

Typical construction noise mitigation measures	Anticipated noise reduction (dBA)
Orienting equipment away from sensitive receivers	3-5
Carrying out loading and unloading away from sensitive receivers	3-5
Using dampened tips on rock breakers	3-6
Using noise source controls, such as residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	5-10

9.5 Social and economic

A social and economic assessment for the project has been undertaken as presented below.

DGRs	Where addressed
Social and economic (including but not limited to):	
The agricultural sector taking into account the fragmentation and potential loss of prime agricultural land, stock diseases and the impact of a revised road network on quarantined properties and travelling stock reserves/route.	Sections 9.5.2, 9.5.3, 9.5.4
Local community socio-economic impacts arising from changes to landuse, property, amenity and connectivity.	Sections 9.5.2, 9.5.3, 9.5.4
Business (including agribusiness) impacts, including the overall viability, profitability, productivity and sustainability of businesses.	Sections 9.5.2, 9.5.3, 9.5.4

9.5.1 *Assessment approach*

An assessment of the social and economic impacts is presented below. The assessment is informed by the following surveys and interviews:

- Highway-related businesses survey, which identified and profiled businesses in Woomargama village.
- Stopping motorist survey, which identified reasons for travel, origin and destination, previous stop locations, length of stop and expenditure patterns.
- Overnight stayers survey, which identified origin and destination, purpose and mode of travel, length and frequency of stay and expenditure patterns.
- Interviews with business owners directly affected by the project which established profiles for each business and considered impacts of the project on business operations.
- Discussions with agribusiness owners directly affected by the project to consider impacts of the project on agribusiness operations.
- Consultation with the community.

The assessment was supported by baseline socio-economic data comprising Australian Bureau of Statistics (ABS) Census Data (2001 and 2006) and planning documents to understand the social and demographic profile of Woomargama. It was also informed by observations made during site visits, and the key findings of other technical investigations for the project, the *Woomargama Vision 2018* (Greater Hume Shire Council 2008) and previous economic assessments of bypassed towns and the economic assessment undertaken during this environmental assessment.

9.5.2 *Existing social and economic environment*

Social profile

The village of Woomargama is located along the existing Hume Highway in a rural environment. The main land use surrounding the village is agriculture — primarily grazing and cropping. Beef cattle, lamb and wool production are key farming activities. The production and harvesting of fodder crops, such as lucerne and oats, and grazing activities, are common land uses throughout the region.

Woomargama is located in proximity to the larger towns of Holbrook and Albury. Residents have access to employment, and goods and services in these towns that are not accessible or available in Woomargama (Greater Hume Shire Council 2008).

Woomargama's commercial activities comprise a service station, hotel/motel, post office and an earthworks contractor. Community facilities include tennis courts, a church, community hall (with childcare), bushfire brigade and a park/playground adjacent to the existing highway. The Woomargama National Park is also nearby.

Discussions with local businesses indicate that for the service station and the hotel/motel highway-related trade accounts for 60 to 90 per cent of their business. The motel part of the business has a relatively low annual occupancy rate of around ten per cent.

The population of Woomargama¹ locality in 2006 (ABS 2006) was 251 persons (122 female; 129 males). Of this, around 80 people live in the village of Woomargama itself. In the Woomargama locality, the median age is 41 years, while the highest proportion of people are aged between 25 and 54 years (103 persons). There has been an increase in population over the period of 2001 to 2006, which suggests an increased popularity of the area. This is likely to be associated with the proximity of the area to Albury.

In 2006 the most significant industry groups of employment in the Woomargama state-suburb were agriculture, forestry and fishing (35.3 percent). The most common occupation was managers (30.4 percent). A survey undertaken during the Woomargama visioning study indicated that 45 per cent of respondents travel outside the district to work. Half of these respondents travel to Albury, while the other half travel to Holbrook, around the region or interstate (Greater Hume Shire Council 2008).

The existing Hume Highway serves as the main street of the village. Properties within the village are currently affected by traffic noise from the existing highway, while rural properties directly affected by the project are predominantly removed from these impacts.

Business profile

Woomargama is a small village with limited business services which include a service station, a hotel/motel, an earthworks contractor and a post office. Consequently, the local population tend to rely on businesses and services in Albury and Holbrook for most of their lower and higher order goods.

Prior to 2008 post office services were available at the service station. In late 2008 the post office was established as a stand alone business in the village. As the business is new and was not operating as a stand alone business when business surveys were undertaken for the project, it is not known whether or not the business is currently profitable or viable. The post office is typical of business services provided in small towns and is expected to be primarily dependent on local trade rather than stoppers from passing highway traffic.

¹ Based on the ABS definition of the Woomargama state-suburb. A state-suburb is a census-specific area of aggregated census collection districts to approximate a gazetted suburb or locality.

The earthworks contractor is not dependent on highway trade and has contracts associated with the Hume Highway duplication and other government departments. The remaining businesses, the service station and the hotel/motel, are more dependent on passing traffic and may be identified as being highway-related.

Information obtained during surveys highlighted the contribution of passing trade to the service station and hotel/motel. These businesses are likely to be profitable and viable based on the current level of passing trade. The businesses indicated that they have experienced increases in business activity over the past five years, possibly due to the opening of the Albury bypass and as a result of construction activity currently occurring on the highway.

The sustainability of these highway-related businesses would rely mainly on passing trade and local population. Without the proposed bypass, it is likely that the service station and hotel/motel may continue to be sustainable due to the likely increase in passing trade generated by traffic growth along the Hume Highway. The ability to remain sustainable may also be influenced by the age distribution of the population. Although the population of Woomargama is ageing, the locality has become increasingly attractive due to its proximity to Albury. This may attract younger adults who could potentially support the local economy.

