considered when developing the preferred design arrangement, such as: ▪ Limiting the number of points where new alignments cross the existing road network. ▪ Limiting the need to occupy areas of the existing road.
	Individual construction worksites At the individual construction worksites, the objective is to minimise traffic impacts by adopting the following guiding principles: ▪ Planning construction through the use of construction staging and temporary roadworks to minimise interaction with the existing road network and night time freight vehicle movements. ▪ Minimising the road space occupied by works, and the time of construction. ▪ Minimising the impacts of construction works on local and regional traffic by using the new carriageway, as far as practical, for construction traffic. ▪ Implementing traffic control measures only when necessary. ▪ Maintaining property access for the duration of the construction, and where reasonable and feasible, provide alternative access in consultation with affected landowners.
	Coordinating works The objective is to ensure that road users do not experience excessive delays on their journeys, due to frequent road works. This can be achieved through: ▪ Coordinating the delivery of construction materials, and the movement of construction plant and equipment to and from construction sites. ▪ Coordinating all RTA works, and any works by other agencies that affect traffic flow. ▪ Coordinating with transport operators regarding schedules, abnormal loads and other events. ▪ Identifying, evaluating, and documenting other routes (in consultation with local councils). ▪ Coordinating with emergency services and managing incidents.
	Adequate information The objective is to ensure that the highway users and local communities are provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities. This is to be achieved through: ▪ Suitable signage at work sites ▪ Selection of appropriate information (type and format), and the appropriate locations for information dissemination.

4.7.4 Vehicle numbers

The number of vehicles associated with the construction activities would change with different phases of construction.

The number of construction personnel will change during the course of construction. A maximum workforce of 150 people is anticipated on site at any one time. It is anticipated that the number of staff and site vehicles across the two year construction timeframe is 100. These vehicles would be parked at the site compound. Some of these vehicles may be driven to and from Wagga Wagga.

Indicative numbers of vehicles involved in construction activities are described in Table 4-10. This list covers the main types of construction vehicles but is not a complete list of all vehicles required.

Table 4-10 Construction vehicles used on site

Phase/task	Vehicles on site	Duration	Comment on vehicle movements
Earthworks	4 x 773 trucks 6 x 631 scrapers 6 x 773 water carts 2 to 4 x graders 2 to 4 x excavators 2 to 4 x compaction equipment 2 to 4 x bulldozer	~12 months	Most movements would occur within construction footprint, along haul roads and on access roads. Approximately 110,000 cubic metres to be transported from nearby quarries (locations to be determined). Equates to 8,000 truck movements over 90 days.
Select materials	1 x grader 1 x compactor 2 x compaction equipment 1 x flat drum 1 x water cart	~3 months	Most movements would occur within construction footprint, along haul roads and on access roads.
Drainage	3 x excavators Various small tools 3 x compaction equipment	~9 months	Most movements would occur within construction footprint, along haul roads and on access roads.
Structural concrete	6 x transit mixers 1 x concrete pump Various small tools 2 x crane	~9 months (cranes on-site for 2 years) (concrete pump on-site for 3 months)	Most movements would occur within construction footprint, along haul roads and on access roads.
Concrete paving	1 x loader 8 x trucks Various small tools	~3 months	Most movements would occur within construction footprint, along haul roads and on access roads.
Materials delivery	Trucks for earthworks	Would occur across 2-year program	Movements from regional and local road network to work compound sites, batching plant using construction access roads and haul roads.

An estimate has been made of the number of vehicle trips per day on the public road system. For the purposes of this calculation a trip is counted as an in or an out movement, hence a sand delivery would be counted as two trips.

- Staff vehicles — 240 trips per day.
- Delivery of equipment — 20 truck trips per day.
- Delivery of materials — 40 truck trips per day.
- Movement of Earthworks — 90 truck trips per day
- Construction movements outside site boundaries — 50 truck trips per day.

Hence the construction activities are estimated to generate 240 light vehicle and 200 heavy vehicle trips per day on public roads. This represents an increase of approximately 8 per cent of daily traffic and 10 per cent of weekend volume. These increases are small and would be difficult to detect above normal daily fluctuations in traffic. There would be a small increase in delay at intersections. However, there is spare road capacity to accommodate this temporary increase.

4.7.5 Access impacts

Site compound

Access to the site compound would be via the new northbound ramp at the northern end of the project. This ramp would be constructed during the first stage of the northern tie-in works. Until that time, a temporary access would connect to the existing highway near the site of the northern tie-in. Vehicles arriving at the site in the morning would do so during a time of lower traffic volumes than later in the day. Vehicles leaving the site compound during the early evening are likely to experience higher traffic volumes on the highway.

A number of smaller work compounds would be located across the site with access from within the construction area.

Construction access

Access points at the northern and southern tie-ins would be required to facilitate construction activities. At the site compound entry, and where construction turning volumes are likely to be high or where adverse geometry exists, right turn lanes and widened shoulders would be provided. All access points would:

- Have safe intersection sight distance.
- Accommodate the turning movements of the largest heavy vehicle.
- Be constructed of suitable materials.

Temporary roads would be required for construction access as follows:

- A haul road across Tarcutta Creek to the east of the proposed bypass for internal use only.
- A bridge construction access road would be built running parallel to the proposed bypass on the western side. It would run from the northern bank of Tarcutta Creek to Mates Gully Road, where it would connect to the road network.

Local roads

As described in Section 4.7.2, temporary access arrangements would be required for:

- Mates Gully Road during the construction of the new alignment over the existing highway. The temporary connection would require a diversion of 1,900 metres for northbound travel.
- Humula Road during the construction of the new southbound on-load ramp (no diversion required).

The temporary access arrangements for Mates Gully Road would need to take into consideration the turning requirements of school buses.

Heavy vehicles

The Hume Highway plays a vital role in the transport of goods by road from NSW to Victoria. To reduce the impact of construction on road freight, construction activities during the night (when truck volumes are at their highest) would be kept to a minimum.

Public transport

School bus services operate on the Hume Highway as well as Mates Gully Road. Services operate in the morning between 7.45 am and 8.30 am and in the afternoon between 4 pm and 5 pm. Buses stop at selected locations along the Hume Highway. Local bus operators and families would need to be contacted to ensure that safe alternative arrangements are made for school bus stops around the northern and southern tie-in works and the works affecting the connection of Mates Gully Road and Humula Road to the highway.

Long-distance bus services between Sydney and Melbourne use the highway. These services stop infrequently at towns along the route on an on-request basis. Access would be maintained along the highway and hence these services should not be significantly affected.

Pedestrians and bicycles

The northern and southern tie-in points are away from the populated area of Tarcutta, so it is anticipated that the number of pedestrians and cyclists wishing to travel through the affected areas of the Hume Highway, Mates Gully Road and Humula Road would be low. However, it is possible that pedestrian access would be required for school bus access or walking into town.

Current pedestrian and cyclist movements are considered to be low. Where warranted, temporary traffic arrangements would be made in accordance with Sections 9.3 and 9.4 of the RTA's *Traffic Control at Work Sites Manual*, Section 2.3.7 of *Australian Standard 1742.3*, and Austroads *Guide to Traffic Engineering Practice* Part 13 Pedestrians and Part 14 Bicycles.

Properties

The impact of construction activities would be minimised by maintaining access where possible or by providing an access track when property entrances are affected. Fences and gates would be adjusted as required. Residents would be consulted regarding all changes to the access of their property.

Stock route

As discussed in Section 4.6, a travelling stock route runs along the Hume Highway between Mates Gully and Humula Roads. The temporary access arrangements for both Mates Gully Road and Humula Road during Stages 2 and 3 of the southern tie-in would also need to take into consideration the need to maintain the travelling stock route path. Depending on the timing of these works and the times when stock need to be moved there may not be any need for special provisions. Liaison with the Rural Lands Protection Board will be continued throughout the design and construction phases.

4.7.6 Materials handling

The majority of vehicle movements associated with the project would occur within the site boundary and would not affect the public road system. Where possible, material generated by excavations would be reused to reduce the need for transportation.

Any materials required for construction are likely to require transportation to the site via the Hume Highway. Some materials may need to be delivered from Wagga Wagga. For these movements there are two potential routes – Mates Gully Road or Hume Highway and Sturt Highway. Mates Gully Road is shorter (46 kilometres versus 52 kilometres) but has a higher crash rate due to its winding alignment and narrow cross-section. It is not suitable for large volumes of trucks. The highway route uses more suitable roads, but would require trucks to make the right-turn from the Sturt Highway to the Hume Highway. The distance between the northbound and southbound carriageways is narrow and may not provide sufficient storage space for larger vehicles. Mates Gully Road may be the most suitable road provided drivers are warned about the safety risks of the alignment.

The concrete batching plant would be contained within the site boundary near the northern tie-in. It would be accessed for material deliveries via the site compound access from the new northern northbound ramp.

Materials to be transported include fill; concrete components, including aggregate, sand and cement; and manufactured items, including reinforcing steel, precast bridge components, stormwater pipes and pits.

Water would be required for concrete batching, dust suppression, plant and equipment washing, staff amenities, landscape watering and compaction and pavement stabilisation. Stormwater would be retained and used where possible. The remaining water requirements are likely to be supplied by bore well.

The design of the project has attempted to achieve as close as possible to a balance of cut and fill to reduce the amount of transport of spoil material on public roads. The total amount of earthworks is likely to be in the order of 800,000 to 900,000 cubic metres. Of this approximately 110,000 cubic metres of select material may be required from outside the project. The location of the quarries that would supply this material has not been identified yet. Small amounts of waste would require transporting to a suitably licensed facility. The fill material would be transported using various scrapers, dump trucks, and truck and dog combinations.

Fill transportation would be required across the Tarcutta Creek floodplain. A temporary haul road would be constructed for this. It would be located to minimise the impact on trees. A bridge construction access road would be required for the construction of the twin bridges over Tarcutta Creek. The road would connect to Mates Gully Road near its intersection with the Hume Highway and would run parallel to the new bypass on the western side.

5. Conclusions

The project includes the construction of a bypass of Tarcutta on the Hume Highway in south-western NSW. The Federal and NSW governments have committed to the completion of the upgrading of the Hume Highway to four lane dual carriageways by 2012. The upgrading of the sections of the highway through Tarcutta, Holbrook and Woomargama would see the completion of the conversion of the highway to dual carriageway.

5.1 Transport improvements

The proposed bypass would reduce travel times along the highway from Albury to the junction with the Sturt Highway by approximately two minutes, which would improve the efficiency of freight movements. It would also provide additional overtaking opportunities.

The bypass would create additional road capacity and would cater for the busiest times of the year, including long weekends, such as Easter, and the school holidays. If the bypass does not proceed, traffic conditions on the highway would reach unacceptable levels during the busiest times of the year by 2022.

5.2 Traffic impacts

The proposed bypass would provide a shorter travel time, attracting through traffic from the existing highway through town. It is considered that some of the vehicles that currently stop in town do so only because they are driving past and it is convenient to do so. Based on the results of surveys, if the bypass was built between 50 per cent and 90 per cent of stopping traffic would stay on the bypass and no longer stop in town.

Through traffic and some of the existing stopping traffic are forecast to use the bypass. High and low diversion ranges have been used to show the likely bounds of traffic diversion. The numbers and proportions of vehicles forecast to use the bypass and the existing highway in the year of opening (2012) are shown in Tables 5-1 and 5-2.

Table 5-1 2012 forecast southbound traffic, north of north of Tarcutta

Scenario	Vehicle type	North of interchange	Bypass		Existing highway	
		AADT	AADT	Per cent	AADT	Per cent
High diversion to bypass scenario	Light vehicles	1,693	1,042	62	651	38
	Heavy vehicles	1,287	746	58	541	42
Low diversion to bypass scenario	Light vehicles	1,693	974	58	719	42
	Heavy vehicles	1,287	688	53	600	47

Table 5-2 2012 forecast northbound traffic, south of Tarcutta

Scenario	Vehicle type	South of interchange	Bypass		Existing highway	
		AADT	AADT	Per cent	AADT	Per cent
High diversion to bypass scenario	Light vehicles	1,670	1,103	66	567	34
	Heavy vehicles	1,301	907	70	394	30
Low diversion to bypass scenario	Light vehicles	1,670	1,103	66	567	34
	Heavy vehicles	1,301	846	65	456	35

The high diversion scenario forecasts that approximately 65 per cent of vehicles would use the bypass, while for the low diversion scenario, 60 per cent of vehicles are forecast to use the bypass. The difference between the scenarios is the amount of stopping traffic that switches to the bypass.

Local access would be maintained to all properties. Both Mates Gully Road and Humula Road would be connected to the new ramps at the southern tie-in, but would have two-way access maintained. Vehicles on Mates Gully Road at Tarcutta would be required to complete a short detour of 500 metres in order to head south. A new local access road would be constructed over the new bypass to connect properties west of the new alignment to Tarcutta. Cyclists would be encouraged to continue to use the existing highway through Tarcutta.

The proposed bypass would produce a 2% saving in total VKT and a 22% saving in total VHT.

5.3 Crash potential

With the construction of the dual carriageway bypass, some traffic would be moved from the existing highway to the new road, which is anticipated to have a lower crash rate.

Typically, dual carriageway roads experience lower crash rates than single carriageway roads because they create separation between the two traffic flows. On single carriageway roads, crossing the road centreline could mean a head-on crash. The provision of two lanes each way would create safe overtaking opportunities. It is anticipated that the new bypass would be designed to a higher safety level than the existing highway. The removal of traffic from the town would create larger gaps in traffic, allowing easier and safer turns at intersections.

Using RTA percentage reductions for the various crash types and applying these to the crash types recorded on the highway at Tarcutta, it is anticipated that the proposed bypass would have a crash rate 14 per cent lower than the existing highway. Projecting this reduction over a 20 year timeframe from the time of opening, the construction of the upgrade is forecast to result in four less injury crashes and eight less tow-away crashes compared to if the project was not built.

