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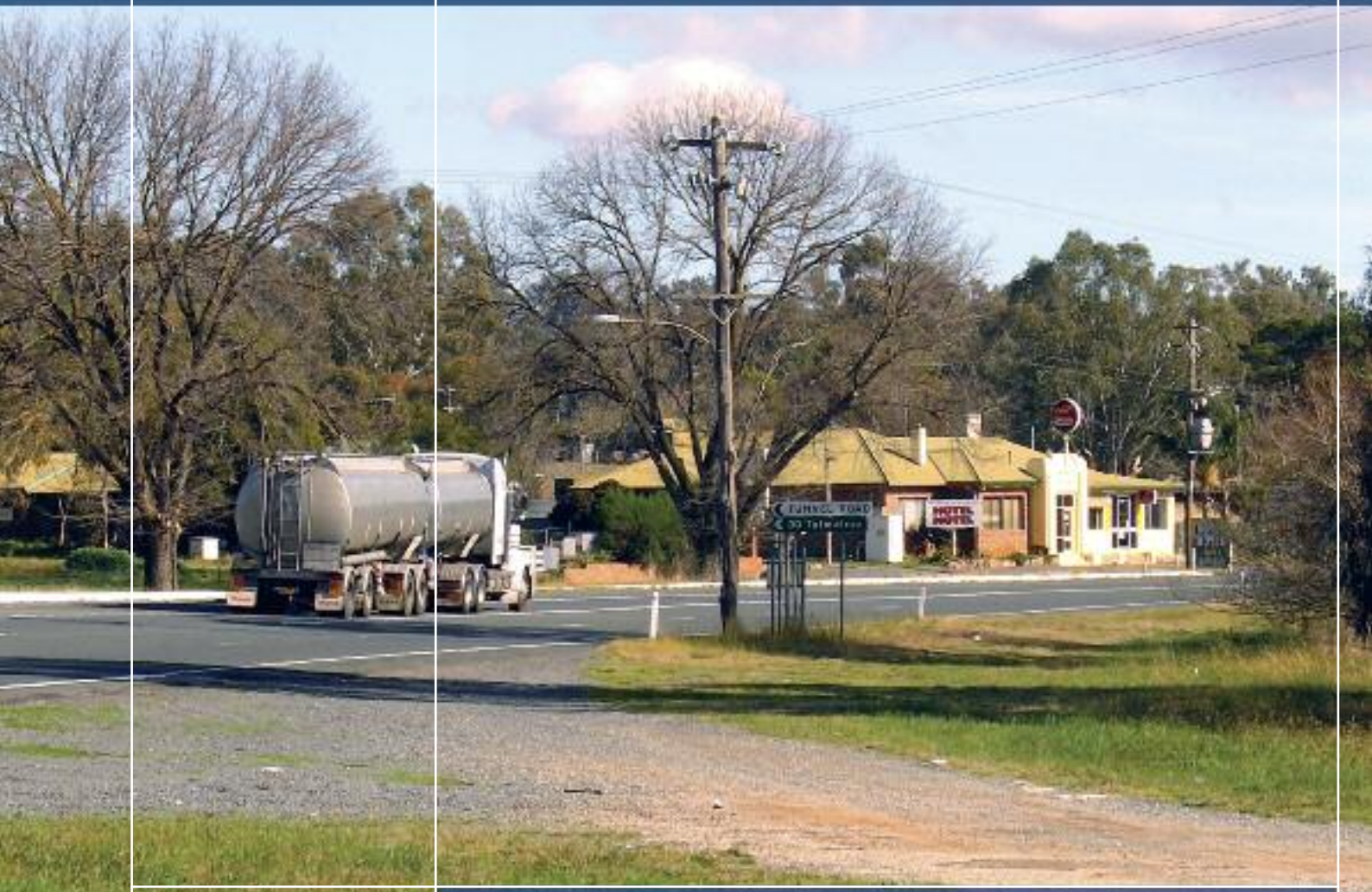

Hume Highway Upgrade

Woomargama bypass

Environmental Assessment
Technical Paper 6 – Traffic and Transport

September 2009

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SH2 Hume Highway Woomargama Bypass Traffic Study

September 2009

NSW Roads and Traffic Authority

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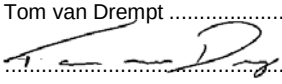
Signed: 

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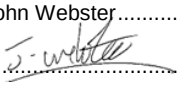
Signed: 

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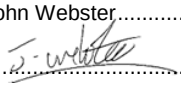
Signed: 

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Contents

Contents (continued)

Page Number

List of tables

List of figures

List of appendices

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, comprising 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 Woomargama bypass.

In order to understand the impact of the proposed bypass, information has been gathered on traffic flows using vehicle counts, travel pattern and time information using origin/destination; and turning count surveys. Traffic growth rates have been applied to estimate the increase in travel by the time of opening (2011) 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. Fewer heavy vehicles travel on weekends.

Traffic impacts

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

The highway performs satisfactorily at present except for the busiest times of the year, such as long weekends and school holidays. If the bypass was not built, traffic volumes would approach the theoretical capacity of the road, resulting in unacceptable levels in the future. The construction of the proposed bypass would create additional capacity for the busiest times of the year.

The diversion from the existing highway through town to the proposed bypass has been calculated using the results of the turn count surveys. Due to the small size of Woomargama village, only a small proportion of traffic is expected to stay on the existing highway. The proportion of vehicles estimated to divert onto the new bypass is shown in the table below.

Time period	Northbound		Southbound	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
6 am to 6 pm	87 per cent	96 per cent	89 per cent	96 per cent
6 pm to 6 am	95 per cent	98 per cent	95 per cent	98 per cent

Local access would be maintained to all properties.

Crash potential

The current crash rate on the Hume Highway at Woomargama is less than the typical crash rate for dual carriageway sections of the Hume Highway. The five year crash history for the section of highway to be upgraded shows two head-on crashes.

The proposed dual carriageway highway has the potential to reduce the occurrence and severity of crashes because it would create separation between the opposing traffic flows. The provision of two lanes in each direction would create safer overtaking opportunities. The removal of through traffic from the village will create larger gaps in traffic, allowing easier and safer turns at intersections and improved safety for pedestrians.

Applying the NSW Roads and Traffic Authority's percentage reductions for the construction of a dual carriageway road to the crash types recorded on the highway at Woomargama, it is anticipated that the bypass would have a crash rate 34 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 24 less tow-away crashes compared with not building the project.

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 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 northern and southern site compounds and batching plants would be via the temporary accesses from the highway. Access to the work areas from the highway would be controlled. Temporary internal haul roads including creek crossings would be built.

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.

The construction activities would result in an increase in traffic volumes on the Hume Highway and in Woomargama. 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. This would increase volumes on the highway by 11 per cent of light vehicles and 24 per cent of heavy vehicles.

1. Introduction

The NSW Roads and Traffic Authority (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 includes the upgrading of the Hume Highway at Woomargama to four-lane dual carriageway as well as a bypass of the village of Woomargama. 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 a 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. All of the Hume 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 highway as single carriageway remaining 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 design development, planning, community consultation and environmental assessment.

1.2 Study area

Woomargama is located on the Hume Highway in south-western NSW approximately half-way between Sydney and Melbourne. It is approximately 14 kilometres (around nine minutes drive) away from Holbrook — the nearest town of significant size.

The two biggest regional cities are Wagga Wagga and Albury. Wagga Wagga is located on the Sturt Highway to the north of the study area, approximately 94 kilometres from Woomargama. Albury is located on the Hume Highway 50 km to the south of the study area.

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

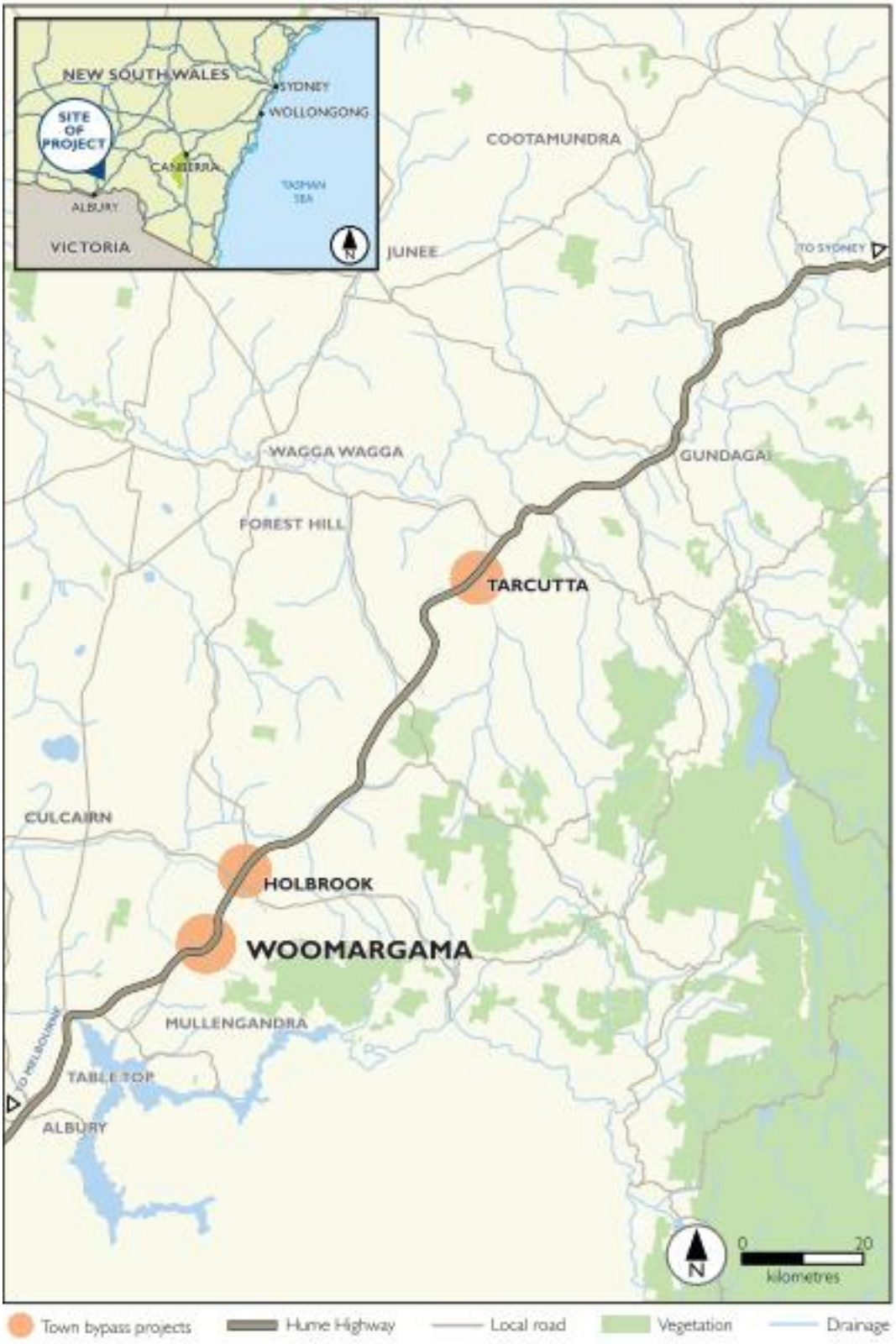


Figure 1-1 Study area showing current upgrade projects

Woomargama village has a population of 251 (ABS 2006). The village has a hotel/motel and service station/general store. The properties on the outskirts of the town and in the surrounding area are used for agriculture. The speed limit through town is 70 kilometres per hour. Tunnel Road connects Woomargama to River Road in the south-east (on the northern bank of the Murray River). Annandale Road connects Woomargama to MR 331 Jingellic Road to the north-east. Fairbairn Road connects to Mountain Creek in the west. A map of the town is shown in Figure 1-2.

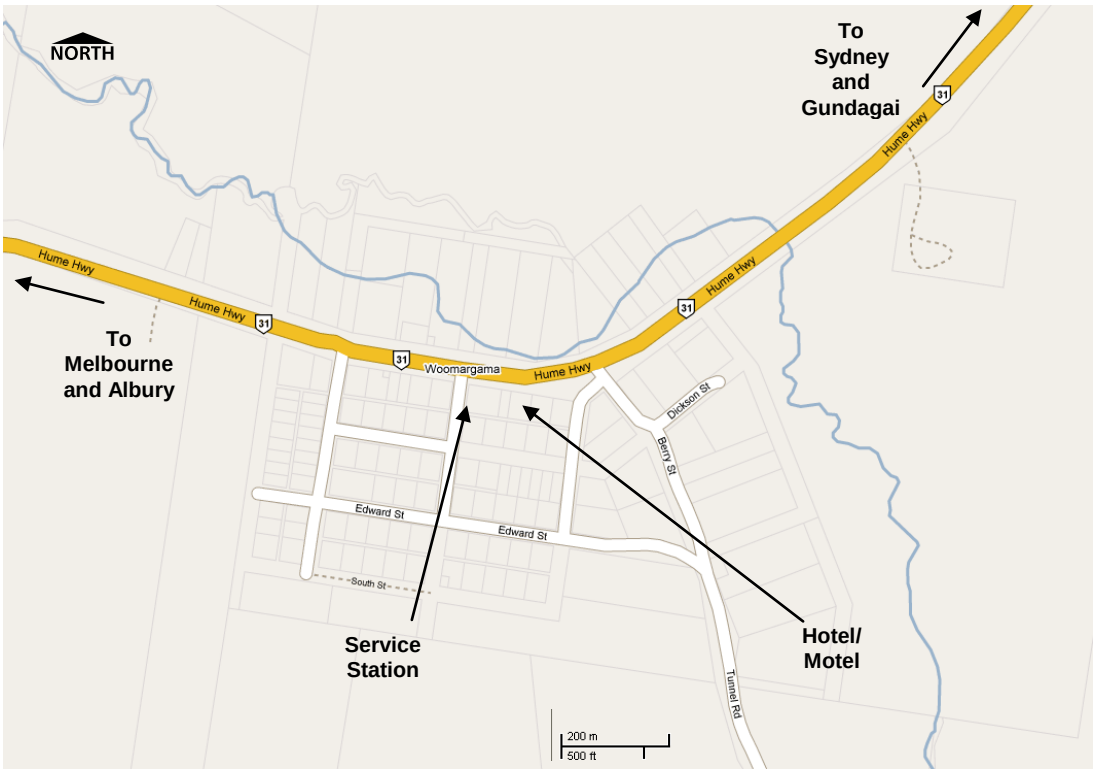


Figure 1-2 Woomargama town layout

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 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 the village)?
- 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 gathered for this study. Surveys undertaken for this study have been targeted to answer specific questions.