Agribusiness profile

The project directly affects three large rural properties that are all around 1400 hectares in size. These properties are commercial agricultural businesses where agricultural activity provides the majority of the income. The primary rural activities conducted on these properties include cattle and sheep grazing with opportunity cropping of winter cereals (triticale and winter wheat) on arable land. The crops are generally dual purpose with grain yields dependent on seasonal conditions. Some of the better quality land is sown to lucerne pastures.

Land use

The project passes through land zoned as I(a) – Non Urban ‘A’ purposes under the *Holbrook Interim Development Order No 1*. This is proposed to be zoned RU1 Primary Production under the *draft Greater Hume Local Environmental Plan 2009* which is an equivalent zone to the current I(a) zoning and will not significantly alter the current permissible land uses in the vicinity of the project.

The council development application register and the Department of Planning major projects register were searched to ascertain if there were any major development proposals located close to the project. Apart from the Hume Highway duplication and bypass projects, no significant development proposals were identified.

The rural land capability in the locality varies from Class 2 (most suitable for cropping) through to Class 7 (tree cover) as identified in the eight-class Rural Land Capability classification system (NSW Department of Land and Water Conservation) (see Figure 9-9). The land classes on properties impacted by the project vary from Class 2 to Class 6 and the dominant land uses vary accordingly.

There are no travelling stock routes located in Woomargama. The Hume Livestock Health and Pest Authority has advised that the nearest stock crossing is at Holbrook. Although there are stock reserves along the existing Hume Highway these would not be affected by the project.

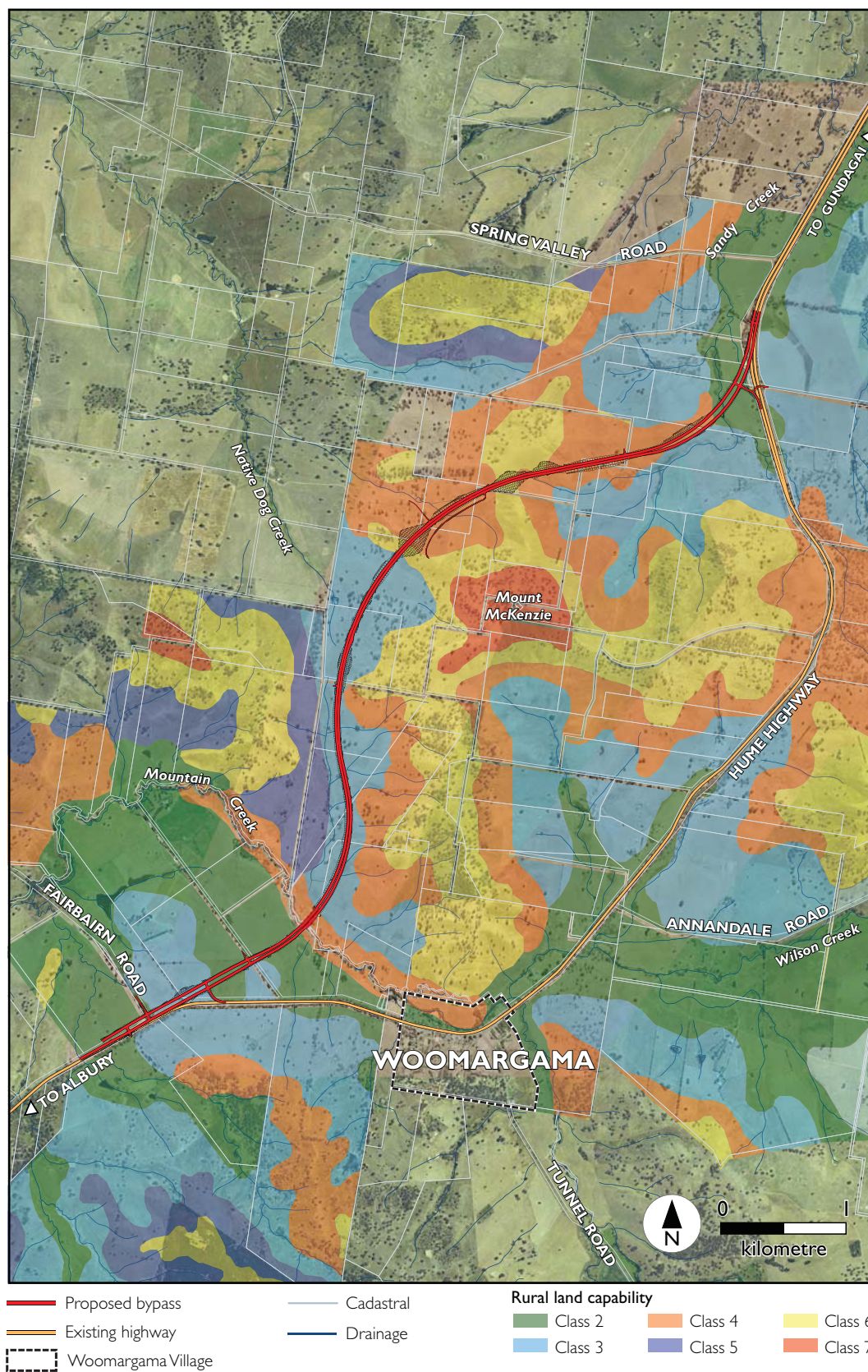


Figure 9-9 Land capability in the locality

9.5.3 *Social and economic impacts*

Impacts attributable to the project during construction and operation are discussed in this section.