5.4 Construction impacts

Construction of the bypass is expected to take two years. The proposed construction hours are between 6 am and 7 pm Monday to Friday, and between 7 am and 4 pm Saturday. However, some construction activity affecting traffic may occur outside of these hours.

Most of the construction activity would be contained within the site boundary and would not affect traffic or access. The areas of construction at the northern and southern tie-ins would affect traffic. Construction would be staged to minimise disruption.

A construction traffic management plan would be prepared, which would detail how the traffic impacts associated with the construction of the bypass would be managed. The plan would include traffic control plans documenting the proposed changes to traffic conditions and access. Some reductions in road speed limits may be required to protect the safety of construction personnel and the travelling public.

Access to the site compound and batching plant would be via the new northbound ramp at the northern end of the project. Access to the work areas from the highway would be controlled. A temporary internal haul road and a bridge construction road would be built across Tarcutta Creek.

Mates Gully Road and Humula Road would require alternative temporary connection to the Hume Highway at different stages of the construction. During Stages 2 and 3 of the southern tie-in works, Mates Gully Road traffic heading into Tarcutta would be required to make a 1,900 metre diversion.

Construction works along the highway on the northern and southern tie-ins should take into consideration the need for school bus stops, pedestrians and bicycles and the travelling stock route between Mates Gully Road and Humula Road.

The construction activities would result in a small increase in traffic volumes on the Hume Highway and in Tarcutta. Additional traffic would be associated with the transport of construction materials, the delivery of plant and equipment, staff movement and construction activities outside the site boundary. Based on the analysis of the existing highway traffic conditions, there is sufficient spare road capacity to accommodate this increase.

Appendix A

RTA 2006 traffic volume data

DAILY TRAFFIC VOLUMES Year 2006

HUME HWY,SH2 HOLBROOK-1.9K N OF MR331,YOUNG ST Station No. 95.002.C

Week	Beginning	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	Percent	GW	FW	F'W
1	2/01/06	11915 p	10969	12418	12651	11851	8405	9155	77364	2.2274	0.8748	0.7970	0.8943
2	9/01/06	10876	11397	10669	11764	10999	7659	7954	71318	2.0533	0.9366	0.8565	0.9610
3	16/01/06	9772	11050	11266	11855	11136	7644	7286	70009	2.0156	0.9541	0.8662	0.9720
4	23/01/06	9939	11593	11219	9800 p	8258	6637	8714	66160	1.9048	1.0158	0.9307	1.0444
5	30/01/06	9825	10793	10933	11217	10040	5857	6601	65266	1.8791	1.0234	0.9035	1.0138
6	6/02/06	4338	4802	11333	11579	10831	6425	6779	56087	1.6148	1.1909	1.1126	1.2484
7	13/02/06	9600	10533	11003	11143	10299	6233	6911	65722	1.8922	1.0163	0.9074	1.0182
8	20/02/06	9338	10517	11119	11536	10743	6195	7310	66758	1.9220	1.0005	0.8959	1.0053
9	27/02/06	9349	11253	11265	11688m	10902	6158	7011	67626m	1.9470	0.9877	0.8761	0.9831
10	6/03/06	9653	11161	11424	12042	11579	7455	6740	70054	2.0169	0.9535	0.8541	0.9584
11	13/03/06	9573	10314	11753	12015	11400	6913	7381	69349	1.9966	0.9632	0.8666	0.9724
12	20/03/06	10827	11480	11657	12240	11111	6993	7819	72127	2.0766	0.9261	0.8324	0.9340
13	27/03/06	10253	11264	11944	11776	11224	6631	7151	70243	2.0224	0.9509	0.8450	0.9482
14	3/04/06	10479	11673	11686	11806	11086	6631	7390	70751	2.0370	0.9441	0.8410	0.9437
15	10/04/06	8803	11016	13468	15478	12821 p	3781	4484	69851	2.0111	1.0039	0.7827	0.8783
16	17/04/06	13370 p	12530	12396	12376	11986	7929	7645	78232	2.2524	0.8827	0.7744	0.8689
17	24/04/06	8141	9261 p	9749	11752	10697	6931	7253	63784	1.8364	1.0501	0.9462	1.0617
18	1/05/06	9358	10669	10742	11110	10223	6003	6105	64210	1.8487	1.0402	0.9157	1.0275
19	8/05/06	8591	10378	10804	10867	9595	5573	5925	61733	1.7773	1.0820	0.9497	1.0657
20	15/05/06	8885	10392	10489	10743	9881	5598	5987	61975	1.7843	1.0778	0.9468	1.0624
21	22/05/06	8697	10128	10533	10639	9544	5379	6176	61096	1.7590	1.0933	0.9630	1.0806
22	29/05/06	8466	9707	10321	10471	9675	5670	5768	60078	1.7297	1.1118	0.9809	1.1006
23	5/06/06	8681	10348	10516	11001	11749	6573	2987	61855	1.7809	1.0798	0.9123	1.0237
24	12/06/06	8362 p	8597	9950	10180	9218	5743	5650	57700	1.6612	1.1604	1.0059	1.1287
25	19/06/06	8474	10148	10411	11084	9794	5567	6072	61550	1.7721	1.0852	0.9559	1.0726
26	26/06/06	8361	9873	10324	10471	9885	6653	7046	62613	1.8027	1.0668	0.9754	1.0945
27	3/07/06	8976	10470	10659	11483	10430	7000	6931	65949	1.8987	1.0128	0.9172	1.0292
28	10/07/06	8964	10492	10336	10703	9705	6154	6539	62893	1.8107	1.0620	0.9504	1.0664
29	17/07/06	7862	9689	9997	10113	9642	5612	6512	59427	1.7110	1.1240	1.0086	1.1317
30	24/07/06	8170	9748	10084	9729	9309	5410	6137	58587	1.6868	1.1401	1.0142	1.1381
31	31/07/06	8730	10049	10107	10493	9340	5300	5743	59762	1.7206	1.1177	0.9793	1.0989
32	7/08/06	8333	10057	10405	10500	9436	5448	5803	59982	1.7269	1.1136	0.9790	1.0986
33	14/08/06	8457	9913	10041	10271	9502	5482	5947	59613	1.7163	1.1205	0.9902	1.1111
34	21/08/06	8636	10099	10400	10291	9426	5657	5987	60496	1.7417	1.1041	0.9766	1.0959
35	28/08/06	8691	10221	10428	11120	10232	6057	6274	63023	1.8145	1.0598	0.9412	1.0561
36	4/09/06	9122	10496	10401	10942	10082	6000	6536	63579	1.8305	1.0506	0.9347	1.0488
37	11/09/06	9034	10689	10781	11438	10753	6883	6795	66373	1.9109	1.0063	0.9054	1.0159
38	18/09/06	10441	11253	11436	12053	11057	6999	6653	69892	2.0123	0.9557	0.8483	0.9519
39	25/09/06	9484	11239	11903	12829	13572	8221	6692	73940	2.1288	0.9034	0.8083	0.9070
40	2/10/06	11010 p	11069	12367	12559	11856	6965	7566	73392	2.1130	0.9178	0.7976	0.8950
41	9/10/06	11607	11863	11800	12013	11470	6953	7293	72999	2.1017	0.9150	0.8120	0.9112
42	16/10/06	9571	10983	11383	11590	9040	6642	6637	65846	1.8958	1.0144	0.9076	1.0184
43	23/10/06	9356	10945	11407	11535	10798	6154	6847	67042	1.9302	0.9963	0.8828	0.9906
44	30/10/06	9254	11119	11470	11835	12173	7497	6846	70194	2.0209	0.9516	0.8542	0.9585
45	6/11/06	9006	10612	10526	11753	10680	6566	7268	66411	1.9120	1.0058	0.9074	1.0182
46	13/11/06	9437	11155	11881	12077	11326	7053	7405	70334	2.0250	0.9497	0.8539	0.9581
47	20/11/06	9761	11301	11691	12071	11562	6676	7281	70343	2.0252	0.9495	0.8461	0.9494
48	27/11/06	10206	11648	11776	12195	11350	6605	7407	71187	2.0495	0.9383	0.8345	0.9363
49	4/12/06	10031	11646	12192	12569	11212	7009	6908	71567	2.0605	0.9333	0.8276	0.9286
50	11/12/06	10308	11787	12351	12292	11349	7818	7242	73147	2.1060	0.9131	0.8214	0.9216
51	18/12/06	10483	12615	13107	13920	15560	14725	5863	86273	2.4839	0.7742	0.7263	0.8150
52	25/12/06	2616 p	10023 p	13314	13249	12317	10584	5455	67558	1.9451	0.8687	0.7363	0.8262
										AADT	AAWT	AAWE	AAPH
Annual Averages:		9238	10675	11185	11590	10723	6706	6690	66795	9542	10707	6698	9909

p indicates Public Holiday

2006 RTA classified count for Hume Highway, North of Holbrook

Table 1. Northbound (adjusted) traffic volume

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehic	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	6	8	14	7	32	39	6	88	94	7	95	102	9	102	111	12	95	107	14	56	70	8	84	92	10	32	42	9	68	77
1:00	5	8	13	6	24	30	5	67	72	4	73	77	6	75	80	8	76	84	11	44	55	6	64	70	8	26	34	6	52	59
2:00	4	5	9	6	15	21	4	43	46	4	47	51	5	51	56	10	49	58	10	30	40	6	42	48	7	18	25	6	34	40
3:00	5	5	10	7	11	18	5	27	31	4	29	33	5	32	37	10	30	40	10	20	31	6	27	33	8	13	20	7	22	29
4:00	6	4	10	10	11	21	7	19	27	7	20	27	8	23	31	13	20	33	15	14	28	9	21	30	10	9	19	9	16	25
5:00	11	4	15	19	11	30	15	18	33	15	20	34	16	21	36	22	19	41	22	12	34	17	22	39	17	8	25	17	15	32
6:00	21	5	25	33	14	47	26	21	46	26	22	48	30	22	51	40	22	62	38	13	51	31	27	58	29	9	38	30	17	47
7:00	39	7	46	53	17	71	43	24	67	46	24	70	51	25	76	67	25	92	64	13	77	52	34	86	52	10	62	52	19	71
8:00	65	9	74	79	18	97	62	25	86	60	25	84	71	26	97	99	22	121	98	15	113	74	39	113	81	12	93	76	20	96
9:00	99	11	111	112	20	133	84	27	110	84	26	110	92	25	116	133	23	156	128	16	144	101	46	147	114	14	128	105	21	126
10:00	133	16	149	135	23	158	94	27	121	92	26	118	111	29	140	153	24	178	140	17	158	117	53	170	137	17	153	123	23	146
11:00	151	17	169	137	26	163	92	29	122	88	29	117	103	29	132	149	27	176	131	18	149	114	55	169	141	18	159	122	25	147
12:00	163	22	185	136	25	161	88	30	118	89	30	119	101	30	132	147	28	175	131	21	151	112	56	168	147	21	168	122	27	149
13:00	171	25	196	144	29	173	94	32	127	91	33	124	103	31	134	149	25	174	124	19	143	116	59	175	148	22	170	125	28	153
14:00	169	29	198	139	36	175	94	38	132	90	37	127	105	34	139	133	26	159	111	17	128	112	62	174	140	23	163	120	31	151
15:00	152	37	188	121	42	163	82	46	128	78	45	123	92	42	134	126	28	154	90	16	105	100	65	165	121	26	147	106	36	142
16:00	119	45	164	92	49	140	66	54	121	66	54	120	80	49	129	116	30	145	70	18	88	84	66	150	94	32	126	87	43	130
17:00	89	52	142	70	56	126	49	58	107	52	61	114	65	54	118	96	31	127	54	18	72	66	66	132	72	35	107	68	47	115
18:00	62	56	118	43	63	106	32	71	103	30	68	98	45	61	105	71	32	103	37	16	53	44	68	112	49	36	85	46	52	98
19:00	45	57	102	28	71	100	22	76	98	22	76	98	33	70	103	48	31	79	26	16	42	31	70	101	36	37	72	32	57	89
20:00	34	58	91	20	78	98	18	78	96	17	84	102	28	74	102	35	37	72	20	15	35	24	74	98	27	36	63	24	61	85
21:00	24	48	71	16	81	98	14	90	104	15	90	105	22	82	104	30	42	72	14	14	28	19	80	100	19	31	50	19	64	83
22:00	15	42	58	12	89	101	10	99	110	12	103	115	19	95	113	21	50	70	11	11	22	15	89	104	13	27	40	14	70	84
23:00	9	38	47	9	96	105	9	105	115	11	108	120	15	100	115	17	53	70	8	10	18	12	94	107	9	24	32	11	73	84
Total	**1597**	**609**	**2206**	**1435**	**937**	**2372**	**1021**	**1193**	**2214**	**1009**	**1224**	**2233**	**1213**	**1180**	**2393**	**1706**	**842**	**2548**	**1375**	**461**	**1836**	**1277**	**1362**	**2639**	**1486**	**535**	**2021**	**1337**	**921**	**2258**

Summary of northbound volume

Day	Light	Heavy	Total
Sunday	1597	609	2206
Monday	1435	937	2372
Tuesday	1021	1193	2214
Wednesday	1009	1224	2233
Thursday	1213	1180	2393
Friday	1706	842	2548
Saturday	1375	461	1836