This data has been used to:

- 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 have been used to establish patterns and trends of traffic on the highway (Appendix A). Site 95.002 on the Hume Highway, north of Holbrook, is the closest count site with sufficient data for this assessment. Additional traffic volume counts have been collected to provide up-to date traffic volume data in Woomargama. 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 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.

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 annual average daily traffic (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. This 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 holiday, 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

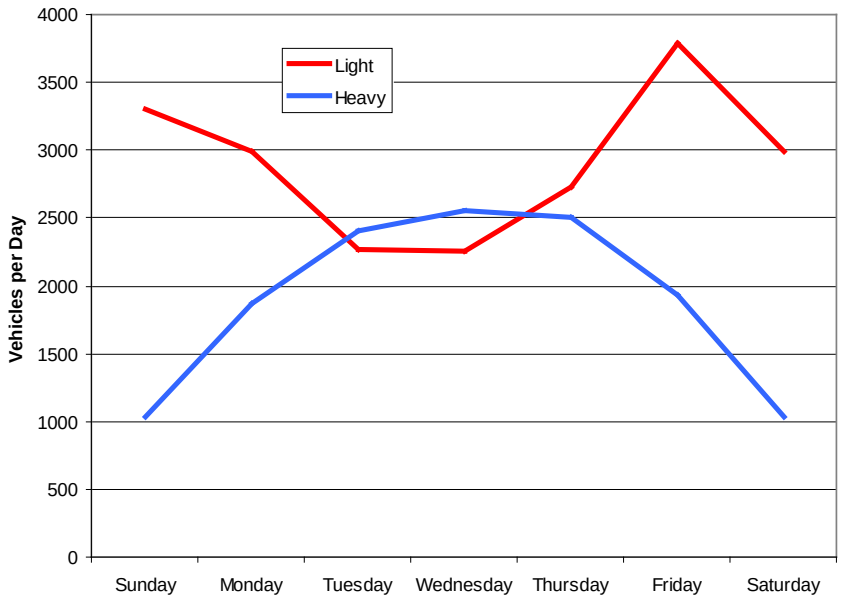
time. Designing for the highest recorded volume would be an over-commitment of public funds as for the rest of the year the additional capacity will not be needed.

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) indicates 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. The traffic patterns it shows are similar to those in Woomargama:

- 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.



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

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

Woomargama experiences the impact of both the midday car peak and night-time heavy vehicle peak.

2.2.4 Additional traffic volume counts

To obtain up-to-date hourly traffic data for Woomargama, additional traffic volume information was gathered. The data from this count was annualised using data from the classified vehicle survey on the Hume Highway north of Holbrook. The details of the additional counts undertaken are as follows:

- Classified tube counts commissioned by Wilkinson Murray Pty Ltd noise consultants.
- Taken from Saturday 31 May to Friday 13 June 2008.
- Located on the Hume Highway in the centre of town and at Annandale Road (see Figure 2-2).
- Northbound and southbound lanes.

The survey period included the June long weekend. Monday 9 June was a public holiday. The RTA axle pair count on the Hume Highway north of Holbrook experienced a 10 per cent higher traffic flow on this day compared to a typical Friday. The data from Friday 6 June to Monday 9 June have been excluded from the analysis.

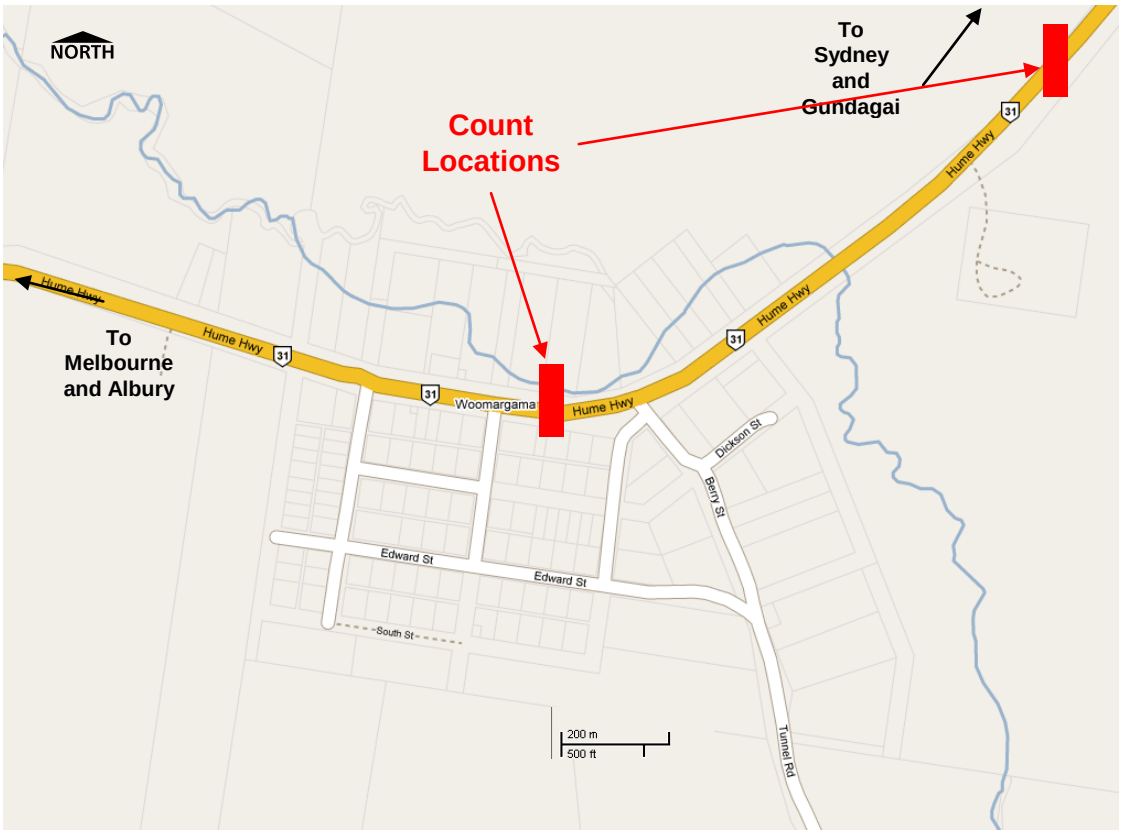


Figure 2-2 Woomargama additional vehicle count locations

2.3 Existing traffic volume

Indicative annual average traffic volumes for 2008 have been obtained by annualising the surveyed volumes at the two count locations north of Woomargama village at Annandale Road and in Woomargama village itself (described in Section 2.2.4) using the traffic data from the permanent count site on the Hume Highway north of Holbrook.

Table 2-1 AADT north of Woomargama (at Annandale Road)

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday (AAWT)	1,656	1,363	3,019	1,567	1,343	2,910
Weekend (AAWE)	1,969	820	2,790	1,787	752	2,538
Weekly (AADT)	1,745	1,208	2,953	1,630	1,174	2,804

Note: AAWT = average annual weekday traffic, AAWE = average annual weekend traffic

Table 2-2 AADT in Woomargama village

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday (AAWT)	1,498	1,248	2,747	1,421	1,354	2,775
Weekend (AAWE)	1,820	752	2,573	1,734	741	2,474
Weekly (AADT)	1,590	1,107	2,697	1,510	1,179	2,689

Traffic volumes at sites north of the village and inside the village show similar patterns; the site north of the village has higher volumes. The difference between the two count locations could be due to the north of Woomargama location including traffic from Berry Street/Tunnel Road at the northern end of Woomargama. This traffic would continue to use the existing highway in the future regardless of the creation of the bypass. In terms of traffic that might potentially divert onto the bypass, the lower volume is likely to be more representative and hence will be used for further analysis.

The change in traffic volumes throughout the day is 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.

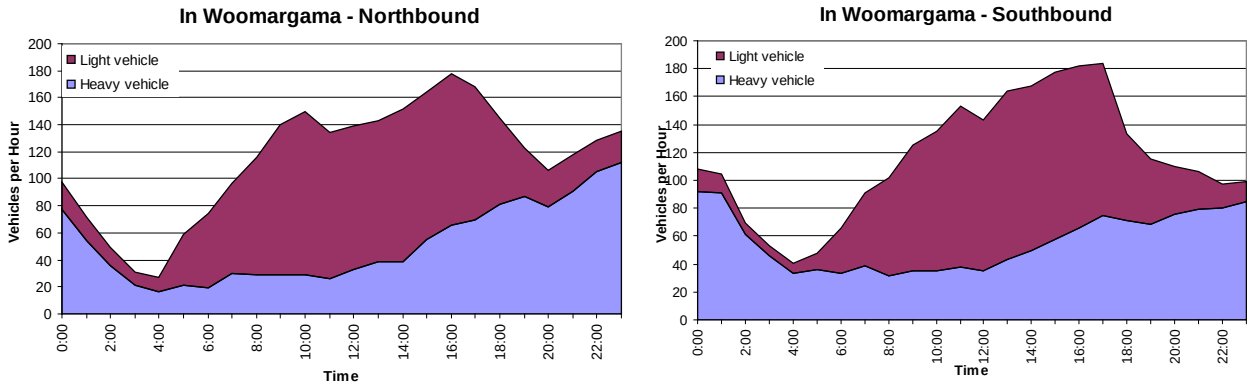


Figure 2-3 Weekday hourly traffic volume on Hume Highway in Woomargama

The peak traffic time for all vehicles was found to be between 4 pm and 5 pm on weekdays and weekends. The peak truck volume occurred between 11 pm and midnight. In general, the reason for this peak time is that trucks passing Woomargama 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.

Table 2-3 Peak hour traffic volumes south of Woomargama

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday midday peak	112	66	178	116	65	182
Weekday night-time truck peak	23	112	136	14	85	99
Weekend	158	36	194	164	34	198
Weekly	120	63	183	130	57	186

Refer to Appendix B for detailed information on traffic volumes at both sites.

2.4 Travel pattern data

Turn count surveys were undertaken to obtain data on the following:

- How much traffic stops in the village?
- How much traffic turns onto local or regional roads?
- How much traffic travels straight through the village without stopping?

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

The small size of Woomargama allowed data to be gathered through observation of turning movements to and from the Hume Highway. A six hour observation of turning vehicles was made from 12 pm to 6 pm on Tuesday 1 April 2008 at the location shown in Figure 2-4.

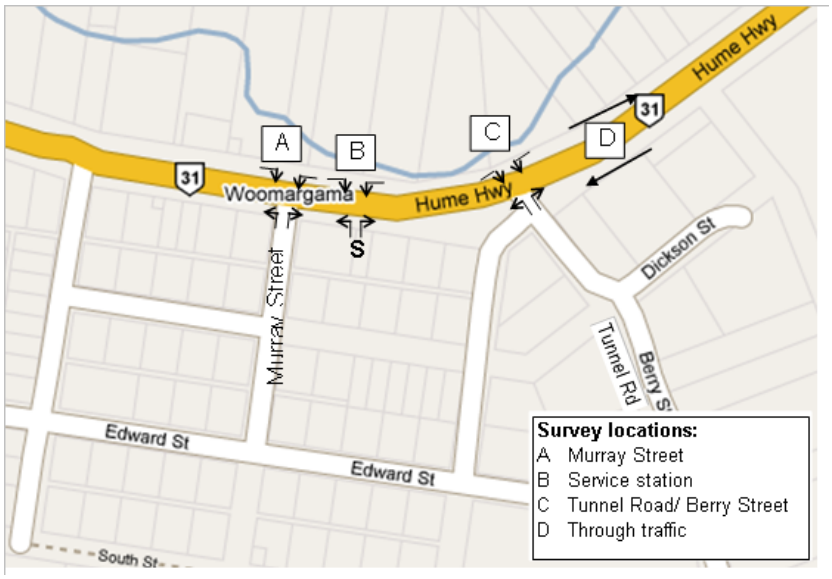


Figure 2-4 Survey locations Woomargama

The proportion of vehicles turning off the highway has been used as an estimate of the traffic that stops in Woomargama. The survey did not include the vehicles that turned off the highway onto other streets, or traffic that stopped at properties along the highway. To make an allowance for vehicles stopping in Woomargama not included in the survey, the proportion of stopping traffic has been factored up by 20 per cent to represent the proportion of properties not included. The results are shown in Table 2-4.

Table 2-4 Proportion of turning movements off the highway

Traffic movement	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Total traffic on the highway	586	324	910	730	295	1,025
Sum of turning movements at all three intersections *	85	14	99	92	12	104
Proportion of traffic turning off the Highway	15 per cent	4 per cent	11 per cent	13 per cent	4 per cent	10 per cent

Source: Intersection survey April 2008
* Note: turning volumes factored up

Of the turning volume recorded, approximately half occurred at the service station in Woomargama.

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:

- Woomargama has been assessed with level terrain due to the conditions in the village. The area north of the village has hills with climbing grades. However, at this location, over-taking lanes are provided, negating the reduction in capacity due to the high proportion of trucks.
- Approximately equal volumes of traffic in each direction.
- 3.3 metre wide lanes with wide shoulders.
- 20 per cent with sight distance less than 450 metres.
- 36 per cent trucks for weekday peak, 84 per cent trucks during the night-time truck peak and 43 per cent trucks during the highest hourly volumes.

The results of the LoS assessment on the highway at peak times are shown in Table 2-5.

Table 2-5 Road LoS at peak times

Annual highest hourly volumes	Northbound	Southbound	Volume/capacity ratio	LoS
50th highest hourly volume (H_{50})	342	437	0.45	D
Weekday peak hour	178	182	0.20	B
Weekday night-time truck peak	136	99	0.18	B

Traffic conditions on the highway through Woomargama are acceptable. 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. The crash history from 2002 to 2006 indicates that eight crashes were recorded on the stretch of highway through Woomargama between points where the proposed bypass is expected to connect to the highway. The crash statistics indicate the following:

- Three of the crashes occurred at or near the bend at the northern entry into the village, the other five were spread along the remaining length of highway.
- Driver fatigue contributed to half of the crashes, speeding contributed to two.
- One crash involved an injury.
- All occurred during dry road conditions.
- Three involved heavy vehicles.
- Three of the eight occurred on public holidays.
- Two were head-on crashes, the rest were a mixture of off-road and intersection.
- Over the previous five year period from 1997 to 2002 twelve crashes were reported, six of which involved injury and one was fatal.
- The crash rate was 12.75 crashes per 100 million vehicle kilometres travelled (MVKT[1]).
- Crash rates on the undivided sections elsewhere on the Hume Highway in this region were approximately 15 per cent higher on undivided sections than on divided sections. The severity of crashes on undivided sections of the Hume Highway are, however, approximately 85 per cent higher than on the divided sections.