Local community

Traffic

Construction

Construction works have the potential to cause temporary inconvenience to the community and interrupt local travel on local roads and the existing highway. This is due to changes in traffic and local access that would occur during construction, including increases in heavy vehicles on the road network and diversions (see construction traffic impacts as detailed in Section 9.6.3). Intersection arrangements would be provided to facilitate the safe movement of vehicles into the construction site from the surrounding road network.

Operation

The removal of through traffic on the existing highway and local road access arrangements would support social cohesion within the confines of the Woomargama village.

The project is also expected to contribute to improved safety and amenity along the existing Hume Highway and within Woomargama village by reducing conflicts between local traffic and through traffic and by reducing traffic noise.

At grade intersections would be provided at the northern and southern sections of the project to allow access to Woomargama village and the local road network.

Property

Acquisition

Land acquisition would be limited to three agricultural based properties. The final road corridor would require the acquisition of about 85 hectares of agricultural land. Acquisitions would be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and the *RTA Land Acquisition Policy* (1999).

Land use

The project would not change land use apart from the introduction of the highway into the rural land use environment. There are no known major development proposals in the locality that would be impacted by or impact on the project.

Connectivity and severance

The project would improve connectivity and cohesion to Woomargama village for rural residences located along the existing highway due to the reduction in through traffic and volume of heavy vehicles. Access for the surrounding community to the village of Woomargama would be supported through the design of effective connections with and between local roads, at the southern and northern end of the project to maintain access to the Woomargama village, and at Fairbairn Road.

The project could result in changes to local travel patterns. The increased control of access points would, however, result in substantially improved safety benefits compared to the many potential conflict points along the existing highway.

The project would result in some severance of existing rural landholdings. Further consultation would be carried out with landowners to develop measures to manage impacts on agricultural production during construction and operation.

Access

The project would result in both temporary and permanent changes to some property access arrangements. If required, temporary access during construction or permanent alternative access would be provided in consultation with the affected landowner(s).

Amenity

Construction

Potential amenity effects during construction would include noise and dust (detailed in Sections 9.4 and 10.4, respectively). There would also be visual impacts in terms of outlook to the construction site and ancillary facilities from some properties. Road construction on the Hume Highway has been occurring to the south and north of Woomargama for the past few years. Local residents and communities, to a certain degree, are accustomed to construction activities. However, prolonged construction activity could cause a level of annoyance related to multiple inconveniences over a period of time within the community, potentially causing 'construction fatigue'. The community would be kept informed of any changes to access, traffic and construction activities.

Operation

The project would remove the majority of through traffic, including heavy vehicles, from the existing highway (refer Section 9.6). This would improve the amenity of the village through a reduction in traffic noise, vibration, air emissions and traffic conflicts. All residences along the existing highway in the village are predicted to experience a reduction in noise levels as most through traffic would predominantly use the project rather than travel on the existing highway through Woomargama.

Rural properties close to the project may experience a decline in visual amenity and an increase in noise, depending on the situation of the residence and the topography of the surrounding land. Where noise criteria exceedances are predicted, all reasonable and feasible mitigation measures would be developed and implemented in consultation with the sensitive receiver(s), where required (refer Section 9.4.6). Landscape measures are also proposed to minimise visual amenity impacts for affected rural properties (see Section 10.3).

Viability, profitability, productivity and sustainability of businesses

Construction

During construction the project is likely to have positive economic benefits for local and regional businesses. The economic benefits from construction personnel (up to 300 workers) may provide localised economic stimulus and increased business turnover from the workforce purchasing local goods, services and accommodation, engagement of local goods and services for construction as well as more regional economic benefits through the provision of specialised goods and services.

Operation

During operation of the project, impacts are likely to be greater for the hotel/motel and the service station than for the post office and earthworks contractor. However, indirect impacts would be experienced by the community generally.

Previous studies of the impacts of highway bypasses have indicated that there is a reduction in stopping traffic (ie typically short stops for fuel, food, rest facilities etc) following the opening of a bypass. In Yass (Parolin and Garner 1996) this was estimated as a 50 per cent reduction in stopping traffic and in Karuah (Rowe and Phibbs 2005) in excess of 90 per cent reduction. A reduction in stopping trade can result in short-term impacts including a decrease in the value of highway-generated trade, the closure of highway-related businesses, loss of jobs and flow-on effects for other businesses and the community as a whole, predominately caused by the out-migration of population.

The project would alter patronage to the two highway dependant businesses (ie the service station and hotel/motel) as traffic wishing to access these businesses would have to leave the Hume Highway and enter Woomargama via the northern or southern at-grade intersections. The extent of adverse impact due to the change in traffic patterns and access would largely be a function of reliance on passing trade. The results from the stoppers survey suggests that at least 50 per cent of those who currently stop in the village would no longer stop once the project is opened.

The hotel/motel and service station expect that decreases in turnover would occur as a result of the project. The owners have predicted that this would be at least 75 per cent at the hotel/motel and 95 per cent at the service station.

The impact of the project on gross annual turnover in highway-related businesses is likely to be considerable. Information collected through survey data suggests that this reduction could be in the order of 50 to 85 per cent. The survey data also suggests that one part-time position could be lost following project opening.

The service station owners have indicated that they may have to extend hours of trade to maintain a profitable business, and it may be that the business would close. Residents would have to travel to Albury or Holbrook for provisions previously available from the service station.