AAWT	1277	1362	2639
AAWE	1486	535	2021
AADT	1337	921	2258

Table 2. Southbound traffic volume

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehic	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	8	9	17	11	21	32	10	85	95	10	99	109	10	102	112	17	101	118	18	62	80	11	84	95	13	36	49	12	69	81
1:00	7	8	15	7	17	25	9	79	88	8	90	98	9	96	105	14	95	109	16	58	73	9	77	86	11	33	44	10	63	73
2:00	6	6	12	7	15	22	6	60	65	6	69	75	6	73	79	11	74	85	13	53	66	7	59	67	9	29	39	8	50	58
3:00	7	5	12	6	13	20	5	45	50	6	48	54	6	50	56	11	52	62	11	42	53	7	43	50	9	23	32	7	37	44
4:00	7	4	11	8	13	22	7	33	41	7	37	44	8	38	45	10	36	47	10	30	41	8	33	41	8	17	26	8	27	36
5:00	7	5	12	15	13	28	11	27	38	10	29	39	11	31	42	17	32	49	14	22	36	13	29	42	11	13	24	12	22	35
6:00	14	5	19	22	14	35	18	26	44	19	29	48	21	29	51	27	28	55	23	20	44	21	30	51	18	13	31	21	22	42
7:00	24	6	30	36	15	51	35	27	61	34	29	64	39	32	72	51	31	81	44	21	65	39	34	73	34	14	48	38	23	61
8:00	49	9	58	61	18	79	54	25	80	58	31	89	66	29	96	85	27	112	77	20	97	65	38	103	63	15	77	64	23	87
9:00	87	11	98	93	21	114	80	26	105	81	28	109	98	29	127	129	28	157	122	21	143	96	45	141	104	16	120	98	23	122
10:00	119	13	132	129	24	153	108	26	133	99	28	128	127	29	156	167	28	196	153	19	172	126	53	179	136	16	152	129	24	153
11:00	148	16	164	152	25	177	119	27	146	121	31	152	141	31	172	187	28	215	171	19	190	144	59	203	160	17	177	148	26	174
12:00	162	17	179	156	27	184	122	29	151	116	33	149	135	33	168	177	30	206	157	18	175	141	62	203	160	18	177	146	27	173
13:00	161	19	180	153	30	184	111	33	144	110	37	147	126	36	162	167	32	199	147	18	165	134	64	198	154	18	172	140	29	169
14:00	166	22	188	155	39	193	116	39	155	112	44	156	128	42	171	171	37	208	138	19	157	136	71	208	152	20	173	141	35	175
15:00	162	25	187	148	51	199	109	49	158	111	52	162	124	51	175	170	41	212	125	18	143	133	78	211	143	21	165	136	41	177
16:00	151	27	178	123	60	183	97	57	153	96	63	159	114	57	171	154	43	196	107	17	124	117	80	197	129	22	151	120	46	166
17:00	126	31	157	94	67	161	73	61	135	78	67	145	99	67	166	136	48	184	88	18	105	96	81	177	107	24	131	99	51	150
18:00	98	33	131	62	71	133	53	65	118	54	73	126	74	69	143	113	48	161	62	18	80	71	78	149	80	25	106	74	54	128
19:00	72	35	107	44	74	118	34	70	104	36	75	111	53	74	126	88	49	137	42	15	57	51	77	128	57	25	82	53	56	109
20:00	50	33	83	29	71	101	23	73	96	25	79	104	42	75	116	70	49	119	28	16	44	38	75	113	39	24	64	38	56	95
21:00	35	32	67	20	72	92	18	77	95	18	81	99	32	77	109	50	52	102	21	13	35	28	76	104	28	22	51	28	58	86
22:00	26	28	54	15	76	91	14	84	98	14	87	101	25	84	109	36	52	87	15	11	26	21	79	100	20	19	40	21	60	81
23:00	15	26	41	13	80	93	11	85	96	12	91	103	21	88	109	26	56	81	10	11	21	16	82	99	13	18	31	15	62	78
Total	**1707**	**424**	**2131**	**1559**	**928**	**2487**	**1242**	**1208**	**2450**	**1241**	**1329**	**2570**	**1515**	**1323**	**2838**	**2084**	**1095**	**3179**	**1613**	**578**	**2192**	**1528**	**1488**	**3017**	**1660**	**501**	**2161**	**1566**	**984**	**2550**

Summary of southbound volume

Day	Light	Heavy	Total
Sunday	1707	424	2131
Monday	1559	928	2487
Tuesday	1242	1208	2450
Wednesday	1241	1329	2570
Thursday	1515	1323	2838
Friday	2084	1095	3179
Saturday	1613	578	2192

AAWT	1528	1488	3017
AAWE	1660	501	2161
AADT	1566	984	2550

Appendix B

2008 traffic volumes

2008 Traffic volume on Hume Highway North of Tarcutta

Table 1. North of Town Northbound traffic volume

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	13	5	18	15	41	56	11	107	118	7	106	113	12	93	105	17	72	89	16	54	70	12	84	96	15	30	44	13	68	81
1:00	10	9	19	7	39	46	4	132	136	9	125	134	7	109	116	10	84	94	12	66	78	7	98	105	11	38	49	8	81	89
2:00	6	11	17	3	27	30	11	88	99	4	88	92	7	74	81	9	58	67	5	72	77	7	67	74	6	42	47	6	60	66
3:00	1	4	5	7	15	22	3	64	67	4	75	79	5	57	62	7	44	51	8	47	55	5	51	56	5	26	30	5	44	49
4:00	5	4	9	7	14	21	7	39	46	8	49	57	8	37	45	11	29	40	11	32	43	8	34	42	8	18	26	8	29	37
5:00	8	4	12	12	16	28	16	23	39	11	27	38	14	24	38	20	19	38	12	17	29	15	22	36	10	11	21	13	19	32
6:00	10	4	14	22	18	40	17	44	61	21	32	53	22	34	56	30	27	57	35	23	58	22	31	53	23	14	36	22	26	48
7:00	24	10	34	29	28	57	26	28	54	28	39	67	30	35	65	42	27	69	37	25	62	31	31	62	31	18	48	31	27	58
8:00	29	12	41	54	25	79	37	38	75	38	44	82	47	39	86	65	30	96	57	9	66	48	35	84	43	11	54	47	28	75
9:00	70	14	84	87	29	116	57	52	109	47	43	90	69	46	115	96	35	132	52	20	72	71	41	112	61	17	78	68	34	103
10:00	100	15	115	86	35	121	77	26	103	78	38	116	88	36	124	122	28	150	86	20	106	90	33	123	93	18	111	91	28	119
11:00	133	26	159	125	28	153	69	35	104	82	31	113	100	34	135	139	27	166	109	27	136	103	31	134	121	27	148	108	30	138
12:00	148	28	176	118	36	154	88	52	140	78	34	112	103	45	148	143	35	178	109	17	126	106	40	146	129	23	151	113	35	148
13:00	155	37	192	149	51	200	105	43	148	67	45	112	117	51	168	162	39	202	90	20	110	120	46	166	123	29	151	121	41	162
14:00	166	34	200	128	37	165	94	40	134	78	49	127	109	46	155	151	36	187	107	27	134	112	42	154	137	31	167	119	38	157
15:00	199	36	235	109	60	169	100	60	160	113	54	167	117	64	181	163	49	212	83	17	100	120	57	178	141	27	168	126	49	175
16:00	169	43	212	118	66	184	71	49	120	73	62	135	95	65	160	132	50	183	60	23	83	98	58	156	115	33	148	103	51	154
17:00	117	56	173	79	59	138	78	94	172	61	89	150	79	89	168	110	69	179	62	20	82	81	80	161	90	38	128	84	68	152
18:00	83	76	159	71	80	151	58	89	147	61	84	145	69	93	162	96	72	168	41	33	74	71	84	155	62	55	117	68	75	144
19:00	81	89	170	42	81	123	23	80	103	29	80	109	34	88	123	47	68	116	30	22	52	35	80	115	56	56	111	41	73	114
20:00	40	51	91	34	86	120	19	97	116	20	97	117	27	103	129	37	80	116	17	27	44	27	92	120	29	39	68	28	77	105
21:00	34	69	103	17	86	103	13	75	88	17	85	102	17	90	107	24	70	94	12	16	28	18	81	99	23	43	66	19	70	89
22:00	13	55	68	17	83	100	12	94	106	8	85	93	13	96	110	19	74	93	12	12	24	14	87	100	13	34	46	13	71	85
23:00	15	38	53	16	91	107	13	110	123	12	102	114	15	111	126	21	86	107	8	8	16	15	100	115	12	23	35	14	78	92
Total	**1629**	**730**	**2359**	**1352**	**1131**	**2483**	**1009**	**1559**	**2568**	**954**	**1563**	**2517**	**1205**	**1561**	**2765**	**1674**	**1208**	**2881**	**1071**	**654**	**1725**	**1239**	**1404**	**2643**	**1350**	**692**	**2042**	**1270**	**1201**	**2471**

Table 2. North of Town Southbound traffic volume

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	4	7	11	7	23	30	40	101	141	37	104	141	31	84	114	42	65	107	20	77	97	31	75	107	12	42	54	26	66	92
1:00	2	5	7	15	13	28	31	71	102	30	92	122	28	65	92	38	50	88	11	68	79	28	58	87	7	37	43	22	52	74
2:00	7	3	10	3	18	21	34	56	90	17	54	71	20	47	67	27	36	64	9	41	50	20	42	62	8	22	30	17	36	53
3:00	2	3	5	3	4	7	24	32	56	17	28	45	16	23	39	22	18	40	7	26	33	16	21	38	5	15	19	13	19	32
4:00	8	4	12	11	6	17	17	17	34	15	30	45	16	19	35	22	15	37	15	25	40	16	17	34	12	15	26	15	17	31
5:00	5	4	9	36	15	51	50	25	75	34	27	61	44	25	68	61	19	80	11	14	25	45	22	67	8	9	17	34	18	53
6:00	10	2	12	50	9	59	30	18	48	35	26	61	42	19	61	58	15	73	25	26	51	43	17	60	18	14	32	36	16	52
7:00	43	6	49	29	21	50	41	37	78	23	52	75	34	40	74	47	31	78	32	17	49	35	36	71	38	12	49	36	29	65
8:00	67	5	72	60	31	91	42	31	73	52	36	88	56	36	92	78	28	106	67	23	90	58	32	90	67	14	81	60	27	87
9:00	109	13	122	81	35	116	78	35	113	68	44	112	82	42	124	115	32	147	91	26	117	85	38	122	100	20	120	89	32	122
10:00	175	21	196	109	42	151	84	50	134	103	42	145	108	49	157	149	38	187	110	22	132	111	44	155	143	22	164	120	38	157
11:00	172	24	196	122	25	147	88	37	125	96	37	133	111	36	148	154	28	183	133	21	154	114	33	147	153	23	175	125	30	155
12:00	170	20	190	127	39	166	70	47	117	92	41	133	105	47	152	146	36	182	110	23	133	108	42	150	140	22	162	117	36	153
13:00	137	20	157	127	62	189	84	53	137	66	46	112	101	59	160	140	46	186	99	17	116	104	53	157	118	19	137	108	43	151
14:00	147	23	170	107	55	162	88	50	138	98	64	162	106	62	168	148	48	196	112	14	126	109	56	165	130	19	148	115	45	160
15:00	156	46	202	105	72	177	82	75	157	98	62	160	104	77	180	144	59	203	98	27	125	106	69	175	127	37	164	112	60	172
16:00	151	38	189	94	83	177	72	65	137	74	76	150	87	82	169	121	64	185	95	17	112	90	74	164	123	28	151	99	61	160
17:00	110	58	168	90	75	165	57	80	137	64	85	149	77	88	165	107	68	175	56	10	66	79	79	158	83	34	117	80	66	146
18:00	84	51	135	51	76	127	54	81	135	41	72	113	53	84	137	74	65	139	39	10	49	55	76	130	62	31	92	57	63	119
19:00	84	39	123	40	97	137	25	94	119	35	95	130	36	105	141	50	81	132	42	19	61	37	94	132	63	29	92	45	76	120
20:00	59	45	104	28	81	109	15	87	102	26	87	113	25	94	119	35	72	107	27	15	42	26	84	110	43	30	73	31	69	99
21:00	45	37	82	29	101	130	23	100	123	29	95	124	29	109	138	41	84	125	18	16	34	30	98	128	32	27	58	31	77	108
22:00	18	29	47	25	100	125	33	97	130	12	116	128	25	115	140	35	89	124	17	22	39	26	103	130	18	26	43	24	81	105
23:00	24	31	55	28	100	128	40	95	135	20	106	126	32	110	142	44	85	130	14	13	27	33	99	132	19	22	41	29	77	106
Total	**1789**	**534**	**2323**	**1377**	**1183**	**2560**	**1202**	**1434**	**2636**	**1182**	**1517**	**2699**	**1367**	**1517**	**2884**	**1899**	**1174**	**3073**	**1258**	**589**	**1847**	**1405**	**1365**	**2770**	**1524**	**562**	**2085**	**1439**	**1135**	**2574**