These records and the estimated traffic volume were used to calculate an average crash rate per 100 MVKT. 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).

Table 2-6 shows that the crash rate on the highway at Woomargama is lower than the divided carriageway sections of the Hume Highway between Sturt Highway and Olympic Highway and the typical crash rates for two lane rural main roads. It is noted, however, that this crash rate is calculated from a relatively low number of total crashes.

[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.

Table 2-6 Crash rate comparison 2002 - 2006

Location	Rate per 100 MVKT			
	Fatal	Injury	Tow-away	Total
Single carriageway section, Woomargama	0.0	1.6	11.2	12.7
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

3. Woomargama upgrade project

The bypass of Woomargama, as well as those of Tarcutta and Holbrook, 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 creation of a bypass at Woomargama would potentially have travel benefits for both the local community and interstate traffic, including:

- 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.
- Consistency 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 project would include the following key components:

- Approximately nine kilometres of dual carriageway.
- An at-grade intersection with the existing Hume Highway approximately 6.5 kilometres north of Woomargama village.
- Bridges over Sandy Creek.
- Six deep cuttings.
- Twin bridges over Mountain Creek.
- An at-grade intersection with the existing Hume Highway approximately two kilometres south of Woomargama village.
- An upgrade to the at-grade intersection at Fairbairn Road.

The project would be undulating and form an elongated curved alignment. It would lie to the west of Woomargama village at a maximum distance of approximately three kilometres from the existing Hume Highway.

At its northern extent, the project would tie-in to the existing Hume Highway. The project would continue south and gradually veer away, in a slight westerly direction, from the existing highway. At approximately 500 metres from the start of the project a new at-grade intersection would be constructed. This intersection would tie-in the project with the existing highway about 6.5 kilometres north of Woomargama village and would provide access to Woomargama village from the north.

The project would include bridges over Sandy Creek. The project would continue in a westerly direction gradually ascending and traversing through the saddles of Mount McKenzie and would require three deep cuts on the ascent.

The project would then gradually descend in a southerly direction and pass through two further cuts. Still descending the project would travel adjacent to a drainage line.

Twin bridges would be constructed to enable the crossing of Mountain Creek and its floodplain. The project would continue travelling in a south-westerly direction.

A new at-grade intersection would be constructed approximately 900 metres south of Mountain Creek. This intersection would tie-in with the existing Hume Highway approximately two kilometres south of Woomargama village. This would provide access to the village from the south.

A final deep cut would then be required for the project. The project would include an upgrade of the intersection at Fairbairn Road. It would then tie-in to the new section of Hume Highway dual carriageway scheduled to be completed in December 2009.

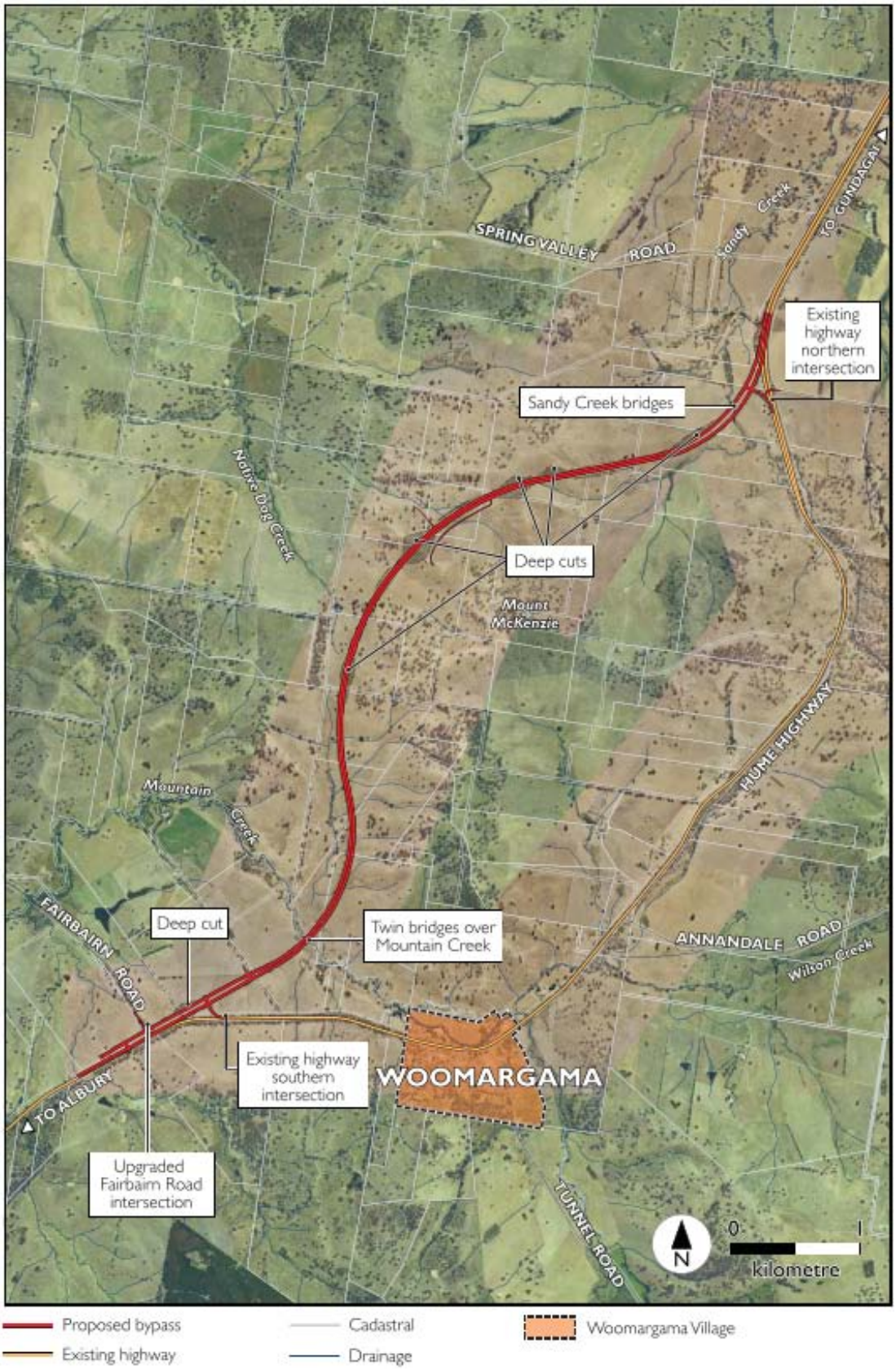


Figure 3-1 Proposed Woomargama bypass

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 trend 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 growth rate of between 4 and 6 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.

4.1.2 Forecasts

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

1. Future 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).
2. 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, 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.
3. 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 will also reduce.

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 2011, traffic forecasts have been made for this year. The future years of 2021 and 2031 were chosen to assess the impacts 10 and 20 years from the date of opening.

4.2 Future travel changes

It is proposed that the upgrade of the Hume Highway at Woomargama include a bypass on the western side of Mount McKenzie, with access at either end of the project back onto the current alignment. The bypass would change travel patterns by moving a large proportion of the traffic travelling on the highway through the village onto the proposed bypass.

4.2.1 Travel times

Travel times have been used to confirm that through traffic will use the bypass. For the purposes of this comparison, the travel time on the existing highway will be used for the future travel time on the highway if no upgrade is carried out.

Including the 860 metres (70 kilometres per hour) section through the town, the total travel time from the northern to the southern end of the project is estimated to be six minutes 31 seconds. This assumes that vehicles will be travelling at the signposted speed limit along the 10.1 kilometre length.

The travel time on the bypass has been estimated at four minutes 55 seconds based on the posted speed limit of 110 kilometres per hour and the length of 9.0 kilometres. It is, therefore, considered that through traffic will use the bypass due to the one minute 36 second travel time saving.

4.2.2 Local access

The proposed bypass maintains local access with only small impacts to the accesses of some properties. Some access roads would be reconstructed with slightly different configurations including:

- Full access to Sanananda property (south of Fairbairn Road) with median crossover.
- Full access to Dunraven property (north of Fairbairn Road) with median crossover.
- Left-in left-out access to Dunraven property (2 kilometres north of Mountain Creek).
- Full access to Mt Raven property (3.5 kilometres north of Mountain Creek – near Mount McKenzie) with median crossover.
- Left-in left-out access to Mount McKenzie for communications tower on southbound carriageway.
- Left-in left out access to Mt Raven property (0.9 kilometres south west of Sandy Creek).
- Full access to Spring Valley property (at northern tie-in) with median crossover.

4.2.3 Travel patterns

The bypass would provide a shorter travel time than travelling through the village, therefore it has been assumed that through traffic would divert onto the bypass. In addition, given the small size of Woomargama, some of the through traffic that currently stops may consider switching to the bypass and stopping at a different location such as Holbrook, Tarcutta and Albury.

The survey undertaken did not include the amount of time vehicles stayed in the village. However half of the vehicles that did turn off the highway accessed the service station.

It is considered that the trucks that stopped or turned off the highway are more likely to have business in town than light vehicles. It has, therefore, been assumed that none of the trucks that did stop would bypass the village in the future. For light vehicles, Table 2-4 shows that the proportion of light vehicles which stopped was around 13 to 15 per cent. It is assumed that one tenth of these vehicles (currently stopping in Woomargama) were doing so only because it was convenient to use the facilities on the side of the highway, and that these vehicles would no longer stop in Woomargama if the town was bypassed.

The main land use in Woomargama is residential, which does not attract large numbers of vehicles during the evening, night and early morning. The hotel/motel and service station/general store would generate some trips, but as they are only two businesses the absolute numbers are still small. Therefore, a different proportion has been used between 6 pm and 6 am, with a higher proportion of traffic using the bypass.

The recommended proportions of the Hume Highway volumes that would use the bypass are shown in Table 4-1.

Table 4-1 Proportion of vehicles diverting to bypass

Traffic movement	Northbound		Southbound	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Daytime proportion of vehicles diverting to bypass – 6 am to 6 pm	87 per cent	96 per cent	89 per cent	96 per cent
Night-time proportion of vehicles diverting to bypass – 6 pm to 6 am	95 per cent	98 per cent	95 per cent	98 per cent

4.2.4 Traffic volume

Traffic volumes are forecast to increase in the future. The 2008 volumes have been factored up using the 2.8 per cent per annum factor discussed in Section 4.1.2 for the design years of 2011, 2021 and 2031. The volumes on the Hume Highway with no upgrade are shown in Table 4-2.

Table 4-2 Future AADT volumes in Woomargama with no upgrade

Year	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
2011	1,728	1,202	2,930	1,640	1,281	2,921
2021	2,277	1,585	3,862	2,162	1,688	3,850
2031	3,002	2,089	5,090	2,850	2,225	5,075

The majority of the traffic currently using the highway would transfer to the new road if the upgrade was built. The forecast volumes on the existing highway with the bypass constructed are shown in Table 4-3.

Table 4-3 Future AADT volumes on existing highway in Woomargama with bypass

Year	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
2011	195	37	232	164	37	201
2021	257	49	306	216	48	264
2031	339	65	404	285	64	349

The volume on the existing Hume Highway north of Woomargama was approximately 370 vehicles higher than the volume in town. It is likely that this volume would continue to use the existing highway between Woomargama and the northern end of the project.

The forecast volumes on the bypass itself are shown in Table 4-4.

Table 4-4 Future AADT volumes on new Woomargama bypass

Year	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
2011	1,533	1,165	2,698	1,476	1,244	2,721
2021	2,020	1,535	3,556	1,946	1,640	3,586
2031	2,663	2,024	4,686	2,565	2,162	4,726

The impact of these changes on road congestion is discussed below. Detailed forecast future traffic volumes are included in Appendix D.

4.3 Transport impact

4.3.1 Road network performance

Traffic volumes on the highway are forecast to increase with or without the upgrade. This will have an impact on the LoS experienced on the existing highway. Table 4-5 shows the LoS if the highway is not upgraded. Unacceptable conditions (LoS E or F) would be experienced during the highest traffic times through the year (e.g. long weekends and school holidays) in the years 2021 and 2031. 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})	0.43	D				
Weekday midday peak	0.20	B				
Weekday night time truck peak	0.18	B				
2011						
50th highest hourly volume (H_{50})	0.49	D	0.03	A	0.30	A
Weekday midday peak	0.22	B	0.01	A	0.11	A
Weekday night time truck peak	0.20	B	0.00	A	0.11	A
2021						
50th highest hourly volume (H_{50})	0.65	E	0.04	A	0.39	B
Weekday midday peak	0.28	C	0.02	A	0.14	A
Weekday night time truck peak	0.26	C	0.01	A	0.14	A
2031						
50th highest hourly volume (H_{50})	0.90	E	0.05	A	0.52	C
Weekday midday peak	0.40	D	0.02	A	0.19	A
Weekday night time truck peak	0.36	C	0.01	A	0.18	A

With the bypass, traffic volumes would be split between the two roads, with the bypass taking the majority of the traffic. The new bypass would have sufficient capacity to accommodate this traffic for the years tested.

4.4 Crash potential

The construction of the dual carriageway bypass would move the majority of traffic from the existing highway to the new road. The existing measured crash rate on the Hume Highway at Woomargama is lower than the typical rate for a single carriageway two lane rural main road, and less than the measured rate on the divided carriageway sections of the Hume Highway. However, it is considered likely that the crash rate would be exacerbated in the future if the highway was left as a single carriageway. This is because drivers would be used to a particular standard of road and would not react accordingly to the short section of single carriageway road. This could mean a failure to recognise, for example, that overtaking would mean choosing an appropriate gap in the oncoming 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 4-6.

Table 4-6 Duplication of roadway crash reductions

Crash type	2002-2006 crashes	Per cent reduction
Head-on	2	100%
Rear-end	1	30%
Off carriageway; straight	1	10%
Off straight; hit object	1	10%
Off curve, hit object	1	10%
Out of control; curve	1	10%
Other	1	0%

Applying these reductions, the duplication of the highway would result in an average 34 per cent reduction in the 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 Woomargama calculated in Section 2.6 was 12.75 crashes per 100 MVKT. Assuming a 34 per cent reduction in this rate, the new bypass is expected to have an accident rate of 8.45 crashes per 100 MVKT.

Using the recorded rate for the existing alignment and the reduced rate for the new bypass and the forecast AADT volumes for 2011, 2021 and 2031, the anticipated reduction in accidents for each of these years is shown in Table 4-7.

Table 4-7 Comparison of forecast future annual crashes

Year	Do nothing	With upgrade		Difference
	Existing highway	Existing highway	New bypass	
2011	2.9	0.3	1.5	-1.1
2021	3.7	0.4	2.0	-1.4
2031	4.9	0.4	2.6	-1.8

Across the 20 year period from 2011 to 2031 the proposed bypass is anticipated to save four injury crashes and 24 tow-away crashes.