The impact on the local economy from the stayers trade (that is, those staying overnight in the village) at the hotel/motel is likely to be least affected by the project. Previous studies of bypassed towns have indicated that the accommodation sector is likely to experience higher activity levels in the immediate post-bypass period compared to the pre-bypass period (Parolin and Gardner 1996), as well as in the longer term. This is as a result of the improved amenity of the bypassed town, which is appealing to both potential short-term and long-term stayers and the increased tourism potential.

While the survey data collected is limited in terms of timeframe and seasonality, it highlights the potential for adverse impacts of the project on the viability, profitability, productivity and sustainability of highway-related businesses in Woomargama. The adverse impacts of the project on turnover and employment are likely to affect the profitability and viability of the highway-related businesses. At worst this may result in closure of the businesses. This would be significant for the individual businesses but would have a minimal impact on the larger community of Woomargama as there is only a small local reliance on these services. It may also be that other businesses, or new businesses, could capture any residual demand for services provided by those businesses that have closed.

Impacts are likely to be less severe for the motel component of the hotel/motel as it is a convenient stopping point between Sydney and Melbourne. Those who currently stay overnight are likely to continue to stop and additional stayers may be attracted by the improved amenity in Woomargama. The income generated by the hotel/motel may also have some positive effects on other businesses in Woomargama as income would flow from both the motel and the stayers themselves.

As has occurred with other bypasses, the project may allow some businesses to capitalise on the improvements in amenity in the village and redirect trade towards local patronage, attracting more locals to shop in Woomargama rather than in Holbrook or Albury. This can include focussing on improvements to services, appearance of premises, promotions and advertising (Parolin and Garner 1996). These changes to business can often add to amenity and attract more travellers to stop. From the experience of other bypasses, it is expected that initial negative impacts may be reduced over time, once the community re-establishes itself (Chase and Gustavson 2004).

The project, and nearby Hume Highway duplication works would reduce travel times to nearby towns and service centres, and Woomargama may become a more attractive place to live for commuters. Should this occur, population growth and employment may increase the use of local businesses and services or encourage new businesses or services to develop.

The community in Woomargama has been proactive in setting objectives for the village to achieve over the next 10 years as reflected in the *Woomargama Vision 2018* (Greater Hume Shire Council 2008). This vision includes the possibility of new business opportunities within the village related to tourism and recreational based trade. If the community and relevant stakeholders remain active in implementing the vision this may assist longer term business sustainability. To further assist in fostering longer-term business sustainability and to encourage the development of new business opportunities in Woomargama (and in the local government area generally), the RTA is providing support and partial funding to Greater Hume Shire Council over a two year period for the employment of an economic development officer. The economic development officer would assist in the implementation of the *Woomargama Vision 2018*. Section 9.5.3 outlines some additional opportunities for consideration by relevant stakeholders, the community and local businesses to develop opportunities to sustain viable businesses following project opening and into the longer term.

Viability, profitability, productivity and sustainability of agribusinesses

The extent of impact to individual agribusinesses is influenced by how much land is affected and whether productive land is severed. The project would result in the loss of some agricultural land which would impact on the viability, profitability, productivity and sustainability of agribusiness.

The three rural properties directly affected by the project would experience different levels of agribusiness impacts. The RTA has held discussions with all directly affected landowners on how to best minimise the impact on the function and amenity of their land use.

On two of the affected properties there would be substantial severance impacts. To minimise the ongoing farm management issues resulting from severance, these landowners have identified that they would prefer that the RTA purchase the land that would be fragmented by the project.

Loss of land may reduce production, which in turn may reduce profitability. Reductions in profitability may reduce viability of the agribusiness but the extent would depend on the individual business structure. Reduction in viability may have an impact on employment of labour for individual agribusinesses.

For one of the directly affected agribusinesses, impacts would be limited to minor edge effects. A small area of productive land, less than one per cent of the property, would be acquired adjoining the property boundary for the project. This would be unlikely to result in any significant impacts on the viability, profitability, productivity or sustainability of this agribusiness.

For the other directly affected agribusinesses, larger portions of the properties may be acquired for the project or purchased (between 20 and 40 per cent of the properties). Purchase of land, primarily to the east of the project, in preference to severing these properties, would minimise fragmentation impacts on agribusiness operations. The land area of these properties would continue to be of a sufficient size to maintain viability of these agribusiness operations into the longer term.

The loss of land is likely to have an impact on the profitability and productivity of the affected agribusinesses. To some extent, the loss of agribusiness profitability and productivity would be offset by acquisition or purchase of the land. Land would be purchased at an unaffected market value that reflects the current productive potential. There may be opportunities for diversification of operations and/or employment of more efficient farm management practices, which may assist in maintaining the long-term sustainability of individual agribusinesses.

As discussed above, fragmented land may be purchased in addition to that required for the final road corridor. During construction this land would be temporarily unavailable for agricultural production if purchased. This land would likely be sold following completion of the project and would then continue to be available as productive agricultural land. These portions of land are of sufficient size to support the development of new agribusiness operations.

The loss of around 85 hectares of productive land required for the final road corridor would result in the loss of around 0.1 per cent of the agricultural land in the Greater Hume Shire. No prime agricultural land (land capability Class 1) would be impacted by the project. Impacts would be to land ranging from land capability Class 2 (most suitable for cropping) through to Class 6 (grazing land) (refer Figure 9-9). The loss of this agricultural land would have minimal impact on the viability, productivity and sustainability of agribusiness in the region.

The agricultural sector

Fragmentation and loss of prime agricultural land

As outlined above, the project would not result in the loss of any prime agricultural land. The project has sought to minimise the fragmentation impacts on the agricultural sector and where agricultural properties are fragmented by the project, the resultant portions would continue to be of a sufficient size to maintain agricultural viability. These impacts would be negligible at the regional level.