Table 3. Combination

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	17	12	29	22	64	86	51	208	259	44	210	254	43	177	219	59	137	196	36	131	167	44	159	203	27	72	98	39	134	173
1:00	12	14	26	22	52	74	35	203	238	39	217	256	35	173	208	48	134	183	23	134	157	36	156	192	18	74	92	31	132	163
2:00	13	14	27	6	45	51	45	144	189	21	142	163	26	121	148	36	94	130	14	113	127	27	109	136	14	64	77	23	96	119
3:00	3	7	10	10	19	29	27	96	123	21	103	124	21	80	101	29	62	91	15	73	88	22	72	94	9	40	49	18	63	81
4:00	13	8	21	18	20	38	24	56	80	23	79	102	24	57	80	33	44	77	26	57	83	24	51	75	20	33	52	23	46	69
5:00	13	8	21	48	31	79	66	48	114	45	54	99	58	49	107	80	38	118	23	31	54	59	44	103	18	20	38	48	37	85
6:00	20	6	26	72	27	99	47	62	109	56	58	114	64	54	118	88	42	130	60	49	109	65	49	114	40	28	68	58	43	101
7:00	67	16	83	58	49	107	67	65	132	51	91	142	64	75	139	89	58	147	69	42	111	66	68	133	68	29	97	66	57	123
8:00	96	17	113	114	56	170	79	69	148	90	80	170	103	75	178	143	58	201	124	32	156	106	68	173	110	25	135	107	55	162
9:00	179	27	206	168	64	232	135	87	222	115	87	202	152	87	239	211	68	279	143	46	189	156	79	235	161	37	198	158	67	224
10:00	275	36	311	195	77	272	161	76	237	181	80	261	195	85	281	271	66	337	196	42	238	201	77	278	236	39	275	211	66	277
11:00	305	50	355	247	53	300	157	72	229	178	68	246	211	71	282	294	55	349	242	48	290	217	64	281	274	49	323	233	60	293
12:00	318	48	366	245	75	320	158	99	257	170	75	245	208	91	300	289	71	360	219	40	259	214	82	296	269	44	313	230	71	301
13:00	292	57	349	276	113	389	189	96	285	133	91	224	217	110	327	302	85	387	189	37	226	223	99	323	241	47	288	228	84	313
14:00	313	57	370	235	92	327	182	90	272	176	113	289	215	108	324	299	84	383	219	41	260	222	97	319	266	49	315	234	84	318
15:00	355	82	437	214	132	346	182	135	317	211	116	327	221	141	361	306	109	415	181	44	225	227	126	353	268	63	331	239	108	347
16:00	320	81	401	212	149	361	143	114	257	147	138	285	182	147	330	253	114	367	155	40	195	188	132	320	238	61	298	202	112	314
17:00	227	114	341	169	134	303	135	174	309	125	174	299	156	177	333	217	137	353	118	30	148	160	159	319	173	72	245	164	134	298
18:00	167	127	294	122	156	278	112	170	282	102	156	258	122	177	299	170	137	307	80	43	123	126	159	285	124	85	209	125	138	263
19:00	165	128	293	82	178	260	48	174	222	64	175	239	70	193	264	98	150	248	72	41	113	72	174	246	119	85	203	86	148	234
20:00	99	96	195	62	167	229	34	184	218	46	184	230	52	196	248	72	152	224	44	42	86	53	177	230	72	69	141	58	146	204
21:00	79	106	185	46	187	233	36	175	211	46	180	226	47	199	245	65	154	219	30	32	62	48	179	227	55	69	124	50	148	197
22:00	31	84	115	42	183	225	45	191	236	20	201	221	39	211	250	54	163	217	29	34	63	40	190	230	30	59	89	37	152	190
23:00	39	69	108	44	191	235	53	205	258	32	208	240	47	222	269	65	172	237	22	21	43	48	199	248	31	45	76	43	155	198
Total	**3418**	**1264**	**4682**	**2729**	**2314**	**5043**	**2211**	**2993**	**5204**	**2136**	**3080**	**5216**	**2571**	**3078**	**5649**	**3573**	**2382**	**5954**	**2329**	**1243**	**3572**	**2644**	**2769**	**5413**	**2874**	**1254**	**4127**	**2710**	**2336**	**5046**

Daily

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
AAWT	1239	1404	2643	1405	1365	2770
AAWE	1350	692	2042	1524	562	2085
AADT	1270	1201	2471	1439	1135	2574

2008 Traffic volume on Hume Highway South of Tarcutta

Table 1. South of Town Northbound traffic volume

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	6	5	11	11	38	49	14	113	127	6	110	116	11	96	107	16	74	90	23	43	66	12	86	98	15	24	39	12	68	81
1:00	11	8	19	8	35	43	10	118	128	7	107	114	9	95	104	13	74	86	17	67	84	9	86	95	14	38	52	11	72	83
2:00	6	12	18	1	25	26	10	72	82	3	85	88	5	67	72	7	52	59	3	65	68	5	60	65	5	39	43	5	54	59
3:00	1	5	6	11	11	22	5	58	63	5	72	77	8	52	59	11	40	51	9	39	48	8	47	54	5	22	27	7	40	47
4:00	5	3	8	5	16	21	8	35	43	10	40	50	8	33	42	12	26	37	13	23	36	9	30	39	9	13	22	9	25	34
5:00	9	2	11	16	14	30	16	21	37	13	25	38	16	22	38	23	17	40	20	11	31	17	20	37	15	7	21	16	16	32
6:00	9	4	13	28	20	48	19	40	59	21	32	53	25	34	58	34	26	60	39	20	59	25	30	56	24	12	36	25	25	50
7:00	29	7	36	39	23	62	37	25	62	38	43	81	41	33	75	58	26	83	45	20	65	43	30	73	37	14	51	41	25	66
8:00	37	9	46	67	22	89	59	37	96	49	43	92	64	37	101	88	29	117	62	10	72	65	34	99	50	10	59	61	27	88
9:00	87	11	98	96	26	122	78	43	121	69	42	111	88	41	129	123	32	154	68	14	82	91	37	127	78	13	90	87	30	117
10:00	108	14	122	101	28	129	78	27	105	95	31	126	100	32	131	138	24	163	101	20	121	102	28	131	105	17	122	103	25	128
11:00	144	22	166	131	25	156	81	30	111	100	30	130	113	31	145	158	24	182	123	27	150	117	28	145	134	25	158	121	27	148
12:00	172	21	193	135	37	172	96	58	154	80	32	112	113	47	160	157	36	193	122	14	136	116	42	158	147	18	165	125	35	160
13:00	164	34	198	152	37	189	110	30	140	84	37	121	126	38	164	175	30	204	113	17	130	129	34	164	139	26	164	132	32	164
14:00	171	33	204	135	39	174	111	40	151	91	48	139	122	47	169	170	36	206	116	26	142	126	42	168	144	30	173	131	38	169
15:00	212	31	243	134	59	193	105	54	159	128	46	174	133	58	192	185	45	230	97	14	111	137	52	190	155	23	177	142	44	186
16:00	181	49	230	126	63	189	80	47	127	107	63	170	114	63	177	158	49	207	78	24	102	117	57	174	130	37	166	121	51	172
17:00	136	53	189	112	60	172	98	86	184	78	91	169	105	87	192	145	67	213	76	13	89	108	78	186	106	33	139	107	65	172
18:00	93	76	169	113	89	202	86	91	177	82	81	163	102	96	198	142	74	216	70	35	105	105	86	191	82	56	137	98	77	176
19:00	85	82	167	51	82	133	36	87	123	42	92	134	47	96	143	65	74	139	37	24	61	48	86	134	61	53	114	52	77	129
20:00	37	54	91	38	89	127	31	97	128	30	94	124	36	103	139	50	80	130	16	22	38	37	92	129	27	38	65	34	77	111
21:00	39	70	109	23	93	116	20	73	93	22	79	101	24	90	114	33	70	102	15	13	28	24	81	105	27	42	69	25	70	95
22:00	12	50	62	23	87	110	18	104	122	11	87	98	19	102	121	26	79	105	11	13	24	19	92	111	12	32	43	17	75	92
23:00	18	44	62	9	95	104	10	124	134	16	131	147	13	128	141	18	99	117	11	10	21	13	116	129	15	27	42	13	90	104
Total	**1772**	**699**	**2471**	**1565**	**1113**	**2678**	**1216**	**1510**	**2726**	**1187**	**1541**	**2728**	**1442**	**1528**	**2970**	**2003**	**1183**	**3186**	**1285**	**584**	**1869**	**1483**	**1375**	**2858**	**1529**	**642**	**2170**	**1496**	**1165**	**2661**

Table 2. South of Town Southbound traffic volume

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	7	8	15	10	23	33	19	97	116	22	122	144	19	89	107	26	69	94	18	74	92	19	80	99	13	41	54	17	69	86
1:00	5	8	13	8	21	29	5	95	100	9	99	108	8	79	87	11	61	72	14	66	80	8	71	79	10	37	47	9	61	70
2:00	8	2	10	4	17	21	13	53	66	8	76	84	9	54	63	13	41	54	8	52	60	9	48	58	8	27	35	9	42	51
3:00	2	5	7	4	6	10	5	48	53	5	43	48	5	36	41	7	28	35	7	37	44	5	32	37	5	21	26	5	29	34
4:00	9	4	13	13	5	18	7	27	34	8	28	36	10	22	32	14	17	31	17	31	48	10	20	30	13	18	31	11	19	30
5:00	6	5	11	39	18	57	45	27	72	46	31	77	47	28	75	66	22	87	12	12	24	49	25	74	9	9	18	37	20	58
6:00	16	0	16	61	15	76	44	22	66	50	35	85	56	26	83	78	20	99	31	30	61	58	24	82	24	15	39	48	21	69
7:00	42	6	48	53	22	75	46	44	90	44	46	90	52	41	93	72	32	104	43	22	65	53	37	90	43	14	57	50	30	81
8:00	64	6	70	64	32	96	52	28	80	59	41	100	64	37	101	88	29	117	70	21	91	65	33	99	67	14	81	66	28	94
9:00	107	13	120	95	31	126	79	35	114	71	48	119	89	42	131	124	32	156	95	27	122	92	38	129	101	20	121	94	33	127
10:00	187	18	205	112	41	153	101	47	148	114	46	160	119	49	168	165	38	203	142	25	167	122	44	166	165	22	186	134	38	172
11:00	173	24	197	135	30	165	96	39	135	105	38	143	122	39	161	170	30	200	144	20	164	126	35	161	159	22	181	135	32	166
12:00	185	23	208	124	34	158	71	48	119	101	41	142	108	45	153	149	35	184	110	21	131	111	41	151	148	22	170	121	35	156
13:00	154	19	173	139	60	199	92	46	138	89	43	132	116	55	171	162	42	204	108	18	126	120	49	169	131	19	150	123	40	163
14:00	146	26	172	126	55	181	106	53	159	99	64	163	120	63	183	167	49	216	122	15	137	124	57	180	134	21	155	127	46	173
15:00	174	40	214	109	74	183	79	69	148	106	63	169	107	76	182	148	59	207	101	25	126	110	68	178	138	33	170	118	58	176
16:00	152	46	198	96	76	172	61	61	122	85	67	152	88	75	163	122	58	180	103	14	117	90	67	158	128	30	158	101	57	158
17:00	123	50	173	94	78	172	67	83	150	83	83	166	89	90	178	123	69	192	72	8	80	91	81	172	98	29	127	93	66	159
18:00	89	53	142	57	71	128	62	79	141	45	70	115	60	81	140	83	62	145	40	9	49	61	73	134	65	31	96	62	61	123
19:00	77	45	122	62	89	151	34	91	125	49	95	144	53	101	154	73	78	151	44	20	64	54	91	145	61	33	93	56	74	130
20:00	53	45	98	36	82	118	16	84	100	30	86	116	30	92	122	41	72	113	26	19	45	31	83	114	40	32	72	33	69	102
21:00	61	36	97	24	89	113	20	87	107	22	84	106	24	95	119	33	74	107	24	17	41	25	86	111	43	27	69	30	69	99
22:00	21	25	46	16	102	118	17	85	102	12	104	116	16	107	123	23	83	105	21	22	43	17	96	113	21	24	45	18	75	93
23:00	12	35	47	22	108	130	16	100	116	10	106	116	17	115	133	24	89	113	25	11	36	18	104	122	19	23	42	18	81	99
Total	**1873**	**542**	**2415**	**1503**	**1179**	**2682**	**1153**	**1448**	**2601**	**1272**	**1559**	**2831**	**1427**	**1536**	**2963**	**1983**	**1189**	**3172**	**1397**	**616**	**2013**	**1468**	**1382**	**2850**	**1635**	**579**	**2214**	**1516**	**1153**	**2668**

Table 3. Combination

	Sun			Mon			Tue			Wed			Thu			Fri			Sat			Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
Time	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	13	13	26	21	61	82	33	210	243	28	232	260	30	185	214	41	143	184	41	117	158	31	166	197	27	65	92	30	137	167
1:00	16	16	32	16	56	72	15	213	228	16	206	222	17	174	191	24	135	159	31	133	164	18	157	174	24	75	98	19	133	153
2:00	14	14	28	5	42	47	23	125	148	11	161	172	14	120	135	20	93	113	11	117	128	15	108	123	13	66	78	14	96	110
3:00	3	10	13	15	17	32	10	106	116	10	115	125	13	87	100	18	68	85	16	76	92	13	79	92	10	43	53	12	68	80
4:00	14	7	21	18	21	39	15	62	77	18	68	86	19	55	74	26	43	69	30	54	84	19	50	69	22	31	53	20	44	64
5:00	15	7	22	55	32	87	61	48	109	59	56	115	64	50	113	88	39	127	32	23	55	65	45	110	24	15	39	53	36	90
6:00	25	4	29	89	35	124	63	62	125	71	67	138	81	60	141	113	47	159	70	50	120	93	54	137	48	27	75	73	46	119
7:00	71	13	84	92	45	137	83	69	152	82	89	171	93	74	168	130	58	187	88	42	130	96	67	163	80	28	107	91	56	147
8:00	101	15	116	131	54	185	111	65	176	108	84	192	127	74	202	177	58	234	132	31	163	131	67	198	117	23	140	127	54	181
9:00	194	24	218	191	57	248	157	78	235	140	90	230	177	83	260	246	64	310	163	41	204	182	74	257	179	33	211	181	62	244
10:00	295	32	327	213	69	282	179	74	253	209	77	286	218	81	299	303	62	366	243	45	288	225	73	297	269	39	308	237	63	300
11:00	317	46	363	266	55	321	177	69	246	205	68	273	235	70	306	327	55	382	267	47	314	242	63	306	292	47	339	256	59	315
12:00	357	44	401	269	71	330	167	106	273	181	73	254	221	92	312	306	71	377	232	35	267	227	83	309	295	40	334	246	70	316
13:00	318	53	371	291	97	388	202	76	278	173	80	253	242	93	335	336	72	408	221	35	256	249	84	332	270	44	314	255	72	327
14:00	317	59	376	261	94	355	217	93	310	190	112	302	243	110	352	337	85	422	238	41	279	250	99	348	278	50	328	258	85	342
15:00	386	71	457	243	133	376	184	123	307	234	109	343	240	134	374	334	104	437	198	39	237	247	121	368	292	55	347	260	102	362
16:00	333	95	428	222	139	361	141	108	249	192	130	322	202	138	340	280	107	387	181	38	219	207	124	332	257	67	324	222	108	329
17:00	259	103	362	206	138	344	165	169	334	161	174	335	193	176	370	269	137	405	148	21	169	199	159	358	204	62	266	200	131	331
18:00	182	129	311	170	160	330	148	170	318	127	151	278	162	176	338	225	137	361	110	44	154	166	159	325	146	87	233	160	138	299
19:00	162	127	289	113	171	284	70	178	248	91	187	278	100	197	296	138	152	291	81	44	125	102	177	279	122	86	207	108	151	259
20:00	90	99	189	74	171	245	47	181	228	60	180	240	66	195	261	91	151	242	42	41	83	68	176	243	66	70	136	67	145	213
21:00	100	106	206	47	182	229	40	160	200	44	163	207	48	185	233	66	143	210	39	30	69	49	167	216	70	68	138	55	139	193
22:00	33	75	108	39	189	228	35	189	224	23	191	214	35	209	244	49	162	211	32	35	67	36	188	224	33	55	88	35	150	185
23:00	30	79	109	31	203	234	26	224	250	26	237	263	30	244	274	42	189	230	36	21	57	31	219	250	33	50	83	32	171	202
Total	**3645**	**1241**	**4886**	**3068**	**2292**	**5360**	**2369**	**2958**	**5327**	**2459**	**3100**	**5559**	**2869**	**3064**	**5933**	**3987**	**2371**	**6358**	**2682**	**1200**	**3882**	**2950**	**2757**	**5707**	**3164**	**1221**	**4384**	**3011**	**2318**	**5329**