4.5 Cycle facilities

Due to the large distances between towns and the small population surrounding Woomargama, the number of cyclists using the bypass is expected to be low. Long distance cyclists may want to stop in the village to rest and use the facilities. The reduction in traffic through Woomargama would create safer and more pleasant riding conditions.

Cyclists would be encouraged to continue to use the existing highway through Woomargama by the placement of signs before the connection intersections at the start of the bypass in each direction.

There is still the chance that cyclists would use the proposed bypass. To enable this, the road shoulder should be made suitable for use by cyclists. A 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 kilometres per hour (Austroads Guide to Traffic Engineering Part 14 Bicycles, 1999). No value is given for speeds higher than 100 km/h. This does not allow for side clearances to obstructions.

4.6 Travelling stock routes/reserves

The Livestock Health and Pest Authority has reported that there are no travelling stock routes or travelling stock reserves affected by the proposed bypass.

4.7 Construction impact

Construction of the bypass is anticipated to take two years. Two site compounds would be established at the northern and southern ends of the bypass.

4.7.1 Construction times

The majority of construction activities would take place from 6 am to 7 pm, Monday to Friday; and 7 am to 4 pm Saturday (the daytime period), with no work on Sunday or public holidays. However, certain activities would be required to take place during the evening and night-time periods due to:

- Technical considerations (such as the need to meet particular quality specifications for placement of concrete pavement).
- The climatic environment (cold winters and hot summers).

- An accelerated construction program.

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 of these hours. Works which could occur during the evening (7 pm to 10 pm) include:

- Concrete paving (due to temperature and curing requirements).
- Concrete saw cutting.
- Concrete batch plant deliveries and operation.
- Casting of bridge decks.

Out-of-hours work may be required for:

- Utility relocations (as directed by service providers).
- Delivery of materials required by the Police or other authorities for safety reasons.
- Emergency works.

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.

Northern tie-in:

1. To minimise safety risks to traffic along the highway during construction and to provide safe entry and exit points for construction traffic, a section of temporary bi-directional single lane highway would be constructed immediately to the east of the existing highway around the tie in of the new bypass and the existing highway. A crossing in the median would also be constructed to facilitate traffic merging.
2. The northbound carriageway would be closed from where it begins south of the start of the bypass and northbound traffic would be diverted to the southbound carriageway. The southbound carriageway would be converted to bi-directional with a single lane in each direction. Approximately 300 metres north of the tie-in, northbound traffic would be diverted back to the northbound carriageway. This would allow the construction of the tie-in to proceed without affecting traffic flow.

Southern tie-in:

1. A section of temporary bi-directional single lane highway would be constructed from the western side of the highway. It would connect back to the highway approximately 300 metres east of the tie-in point. A crossing in the median would also be constructed to facilitate southbound traffic merging onto the northbound side. This would allow construction of the new southbound carriageway with the existing highway raised to create a second temporary road for use in stage 2.

2. Traffic would be switched onto the second temporary road and the new southbound carriageway. Approximately 300 metres south of the tie-in, northbound traffic would be diverted back to the northbound carriageway. This would allow the construction of the remaining works.

4.7.3 Temporary access requirements

Construction access

Access points at the northern and southern tie-ins would be required to facilitate construction activities. At the site compound entries, 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.

In addition to the roads mentioned in Section 4.7.2, a number of other temporary roads and creek crossing would be required to provide alternative access to the construction area. This includes:

- A major haul road — this would be constructed for the length of the proposed bypass along the eastern side. This road would be used to access major cuts and excavated areas. Also it would provide an alternative access when the carriageways are unavailable (e.g. after paving).
- Minor haul roads — these would be required to access key areas of the project (e.g. the top of cuts, stock pile areas).
- Creek crossings — two crossings of Mountain Creek and up to four crossings of Sandy Creek would be required.

Local access

Temporary access for landowners and operators of equipment on Mount McKenzie would be required. The location and type of road would be negotiated with landowners. These generally would be all weather access roads capable of handling a B-Double.

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 in the morning between 7.15 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. Widened shoulders are proposed at property entrances to cater for school bus stops.

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 Woomargama, so it is anticipated that the number of pedestrians and cyclists wishing to travel through the affected areas would 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.

4.7.4 Materials and associated traffic movements

Materials for road construction would need to be sourced off-site and delivered to the site. The type of materials and the number of deliveries are presented below:

- Select material — 200 truck and dog deliveries per day. However, this would only be required if the rock material on-site was not suitable as select material.
- Drainage/backfill — 50 truck and dog deliveries per day.
- Aggregate for concrete — 100 truck and dog deliveries per day (only required when batch plants are in operation).
- Sand — 50 truck and dog deliveries per day (only required when batch plants are in operation).
- Cement/ash — 15 movements per day (only required when batch plants are in operation).

There is the potential that a batch plant would only be constructed at the southern end. If this were the case, concrete would be produced at the southern end batch plant and transported to the northern end via the existing highway. This would equate to 200 deliveries per day for a duration of six months.

4.7.5 Plant and equipment

The following plant and equipment would be used for the construction of the bypass:

- Delivery trucks including semi-trailers, HIABs and truck and trailers.
- Loaders including excavators, backhoes and bobcats.
- Scrapers, dump trucks and side-tippers.
- Water carts and sweepers.
- Graders and bulldozers.
- Grinders and pavers.
- Compactors including rollers.
- Cranes.

- Concrete agitators and concrete pumps.
- Saw-cutters.
- Drill-rigs, pile-rigs and augers.

The number of pieces of equipment needed on the various stages of construction is around 460, although the shared use of equipment on different stages could see the total number of pieces of equipment reduced to approximately 230.

4.7.6 Vehicle numbers

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

The number of construction personnel would change during the course of construction. A maximum workforce of 400 people is anticipated on-site at any one time, with two thirds working mainly at the southern end. This includes office staff, construction workers, engineers, subcontractors, professional staff (e.g. environmental and design personnel), truck drivers and others. It is anticipated that the number of staff and site vehicles would be 150. These vehicles would be parked at the site compounds. The majority of these vehicles would be driven from nearby towns including Holbrook, Wagga Wagga and Albury. Some construction personnel may stay in Woomargama.

Indicative numbers of vehicles involved in construction activities are described in Section 4.7.4. This list covers the main types of construction vehicles but is not a complete list of all vehicles required.

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 out movement, hence a sand delivery would be counted as two trips.

- Staff vehicles — 350 trips per day.
- Delivery of equipment — 50 trips per day.
- Delivery of materials — 650 trips per day.
- Construction movements outside site boundaries — 100 trips per day.

Hence the construction activities are estimated to generate 350 light vehicle and 800 heavy vehicle trips per day on public roads. This represents an 11 per cent and 24 per cent increase in light and heavy vehicle volumes respectively of average weekday traffic.

Generally the vehicle split will be 50:50 between north and south. All deliveries would originate from the north.

4.7.7 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 (up to 15 minute) closures, short-term one lane alternative operations, haulage operations, haulage road crossing, and over-dimension vehicle movements.

A construction traffic management plan would be prepared in the later stage of the project. The plan would detail how the traffic impacts associated with the construction of the project would be managed.

Site specific traffic control plans would be developed for both long and short-term works, with the aim to maximise safety for workers and road users. These plans would 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* and would 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.

The 70 kilometres per hour zone at Woomargama would be lengthened to include the southern site access. 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).

5. Conclusions

The project includes the construction of a bypass of Woomargama 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 entire highway to dual carriageway.

5.1 Transport improvements

The bypass would reduce travel times along the highway from Albury to the junction with the Sturt Highway by approximately one minute 30 seconds, which would improve the efficiency of freight movements. It would also provide additional overtaking opportunities, making the Hume Highway safer.

In terms of road capacity, the bypass would create additional capacity for the busiest times of the year, including long weekends such as Easter, and the school holidays. If the bypass was not constructed, traffic conditions on the highway would reach unacceptable levels during these busy times by 2021.

5.2 Traffic impacts

The bypass would provide a shorter travel time compared with the existing alignment, attracting through traffic from the existing road through the village. It is considered that some of the vehicles that currently stop in Woomargama do so only because they are driving past and it is convenient to do so. If the town is bypassed, it is likely that a small percentage of these vehicles would use the bypass rather than diverting into the village. The proportion of vehicles that are estimated to divert onto the bypass is shown in Table 5-1.

Table 5-1 Proportion of vehicles diverting to bypass

Traffic movement	Northbound		Southbound	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Daytime proportion of vehicles diverting to bypass – 6 am to 6 pm	87 per cent	96 per cent	89 per cent	96 per cent
Night-time proportion of vehicles diverting to bypass – 6 pm to 6 am	95 per cent	98 per cent	95 per cent	98 per cent

Local access would be maintained to all properties.

The road shoulder should be made suitable for use by cyclists wishing to use the new bypass.

5.3 Crash potential

The highway at Woomargama currently has a low accident rate, although this is forecast to increase as the sections of the highway north and south of the project are upgraded. The five year crash history for the section of highway to be bypassed shows two head-on crashes and one injury crash.

Typically, the construction of a dual carriageway highway results in a lower crash rate. This is because the dual carriageway road creates separation between the two traffic flows, reducing head-on collisions from failed overtaking manoeuvres and from errant vehicles crossing the centreline. The provision of two lanes each way would create safer overtaking opportunities, reducing the chance of a head-on collision. It is also anticipated that the new bypass would be designed to a higher standard than the existing highway. The removal of through traffic from the village 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 Woomargama, it is anticipated that the bypass would have a crash rate 34 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 24 less tow-away crashes than if the project was not built.

5.4 Construction impacts

Construction of the bypass is expected to take two years. Construction activity is proposed 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 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 northern and southern site compounds and batching plants would be via the temporary accesses from the highway. Access to the work areas from the highway would be controlled. Temporary internal haul roads would be built along with creek crossings.

Construction works along the highway on the northern and southern tie-ins would need to take into consideration the need for school bus stops, pedestrians and bicycles.

The construction activities would result in an increase in traffic volumes on the Hume Highway and in Woomargama. 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. This would increase volumes on the highway by 11 per cent of light vehicles and 24 per cent of heavy vehicles.

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 Woomargama

Table 1. 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	11	15	26	17	35	52	35	78	113	50	126	176	43	87	130	68	106	174	24	82	106	43	86	129	17	49	66	35	76	111
1:00	3	14	17	10	21	30	24	71	95	35	82	117	31	57	89	41	75	116	10	57	67	28	61	89	6	35	42	22	54	76
2:00	6	11	17	5	22	27	16	30	46	17	49	66	23	46	69	41	58	99	9	31	39	21	41	62	7	21	28	17	35	52
3:00	14	9	23	5	3	9	17	26	43	22	35	57	9	21	30	31	27	58	10	19	28	17	22	39	12	14	26	15	20	35
4:00	17	11	28	15	12	27	12	17	30	17	23	40	12	17	29	16	16	32	16	11	27	15	17	32	17	11	27	15	15	30
5:00	15	3	18	55	27	82	34	21	55	53	19	71	37	26	64	38	17	55	26	14	41	43	22	65	21	9	29	37	18	55
6:00	29	6	35	65	22	87	54	28	82	41	19	60	50	23	72	50	24	74	58	16	74	52	23	75	44	11	55	50	20	69
7:00	43	14	57	92	37	129	79	36	115	50	29	79	65	39	104	53	33	86	43	15	58	68	35	103	43	15	57	61	29	90
8:00	102	9	112	81	34	115	85	27	112	81	31	112	89	42	131	53	37	90	102	22	124	78	34	112	102	16	118	85	29	114
9:00	154	17	171	130	28	158	112	31	143	99	37	136	108	42	151	102	36	138	135	11	146	110	35	145	145	14	158	120	29	149
10:00	200	28	228	155	34	189	136	30	166	112	33	145	136	27	163	107	36	143	173	18	191	129	32	161	187	23	209	146	29	175
11:00	211	35	246	130	27	157	145	37	182	97	33	130	119	29	148	104	28	132	151	25	176	119	31	150	181	30	211	137	31	167
12:00	194	38	232	95	31	127	128	42	170	108	36	144	112	39	151	115	25	140	111	26	137	112	35	146	152	32	185	123	34	157
13:00	258	40	298	107	47	154	139	51	190	100	46	146	120	35	154	99	38	137	97	24	122	113	43	156	178	32	210	132	40	172
14:00	252	52	304	104	50	154	144	46	190	101	44	145	122	49	171	125	33	158	91	27	118	119	44	164	172	40	211	134	43	177
15:00	226	67	293	91	53	144	127	76	202	91	62	153	108	64	173	112	37	149	103	22	125	106	58	164	165	45	209	123	54	177
16:00	211	96	307	115	67	182	114	86	201	88	84	172	110	81	191	110	53	163	68	30	97	107	74	182	139	63	202	117	71	188
17:00	168	104	272	81	70	152	102	86	188	83	85	169	95	78	173	100	52	152	67	24	91	92	74	167	117	64	181	100	71	171
18:00	147	116	263	61	102	163	73	107	180	60	96	155	71	93	165	72	39	111	44	25	69	67	87	155	95	71	166	75	83	158
19:00	81	102	183	30	99	129	49	108	157	54	100	154	49	104	153	60	57	117	45	16	61	48	94	142	63	59	122	53	84	136
20:00	63	84	147	31	94	126	41	104	144	32	98	130	46	96	142	33	35	68	19	21	39	37	85	122	41	52	93	38	76	114
21:00	40	72	112	29	100	129	32	108	139	35	111	145	49	104	153	37	58	95	19	12	31	36	96	132	29	42	71	34	81	115
22:00	29	78	107	31	103	134	46	122	168	56	136	193	51	118	169	55	83	138	9	18	26	48	112	160	19	48	67	40	94	134
23:00	18	43	61	20	114	133	51	126	176	56	150	206	56	124	180	54	83	137	18	11	28	47	119	167	18	27	45	39	93	132
Total	**2493**	**1064**	**3556**	**1559**	**1230**	**2789**	**1794**	**1494**	**3287**	**1538**	**1563**	**3101**	**1709**	**1442**	**3151**	**1678**	**1087**	**2765**	**1446**	**577**	**2023**	**1656**	**1363**	**3019**	**1969**	**820**	**2790**	**1745**	**1208**	**2953**