Stock diseases and the impact of a revised road network on quarantined properties and travelling stock reserves/route

Individual access would be provided for all agricultural properties as part of the project. In the event of a stock disease outbreak, access arrangements would allow for individual agricultural properties to be quarantined if required. As outlined above, there are no travelling stock routes located in Woomargama. There is one stock reserve at the northern end of the project. This is located on the eastern side of the existing highway. The stock reserve would not be impacted by the project and access to the reserve would be maintained.

9.5.4 Management of impacts

Table 9-36 identifies the mitigation and management measures that would be implemented for social and economic impacts. These measures have been incorporated into the draft statement of commitments in Chapter 11. The measures to mitigate and manage construction impacts associated with noise and vibration, traffic and air quality are addressed in Sections 9.4, 9.6 and 10.4 respectively.

Table 9-36 Social and economic mitigation and management measures

Potential impact	Mitigation and management measure
<i>Pre-construction</i>	
Impacts on viability of directly affected agribusiness enterprises	- Undertake all property acquisitions required for the project in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and the RTA's (1999) <i>Land Acquisition Policy</i>. - Undertake consultation with affected landowners throughout detailed design and construction to develop and implement reasonable and feasible measures to mitigate impacts on land use viability and infrastructure. - Continue consultation with Greater Hume Shire Council through detailed design and construction to assist in developing strategies to encourage the continued viability of Woomargama and the further development of the <i>Woomargama Vision 2018</i> (Greater Hume Shire Council 2008).
<i>Construction</i>	
Construction impacts leading to reduced community cohesion and non-acceptance of the project	Keep the community informed with measures such as: - Letter box drops, media releases and community updates. - An internet site established and maintained for the duration of the project. - Variable message signs. - Targeted consultation with affected individuals or groups. Information to be provided will include: - Changes to access and traffic conditions. - Details of future works programs. - General construction progress.
Property access	Maintain property access for the duration of the construction. Should temporary or alternative access be required this would be provided in consultation with the affected landowner(s).
Positive benefits on social and economic environment of Woomargama during construction	Locally source construction materials and other products and services as far as possible.
<i>Operation</i>	
Reduction in motorists stopping in Woomargama impacting the economic viability of highway-related businesses	- Provide appropriate signage near to the northern and southern intersections with the project. - Provide funding and support to Greater Hume Shire Council over a two year period for the employment of an economic development officer.

In addition to the management measures to be implemented by the RTA, experience from other bypass projects has shown that other strategies could be adopted by the community or other stakeholders to assist in managing certain social and economic impacts of the project.

These strategies typically seek to identify future advantages that can be realised for the local community when a bypass has been opened. They usually relate to programs that enhance the character and amenity of community places or areas and that promote and revitalise business activities and community events.

In this context, the opportunities identified below are presented for consideration by stakeholders such as Greater Hume Shire Council and individual businesses. The potential measures outlined below do not form part of the draft statement of commitments identified in Chapter 11 nor do they amount to an exhaustive list:

- Enhance the amenity of Woomargama through the development of a streetscape and heritage strategy. This would contribute to the achieving the objectives of the *Woomargama Vision 2018* (Greater Hume Shire Council 2008).
- Increase local business promotional activities for Woomargama (promote the village to attract local residents or tourism).

The RTA has commenced discussions with Greater Hume Shire Council to assist in developing strategies to encourage the continued viability of Woomargama. Consultation would continue throughout construction and operation of the project.

9.6 Traffic and transport

A detailed traffic and transport assessment was undertaken for the project as presented below. This is supported by *Technical Paper 6 — Traffic and Transport* (Volume 2).

DGR	Where addressed
Traffic and transport (including but not limited to):	
Demonstrate how the preferred route and road design meets the traffic and transport objectives for the project, particularly with respect to increasing infrastructure handling capacity and efficiency, and improving transport productivity on nationally strategic and export-oriented freight corridors.	Sections 9.6.1, 9.6.4, 3.3, 12.1.1 Technical Paper 6 (Volume 2)
Construction traffic impacts, including spoil haulage, and potential disruption to existing school bus services and travelling stock routes.	Section 9.6.3 Technical Paper 6 (Volume 2)
Operational traffic and transport impacts to the local and regional road network, including direct impacts from replacement of the existing highway that currently passes through the town centre.	Section 9.6.4 Technical Paper 6 (Volume 2)
Determine traffic capacity of the proposal and its ability to cater for predicted growth. Consideration should be given to what effect potential major land use changes in the locality may have on the traffic assessment outcomes.	Section 9.6.4 Technical Paper 6 (Volume 2)
Consider the opportunity for the provision of cycle way connections along the highway and to adjoining communities.	Section 9.6.4 Technical Paper 6 (Volume 2)

9.6.1 *Assessment approach*

Technical Paper 6 (Volume 2) provides a detailed description of the approach taken for the traffic and transport assessment. The assessment included:

- Patterns and trends of traffic on the Hume Highway were established using existing traffic data as well as additional data gathered for the project:
 - Classified tube counts conducted from Saturday 31 May to Friday 13 June 2008.
 - Turn count surveys from 12pm to 6pm on Tuesday 1 April 2008.
- Traffic flow and pattern predictions were made into the future to assess the potential impacts of the project.

9.6.2 *Existing traffic and transport environment*

Existing traffic volume

Traffic volumes surveyed at the northern end of Woomargama and in the centre of the village were annualised to give indicative annual average numbers for 2008. The volumes at the two survey locations were similar. The survey data from the centre of Woomargama has been used for this assessment. Table 9-37 shows the annual average daily traffic (AADT) existing traffic volumes for the centre of Woomargama.