Daily

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
AAWT	1483	1375	2858	1468	1382	2850
AAWE	1529	642	2170	1635	579	2214
AADT	1496	1165	2661	1516	1153	2668

Peak Hours

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
Weekday midday peak	137	52	190	110	68	178
Weekday night-time truck peak	13	116	129	18	104	122
Weekend	155	23	177	138	33	170
Weekly	142	44	186	118	58	176

Peak Hours

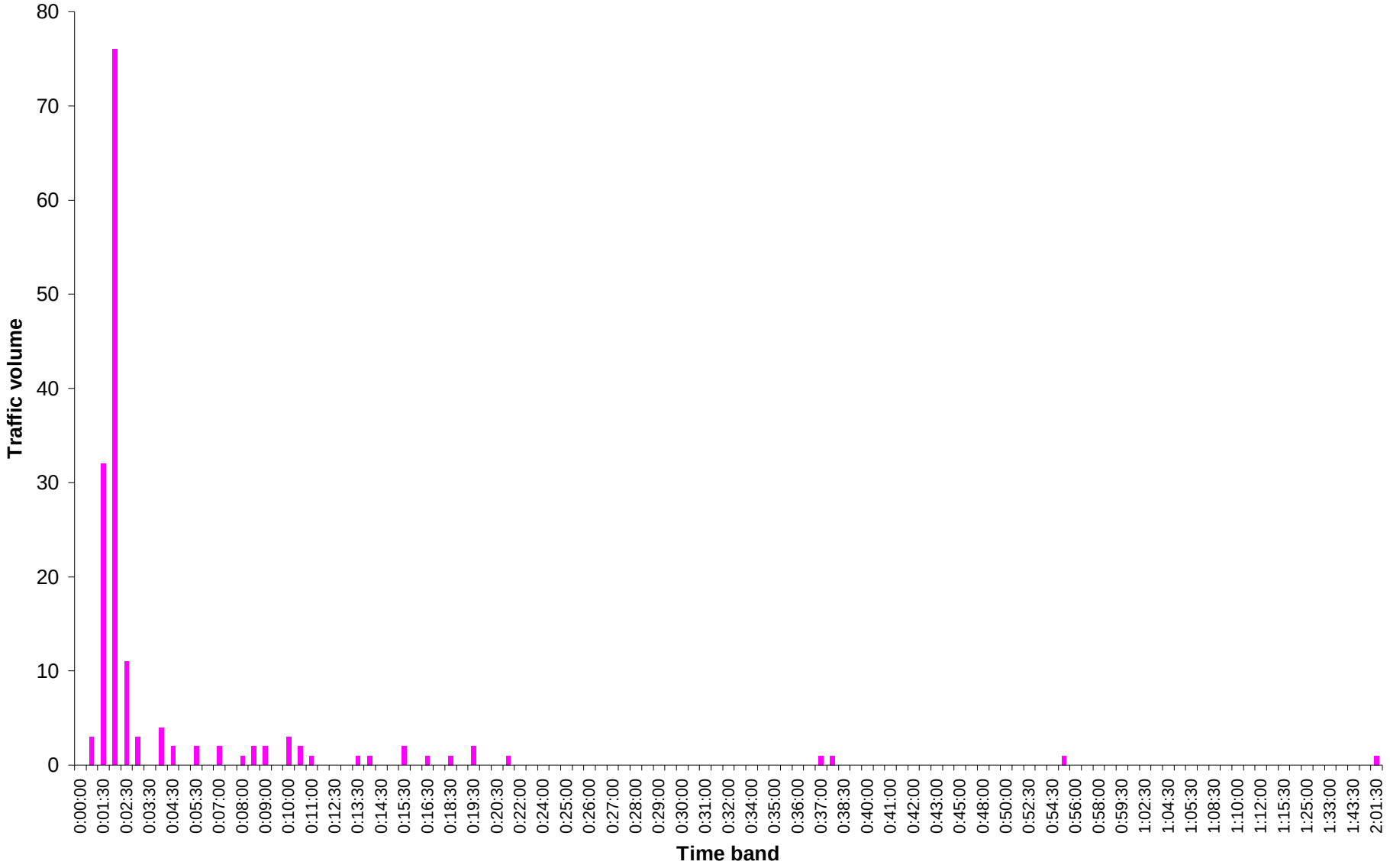
	Northbound Heavy Vehicles			Southbound Heavy Vehicles		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
H30	217	169	387	276	210	486
H50	189	148	337	246	187	433
H100	162	126	289	204	156	360

4948
5224

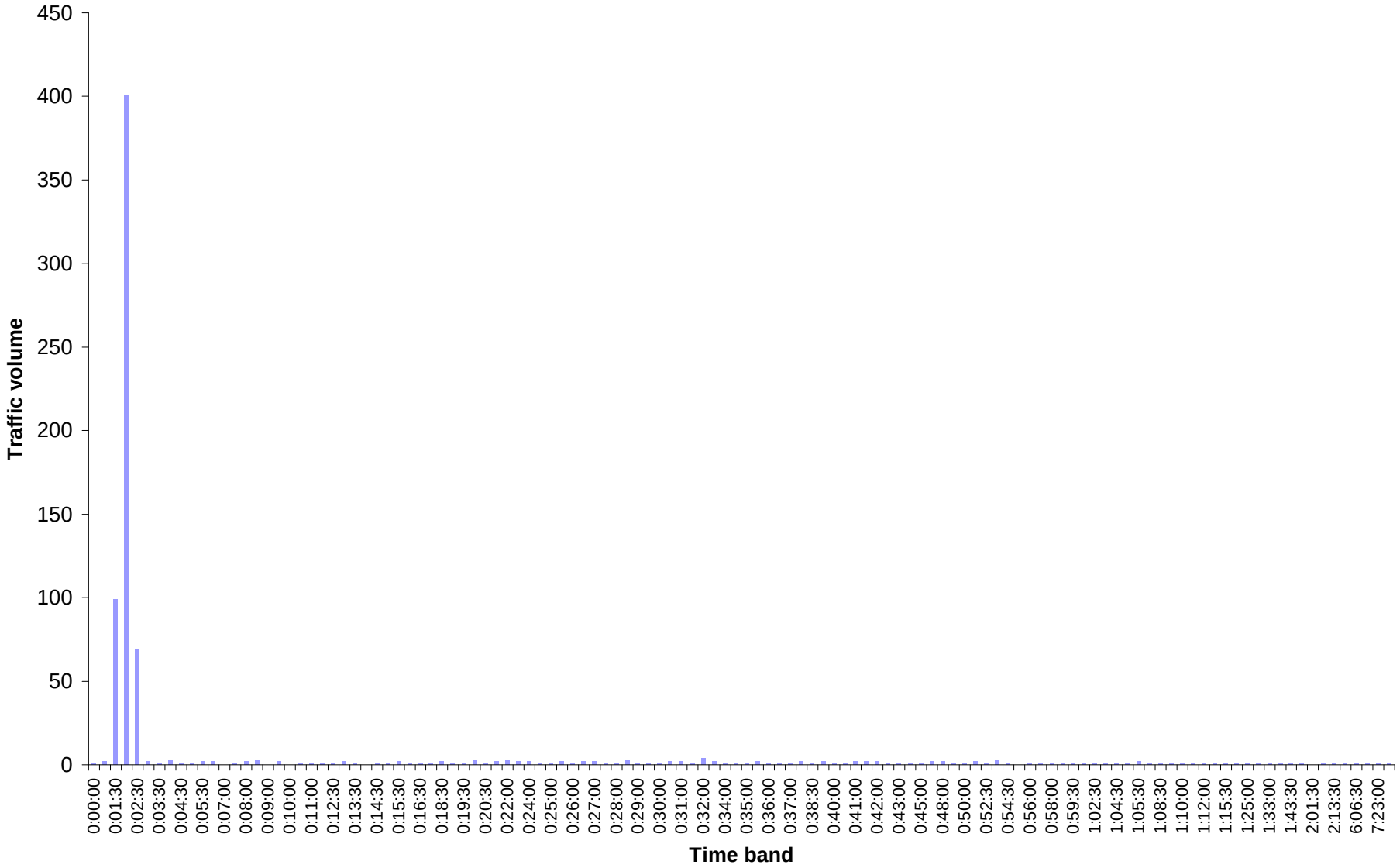
Appendix C

Travel Time Distribution on Hume Highway in Tarcutta

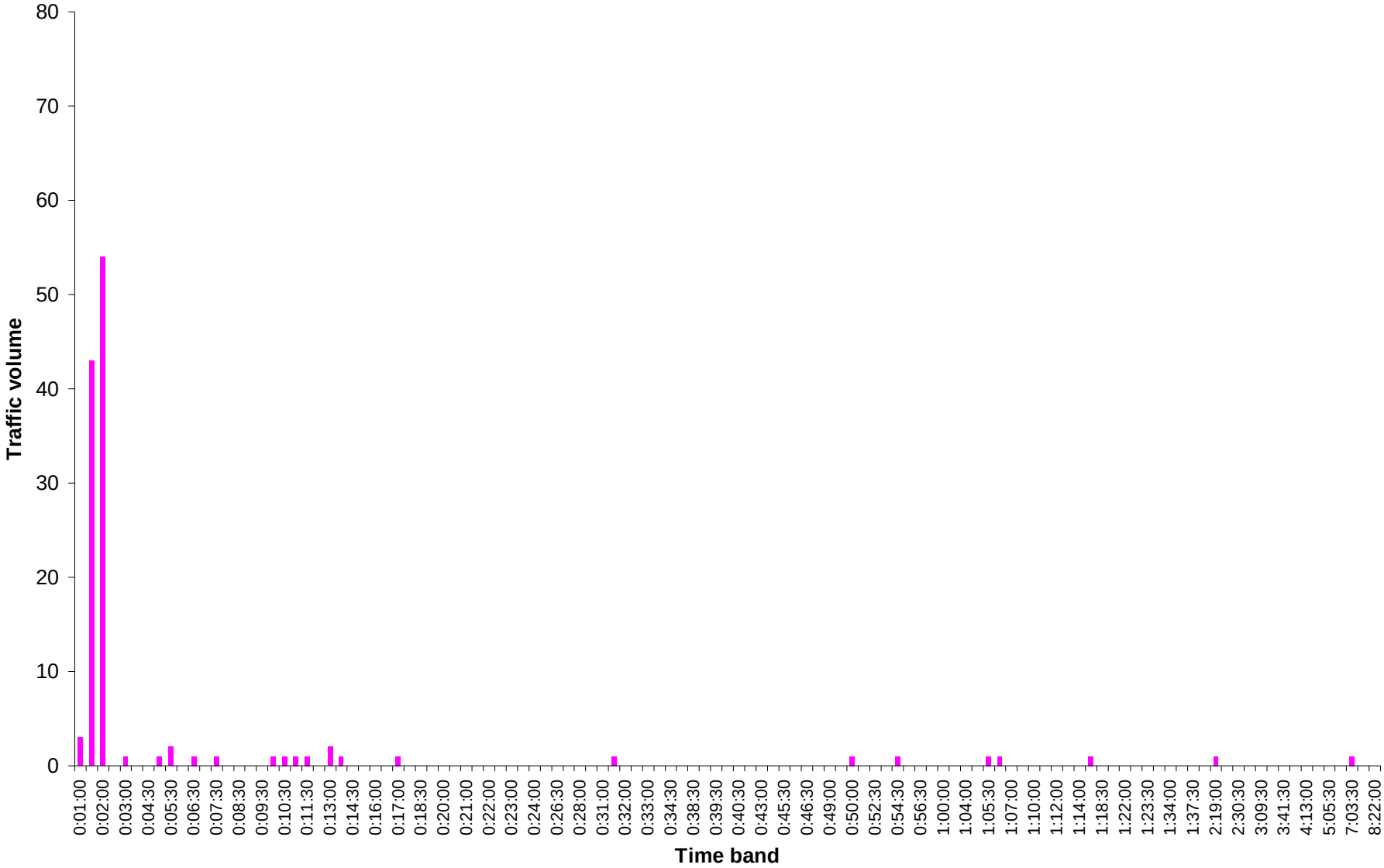
Distribution of northbound travel time through Tarcutta (Light vehicles)