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 vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	28	23	50	16	38	54	22	66	88	32	122	154	32	123	155	36	115	151	23	76	99	28	93	121	25	49	75	27	81	107
1:00	12	11	23	12	28	40	26	84	110	31	116	147	28	96	124	36	132	168	19	70	89	27	91	118	15	40	56	23	77	100
2:00	9	9	18	4	20	24	20	51	71	28	95	123	27	63	90	34	79	113	12	66	78	23	61	84	11	37	48	19	55	74
3:00	2	6	8	2	15	17	14	38	52	20	55	75	20	59	79	16	60	76	30	60	90	14	45	60	16	33	49	15	42	57
4:00	9	3	12	11	14	25	11	35	47	14	46	60	13	37	50	18	42	60	10	24	34	14	35	48	10	14	23	12	29	41
5:00	15	11	26	16	20	36	19	25	44	18	46	64	16	40	56	23	44	67	31	43	73	19	35	53	23	27	50	20	32	52
6:00	17	9	26	29	17	47	36	32	68	34	42	76	37	39	77	25	31	56	26	21	47	32	32	65	22	15	37	29	27	57
7:00	26	18	44	59	27	86	57	36	94	53	49	103	51	43	93	53	44	97	32	30	61	55	40	94	29	24	53	47	35	83
8:00	47	14	61	53	15	68	76	29	105	64	39	104	72	31	103	85	28	113	74	22	96	70	28	98	61	18	79	67	25	93
9:00	73	26	99	85	30	115	103	31	134	83	32	115	75	29	104	103	42	145	116	24	140	90	33	123	95	25	120	91	31	122
10:00	109	18	127	91	35	126	118	32	150	92	33	125	96	37	133	133	30	163	121	23	144	106	33	139	115	21	135	108	30	138
11:00	139	28	167	92	47	139	116	37	153	108	33	142	122	32	154	141	33	174	110	19	128	116	37	152	124	23	147	118	33	151
12:00	183	26	209	123	26	149	121	33	154	99	40	139	103	33	137	117	33	150	135	22	157	113	33	146	159	24	183	126	30	156
13:00	197	28	225	121	34	155	154	51	185	97	35	133	118	39	157	137	34	171	127	24	151	121	39	160	162	26	188	133	35	168
14:00	206	31	237	113	54	167	118	43	161	110	54	164	137	57	194	128	34	162	145	23	168	121	48	170	175	27	202	137	42	179
15:00	238	46	284	125	69	194	122	56	179	121	56	178	134	62	196	133	35	168	110	16	126	127	56	183	174	31	205	140	49	189
16:00	215	57	272	139	64	203	134	74	208	97	67	164	136	62	198	122	58	180	104	21	125	126	65	190	160	39	198	135	57	193
17:00	176	57	232	137	98	234	105	76	181	96	76	172	126	78	204	118	49	167	84	18	102	116	75	192	130	37	167	120	64	185
18:00	153	78	231	63	78	141	50	78	128	64	71	135	87	86	173	92	50	142	57	16	73	71	73	144	105	47	152	81	65	146
19:00	60	52	112	50	74	124	45	69	113	35	84	119	55	64	119	89	48	137	43	24	67	55	68	122	51	38	89	54	59	113
20:00	70	63	133	28	76	104	36	95	131	33	77	111	55	89	143	51	44	95	28	15	44	41	76	117	49	39	88	43	65	109
21:00	38	66	104	26	82	108	30	88	119	23	86	110	43	88	131	39	55	94	35	23	58	32	80	112	37	44	81	33	70	103
22:00	26	61	87	18	87	105	26	90	116	18	79	98	26	95	121	36	52	88	22	16	38	25	81	106	24	39	63	25	69	93
23:00	23	53	76	28	92	120	23	94	117	23	87	110	33	99	132	30	55	85	9	16	25	27	86	113	16	35	51	24	71	95
Total	**2072**	**792**	**2864**	**1441**	**1139**	**2580**	**1563**	**1343**	**2905**	**1395**	**1523**	**2917**	**1642**	**1480**	**3122**	**1797**	**1228**	**3025**	**1501**	**712**	**2213**	**1567**	**1343**	**2910**	**1787**	**752**	**2538**	**1630**	**1174**	**2804**

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	38	38	76	34	73	106	57	145	202	82	248	330	74	211	285	104	221	325	47	158	205	70	179	250	43	98	141	62	156	218
1:00	15	24	40	22	49	70	50	155	205	65	199	264	59	153	212	77	207	284	28	127	156	55	152	207	22	76	98	45	131	176
2:00	15	20	35	10	41	51	37	81	117	46	144	189	50	109	159	75	137	212	21	96	117	43	102	146	18	58	76	36	90	126
3:00	15	15	31	8	18	26	31	64	95	42	90	132	29	80	108	47	87	134	39	79	118	31	68	99	27	47	74	30	62	92
4:00	26	14	40	26	26	52	24	53	77	31	68	99	25	54	79	34	58	92	26	35	61	28	52	80	26	24	51	27	44	71
5:00	31	14	44	72	47	118	53	46	99	71	64	135	53	66	120	61	61	122	57	57	114	62	57	119	44	35	79	57	51	107
6:00	46	15	61	94	39	133	90	60	150	75	61	136	87	62	149	75	55	130	84	37	122	84	55	140	65	26	91	79	47	126
7:00	69	32	101	151	64	215	136	72	208	103	78	181	116	82	198	106	77	183	74	45	119	122	75	197	72	39	110	108	64	172
8:00	150	23	173	134	49	183	160	56	216	145	70	216	161	72	233	138	65	203	176	44	220	148	63	210	163	33	196	152	54	206
9:00	228	43	271	215	59	273	215	62	277	183	68	251	194	71	265	205	78	283	251	35	286	200	68	268	239	39	278	211	59	271
10:00	309	46	355	246	68	314	254	62	316	205	66	271	232	64	296	240	66	306	294	41	334	235	65	301	301	43	344	254	59	313
11:00	350	63	413	222	74	296	261	74	335	205	67	272	241	62	302	245	61	306	261	44	305	235	67	302	305	53	359	255	63	318
12:00	377	64	442	218	57	275	249	75	324	207	76	283	215	72	287	232	58	290	245	48	294	224	68	292	311	56	368	249	64	314
13:00	455	67	523	229	80	309	273	102	375	197	82	279	238	74	311	236	72	308	225	48	273	235	82	317	340	58	398	265	75	340
14:00	458	83	541	217	104	321	263	89	352	211	98	309	259	105	364	253	67	320	236	50	286	241	93	333	347	66	413	271	85	356
15:00	465	113	578	216	123	338	249	132	381	212	119	331	242	126	369	245	72	317	213	38	251	233	114	347	339	76	414	263	103	366
16:00	426	153	579	254	131	385	248	161	409	185	151	336	246	143	388	232	111	343	172	50	222	233	139	372	299	102	401	252	128	380
17:00	344	160	504	218	168	386	207	162	369	179	162	341	221	155	377	218	101	319	151	42	193	209	150	358	248	101	349	220	136	356
18:00	300	194	494	124	180	304	123	185	308	123	167	290	158	179	337	164	89	253	101	42	142	138	160	298	200	118	318	156	148	304
19:00	141	154	295	80	172	253	94	177	270	89	184	273	104	168	272	149	105	254	88	41	128	103	161	264	114	97	212	106	143	249
20:00	133	147	280	60	170	230	77	198	275	65	175	240	100	185	285	84	79	163	47	36	83	77	161	239	90	91	181	81	141	222
21:00	78	138	215	55	182	237	62	196	258	58	197	255	91	192	283	76	113	189	54	35	89	69	176	245	66	86	152	68	150	218
22:00	55	139	194	50	190	240	72	212	284	75	216	290	78	213	290	91	135	226	31	34	65	73	193	266	43	87	129	64	163	227
23:00	41	96	138	48	206	254	73	220	293	78	238	316	89	223	312	84	138	222	26	27	54	74	205	279	34	62	96	63	164	227
Total	**4565**	**1855**	**6420**	**3000**	**2370**	**5369**	**3356**	**2837**	**6193**	**2932**	**3086**	**6018**	**3351**	**2922**	**6273**	**3475**	**2315**	**5790**	**2947**	**1289**	**4236**	**3223**	**2706**	**5929**	**3756**	**1572**	**5328**	**3375**	**2382**	**5757**

Daily

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
AAWT	1,656	1,363	3,019	1,567	1,343	2,910
AAWE	1,969	820	2,790	1,787	752	2,538
AADT	1,745	1,208	2,953	1,630	1,174	2,804
	155	102	256	120	-5	115

2008 Traffic volume on Hume Highway in Woomargama town

Table 1. 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	8	15	23	14	35	49	22	74	96	18	114	133	23	75	98	24	90	114	21	76	96	20	78	98	14	45	60	18	68	87
1:00	5	14	18	7	17	24	23	66	88	21	74	96	10	51	60	23	64	87	13	56	69	17	54	71	9	35	44	14	49	63
2:00	6	9	15	8	20	27	8	28	35	17	42	59	13	41	55	18	50	68	15	27	43	13	36	49	11	18	29	12	31	43
3:00	14	8	21	3	3	7	12	26	38	10	32	41	12	19	31	11	26	37	7	20	26	10	21	31	10	14	24	10	19	29
4:00	14	11	24	16	11	27	9	16	25	10	20	30	11	18	29	8	15	23	18	11	28	11	16	27	16	11	26	12	15	27
5:00	14	2	15	56	25	81	30	23	52	42	18	60	36	23	59	28	16	44	30	12	42	38	21	59	22	7	28	34	17	51
6:00	24	6	31	73	23	95	53	23	76	46	14	60	55	18	72	49	21	70	55	16	71	55	20	75	40	11	51	51	17	68
7:00	40	14	53	90	34	124	71	30	101	49	26	76	63	33	96	59	29	88	41	13	54	66	30	97	40	13	54	59	26	84
8:00	96	6	102	98	25	123	90	24	114	88	27	115	87	36	124	73	33	106	87	23	110	87	29	116	91	15	106	88	25	113
9:00	141	15	156	125	23	147	110	27	137	98	32	129	110	38	148	109	27	136	121	5	126	110	29	140	131	10	141	116	24	140
10:00	170	26	196	139	30	169	137	24	161	99	30	128	130	25	155	97	37	134	149	13	162	120	29	150	159	20	179	131	26	158
11:00	190	32	222	108	26	134	131	33	165	98	29	127	103	22	125	99	22	121	136	26	162	108	26	134	163	29	192	124	27	151
12:00	188	35	223	94	29	124	124	37	161	106	35	141	98	36	134	110	26	136	94	24	118	106	33	139	141	30	171	116	32	148
13:00	231	31	261	99	46	144	134	47	181	91	42	133	108	32	140	91	27	118	103	20	123	105	39	143	167	25	192	122	35	157
14:00	234	46	280	101	48	149	135	42	177	101	37	137	106	42	148	122	26	148	82	25	107	113	39	152	158	36	194	126	38	164
15:00	206	60	266	100	51	151	138	70	208	84	63	147	111	58	169	112	35	147	85	16	102	109	55	164	146	38	184	120	50	170
16:00	206	89	295	124	64	188	123	72	195	85	78	163	120	67	188	109	47	156	70	23	93	112	66	178	138	56	194	120	63	183
17:00	159	90	249	90	69	159	108	87	194	84	82	166	100	73	173	107	38	145	69	20	89	98	70	168	114	55	169	102	66	168
18:00	138	112	249	62	98	159	66	98	165	47	89	136	66	87	154	78	35	113	46	23	69	64	81	145	92	67	159	72	77	149
19:00	81	93	174	29	94	124	32	103	135	28	97	125	45	95	140	43	48	91	41	16	57	36	87	123	61	55	116	43	78	121
20:00	58	79	138	17	92	109	28	96	124	21	87	109	37	89	126	31	32	63	23	20	43	27	79	106	41	50	90	31	71	102
21:00	31	70	101	36	92	128	21	101	122	23	106	129	32	105	137	24	51	75	20	10	30	27	91	118	25	40	65	27	76	103
22:00	23	78	101	30	100	130	16	116	132	26	132	158	21	110	130	19	72	91	9	18	26	23	106	128	16	48	64	21	89	110
23:00	18	41	60	24	112	136	26	117	144	21	144	165	24	121	145	21	68	89	16	10	26	23	112	136	17	26	43	22	88	109
Total	**2292**	**981**	**3274**	**1542**	**1165**	**2707**	**1648**	**1377**	**3025**	**1314**	**1449**	**2762**	**1523**	**1315**	**2838**	**1467**	**936**	**2402**	**1349**	**524**	**1872**	**1498**	**1248**	**2747**	**1820**	**752**	**2573**	**1590**	**1107**	**2697**

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 vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total	Light vehicle	Heavy vehicle	Total
0:00	28	20	47	10	37	47	14	66	81	17	119	136	16	123	139	20	116	136	18	76	93	15	92	108	23	48	70	17	80	97
1:00	11	11	21	8	28	36	25	82	107	13	113	126	13	99	112	7	134	141	14	69	83	13	91	104	12	40	52	13	77	90
2:00	12	11	23	3	20	23	7	49	56	10	93	103	12	65	77	9	81	90	10	67	77	8	61	70	11	39	50	9	55	64
3:00	2	6	8	1	15	16	6	39	45	9	57	66	13	58	71	7	60	67	15	60	76	7	46	53	8	33	42	8	42	50
4:00	9	3	12	4	13	17	7	35	42	10	43	53	5	35	40	11	40	51	9	21	30	8	33	41	9	12	21	8	27	35
5:00	15	8	23	14	20	34	14	25	39	10	46	55	9	42	50	12	46	58	22	43	65	12	36	47	19	25	44	14	33	46
6:00	15	9	24	36	18	54	35	37	73	32	43	76	32	39	71	29	28	57	24	20	44	33	33	66	20	14	34	29	28	57
7:00	26	15	41	59	26	85	60	34	95	51	46	97	41	42	83	52	46	98	28	31	59	53	39	91	27	23	50	45	34	80
8:00	52	15	67	61	14	75	72	34	106	63	46	108	73	33	106	85	30	115	77	23	100	71	31	102	64	19	83	69	28	97
9:00	78	20	98	82	31	114	99	35	134	88	34	122	80	34	114	102	40	142	117	25	142	90	35	125	98	23	120	92	31	124
10:00	110	17	127	90	34	124	113	33	146	84	37	121	88	38	127	126	32	158	118	22	140	100	35	135	114	19	134	104	30	135
11:00	133	26	159	91	46	137	113	38	151	101	36	137	118	34	152	154	35	189	110	19	128	115	38	153	121	22	144	117	33	150
12:00	174	28	202	112	27	139	119	37	156	97	41	137	98	36	134	117	34	151	137	19	156	109	35	144	156	23	179	122	32	154
13:00	188	28	215	114	40	154	134	53	187	99	38	137	116	44	160	143	40	183	123	24	147	121	43	164	155	26	181	131	38	169
14:00	208	28	235	119	49	168	112	46	158	104	59	163	131	59	190	124	34	158	140	22	162	118	49	167	174	25	199	134	42	176
15:00	232	43	275	121	69	191	118	56	174	114	57	171	124	60	184	121	44	165	97	23	121	120	57	177	165	33	198	133	50	183
16:00	228	49	277	133	64	197	118	78	197	97	69	165	124	71	195	109	45	154	100	20	119	116	65	182	164	34	198	130	57	186
17:00	165	61	226	127	98	224	103	75	178	86	76	162	120	77	197	108	50	158	89	21	110	109	75	184	127	41	168	114	65	179
18:00	150	81	231	57	72	129	42	76	118	53	71	125	78	84	162	81	53	134	56	16	72	62	71	134	103	49	152	74	65	139
19:00	60	49	109	40	75	115	35	67	103	25	86	111	48	65	113	87	47	134	41	23	64	47	68	115	50	36	86	48	59	107
20:00	70	63	133	18	75	93	23	91	114	25	79	105	49	88	137	56	45	101	27	15	43	34	76	110	49	39	88	38	65	104
21:00	31	64	95	22	81	103	18	90	108	14	84	99	36	87	123	42	55	97	25	25	50	26	79	106	28	45	73	27	70	96
22:00	28	63	90	14	83	98	15	90	104	12	80	92	19	94	113	27	52	79	18	15	33	17	80	97	23	39	62	19	68	87
23:00	23	52	75	11	92	103	10	93	103	9	87	96	16	100	116	26	51	77	7	16	23	14	85	99	15	34	49	14	70	85
Total	**2046**	**767**	**2814**	**1348**	**1126**	**2474**	**1415**	**1360**	**2775**	**1223**	**1538**	**2762**	**1460**	**1508**	**2968**	**1657**	**1239**	**2896**	**1421**	**714**	**2135**	**1421**	**1354**	**2775**	**1734**	**741**	**2474**	**1510**	**1179**	**2689**