Table 9-37 Existing traffic volumes (AADT) in Woomargama

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday	1498	1248	2746	1421	1354	2775
Weekend	1820	752	2572	1734	741	2475
Weekly	1590	1107	2697	1510	1179	2689

Traffic volumes change throughout the day. Figure 9-10 shows that for northbound and southbound traffic, the bulk of light vehicle traffic occurs in the middle of the day while heavy vehicle traffic builds steadily from a low at 4am to a peak around midnight.

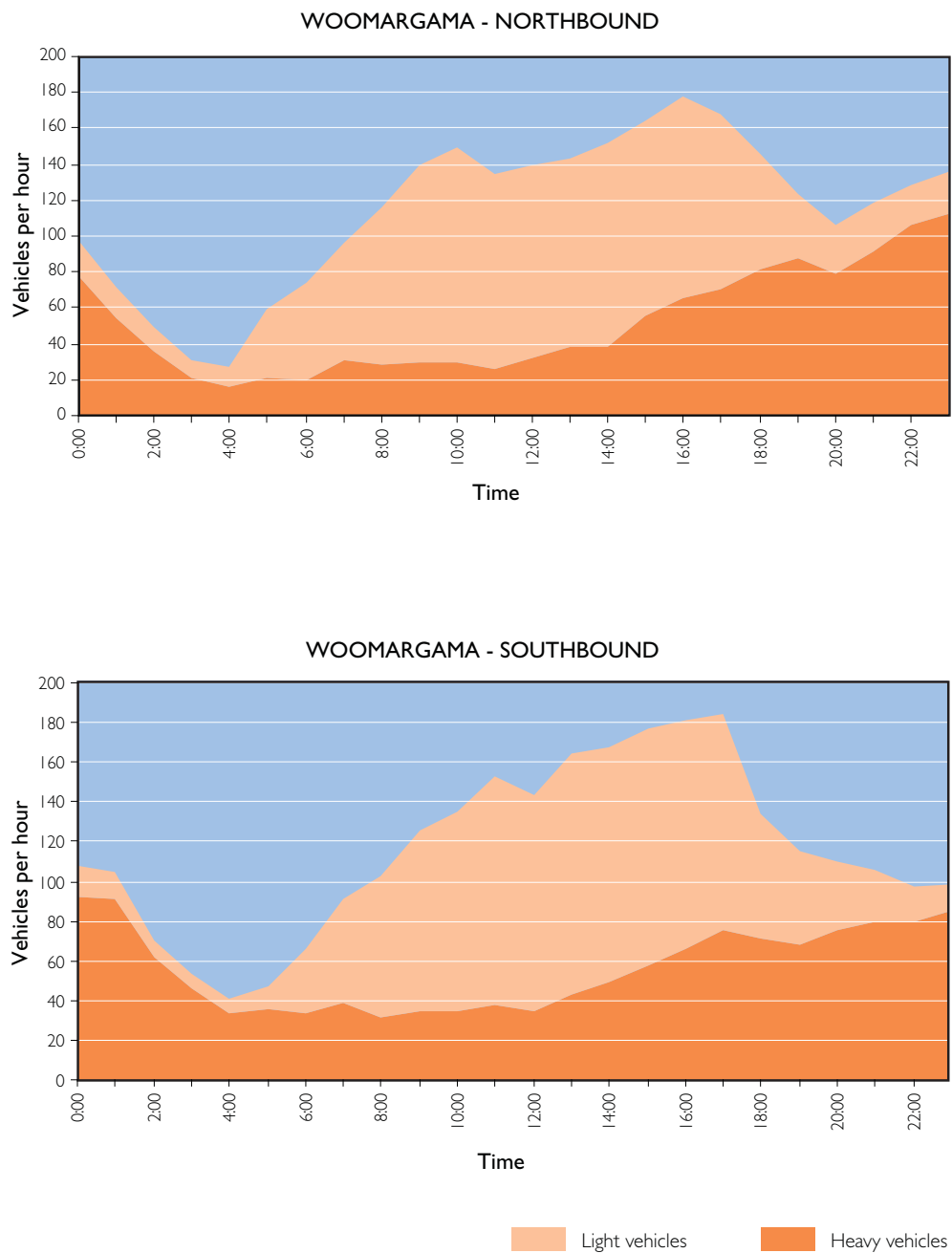


Figure 9-10 Hourly change in traffic volume on the Hume Highway in Woomargama

Peak hour traffic volumes on the Hume Highway in Woomargama are summarised in Table 9-38.

Table 9-38 Peak hour traffic volumes in Woomargama

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday midday peak	112	66	178	116	65	181
Weekday night-time truck peak	23	112	135	14	85	99
Weekend	138	25	163	164	34	198
Weekly	120	63	183	130	57	187

The peak traffic time for all vehicles is between 4pm and 5pm on weekdays and weekends. The peak heavy vehicle volume occurs between 11pm and midnight due to Woomargama being close to the halfway point between Melbourne and Sydney. Heavy vehicles pass through Woomargama at this time having left Melbourne or Sydney after the evening peak and aiming to arrive at their destination before the start of the morning peak.

Travel patterns

The proportion of vehicles making turning movements off the highway, as indicated by the turn count survey, is provided in Table 9-39. The assessment identified that approximately half the vehicles turning off the highway do so at the service station.