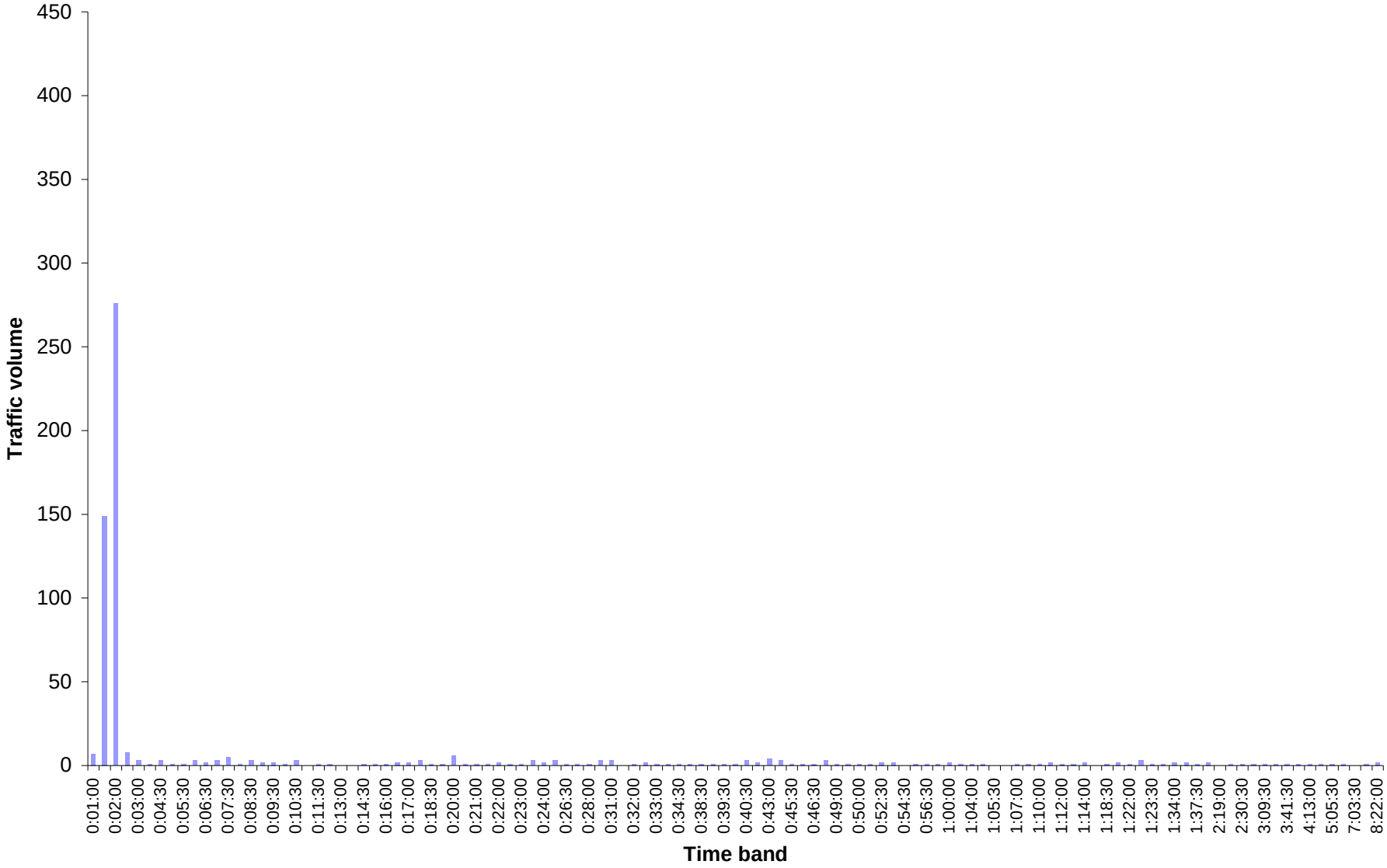
Distribution of northbound travel time through Tarcutta (Heavy vehicles)



Distribution of southbound travel time through Tarcutta (Light vehicles)



Distribution of southbound travel time through Tarcutta (Heavy vehicles)



Appendix D

Forecast Future Traffic Volumes

Hume Highway Forecast Traffic Volumes south of Tarcutta, 2012

2012 Do Nothing - Hume Highway

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	13	96	109	16	27	43	14	76	90
1:00	10	96	106	16	42	58	12	80	92
2:00	6	67	73	5	43	48	6	60	66
3:00	9	52	61	6	25	30	8	44	52
4:00	10	34	43	10	15	25	10	28	38
5:00	19	22	41	16	7	23	18	18	36
6:00	28	34	62	27	13	40	28	28	56
7:00	48	34	81	41	15	56	46	28	74
8:00	73	38	111	55	11	66	68	30	98
9:00	101	41	142	87	14	101	97	33	130
10:00	114	32	146	117	19	136	115	28	143
11:00	130	31	162	149	27	176	136	30	166
12:00	130	47	177	164	20	184	140	39	179
13:00	144	38	183	155	28	183	147	36	183
14:00	141	47	187	160	33	193	146	43	189
15:00	153	59	212	173	25	198	159	49	208
16:00	131	64	194	145	41	185	135	57	192
17:00	120	87	208	118	37	155	120	73	193
18:00	117	96	214	91	62	153	110	86	196
19:00	54	96	150	68	59	127	58	86	144
20:00	41	103	145	30	42	72	38	86	124
21:00	27	90	117	30	46	77	28	78	106
22:00	22	103	124	13	35	48	19	83	102
23:00	15	129	144	16	30	46	15	101	116
Total	1,656	1,535	3,191	1,707	716	2,423	1,670	1,301	2,972

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	21	89	111	14	46	60	19	77	96
1:00	9	79	88	11	41	52	10	68	78
2:00	10	54	64	9	30	39	10	47	57
3:00	6	36	42	5	23	28	6	32	38
4:00	12	22	34	15	20	34	12	21	34
5:00	54	28	82	10	9	20	42	23	64
6:00	65	27	91	26	17	43	54	24	77
7:00	60	41	101	47	16	63	56	34	90
8:00	73	37	110	75	15	90	74	31	104
9:00	102	42	144	113	22	135	105	36	142
10:00	136	49	186	184	24	208	150	42	192
11:00	140	39	180	177	25	202	151	35	186
12:00	124	45	169	165	25	189	135	39	175
13:00	134	55	188	146	21	167	137	45	182
14:00	138	63	202	150	23	173	141	52	193
15:00	123	76	199	154	36	190	132	65	196
16:00	101	75	176	142	34	176	113	63	176
17:00	102	90	192	109	32	141	104	74	177
18:00	68	81	150	72	35	107	69	68	137
19:00	61	101	162	68	36	104	63	83	145
20:00	34	93	127	44	36	80	37	77	114
21:00	28	96	123	47	30	77	33	77	110
22:00	19	107	126	23	26	50	20	84	104
23:00	20	116	136	21	26	46	20	90	110
Total	1,639	1,544	3,183	1,826	647	2,473	1,693	1,287	2,980

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	34	185	220	30	73	103	33	153	186
1:00	20	175	195	26	83	109	22	149	170
2:00	16	121	137	14	73	87	16	107	123
3:00	15	88	102	11	48	59	13	76	90
4:00	21	56	77	25	34	59	22	50	72
5:00	73	50	123	26	17	43	60	41	100
6:00	93	60	154	53	30	83	82	52	133
7:00	107	75	182	89	31	119	102	62	164
8:00	146	75	221	130	26	156	141	61	202
9:00	204	83	287	199	36	236	202	70	272
10:00	251	81	332	300	43	343	265	70	335
11:00	270	71	341	326	52	378	286	65	352
12:00	253	92	345	329	44	373	275	78	353
13:00	278	93	371	301	49	350	285	81	365
14:00	279	110	389	310	56	366	288	95	382
15:00	276	135	410	326	61	388	290	114	404
16:00	232	139	371	287	74	361	247	121	368
17:00	222	177	399	227	69	297	224	146	370
18:00	186	177	363	163	97	260	179	154	334
19:00	114	198	312	136	95	231	120	168	289
20:00	76	196	272	74	78	152	75	162	237
21:00	55	186	241	78	76	154	61	155	216
22:00	40	210	250	36	61	98	39	167	207
23:00	35	245	279	37	56	93	35	191	226
Total	3,295	3,079	6,374	3,533	1,363	4,896	3,363	2,589	5,952

2012 with Bypass - Hume Highway

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	4	29	34	5	8	14	5	23	28
1:00	4	29	33	5	13	18	4	24	28
2:00	2	20	22	2	13	15	2	18	20
3:00	3	16	19	2	7	9	3	13	16
4:00	3	10	13	3	4	8	3	9	12
5:00	6	7	13	5	2	8	6	5	12
6:00	10	10	20	9	4	13	9	8	18
7:00	16	10	26	14	5	19	16	9	24
8:00	25	11	36	19	3	22	23	9	32
9:00	34	12	47	29	4	34	33	10	43
10:00	39	10	48	40	6	45	39	9	48
11:00	44	9	54	51	8	59	46	9	55
12:00	44	14	58	56	6	62	47	12	59
13:00	49	12	61	53	9	61	50	11	61
14:00	48	14	62	54	10	64	50	13	63
15:00	52	18	70	59	8	66	54	15	69
16:00	44	19	64	49	12	61	46	17	63
17:00	41	26	67	40	11	51	41	22	63
18:00	40	29	69	31	19	50	37	26	63
19:00	18	29	47	23	18	41	20	26	46
20:00	14	31	45	10	13	23	13	26	39
21:00	9	27	37	10	14	24	10	24	33
22:00	7	31	38	4	11	15	7	25	32
23:00	5	39	44	5	9	15	5	31	36
Total	562	465	1,027	580	217	797	567	394	961

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	8	38	46	5	19	25	7	32	40
1:00	4	33	37	4	17	21	4	29	32
2:00	4	23	27	3	13	16	4	20	24
3:00	2	15	17	2	10	12	2	14	16
4:00	4	9	14	6	8	14	5	9	14
5:00	21	12	33	4	4	8	16	10	26
6:00	25	11	36	10	7	17	21	10	31
7:00	23	17	40	18	7	25	22	14	36
8:00	28	16	44	29	6	35	28	13	41
9:00	39	18	57	43	9	53	40	15	56
10:00	52	21	73	71	10	81	58	18	75
11:00	54	17	71	68	10	78	58	15	73
12:00	48	19	67	63	10	74	52	17	69
13:00	51	23	74	56	9	65	53	19	72
14:00	53	27	80	58	10	67	54	22	76
15:00	47	32	79	59	15	74	51	27	78
16:00	39	32	70	55	14	69	43	27	70
17:00	39	38	77	42	14	55	40	31	71
18:00	26	34	60	28	15	42	27	29	55
19:00	23	43	66	26	15	41	24	35	59
20:00	13	39	52	17	15	32	14	32	46
21:00	11	40	51	18	12	31	13	32	45
22:00	7	45	52	9	11	20	8	35	43
23:00	8	49	56	8	11	19	8	38	46
Total	630	649	1,279	702	272	974	651	541	1,192

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	13	67	79	11	27	38	12	55	68
1:00	7	62	69	9	30	39	8	53	61
2:00	6	43	49	5	26	31	6	38	44
3:00	5	31	36	4	17	21	5	27	32
4:00	8	19	27	9	13	22	8	18	26
5:00	27	18	46	9	6	16	22	15	37
6:00	35	21	56	19	11	30	30	18	49
7:00	39	28	67	32	11	43	37	23	60
8:00	53	27	80	48	10	57	51	22	73
9:00	74	30	104	73	14	86	73	25	99
10:00	91	30	122	110	16	126	97	26	123
11:00	98	26	124	119	19	137	104	24	128
12:00	92	33	125	119	16	135	99	28	128
13:00	100	35	135	109	17	126	103	30	133
14:00	101	41	142	112	20	132	104	35	139
15:00	99	50	149	118	23	141	104	42	146
16:00	83	51	134	104	26	130	89	44	133
17:00	80	64	144	82	25	107	81	53	134
18:00	66	63	129	59	33	92	64	55	119
19:00	42	72	113	49	33	82	44	61	104
20:00	27	70	98	27	28	55	27	58	85
21:00	20	68	87	28	26	55	22	56	78
22:00	15	76	91	13	22	35	14	61	75
23:00	13	88	100	13	20	33	13	68	81
Total	1,193	1,114	2,307	1,282	489	1,771	1,218	935	2,154

2012 with Bypass - Bypass (High Diversion)

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	9	67	76	11	19	29	9	53	62
1:00	7	67	74	10	29	40	8	56	64
2:00	4	47	51	3	30	33	4	42	46
3:00	6	36	42	4	17	21	5	31	36
4:00	6	23	30	7	10	17	6	20	26
5:00	12	15	28	11	5	16	12	12	24
6:00	19	24	42	18	9	27	18	20	38
7:00	31	23	55	27	11	38	30	20	50
8:00	48	26	74	37	7	44	45	21	66
9:00	67	29	96	57	10	67	64	23	87
10:00	76	22	98	77	13	90	76	20	96
11:00	86	22	108	98	19	118	90	21	111
12:00	86	33	118	108	14	122	92	27	119
13:00	95	27	122	102	20	122	97	25	122
14:00	93	33	126	106	23	129	97	30	126
15:00	101	41	142	114	18	131	105	34	139
16:00	86	44	131	96	28	124	89	40	129
17:00	79	61	140	78	26	104	79	51	130
18:00	77	67	145	60	43	103	72	60	133
19:00	36	67	103	45	41	86	38	60	98
20:00	27	72	99	20	30	49	25	60	85
21:00	18	63	81	20	32	52	18	54	73
22:00	14	71	86	8	25	33	13	58	71
23:00	10	90	100	11	21	32	10	70	80
Total	1,093	1,071	2,164	1,127	499	1,627	1,103	907	2,010