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	35	35	70	24	72	95	36	140	176	35	234	269	39	198	237	44	206	250	38	151	190	36	170	206	37	93	130	36	148	184
1:00	15	24	40	14	46	60	47	148	196	34	187	221	23	150	173	30	198	228	27	125	152	30	146	175	21	75	96	27	125	153
2:00	18	20	38	11	39	50	15	77	92	27	135	162	25	106	131	27	131	158	25	94	119	21	97	119	22	57	79	21	86	107
3:00	15	14	29	4	18	23	18	65	83	19	89	107	25	77	103	18	86	104	22	80	102	17	67	84	19	47	65	17	61	79
4:00	23	14	37	21	24	44	16	51	68	19	63	83	16	53	69	19	55	74	26	32	58	18	49	68	25	23	47	20	42	62
5:00	29	9	38	70	44	115	44	48	92	52	63	115	44	65	109	40	62	102	51	55	106	50	57	107	40	32	72	47	49	97
6:00	40	15	55	108	41	150	88	60	148	78	58	136	87	57	144	78	49	127	79	36	115	88	53	141	59	26	85	80	45	125
7:00	66	29	95	149	60	208	131	64	196	100	72	172	104	75	179	111	75	186	69	44	113	119	69	188	67	36	104	104	60	164
8:00	148	21	170	158	39	197	162	58	220	151	72	223	160	69	229	158	63	221	163	46	209	158	60	218	156	34	189	157	53	210
9:00	219	35	254	207	54	261	209	62	271	186	66	252	191	72	263	211	67	278	238	31	268	201	64	265	228	33	261	209	55	264
10:00	280	43	322	229	64	293	250	56	307	183	67	250	219	64	282	223	69	292	267	35	302	221	64	285	273	39	312	236	57	293
11:00	322	58	381	199	72	271	245	71	316	199	65	264	221	56	277	253	57	310	245	45	290	223	64	287	284	51	335	241	61	301
12:00	362	63	425	206	56	262	243	74	317	202	76	278	196	72	269	227	60	287	231	43	274	215	68	283	297	53	349	238	63	302
13:00	419	58	477	212	86	298	268	100	367	191	79	270	225	76	301	234	67	301	226	44	269	226	82	307	322	51	373	253	73	326
14:00	442	73	515	220	96	317	247	88	336	205	95	300	238	100	338	246	60	306	222	47	269	231	88	319	332	60	392	260	80	340
15:00	439	102	541	221	120	341	256	126	382	198	120	318	235	119	354	233	79	312	183	39	222	229	113	341	311	71	382	252	101	353
16:00	434	138	572	257	128	385	242	150	392	181	147	329	244	139	383	218	92	310	170	43	213	228	131	360	302	90	392	249	119	369
17:00	324	151	475	217	167	384	211	162	372	171	158	329	221	150	370	215	88	303	158	41	198	207	145	352	241	96	337	217	131	347
18:00	287	193	480	119	169	288	109	174	283	100	160	260	144	172	316	159	88	247	102	39	141	126	153	279	195	116	311	146	142	288
19:00	141	142	283	69	169	238	68	170	237	53	183	236	93	160	253	130	95	225	81	39	121	83	155	238	111	91	202	91	137	228
20:00	128	142	271	36	167	203	51	187	238	47	167	214	86	177	262	87	77	164	50	35	85	61	155	216	89	89	178	69	136	205
21:00	61	134	196	57	173	231	39	190	229	37	191	228	69	192	260	66	106	172	45	35	80	54	170	224	53	85	138	53	146	199
22:00	50	141	191	44	183	228	31	206	237	38	211	250	39	204	243	46	124	170	26	33	59	40	186	226	38	87	125	39	157	197
23:00	41	93	134	35	204	238	36	210	246	30	231	261	40	221	261	47	119	166	23	26	49	38	197	235	32	60	92	36	158	194
Total	**4339**	**1748**	**6087**	**2889**	**2292**	**5181**	**3063**	**2737**	**5800**	**2537**	**2987**	**5524**	**2983**	**2822**	**5805**	**3123**	**2175**	**5298**	**2769**	**1238**	**4007**	**2919**	**2603**	**5522**	**3554**	**1493**	**5047**	**3100**	**2286**	**5386**

Daily

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
AAWT	1,498	1,248	2,747	1,421	1,354	2,775
AAWE	1,820	752	2,573	1,734	741	2,474
AADT	1,590	1,107	2,697	1,510	1,179	2,689

Peak Hours

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
Weekday midday peak	112	66	178	116	65	182
Weekday night-time truck peak	23	112	136	14	85	99
Weekend	138	25	192	164	34	198
Weekly	120	63	183	130	57	186

Peak Hours

	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
H30	231	161	392	275	215	489
H50	201	140	342	245	191	437
H100	173	120	293	204	159	363

Appendix C

Forecast future traffic volumes

Hume Highway Forecast Traffic Volumes in Woomargama, 2011

2011 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	33	83	117	25	51	76	32	74	106
1:00	22	67	90	17	46	64	22	61	82
2:00	19	45	65	15	30	45	18	41	59
3:00	12	31	44	11	16	28	12	27	39
4:00	13	21	34	18	12	30	14	19	33
5:00	41	26	67	22	16	38	37	23	60
6:00	108	47	154	34	11	45	92	38	130
7:00	65	46	111	57	15	72	63	38	102
8:00	70	47	117	87	22	109	75	40	115
9:00	107	44	151	122	21	143	112	38	150
10:00	123	46	169	174	22	196	136	40	176
11:00	125	45	170	187	28	215	141	40	181
12:00	117	47	164	184	34	218	134	43	177
13:00	130	49	179	187	34	221	145	44	189
14:00	118	52	171	173	40	213	132	48	181
15:00	105	62	167	160	42	202	119	56	175
16:00	95	64	159	144	51	195	107	59	166
17:00	80	67	147	107	56	164	87	62	150
18:00	68	68	136	86	57	143	73	64	136
19:00	41	66	107	54	53	108	44	61	106
20:00	34	70	103	46	49	95	37	63	100
21:00	31	75	106	34	44	78	32	66	98
22:00	33	93	126	16	38	54	29	79	108
23:00	37	95	132	16	29	45	33	78	111
Total	1,628	1,356	2,984	1,978	817	2,795	1,728	1,202	2,930

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	25	92	117	19	51	70	24	80	104
1:00	22	89	112	22	51	73	22	78	101
2:00	14	59	73	14	38	52	14	53	67
3:00	12	40	51	11	29	40	12	36	48
4:00	10	29	39	12	22	33	11	27	37
5:00	18	29	47	14	24	37	17	27	44
6:00	46	34	80	24	22	46	41	31	71
7:00	47	40	87	43	14	57	46	33	79
8:00	73	42	115	77	16	93	74	35	109
9:00	95	46	141	118	21	139	102	39	141
10:00	111	42	153	147	15	162	121	35	155
11:00	112	41	153	178	29	206	129	37	166
12:00	119	44	163	171	32	203	133	40	173
13:00	124	52	176	180	31	211	139	46	185
14:00	125	55	180	154	34	188	133	49	182
15:00	115	62	177	158	34	192	127	54	180
16:00	115	78	193	146	41	187	124	68	191
17:00	108	78	186	130	47	177	115	69	183
18:00	77	81	158	89	52	142	81	72	153
19:00	52	78	130	67	45	111	56	68	124
20:00	35	79	114	45	45	91	38	69	107
21:00	34	81	115	32	44	76	34	70	104
22:00	28	97	125	17	36	52	25	81	106
23:00	26	104	129	17	32	49	24	85	108
Total	1,543	1,471	3,015	1,883	805	2,688	1,640	1,281	2,921

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	58	175	234	44	103	146	56	154	210
1:00	45	157	201	39	97	137	44	139	183
2:00	34	104	138	29	67	97	33	93	126
3:00	24	71	95	23	45	68	24	64	88
4:00	23	50	73	30	34	63	25	45	70
5:00	59	55	114	36	39	75	54	50	104
6:00	154	81	235	58	33	91	133	68	201
7:00	112	86	198	99	30	129	110	71	181
8:00	143	89	232	163	39	202	149	75	224
9:00	202	90	292	240	42	281	213	77	290
10:00	234	88	322	321	37	358	257	74	331
11:00	237	85	322	365	57	422	270	77	347
12:00	236	92	328	355	65	420	267	83	350
13:00	255	101	355	367	65	432	284	90	374
14:00	243	108	351	327	74	401	265	97	362
15:00	220	123	344	318	76	394	246	109	355
16:00	210	142	351	290	92	382	231	126	357
17:00	189	145	333	237	103	340	202	131	333
18:00	145	149	294	175	109	284	154	136	290
19:00	93	144	237	121	98	219	100	130	230
20:00	69	148	217	92	94	186	75	132	207
21:00	65	156	220	66	89	154	66	137	202
22:00	61	190	251	32	74	106	55	159	214
23:00	63	199	261	33	61	94	56	163	219
Total	3,171	2,827	5,999	3,861	1,622	5,483	3,368	2,483	5,851

2011 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	2	2	3	1	1	2	2	1	3
1:00	1	1	2	1	1	2	1	1	2
2:00	1	1	2	1	1	1	1	1	2
3:00	1	1	1	1	0	1	1	1	1
4:00	1	0	1	1	0	1	1	0	1
5:00	2	1	3	1	0	1	2	0	2
6:00	14	2	16	4	0	5	12	2	14
7:00	8	2	10	7	1	8	8	2	10
8:00	9	2	11	11	1	12	10	2	12
9:00	14	2	16	16	1	17	15	2	16
10:00	16	2	18	23	1	24	18	2	20
11:00	16	2	18	24	1	26	18	2	20
12:00	15	2	17	24	1	26	18	2	19
13:00	17	2	19	24	2	26	19	2	21
14:00	15	2	18	23	2	24	17	2	19
15:00	14	3	17	21	2	23	16	2	18
16:00	12	3	15	19	2	21	14	3	17
17:00	11	3	13	14	3	17	11	3	14
18:00	3	1	5	4	1	5	4	1	5
19:00	2	1	3	3	1	4	2	1	3
20:00	2	1	3	2	1	3	2	1	3
21:00	2	2	3	2	1	3	2	1	3
22:00	2	2	4	1	1	2	1	2	3
23:00	2	2	4	1	1	1	2	2	3
Total	182	42	224	230	26	255	195	37	232

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	1	2	3	1	1	2	1	2	3
1:00	1	2	3	1	1	2	1	2	3
2:00	1	1	2	1	1	1	1	1	2
3:00	1	1	1	1	1	1	1	1	1
4:00	1	1	1	1	0	1	1	1	1
5:00	1	1	1	1	0	1	1	1	1
6:00	5	1	7	3	1	4	5	1	6
7:00	5	2	7	5	1	5	5	1	7
8:00	8	2	10	9	1	9	8	1	10
9:00	11	2	13	13	1	14	12	2	13
10:00	13	2	14	17	1	17	14	1	15
11:00	13	2	14	20	1	21	15	1	16
12:00	14	2	15	19	1	21	15	2	17
13:00	14	2	16	21	1	22	16	2	18
14:00	14	2	16	18	1	19	15	2	17
15:00	13	3	16	18	1	19	14	2	17
16:00	13	3	16	17	2	18	14	3	17
17:00	12	3	16	15	2	17	13	3	16
18:00	4	2	5	4	1	6	4	1	5
19:00	3	2	4	3	1	4	3	1	4
20:00	2	2	3	2	1	3	2	1	3
21:00	2	2	3	2	1	2	2	1	3
22:00	1	2	3	1	1	2	1	2	3
23:00	1	2	3	1	1	1	1	2	3
Total	153	42	195	192	23	215	164	37	201

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	3	4	6	2	2	4	3	3	6
1:00	2	3	5	2	2	4	2	3	5
2:00	2	2	4	1	1	3	2	2	4
3:00	1	1	3	1	1	2	1	1	2
4:00	1	1	2	1	1	2	1	1	2
5:00	3	1	4	2	1	3	3	1	4
6:00	19	3	23	7	1	9	17	3	20
7:00	14	4	17	12	1	14	14	3	17
8:00	17	4	21	20	2	22	18	3	21
9:00	25	4	29	29	2	31	26	3	29
10:00	29	4	32	39	2	41	32	3	35
11:00	29	4	33	45	2	47	33	3	36
12:00	29	4	33	44	3	46	33	4	36
13:00	31	4	35	45	3	48	35	4	39
14:00	30	5	34	40	3	43	32	4	37
15:00	27	5	32	39	3	42	30	5	35
16:00	26	6	32	35	4	39	28	5	33
17:00	23	6	29	29	4	33	25	6	30
18:00	7	3	10	9	2	11	8	3	10
19:00	5	3	8	6	2	8	5	3	8
20:00	3	3	6	5	2	6	4	3	6
21:00	3	3	6	3	2	5	3	3	6
22:00	3	4	7	2	1	3	3	3	6
23:00	3	4	7	2	1	3	3	3	6
Total	335	84	419	421	49	470	359	74	433