Table 9-39 Proportion of vehicles turning off the highway in Woomargama

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	1025
Sum of turning movements at all three intersections	85	14	99	92	12	104
Proportion of traffic turning off the highway ¹	15%	4%	11%	13%	4%	10%

Note: 1. Proportion of traffic turning off the highway as a percentage of total vehicle number.

Tunnel Road in Woomargama village provides an alternative minor connection to Jingellic. Some traffic along this road is associated with logging trucks that access forestry areas such as Woomargama State Forest to the south-east of Woomargama. Logging trucks using Tunnel Road turn onto the existing Hume Highway and may head north or south depending on their market.

Road network performance

The amount of congestion on a road is related to the volume of traffic, the characteristics of the road and the composition of the traffic stream. The mid-block level of service (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 ratings of A to F, with A the best and F the worst. An LoS of D or better is considered acceptable. The estimated road LoS at peak times in Woomargama was determined from estimates of the volume to road capacity ratio, as summarised in Table 9-40.

Table 9-40 Road LoS in Woomargama at peak times

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

In general, traffic conditions on the highway through Woomargama are acceptable. Conditions are worse during the night due to the high volume of heavy vehicle traffic, but are still acceptable.

Crash history

Crash records provided for the period 2002 to 2006 indicate that eight crashes were recorded on the stretch of highway through Woomargama equating to a crash rate of 12.75 crashes per hundred million vehicle kilometres travelled (MVKT). The crash statistics indicate the following:

- Three crashes occurred at or near the bend toward the northern entry into the village. The remaining crashes occurred along the length of the highway.
- Speeding contributed to two crashes and driver fatigue contributed to four crashes.
- Three crashes involved heavy vehicles.
- The crash rate on undivided sections of the Hume Highway between the Sturt Highway and Olympic Highway is approximately 15 per cent higher than on divided sections. The severity of crashes on the undivided sections is approximately 85 per cent higher than on divided sections.
- The crash rate on the single carriageway section of highway through Woomargama is lower than divided carriageway sections of the Hume Highway between the Sturt Highway and Olympic Highway and typical two-lane rural main roads. However, it should be noted that this crash rate is calculated from a relatively low number of total crashes.

9.6.3 Construction traffic and transport impacts

Construction programming and temporary works

The proposed construction works would be programmed to minimise the interaction between the construction works and the local and regional road network. This would minimise disruption to local and through traffic.

Temporary roadworks would be required during construction to tie the existing road network into the construction works at the northern and southern ends of the project. Temporary roadworks may be constructed under traffic and could result in some short-term traffic impacts to users of the existing road network.

Construction traffic

An estimate has been made of the number of construction vehicle trips per day on the public road network (for the purposes of this calculation, a trip is considered as an in or out movement, hence a delivery would be counted as two trips). The number of vehicles would vary depending on the construction activities being carried out. This could be up to:

- 350 staff vehicles.
- 50 equipment deliveries.
- 650 material deliveries.
- 100 other movements.

The construction activities are estimated to generate in the order of 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 of average weekday traffic respectively. The vehicles would generally be split equally between the existing northern and southern carriageways.

Spoil haulage

As outlined in Section 6.3.1, the project is not likely to generate excess spoil as the design seeks to achieve balanced earthworks. If spoil haulage is required, vehicles would use the proposed construction haul roads and the existing road network.

Access impacts

Site compound

Section 6.6.1 details the likely location of the main site compounds. Right turn lanes and widened shoulders would be provided at site compound entries, where construction turning volumes are likely to be high or where adverse geometry exists. Vehicles arriving at the site in the morning would do so during periods of lower traffic volume. Vehicles leaving the site compound during the early evening are likely to experience higher traffic volumes on the highway.

Construction access

Access points at the northern and southern tie-in points would be required to facilitate construction activities. Right turn lanes and widened shoulders would be provided where construction turning volumes are likely to be high or where adverse geometry exists. All access points would:

- Have safe intersection sight distances.
- Accommodate the turning movements of the largest heavy vehicle.

Local roads

During construction, some temporary changes to access arrangements may be needed for local roads, including to Fairbairn Road. Temporary changes to access arrangements would consider the turning requirements of school buses and would be finalised during detailed design.

School bus services

School bus services operate on the Hume Highway between 7.15am and 8.30am and between 4pm and 5pm. Local bus operators and the community would be consulted on any alternative arrangements required for school bus stops around the southern and northern tie-in works.

Public transport

Long-distance bus services between Sydney and Melbourne also use the existing highway. These services stop in Woomargama when requested. Access to Woomargama would be maintained throughout construction so these services would not be affected.

Properties

Property access would be maintained for the duration of the construction. If required, temporary or alternative access would be provided in consultation with the affected landowner(s).

Heavy vehicles

The Hume Highway plays a vital role in the transport of goods by road between NSW and Victoria. To reduce the impact of construction on road freight, night-time construction affecting highway traffic would be minimised.

Pedestrians and bicycles

Access for pedestrians and cyclists in and around Woomargama would be maintained throughout construction. Any temporary changes to these access arrangements would be undertaken in accordance with RTA requirements.

Travelling stock route

There are no travelling stock routes that would be affected by the project.

9.6.4 Operational traffic and transport impacts

Travel times

The current travel time for the 10.1 kilometre section of existing Hume Highway that would be bypassed is six minutes and 31 seconds. The travel time on the project has been estimated to be four minutes and 55 seconds based on a posted speed limit of 110 kilometres per hour and a length of nine kilometres. Therefore, it is estimated that the project would result in a travel saving of one minute and 36 seconds.

Local access

All local road access would be maintained for operation of the project. Some local accesses would need to be altered from their existing arrangements. This would be confirmed during detailed design in consultation with the relevant road authority and any affected landowners.