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	13	52	65	9	27	35	12	45	56
1:00	6	46	52	7	24	30	6	40	46
2:00	6	31	38	5	17	23	6	27	33
3:00	4	21	24	3	14	17	3	19	22
4:00	7	13	20	9	11	20	8	12	20
5:00	33	16	50	6	6	12	26	13	39
6:00	40	15	55	16	10	26	33	14	47
7:00	37	24	61	29	9	38	35	20	54
8:00	45	22	67	46	9	55	45	18	63
9:00	63	24	87	69	13	82	65	21	86
10:00	84	29	113	113	14	127	92	24	117
11:00	86	23	109	109	14	123	93	20	113
12:00	76	26	102	101	14	116	83	23	106
13:00	82	32	114	90	12	102	84	26	111
14:00	85	37	122	92	13	105	87	30	117
15:00	76	44	120	95	21	116	81	37	118
16:00	62	44	106	88	19	107	69	37	106
17:00	63	52	115	67	19	86	64	43	107
18:00	42	47	89	44	20	64	43	39	82
19:00	37	59	96	42	21	63	38	48	86
20:00	21	54	75	27	21	48	23	44	67
21:00	17	56	73	29	17	46	20	45	65
22:00	12	62	74	14	15	30	12	49	61
23:00	12	67	79	13	15	28	12	52	65
Total	1,009	895	1,903	1,124	375	1,498	1,042	746	1,788

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	22	119	140	19	45	65	21	98	119
1:00	13	113	125	17	53	70	14	96	110
2:00	10	78	88	9	47	56	10	69	79
3:00	9	57	66	7	31	38	9	49	58
4:00	14	36	50	16	21	37	14	32	46
5:00	46	32	77	17	11	27	38	26	63
6:00	59	39	98	34	19	53	51	33	85
7:00	68	47	115	56	20	76	65	39	104
8:00	93	48	141	83	16	99	90	39	129
9:00	130	53	183	127	23	149	129	44	173
10:00	159	51	210	190	27	217	168	44	212
11:00	172	45	217	207	33	241	182	41	224
12:00	162	59	221	210	28	238	175	50	226
13:00	178	59	236	192	32	224	182	51	233
14:00	178	69	247	198	36	234	184	60	244
15:00	177	85	262	208	39	247	186	72	257
16:00	148	88	236	183	48	231	158	77	235
17:00	142	113	255	145	44	190	143	93	236
18:00	120	114	234	104	63	168	115	100	215
19:00	73	126	199	87	62	149	77	108	184
20:00	48	126	174	47	50	97	48	104	152
21:00	35	119	153	49	49	99	39	99	138
22:00	26	134	160	23	40	63	25	107	132
23:00	22	157	179	23	36	59	22	122	145
Total	2,102	1,965	4,067	2,251	874	3,125	2,145	1,653	3,798

Note: Traffic volumes presented based on 'High diversion' scenario. Refer to Section 4.2.3 for more details.

Hume Highway Forecast Traffic Volumes south of Tarcutta, 2022

2022 Do Nothing - Hume Highway

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	17	127	144	21	35	57	18	101	119
1:00	14	126	140	21	55	76	16	106	122
2:00	8	88	96	7	57	63	7	79	87
3:00	12	69	80	7	32	40	10	58	69
4:00	13	44	57	13	19	32	13	37	50
5:00	25	29	54	21	10	31	24	24	47
6:00	37	45	82	35	18	53	37	37	74
7:00	63	44	107	54	20	74	60	37	98
8:00	96	50	146	73	14	87	90	39	129
9:00	134	54	188	114	18	132	128	44	172
10:00	151	42	193	154	25	179	152	37	189
11:00	172	41	213	197	36	233	179	40	219
12:00	171	62	233	216	26	242	184	51	235
13:00	190	51	241	204	38	241	194	47	241
14:00	185	62	247	211	43	255	193	56	249
15:00	202	77	279	227	33	261	209	65	274
16:00	172	84	256	191	54	244	177	75	253
17:00	158	115	274	156	49	205	158	96	254
18:00	155	127	281	120	82	202	145	114	259
19:00	71	127	198	90	78	168	76	113	189
20:00	54	136	191	39	56	95	50	113	163
21:00	36	119	155	40	61	101	37	103	139
22:00	29	135	164	17	46	63	25	110	135
23:00	19	170	189	21	40	61	20	133	153
Total	2,182	2,024	4,206	2,250	944	3,194	2,202	1,715	3,917

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	28	118	146	18	60	79	25	101	127
1:00	12	104	117	14	54	68	13	90	103
2:00	14	71	85	12	40	52	13	62	75
3:00	8	47	55	7	31	38	7	43	50
4:00	15	29	45	19	26	45	16	28	45
5:00	72	37	108	13	13	26	55	30	85
6:00	85	35	120	35	22	57	71	31	102
7:00	79	54	133	63	21	83	74	45	119
8:00	96	49	145	99	20	118	97	41	138
9:00	135	55	190	149	29	178	139	48	187
10:00	180	65	245	242	32	274	198	56	253
11:00	185	52	237	233	32	266	199	46	245
12:00	163	60	223	217	32	250	178	52	230
13:00	176	72	248	193	27	220	181	60	240
14:00	182	84	266	197	30	227	186	68	255
15:00	162	100	262	202	48	250	173	85	259
16:00	133	99	232	188	44	232	149	83	232
17:00	134	119	253	144	43	186	137	97	234
18:00	90	107	197	95	46	141	92	89	181
19:00	80	134	213	89	48	137	82	109	192
20:00	45	122	168	58	47	105	49	101	150
21:00	36	126	163	63	39	102	44	101	145
22:00	25	141	166	31	35	66	27	111	137
23:00	26	153	179	27	34	61	27	119	145
Total	2,160	2,035	4,195	2,407	852	3,259	2,231	1,697	3,928

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	45	244	290	40	96	135	44	202	246
1:00	26	231	257	35	110	144	28	196	225
2:00	21	159	181	18	96	115	21	141	162
3:00	19	116	135	14	63	77	18	101	118
4:00	28	73	101	32	45	77	29	65	95
5:00	96	66	162	35	22	57	79	54	132
6:00	123	80	202	70	40	110	108	68	176
7:00	141	99	240	117	40	158	134	82	216
8:00	193	99	291	171	34	205	186	80	267
9:00	268	109	378	263	48	311	267	92	359
10:00	331	107	437	396	57	453	349	93	442
11:00	356	93	450	430	68	498	377	86	464
12:00	334	122	455	433	58	492	362	103	466
13:00	366	123	489	397	65	461	375	106	481
14:00	367	145	513	408	74	482	379	125	504
15:00	364	177	541	430	81	511	382	150	532
16:00	305	183	488	378	98	476	326	159	485
17:00	293	234	526	300	91	391	295	193	488
18:00	245	234	479	215	127	342	236	203	440
19:00	151	261	411	179	126	305	159	222	381
20:00	100	259	358	97	103	200	99	214	313
21:00	72	245	317	102	100	202	81	204	285
22:00	53	277	330	48	81	129	52	221	272
23:00	46	323	368	49	74	122	46	252	298
Total	4,343	4,058	8,401	4,657	1,797	6,453	4,433	3,412	7,845

2022 with Bypass - Hume Highway

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	6	38	44	7	11	18	6	30	37
1:00	5	38	43	7	17	24	5	32	37
2:00	3	27	29	2	17	19	3	24	27
3:00	4	21	25	2	10	12	4	18	21
4:00	4	13	18	4	6	10	4	11	16
5:00	8	9	17	7	3	10	8	7	15
6:00	13	14	26	12	5	17	13	11	24
7:00	21	13	35	18	6	25	20	11	32
8:00	33	15	48	25	4	29	30	12	42
9:00	45	16	62	39	6	44	43	13	57
10:00	51	13	64	52	8	60	51	11	63
11:00	58	13	71	67	11	78	61	12	73
12:00	58	19	77	73	8	81	62	16	78
13:00	65	15	80	69	11	81	66	14	80
14:00	63	19	82	72	13	85	65	17	83
15:00	69	23	92	77	10	87	71	20	91
16:00	58	25	84	65	16	81	60	23	83
17:00	54	35	89	53	15	68	54	29	83
18:00	52	38	91	41	25	65	49	35	84
19:00	24	38	63	30	24	54	26	34	60
20:00	18	41	60	13	17	30	17	34	51
21:00	12	36	48	13	18	32	13	31	44
22:00	10	41	51	6	14	20	9	33	42
23:00	7	52	58	7	12	19	7	40	47
Total	741	613	1,354	764	286	1,050	748	519	1,267

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	11	49	60	7	25	32	10	43	52
1:00	5	44	49	5	23	28	5	38	43
2:00	5	30	35	5	17	21	5	26	31
3:00	3	20	23	3	13	16	3	18	21
4:00	6	12	18	7	11	18	6	12	18
5:00	27	16	43	5	5	10	21	13	34
6:00	33	15	48	13	9	23	27	13	40
7:00	30	23	53	24	9	33	28	19	47
8:00	37	21	58	38	8	46	37	17	54
9:00	52	23	75	57	12	70	53	20	74
10:00	69	27	97	93	13	106	76	23	99
11:00	71	22	93	90	14	103	76	20	96
12:00	63	25	88	83	14	97	69	22	90
13:00	68	30	98	74	11	86	70	25	95
14:00	70	35	105	76	13	89	72	29	100
15:00	62	42	104	78	20	98	67	36	102
16:00	51	42	93	72	19	91	57	35	92
17:00	52	50	101	55	18	73	53	41	93
18:00	35	45	80	37	19	56	35	38	73
19:00	31	56	87	34	20	54	32	46	78
20:00	17	52	69	22	20	42	19	42	61
21:00	14	53	67	24	16	40	17	43	59
22:00	10	59	69	12	15	26	10	47	57
23:00	10	64	74	10	14	25	10	50	60
Total	831	855	1,686	926	358	1,284	858	713	1,571

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	17	88	104	14	36	50	16	73	89
1:00	9	82	92	12	40	52	10	70	80
2:00	8	57	65	7	34	41	8	50	58
3:00	7	41	47	5	23	28	6	35	42
4:00	10	26	36	12	17	28	11	23	34
5:00	36	24	60	12	8	21	29	20	49
6:00	45	28	74	25	15	40	40	24	64
7:00	52	36	88	43	15	57	49	30	79
8:00	70	36	105	63	13	75	68	29	97
9:00	97	40	137	96	18	114	97	33	130
10:00	120	40	160	145	21	166	127	35	162
11:00	129	34	164	156	25	181	137	32	169
12:00	121	44	165	157	21	178	131	37	168
13:00	132	46	178	143	23	166	135	39	175
14:00	133	54	187	148	26	173	137	46	183
15:00	131	66	196	155	30	185	138	55	193
16:00	110	67	177	137	35	172	117	58	175
17:00	105	85	190	108	33	141	106	70	176
18:00	87	83	171	77	44	121	84	72	156
19:00	55	95	149	65	44	108	58	80	138
20:00	36	93	129	36	37	72	36	77	112
21:00	26	89	115	38	35	72	29	74	103
22:00	19	100	120	18	29	46	19	80	99
23:00	17	116	132	18	26	44	17	90	107
Total	1,572	1,468	3,040	1,690	644	2,334	1,606	1,233	2,839

2022 with Bypass - Bypass (High Diversion)

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	11	88	100	14	25	39	12	70	82
1:00	9	88	97	14	38	52	10	74	84
2:00	5	62	67	4	40	44	5	55	60
3:00	8	48	55	5	23	27	7	41	47
4:00	8	31	39	9	13	22	8	26	34
5:00	16	20	37	14	7	21	16	16	32
6:00	25	31	56	23	12	36	24	26	50
7:00	41	31	72	36	14	50	40	26	66
8:00	64	35	98	48	10	58	59	27	87
9:00	88	38	126	75	13	88	85	31	115
10:00	100	29	129	102	17	119	100	26	126
11:00	113	29	142	130	25	155	118	28	146
12:00	113	43	156	143	18	161	122	36	157
13:00	126	35	161	135	26	161	128	33	161
14:00	122	43	165	139	30	170	127	39	167
15:00	133	54	187	150	23	173	138	45	183
16:00	114	59	172	126	37	163	117	53	170
17:00	105	80	185	103	34	137	104	67	171
18:00	102	88	191	79	57	136	96	79	175
19:00	47	88	135	59	54	114	50	79	129
20:00	36	95	131	26	39	65	33	79	112
21:00	24	83	107	26	43	69	24	71	96
22:00	19	94	113	11	32	44	17	77	93
23:00	13	119	131	14	28	42	13	93	106
Total	1,441	1,411	2,852	1,486	658	2,144	1,454	1,196	2,650

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	17	68	85	11	35	46	16	59	74
1:00	7	61	68	9	32	40	8	52	60
2:00	8	41	50	7	23	30	8	36	44
3:00	5	27	32	4	18	22	5	25	29
4:00	9	17	26	12	15	27	10	16	26
5:00	44	21	65	8	7	15	34	17	51
6:00	52	20	73	21	13	34	44	18	62
7:00	48	32	80	39	12	50	46	26	72
8:00	59	28	88	61	12	72	60	24	83
9:00	83	32	115	91	17	109	85	28	113
10:00	111	38	148	149	18	167	122	32	154
11:00	114	30	144	144	19	162	122	27	149
12:00	100	35	135	134	19	152	110	30	140
13:00	108	42	150	119	16	134	111	34	146
14:00	112	48	160	121	17	139	115	40	154
15:00	100	58	158	125	28	152	107	49	156
16:00	82	57	139	116	26	141	92	48	140
17:00	83	69	151	88	25	113	84	56	140
18:00	56	62	117	58	26	85	56	52	108
19:00	49	77	127	55	28	83	51	63	114
20:00	28	71	99	36	27	63	30	58	89
21:00	22	73	96	39	23	61	27	59	86
22:00	15	82	97	19	20	39	16	64	81
23:00	16	88	105	17	20	36	16	69	85
Total	1,330	1,179	2,509	1,481	494	1,975	1,373	983	2,356

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	29	157	185	25	60	85	28	129	157
1:00	17	149	165	22	70	92	18	126	144
2:00	14	103	116	12	63	74	13	91	104
3:00	12	75	87	9	40	49	11	65	77
4:00	18	48	66	21	28	49	19	42	61
5:00	60	42	102	22	14	36	49	34	83
6:00	77	51	129	45	25	70	68	44	112
7:00	90	62	152	74	26	100	85	52	137
8:00	123	63	186	109	21	130	119	51	170
9:00	171	70	241	167	30	197	170	58	228
10:00	210	67	277	251	36	286	222	58	280
11:00	227	59	286	273	44	317	240	55	295
12:00	213	78	291	277	37	313	231	66	297
13:00	234	77	311	253	42	295	240	67	307
14:00	234	91	326	261	48	309	242	79	321
15:00	233	112	345	275	51	326	245	94	339
16:00	196	116	312	241	63	304	209	101	310
17:00	187	149	336	191	59	250	188	123	312
18:00	158	150	308	138	83	221	152	131	283
19:00	96	166	262	114	82	196	101	142	243
20:00	64	166	230	62	66	128	63	137	201
21:00	46	156	202	65	65	130	51	130	182
22:00	34	176	210	30	52	83	33	141	174
23:00	29	207	236	31	47	78	30	161	191
Total	2,771	2,590	5,361	2,967	1,152	4,119	2,827	2,179	5,006

Note: Traffic volumes presented based on 'High diversion' scenario. Refer to Section 4.2.3 for more details.