2011 with Bypass - Bypass

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	32	82	113	23	50	74	30	73	103
1:00	21	66	87	17	45	62	20	60	80
2:00	18	45	63	14	29	44	18	40	58
3:00	12	31	42	11	16	27	12	27	38
4:00	12	21	33	17	12	29	13	18	32
5:00	39	25	64	21	15	37	35	22	58
6:00	93	45	138	30	10	40	80	36	116
7:00	56	44	100	49	15	64	55	37	92
8:00	61	45	106	76	21	97	65	38	103
9:00	93	42	135	106	20	126	97	36	133
10:00	107	44	151	151	21	173	118	38	156
11:00	109	43	151	163	27	190	122	38	161
12:00	102	45	147	160	32	192	116	41	158
13:00	113	47	160	163	32	195	126	42	168
14:00	103	50	153	150	38	189	115	46	161
15:00	91	59	150	139	40	179	104	53	157
16:00	83	61	143	125	49	174	93	56	150
17:00	70	64	133	93	54	147	76	60	136
18:00	65	67	131	82	55	137	69	62	132
19:00	39	64	103	52	52	104	42	60	102
20:00	32	68	100	44	48	92	35	62	97
21:00	29	74	103	32	43	75	30	65	95
22:00	31	91	123	15	37	52	28	77	105
23:00	35	93	128	15	28	44	31	77	108
Total	1,446	1,314	2,760	1,748	792	2,540	1,533	1,165	2,698

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	24	90	114	18	50	68	23	79	101
1:00	21	88	109	21	50	71	21	77	98
2:00	14	58	72	14	37	50	14	52	65
3:00	11	39	50	11	28	39	11	36	47
4:00	10	28	38	11	21	32	10	26	36
5:00	17	29	46	13	23	36	16	27	43
6:00	41	33	74	21	21	42	36	29	66
7:00	42	38	80	38	14	51	41	32	73
8:00	64	41	105	68	16	84	66	34	100
9:00	84	44	128	105	20	125	90	37	127
10:00	98	40	138	130	15	144	107	33	140
11:00	99	39	138	157	27	185	114	35	150
12:00	105	42	148	151	30	182	118	39	156
13:00	110	50	160	160	30	190	123	44	167
14:00	110	53	163	136	33	169	118	47	165
15:00	102	59	161	140	33	173	112	52	164
16:00	102	75	177	130	39	169	109	65	174
17:00	96	75	171	115	45	160	102	66	168
18:00	73	79	153	85	51	136	77	71	148
19:00	49	77	126	63	44	107	53	67	120
20:00	34	77	111	43	45	88	36	68	104
21:00	32	79	111	30	44	74	32	69	101
22:00	27	95	122	16	35	51	24	79	103
23:00	24	102	126	16	31	47	23	83	105
Total	1,390	1,429	2,819	1,692	782	2,473	1,476	1,244	2,721

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	56	172	227	41	101	142	53	151	204
1:00	42	154	196	37	95	133	42	136	178
2:00	32	102	134	28	66	94	31	92	123
3:00	23	70	93	22	45	66	23	62	85
4:00	22	49	71	28	33	61	24	44	68
5:00	56	54	110	34	38	73	52	49	100
6:00	134	78	212	51	31	82	116	65	181
7:00	98	82	180	87	28	116	96	68	164
8:00	125	85	210	143	37	180	131	72	203
9:00	177	86	264	210	40	250	187	74	261
10:00	205	84	289	281	36	317	225	71	296
11:00	208	82	290	320	54	375	237	74	310
12:00	207	88	295	311	62	374	234	80	314
13:00	223	97	320	322	62	384	249	86	336
14:00	213	103	316	287	71	358	233	93	326
15:00	193	118	312	279	73	352	216	105	321
16:00	184	136	320	255	88	342	203	121	324
17:00	166	139	304	208	99	307	178	126	303
18:00	138	146	284	166	107	273	146	133	279
19:00	88	141	229	115	96	211	95	127	222
20:00	66	145	211	87	92	180	71	129	201
21:00	62	153	214	62	87	149	62	134	196
22:00	58	186	244	31	72	103	52	156	208
23:00	60	195	254	32	60	91	54	160	213
Total	2,836	2,743	5,579	3,440	1,574	5,013	3,009	2,409	5,418

Hume Highway Forecast Traffic Volumes in Woomargama, 2021

2021 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	44	110	154	32	68	100	42	98	139
1:00	30	89	118	23	61	84	28	80	109
2:00	25	60	85	20	39	59	24	54	78
3:00	16	41	58	15	22	37	16	36	52
4:00	17	28	45	24	15	39	19	25	43
5:00	54	34	88	30	20	50	49	30	79
6:00	142	62	203	45	14	59	121	50	171
7:00	85	61	146	75	20	95	84	51	134
8:00	92	62	154	115	29	144	99	53	152
9:00	141	58	200	160	28	188	147	50	197
10:00	162	61	223	230	29	259	180	52	232
11:00	165	59	224	247	37	284	186	53	238
12:00	154	62	217	243	44	287	177	57	233
13:00	172	64	236	247	45	291	191	58	249
14:00	156	69	225	228	53	281	175	64	238
15:00	139	81	220	211	55	266	157	73	230
16:00	125	84	209	190	67	257	142	78	219
17:00	106	88	194	141	74	216	115	82	198
18:00	90	90	179	113	75	188	96	84	180
19:00	54	87	141	72	70	142	59	81	139
20:00	44	92	136	61	64	125	49	83	132
21:00	41	99	140	44	58	103	42	87	129
22:00	43	123	166	21	50	71	39	104	143
23:00	49	125	174	21	38	60	43	103	146
Total	2,146	1,787	3,933	2,607	1,077	3,684	2,277	1,585	3,862

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	33	121	154	25	68	93	31	106	137
1:00	29	118	147	29	68	97	30	103	133
2:00	19	78	97	19	50	68	19	69	88
3:00	15	53	68	15	38	53	15	48	63
4:00	14	38	52	15	29	44	14	35	49
5:00	23	39	62	18	31	49	22	36	58
6:00	61	45	106	31	29	60	54	40	94
7:00	62	52	114	56	19	75	61	43	104
8:00	96	56	151	101	22	122	98	46	144
9:00	125	61	186	156	27	183	134	51	185
10:00	146	55	201	193	20	213	159	46	205
11:00	148	53	201	234	38	272	170	48	219
12:00	157	58	215	225	42	267	175	53	228
13:00	164	69	232	238	41	279	183	60	244
14:00	164	73	237	203	45	248	175	64	240
15:00	152	81	233	208	45	253	167	71	238
16:00	151	103	254	193	54	247	163	89	252
17:00	143	103	246	172	61	233	151	91	242
18:00	102	107	208	118	69	187	106	95	202
19:00	68	103	171	88	59	147	74	90	164
20:00	47	104	150	60	60	120	50	91	141
21:00	45	106	151	42	59	101	45	93	137
22:00	37	128	165	22	47	69	33	106	140
23:00	34	137	170	22	42	65	31	111	143
Total	2,034	1,939	3,973	2,482	1,061	3,543	2,162	1,688	3,850

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	77	231	308	57	135	193	73	204	277
1:00	59	207	266	52	128	180	58	184	241
2:00	44	138	182	39	89	128	43	123	167
3:00	31	94	125	30	60	90	31	84	115
4:00	30	66	96	39	44	84	33	60	92
5:00	78	72	150	48	52	99	71	66	137
6:00	203	107	309	76	43	119	175	90	265
7:00	147	113	260	131	39	170	145	94	239
8:00	188	117	305	215	51	267	196	99	296
9:00	267	119	385	316	55	371	281	101	383
10:00	308	116	424	423	49	472	339	98	436
11:00	312	113	425	481	75	556	356	101	457
12:00	311	121	432	468	86	554	352	110	461
13:00	335	133	468	484	85	570	375	119	493
14:00	320	142	462	431	98	528	350	128	478
15:00	290	163	453	420	100	520	324	144	468
16:00	277	187	463	382	121	503	304	167	471
17:00	249	191	439	313	136	449	266	173	439
18:00	191	196	388	231	144	374	203	179	382
19:00	122	190	312	159	130	289	132	171	303
20:00	91	195	286	121	124	245	99	174	273
21:00	85	205	291	87	117	203	86	180	266
22:00	80	251	331	43	97	140	72	210	282
23:00	83	262	345	44	80	124	74	215	289
Total	4,180	3,727	7,906	5,089	2,138	7,227	4,440	3,273	7,712

2021 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	2	2	4	2	1	3	2	2	4
1:00	1	2	3	1	1	2	1	2	3
2:00	1	1	2	1	1	2	1	1	2
3:00	1	1	2	1	0	1	1	1	2
4:00	1	1	1	1	0	2	1	0	1
5:00	3	1	3	1	0	2	2	1	3
6:00	19	3	21	6	1	7	16	2	18
7:00	11	3	14	10	1	11	11	2	13
8:00	12	3	15	15	1	16	13	2	15
9:00	18	3	21	21	1	22	19	2	21
10:00	21	3	24	30	1	31	23	2	26
11:00	22	3	24	32	2	34	24	2	27
12:00	20	3	23	32	2	34	23	3	26
13:00	22	3	25	32	2	34	25	3	28
14:00	20	3	24	30	2	32	23	3	26
15:00	18	4	22	28	2	30	21	3	24
16:00	16	4	20	25	3	28	19	3	22
17:00	14	4	18	18	3	22	15	4	19
18:00	4	2	6	6	1	7	5	2	6
19:00	3	2	4	4	1	5	3	2	5
20:00	2	2	4	3	1	4	2	2	4
21:00	2	2	4	2	1	3	2	2	4
22:00	2	2	5	1	1	2	2	2	4
23:00	2	3	5	1	1	2	2	2	4
Total	240	56	295	303	34	336	257	49	306

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	2	2	4	1	1	3	2	2	4
1:00	1	2	4	1	1	3	1	2	4
2:00	1	2	3	1	1	2	1	1	2
3:00	1	1	2	1	1	2	1	1	2
4:00	1	1	1	1	1	1	1	1	1
5:00	1	1	2	1	1	2	1	1	2
6:00	7	2	9	4	1	5	6	2	8
7:00	7	2	9	6	1	7	7	2	9
8:00	11	2	13	11	1	12	11	2	13
9:00	14	2	17	18	1	19	15	2	17
10:00	17	2	19	22	1	23	18	2	20
11:00	17	2	19	27	2	28	19	2	21
12:00	18	2	20	26	2	27	20	2	22
13:00	19	3	21	27	2	29	21	2	23
14:00	19	3	22	23	2	25	20	3	23
15:00	17	3	21	24	2	26	19	3	22
16:00	17	4	21	22	2	24	19	4	22
17:00	16	4	20	20	3	22	17	4	21
18:00	5	2	7	6	1	7	5	2	7
19:00	3	2	5	4	1	6	4	2	5
20:00	2	2	4	3	1	4	3	2	4
21:00	2	2	4	2	1	3	2	2	4
22:00	2	3	4	1	1	2	2	2	4
23:00	2	3	4	1	1	2	2	2	4
Total	202	56	257	253	30	283	216	48	264

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	4	5	8	3	3	6	4	4	8
1:00	3	4	7	3	3	5	3	4	7
2:00	2	3	5	2	2	4	2	2	5
3:00	2	2	3	1	1	3	2	2	3
4:00	2	1	3	2	1	3	2	1	3
5:00	4	1	5	2	1	3	4	1	5
6:00	25	5	30	9	2	11	22	4	26
7:00	18	5	23	16	2	18	18	4	22
8:00	23	5	28	26	2	29	24	4	28
9:00	33	5	38	39	2	41	35	4	39
10:00	38	5	43	52	2	54	42	4	46
11:00	38	5	43	59	3	62	44	4	48
12:00	38	5	43	57	4	61	43	5	48
13:00	41	6	47	59	4	63	46	5	51
14:00	39	6	45	53	4	57	43	5	48
15:00	35	7	42	51	4	56	40	6	46
16:00	34	8	42	47	5	52	37	7	44
17:00	30	8	38	38	6	44	32	7	40
18:00	10	4	13	12	3	14	10	4	14
19:00	6	4	10	8	3	11	7	3	10
20:00	5	4	8	6	2	9	5	3	8
21:00	4	4	8	4	2	7	4	4	8
22:00	4	5	9	2	2	4	4	4	8
23:00	4	5	9	2	2	4	4	4	8
Total	442	111	553	555	64	619	473	98	571

2021 with Bypass - Bypass

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	42	107	149	31	66	97	40	96	135
1:00	28	87	115	22	60	81	27	79	106
2:00	24	59	83	19	38	58	23	53	76
3:00	15	41	56	14	21	35	15	35	51
4:00	16	28	43	23	15	38	18	24	42
5:00	52	33	85	28	20	48	47	29	76
6:00	123	59	182	39	13	53	105	48	153
7:00	74	58	132	65	20	85	73	48	121
8:00	80	59	139	100	28	128	86	51	136
9:00	123	56	178	139	26	166	128	48	176
10:00	141	58	199	199	28	227	156	50	206
11:00	143	56	200	214	36	250	161	50	212
12:00	134	60	194	211	42	253	154	54	208
13:00	149	61	211	214	43	257	166	56	222
14:00	136	66	202	198	50	249	152	61	213
15:00	121	78	198	184	53	236	137	70	207
16:00	109	80	189	165	64	229	123	74	197
17:00	92	84	176	123	71	194	100	79	179
18:00	85	88	173	108	73	181	91	82	173
19:00	51	85	136	68	69	137	56	79	135
20:00	42	90	132	58	63	121	46	81	128
21:00	39	97	136	42	57	99	40	86	126
22:00	41	120	162	20	49	69	37	102	139
23:00	46	123	169	20	37	58	41	101	142
Total	1,906	1,732	3,638	2,304	1,044	3,348	2,020	1,535	3,556

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	31	119	150	24	66	90	30	104	134
1:00	28	115	143	27	66	94	28	101	129
2:00	18	76	94	18	49	66	18	68	86
3:00	14	52	66	14	38	52	15	47	62
4:00	13	37	50	15	28	43	13	34	48
5:00	22	38	60	17	31	48	21	35	56
6:00	54	43	97	28	28	55	48	39	86
7:00	55	50	105	50	18	68	54	42	96
8:00	85	53	138	89	21	110	87	45	131
9:00	111	58	169	138	26	164	119	49	168
10:00	130	53	182	171	19	190	141	44	185
11:00	131	51	182	207	36	244	151	47	197
12:00	139	56	195	200	40	240	155	51	206
13:00	145	66	211	211	39	250	163	58	221
14:00	146	70	215	180	43	223	155	62	217
15:00	134	78	212	184	43	228	148	68	216
16:00	134	99	233	171	52	222	144	85	230
17:00	126	99	225	152	59	211	134	87	221
18:00	97	104	201	112	68	179	101	93	195
19:00	65	101	166	83	58	141	70	88	159
20:00	44	102	146	57	59	115	48	89	137
21:00	43	104	147	40	57	97	42	91	133
22:00	35	126	160	21	46	67	32	104	136
23:00	32	134	166	21	41	63	30	109	139
Total	1,832	1,884	3,716	2,230	1,030	3,260	1,946	1,640	3,586

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	73	227	300	55	133	187	70	200	269
1:00	56	203	258	49	126	175	55	180	235
2:00	42	135	177	37	87	124	41	121	162
3:00	30	92	122	28	59	87	30	82	112
4:00	29	65	94	37	43	81	31	58	89
5:00	74	71	145	45	51	96	68	64	132
6:00	177	102	279	67	41	108	153	86	239
7:00	129	108	237	115	38	152	127	90	217
8:00	165	112	277	189	49	238	172	95	268
9:00	234	114	348	277	53	330	247	97	344
10:00	270	111	381	371	47	418	297	94	391
11:00	274	108	382	422	72	494	312	97	409
12:00	273	116	389	410	82	493	309	105	414
13:00	294	127	422	425	82	507	329	114	442
14:00	281	136	417	378	93	471	307	123	430
15:00	255	156	411	368	96	464	285	138	423
16:00	243	179	422	336	116	451	267	160	427
17:00	219	183	401	275	130	405	234	166	400
18:00	182	192	374	219	141	360	192	175	368
19:00	116	186	302	151	127	278	126	167	293
20:00	86	191	278	115	122	237	94	171	265
21:00	81	201	282	82	114	197	82	176	259
22:00	76	246	322	40	95	136	68	206	274
23:00	78	257	335	42	79	120	71	211	281
Total	3,738	3,616	7,354	4,534	2,074	6,608	3,966	3,175	7,141

Hume Highway Forecast Traffic Volumes in Woomargama, 2031

2031 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	58	145	203	43	89	132	55	129	184
1:00	39	117	156	30	80	110	37	106	143
2:00	33	79	112	26	52	78	32	71	103
3:00	21	54	76	20	28	48	21	47	69
4:00	22	37	59	32	20	52	24	32	57
5:00	72	44	116	39	27	66	65	39	104
6:00	187	81	268	59	19	78	159	66	225
7:00	112	80	192	99	27	126	110	67	177
8:00	122	81	203	151	39	190	130	70	200
9:00	186	77	263	211	37	248	194	66	260
10:00	214	80	293	303	39	341	237	69	305
11:00	217	78	295	325	49	374	245	69	314
12:00	204	82	286	320	58	378	233	75	307
13:00	226	85	311	325	59	384	252	77	329
14:00	206	91	297	301	70	370	230	84	314
15:00	183	107	290	279	73	351	207	97	304
16:00	165	110	275	250	88	338	187	102	289
17:00	140	116	255	186	98	284	152	108	260
18:00	118	118	236	149	98	248	127	110	237
19:00	71	114	185	94	93	187	77	106	183
20:00	58	121	179	81	85	165	64	110	174
21:00	54	130	184	59	77	135	55	115	171
22:00	57	162	219	27	66	94	51	137	188
23:00	64	165	230	28	50	79	57	136	193
Total	2,828	2,356	5,184	3,436	1,420	4,856	3,002	2,089	5,090

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	43	160	204	33	89	122	41	140	181
1:00	39	155	194	38	89	127	39	136	175
2:00	25	103	128	25	65	90	25	91	117
3:00	20	69	89	20	51	70	20	63	83
4:00	18	50	68	20	38	58	19	46	65
5:00	31	51	82	24	41	65	29	47	77
6:00	80	59	140	41	38	79	71	53	124
7:00	82	69	151	74	25	99	81	57	138
8:00	126	73	199	133	29	161	129	61	190
9:00	165	80	245	205	36	241	177	68	244
10:00	193	72	265	255	26	281	210	60	270
11:00	195	70	265	308	50	358	224	64	288
12:00	207	77	284	297	55	352	231	70	301
13:00	216	90	306	313	54	367	242	80	321
14:00	216	96	312	267	59	326	231	85	316
15:00	200	107	307	274	59	334	220	93	313
16:00	200	136	335	254	71	325	215	117	332
17:00	188	136	324	226	81	307	199	120	319
18:00	134	141	275	155	91	246	140	126	266
19:00	90	136	226	116	78	194	97	119	216
20:00	61	137	198	79	79	158	66	120	186
21:00	59	140	199	55	77	133	59	122	181
22:00	49	169	217	29	62	91	44	140	184
23:00	45	180	225	30	55	85	41	147	188
Total	2,681	2,556	5,237	3,272	1,398	4,670	2,850	2,225	5,075

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	102	305	406	76	178	254	96	268	365
1:00	78	272	350	68	169	238	76	242	318
2:00	58	182	240	51	117	168	57	162	219
3:00	41	124	165	39	79	118	41	111	152
4:00	40	87	127	52	58	110	43	79	122
5:00	103	95	198	63	68	131	94	87	181
6:00	267	141	408	101	57	157	231	119	349
7:00	194	149	343	173	52	224	191	124	315
8:00	248	155	402	284	67	351	259	131	390
9:00	351	157	508	417	72	489	371	134	504
10:00	406	152	559	557	65	622	446	129	575
11:00	412	148	560	634	99	733	469	133	602
12:00	410	159	569	617	113	730	464	145	608
13:00	442	175	617	638	112	751	494	156	650
14:00	422	187	609	568	129	696	461	169	630
15:00	383	214	597	553	132	685	427	190	617
16:00	364	246	610	504	159	663	401	220	621
17:00	328	251	579	412	179	591	351	228	579
18:00	252	259	511	304	189	494	267	236	503
19:00	161	250	411	210	171	381	174	225	400
20:00	120	258	377	159	164	323	130	230	360
21:00	113	270	383	114	154	268	114	237	351
22:00	106	331	436	56	128	184	95	277	372
23:00	109	345	454	58	106	164	98	283	381
Total	5,509	4,912	10,421	6,708	2,818	9,526	5,851	4,314	10,165

2031 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	3	3	6	2	2	4	3	3	5
1:00	2	2	4	2	2	3	2	2	4
2:00	2	2	3	1	1	2	2	1	3
3:00	1	1	2	1	1	2	1	1	2
4:00	1	1	2	2	0	2	1	1	2
5:00	4	1	4	2	1	2	3	1	4
6:00	24	4	28	8	1	9	21	3	24
7:00	15	4	18	13	1	14	14	3	17
8:00	16	4	20	20	2	21	17	3	20
9:00	24	3	28	28	2	29	25	3	28
10:00	28	4	31	40	2	41	31	3	34
11:00	28	3	32	43	2	45	32	3	35
12:00	27	4	30	42	3	44	30	3	34
13:00	30	4	33	43	3	45	33	3	36
14:00	27	4	31	39	3	42	30	4	34
15:00	24	5	29	36	3	40	27	4	31
16:00	22	5	26	33	4	37	24	5	29
17:00	18	5	23	24	4	29	20	5	25
18:00	6	2	8	7	2	9	6	2	9
19:00	4	2	6	5	2	7	4	2	6
20:00	3	2	5	4	2	6	3	2	5
21:00	3	3	5	3	2	4	3	2	5
22:00	3	3	6	1	1	3	3	3	5
23:00	3	3	7	1	1	2	3	3	6
Total	316	73	389	399	44	443	339	65	404

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	2	3	5	2	2	3	2	3	5
1:00	2	3	5	2	2	4	2	3	5
2:00	1	2	3	1	1	3	1	2	3
3:00	1	1	2	1	1	2	1	1	2
4:00	1	1	2	1	1	2	1	1	2
5:00	2	1	3	1	1	2	1	1	2
6:00	9	2	12	5	2	6	8	2	10
7:00	9	3	12	8	1	9	9	2	11
8:00	14	3	17	15	1	16	15	2	17
9:00	19	3	22	23	1	25	20	3	23
10:00	22	3	25	29	1	30	24	2	26
11:00	22	3	25	35	2	37	26	3	28
12:00	24	3	27	34	2	36	26	3	29
13:00	25	4	28	36	2	38	28	3	31
14:00	25	4	29	30	2	33	26	3	30
15:00	23	4	27	31	2	34	25	4	29
16:00	23	6	28	29	3	32	24	5	29
17:00	21	6	27	26	3	29	23	5	28
18:00	7	3	10	8	2	10	7	3	10
19:00	5	3	7	6	2	7	5	2	7
20:00	3	3	6	4	2	6	3	2	6
21:00	3	3	6	3	2	4	3	2	5
22:00	2	3	6	1	1	3	2	3	5
23:00	2	4	6	1	1	3	2	3	5
Total	266	73	339	333	40	373	285	64	349

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	5	6	11	4	4	7	5	5	10
1:00	4	5	9	3	3	7	4	5	9
2:00	3	4	7	3	2	5	3	3	6
3:00	2	2	5	2	2	4	2	2	4
4:00	2	2	4	3	1	4	2	2	4
5:00	5	2	7	3	1	4	5	2	6
6:00	34	6	40	12	2	15	29	5	34
7:00	24	6	30	21	2	24	24	5	29
8:00	30	7	37	35	3	38	32	6	37
9:00	43	7	50	51	3	54	46	6	51
10:00	50	6	56	69	3	71	55	6	60
11:00	51	6	57	78	4	82	58	6	63
12:00	50	7	57	76	5	80	57	6	63
13:00	54	7	62	78	5	83	60	7	67
14:00	52	8	60	70	5	75	56	7	64
15:00	47	9	56	68	6	73	52	8	60
16:00	44	10	55	62	7	68	49	9	58
17:00	40	11	50	50	8	58	43	10	52
18:00	13	5	18	15	4	19	13	5	18
19:00	8	5	13	10	3	14	9	5	13
20:00	6	5	11	8	3	11	7	5	11
21:00	6	5	11	6	3	9	6	5	10
22:00	5	7	12	3	3	5	5	6	10
23:00	5	7	12	3	2	5	5	6	11
Total	582	146	729	732	84	816	624	129	753

2031 with Bypass - Bypass

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	55	142	197	41	87	128	52	126	178
1:00	37	115	152	29	78	107	35	104	139
2:00	32	77	109	25	51	76	30	69	100
3:00	20	53	74	19	28	47	20	46	67
4:00	21	36	57	30	20	50	23	32	55
5:00	68	44	111	37	26	64	62	39	100
6:00	162	78	240	52	18	69	138	63	201
7:00	97	77	174	86	26	111	96	64	160
8:00	106	78	183	131	37	168	113	67	180
9:00	162	73	235	184	35	218	169	63	232
10:00	186	76	262	263	37	300	206	66	271
11:00	189	74	263	283	47	330	213	66	279
12:00	177	78	255	278	56	334	202	71	274
13:00	197	81	278	282	56	339	219	73	292
14:00	179	87	266	261	66	328	200	80	280
15:00	159	102	261	242	69	311	180	92	272
16:00	143	106	249	217	85	302	162	98	260
17:00	121	111	232	162	94	255	132	104	236
18:00	112	116	228	142	96	238	120	108	229
19:00	67	112	179	90	91	181	73	104	177
20:00	55	118	174	77	83	160	61	107	168
21:00	51	128	179	56	75	131	53	113	165
22:00	54	158	213	26	65	91	48	134	183
23:00	61	162	223	27	49	76	54	134	187
Total	2,512	2,283	4,795	3,037	1,376	4,413	2,663	2,024	4,686

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	41	157	198	31	87	119	39	137	176
1:00	37	152	189	36	87	124	37	133	170
2:00	24	100	124	24	64	88	24	90	113
3:00	19	68	87	19	49	68	19	62	81
4:00	17	49	66	19	37	56	18	45	63
5:00	29	50	79	22	40	63	28	46	74
6:00	71	57	128	37	37	73	63	51	114
7:00	72	66	139	66	24	89	71	55	126
8:00	112	70	182	118	27	145	114	59	173
9:00	146	77	223	182	34	216	156	65	221
10:00	171	70	240	226	25	251	186	58	243
11:00	172	68	240	273	48	321	199	61	260
12:00	183	74	257	263	53	316	205	67	272
13:00	191	87	278	278	52	329	214	76	291
14:00	192	92	284	237	57	294	205	81	286
15:00	177	103	280	243	57	300	195	90	285
16:00	177	130	307	225	68	293	190	113	303
17:00	167	130	297	200	78	278	176	115	291
18:00	127	138	265	147	89	236	133	123	256
19:00	86	133	219	110	76	186	92	117	209
20:00	58	134	192	75	77	152	63	118	181
21:00	56	137	193	53	76	128	56	120	175
22:00	46	165	212	28	61	88	42	137	179
23:00	42	176	219	28	54	82	39	144	183
Total	2,415	2,483	4,898	2,939	1,358	4,297	2,565	2,162	4,726

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	97	299	395	72	175	247	92	263	355
1:00	74	267	341	65	166	231	72	237	310
2:00	55	178	233	49	115	163	54	159	213
3:00	39	121	161	37	77	115	39	108	148
4:00	38	86	123	49	57	106	41	77	118
5:00	97	93	191	59	67	126	89	85	174
6:00	233	135	368	88	54	142	202	114	315
7:00	170	143	313	151	49	201	167	119	286
8:00	217	148	366	249	64	313	227	126	353
9:00	308	150	458	366	69	435	325	128	453
10:00	356	146	502	488	62	551	391	123	515
11:00	361	142	503	556	95	651	412	128	539
12:00	360	152	512	541	108	649	407	138	545
13:00	388	168	556	560	108	668	433	150	583
14:00	371	179	550	498	123	621	405	162	566
15:00	336	205	541	485	126	612	375	182	557
16:00	320	236	556	442	153	595	352	210	563
17:00	288	241	529	362	171	534	309	218	527
18:00	240	254	493	289	185	475	254	231	485
19:00	153	245	398	199	167	367	166	221	386
20:00	114	252	366	151	160	312	124	225	349
21:00	107	265	372	108	151	259	108	232	341
22:00	100	324	424	53	126	179	90	271	362
23:00	103	338	442	55	103	159	93	278	371
Total	4,927	4,766	9,692	5,976	2,734	8,709	5,228	4,185	9,413