Hume Highway Forecast Traffic Volumes south of Tarcutta, 2032

2032 Do Nothing - Hume Highway

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	22	167	190	28	47	75	24	133	157
1:00	18	167	185	27	73	100	21	140	160
2:00	10	117	127	9	75	83	10	105	114
3:00	15	90	106	10	43	52	14	77	90
4:00	17	58	75	17	25	43	17	49	66
5:00	33	38	71	28	13	41	31	31	62
6:00	49	59	108	47	23	70	49	49	97
7:00	83	58	141	72	26	98	80	49	129
8:00	127	65	192	96	18	114	118	52	170
9:00	176	71	247	150	24	175	169	58	227
10:00	199	55	254	203	33	236	200	49	249
11:00	226	54	281	259	48	307	236	52	288
12:00	225	81	307	285	34	319	243	68	310
13:00	251	67	317	269	49	318	256	62	318
14:00	244	81	326	278	57	336	254	74	329
15:00	266	102	368	300	44	343	276	85	361
16:00	227	111	338	251	71	322	234	99	333
17:00	209	152	361	206	64	270	208	127	335
18:00	204	167	371	158	108	266	191	150	341
19:00	94	167	261	118	103	221	101	149	249
20:00	72	179	251	51	74	125	66	149	215
21:00	47	157	204	52	81	133	49	135	184
22:00	38	178	216	22	61	83	33	145	178
23:00	25	224	250	28	52	81	26	175	201
Total	2,877	2,667	5,544	2,966	1,245	4,210	2,902	2,261	5,163

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	37	155	192	24	80	104	33	133	167
1:00	16	138	154	18	72	90	17	119	136
2:00	18	94	112	16	52	68	17	82	99
3:00	10	62	72	9	41	49	10	56	66
4:00	20	38	59	25	34	59	22	37	59
5:00	94	49	143	17	16	34	72	39	112
6:00	112	46	158	46	29	75	93	41	135
7:00	104	72	175	82	27	110	98	59	157
8:00	127	65	192	130	26	156	128	54	181
9:00	178	73	251	196	39	235	183	63	246
10:00	237	86	323	319	42	361	261	73	334
11:00	244	69	312	308	43	350	262	61	323
12:00	215	79	293	286	43	329	235	68	304
13:00	232	95	327	254	36	290	238	78	317
14:00	240	110	350	260	40	300	246	90	336
15:00	213	132	345	267	63	330	228	112	341
16:00	175	131	306	247	58	306	196	110	306
17:00	177	156	333	189	56	245	180	128	308
18:00	119	141	260	125	60	185	121	118	239
19:00	105	176	281	117	63	180	109	144	252
20:00	59	161	221	77	62	139	64	133	197
21:00	48	167	214	82	51	134	58	134	191
22:00	33	186	219	41	46	86	35	146	181
23:00	35	201	236	36	45	81	35	156	192
Total	2,848	2,682	5,529	3,172	1,123	4,295	2,940	2,236	5,177

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	59	322	382	52	126	178	57	266	324
1:00	34	304	338	46	145	190	37	259	296
2:00	28	210	238	24	127	151	27	186	214
3:00	25	152	178	18	83	102	23	133	156
4:00	37	97	134	43	59	102	39	86	125
5:00	127	87	214	46	29	75	104	71	174
6:00	162	105	267	92	52	145	142	90	232
7:00	186	130	316	154	53	208	177	108	285
8:00	254	130	384	226	45	271	246	106	351
9:00	354	144	498	346	63	409	352	121	473
10:00	436	141	577	522	75	597	460	122	582
11:00	470	123	593	567	90	657	497	114	611
12:00	440	160	600	571	77	648	478	136	614
13:00	483	162	645	523	85	608	494	140	634
14:00	484	192	676	538	97	635	500	165	664
15:00	479	234	713	567	107	673	504	198	702
16:00	402	242	644	499	129	628	430	209	639
17:00	386	308	694	395	120	515	388	254	643
18:00	323	308	631	283	168	451	311	268	579
19:00	199	343	542	236	166	402	209	293	502
20:00	131	341	472	128	136	264	130	282	413
21:00	95	324	418	135	132	267	106	269	375
22:00	70	365	435	63	107	170	68	291	359
23:00	60	425	486	64	97	161	61	332	393
Total	5,724	5,349	11,073	6,138	2,368	8,506	5,842	4,497	10,340

2032 with Bypass - Hume Highway

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	8	51	58	10	14	24	8	40	48
1:00	6	50	57	9	22	31	7	42	49
2:00	3	35	39	3	23	26	3	32	35
3:00	5	27	33	3	13	16	5	23	28
4:00	6	18	23	6	8	14	6	15	21
5:00	11	12	23	10	4	13	11	9	20
6:00	17	18	35	16	7	23	16	15	31
7:00	28	18	46	24	8	32	27	15	42
8:00	43	20	63	33	6	38	40	16	56
9:00	60	22	81	51	7	58	57	17	75
10:00	67	17	84	69	10	79	68	15	83
11:00	77	16	93	88	14	102	80	16	96
12:00	77	25	101	97	10	107	82	21	103
13:00	85	20	105	91	15	106	87	19	106
14:00	83	25	108	95	17	112	86	23	109
15:00	90	31	121	102	13	115	94	26	119
16:00	77	34	111	85	21	107	79	30	110
17:00	71	46	117	70	19	89	71	38	109
18:00	69	51	120	54	33	86	65	45	110
19:00	32	51	82	40	31	71	34	45	79
20:00	24	54	79	17	22	40	22	45	68
21:00	16	48	64	18	24	42	17	41	57
22:00	13	54	67	8	19	26	11	44	55
23:00	9	68	77	10	16	25	9	53	62
Total	977	808	1,785	1,007	377	1,384	986	685	1,670

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	14	65	79	9	33	43	13	56	69
1:00	6	58	64	7	30	37	6	50	56
2:00	7	39	46	6	22	28	7	34	41
3:00	4	26	30	3	17	20	4	24	27
4:00	8	16	24	10	14	24	8	16	24
5:00	36	20	57	7	7	14	28	17	44
6:00	43	19	63	18	12	30	36	17	53
7:00	40	30	70	32	11	43	38	25	62
8:00	49	27	76	50	11	61	49	23	72
9:00	68	31	99	75	16	92	70	27	97
10:00	91	36	127	123	18	140	100	31	131
11:00	94	29	122	118	18	136	101	26	126
12:00	83	33	116	110	18	128	90	29	119
13:00	89	40	129	98	15	113	92	33	125
14:00	92	46	139	100	17	117	94	38	132
15:00	82	55	137	103	27	129	88	47	135
16:00	67	55	122	95	24	120	75	46	122
17:00	68	66	134	73	24	96	69	54	123
18:00	46	59	105	48	25	73	46	50	96
19:00	40	74	115	45	27	72	42	60	102
20:00	23	68	91	29	26	56	25	56	81
21:00	18	70	88	32	22	53	22	56	78
22:00	13	78	91	16	19	35	13	61	75
23:00	13	85	98	14	19	33	14	66	79
Total	1,095	1,128	2,223	1,220	472	1,692	1,131	940	2,071

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	22	116	138	19	48	66	21	96	117
1:00	12	108	121	16	52	69	13	92	106
2:00	10	75	85	9	45	54	10	66	76
3:00	9	53	63	7	30	37	8	47	55
4:00	13	34	47	16	22	38	14	30	45
5:00	47	32	79	16	11	27	38	26	64
6:00	60	37	97	33	19	53	52	32	84
7:00	68	48	116	56	19	75	65	40	104
8:00	92	47	139	83	17	99	89	38	128
9:00	128	52	180	126	24	150	128	44	172
10:00	159	53	211	192	28	219	168	46	214
11:00	170	45	216	206	32	239	181	42	222
12:00	159	58	217	207	28	235	173	49	222
13:00	174	60	235	189	30	219	179	52	230
14:00	175	71	246	195	34	229	181	60	241
15:00	172	86	259	204	40	244	181	73	255
16:00	145	89	233	180	46	226	155	76	231
17:00	139	112	251	143	43	186	140	92	232
18:00	115	110	225	102	58	160	111	95	206
19:00	72	125	197	85	58	143	76	106	181
20:00	47	122	169	47	48	95	47	101	148
21:00	34	118	152	50	46	96	39	97	136
22:00	25	132	158	23	38	61	25	105	130
23:00	22	152	174	23	35	58	22	119	141
Total	2,072	1,935	4,007	2,227	849	3,076	2,116	1,625	3,741

2032 with Bypass - Bypass (High Diversion)

South of Town Northbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	15	117	131	19	32	51	16	93	108
1:00	12	116	128	18	51	69	14	97	111
2:00	7	81	88	6	52	58	6	73	79
3:00	10	63	73	6	30	36	9	53	62
4:00	11	41	52	12	18	29	11	34	45
5:00	22	27	48	19	9	27	21	22	42
6:00	33	41	74	31	16	47	32	34	66
7:00	55	41	95	47	18	66	53	34	87
8:00	84	46	129	63	13	76	78	36	114
9:00	116	50	166	99	17	116	111	40	152
10:00	131	38	170	134	23	157	132	34	166
11:00	149	38	187	171	33	204	156	37	192
12:00	149	57	206	188	24	212	160	47	207
13:00	166	46	212	177	34	212	169	43	212
14:00	161	57	218	184	40	224	168	52	220
15:00	176	71	247	198	30	228	182	59	241
16:00	150	77	227	166	49	215	154	69	224
17:00	138	106	244	136	45	180	137	88	226
18:00	135	117	251	104	75	179	126	105	231
19:00	62	117	178	78	72	150	66	104	170
20:00	47	125	172	34	51	85	44	104	148
21:00	31	109	141	35	56	91	32	94	126
22:00	25	124	149	15	43	57	22	101	123
23:00	17	156	173	19	37	55	17	122	139
Total	1,900	1,860	3,759	1,958	868	2,826	1,916	1,576	3,493

South of Town Southbound

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	23	90	113	15	46	61	21	77	98
1:00	10	80	90	11	42	53	10	69	79
2:00	11	54	65	10	30	40	11	47	58
3:00	6	36	42	5	24	29	6	32	38
4:00	12	22	35	16	20	35	13	22	35
5:00	58	28	86	11	10	20	44	23	67
6:00	69	27	96	28	17	45	57	24	81
7:00	64	42	105	51	16	66	60	34	94
8:00	78	37	116	80	15	95	79	31	110
9:00	109	42	152	121	22	143	113	37	149
10:00	146	50	196	196	24	221	160	42	203
11:00	150	40	190	189	25	214	161	35	197
12:00	132	46	178	176	25	201	145	40	184
13:00	143	55	198	156	21	177	147	45	192
14:00	148	64	212	160	23	183	151	52	203
15:00	131	76	208	164	37	201	141	65	206
16:00	108	76	184	152	34	186	121	64	184
17:00	109	91	199	116	33	149	111	74	185
18:00	73	82	155	77	35	112	74	68	143
19:00	65	102	167	72	37	109	67	83	150
20:00	37	94	130	47	36	83	40	77	117
21:00	29	97	126	51	30	81	36	77	113
22:00	20	108	128	25	26	51	22	85	106
23:00	21	117	138	22	26	48	22	91	112
Total	1,752	1,554	3,306	1,952	651	2,603	1,810	1,296	3,106

Combination

Time	Average Annual Weekday Traffic			Average Annual Weekend Traffic			Average Annual Daily Traffic		
	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	38	206	244	34	79	112	36	170	206
1:00	22	196	218	29	92	122	24	166	190
2:00	18	135	153	15	82	98	17	120	137
3:00	16	99	115	12	53	65	15	86	101
4:00	24	63	86	27	37	64	25	56	80
5:00	80	55	135	29	18	48	65	45	110
6:00	102	68	170	59	33	92	89	58	147
7:00	118	82	201	98	34	132	113	68	181
8:00	162	83	245	143	28	171	157	67	224
9:00	226	92	318	220	39	259	224	77	301
10:00	277	88	365	330	47	377	292	76	369
11:00	299	78	377	360	58	418	317	72	389
12:00	281	102	383	364	48	413	305	87	392
13:00	308	102	410	334	55	389	316	88	404
14:00	309	121	430	344	63	407	319	104	423
15:00	307	147	454	362	67	429	323	124	447
16:00	258	153	411	318	83	401	275	133	408
17:00	247	196	443	252	77	329	248	162	411
18:00	208	198	406	181	110	291	200	173	373
19:00	126	219	345	150	108	259	133	187	320
20:00	84	219	303	81	87	168	83	181	264
21:00	61	206	267	85	86	171	68	172	239
22:00	45	232	277	40	69	109	43	186	229
23:00	38	273	311	41	62	103	39	213	252
Total	3,652	3,414	7,066	3,911	1,519	5,429	3,726	2,872	6,598

Note: Traffic volumes presented based on 'High diversion' scenario. Refer to Section 4.2.3 for more details.