Impacts from the replacement of the existing highway through Woomargama village

The existing highway would assume a local road function upon project opening. Access to the village and the local road network would be provided at the north and the south of the project via at-grade intersections.

Travel patterns

The project would provide a shorter travel time and less disrupted journey than travelling through the village. It is likely that travellers seeking a faster journey would use the project. The forecast proportions of traffic that would use the project are shown in Table 9-41.

Table 9-41 Proportion of vehicles predicted to use the project

Traffic movement	Northbound		Southbound	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Daytime proportion of vehicles using the project — 6am to 6pm	87%	96%	89%	96%
Night-time proportion of vehicles using the project — 6pm to 6am	95%	98%	95%	98%

Logging trucks using Tunnel Road would continue to use the existing highway during operation of the project. The logging trucks would travel along the existing highway either to the south (ie through the village) or to the north and then join the project.

Traffic volume

If the project did not proceed, traffic volumes would continue to increase. The 2008 volumes have been factored up using a 2.8 per cent per annum growth factor for the design years of 2011, 2021 and 2031. Table 9-42 shows the forecast traffic volumes on the existing highway in Woomargama if the project did not proceed.

Table 9-42 Future AADT volumes in Woomargama without the project

Year	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
2011	1728	1202	2930	1640	1281	2921
2021	2277	1585	3862	2162	1688	3850
2031	3002	2089	5090	2850	2225	5075

If the project proceeds, the majority of the traffic currently using the existing Hume Highway would transfer to the project. The forecast volumes on the existing highway with the project are shown in Table 9-43.

Table 9-43 Future AADT volumes on existing highway in Woomargama with the project

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 forecast traffic volumes on the project are shown in Table 9-44.

Table 9-44 Future AADT volumes on the project

Year	Northbound			Southbound		
	Light Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Heavy Vehicles	Total Vehicles
2011	1533	1165	2698	1476	1244	2720
2021	2020	1535	3555	1946	1640	3586
2031	2663	2024	4687	2565	2162	4727

Road network performance

Traffic volumes on the highway are forecast to increase with or without the project. This will have an impact on the LoS experienced on the existing highway. Table 9-45 shows the future LoS if the project does not proceed as well as the LoS on the project and existing highway if the project does proceed. If the project were not to proceed, unacceptable conditions (LoS E or F) would be experienced during peak traffic times through the year (eg long weekends and school holidays) in the years 2021 and 2031. Traffic under normal conditions would remain within the acceptable range.

Table 9-45 Future LoS with and without project

	No project		Project			
	Hume Highway		Existing Hume Highway		Project	
	vol/cap ratio	LoS	vol/cap ratio	LoS	vol/cap ratio	LoS
2008						
50 th highest hourly volume (H ₅₀)	0.43	D	-	-	-	-
Weekday midday peak	0.20	B	-	-	-	-
Weekday night time truck peak	0.18	B	-	-	-	-
2011						
50 th 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						
50 th 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						
50 th 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 project, traffic volumes would be split between the project and the existing highway. The project would take a significant majority of the traffic. The project would have sufficient capacity to accommodate this traffic up to 2031.

Crash potential

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 increase in the future if the highway was left as a single carriageway. This is because there would not be consistent driving conditions and drivers may not react accordingly.

Predictions of the future crash rates with and without the project have been undertaken. They indicate that, based on recent crash history data, the project would result in a 34 per cent reduction in crashes at Woomargama (see Section 4.4 of Technical Paper 6 (Volume 2)). Projecting this reduction over a 20 year timeframe from the time of opening, the construction of the project is forecast to result in four less injury crashes and 26 less tow-away crashes compared with not building the project. This reduction in crashes is expected by:

- Reducing conflicts between local traffic and through traffic in the village.
- Providing improved clear zones and sealed shoulders on the project to reduce the incidence and impact of any run-off-road crashes.
- Providing a central median on the project to reduce the incidence and impact of head-on crashes.

- Controlling access to and from the project.

Following completion of the project, the crash rate is expected to reduce and to be no more than nine per 100 MVKT, based on RTA published information on percentage reductions for crashes when different treatments are used — the *Accident Reduction Guide, Part 1: Accident Investigation and Prevention* (see Section 4.4 of Technical Paper 6 (Volume 2)).

Pedestrian and cycle facilities

There would be no specific provisions for cyclists and pedestrians as part of the project.

While cyclists could potentially use the proposed bypass, it is considered likely that most would choose to use the existing highway through Woomargama.

Travelling stock route

There are no travelling stock routes that would be affected by the project.

Potential major land use changes in the locality

The Greater Hume Shire Council development application register and the Department of Planning Major Projects register were searched to identify significant development proposals in the locality. No major land use changes have been identified that would be likely to affect traffic assessment outcomes.

Consistency with traffic and transport objectives

The project aims to improve safety and traffic and transport efficiency and would meet the traffic and transport objectives (refer to Section 3.1.6 and Section 3.3) as presented in Table 9-46.

Table 9-46 Project consistency with traffic and transport objectives

Traffic and transport objectives	Consistency with traffic and transport objectives
Increase infrastructure handling capacity and efficiency.	▪ The project would improve performance of the road network (level of service). ▪ The project would result in a shorter travel time and less disrupted journey.
Improve safety and security.	▪ The project would meet design codes (ie traffic lane widths, shoulder widths, grades) to improve safety. ▪ The project would provide consistent dual carriageway driving conditions (including posted speed limit).
Improve transport productivity on its nationally strategic and export-oriented freight corridors.	▪ The project would improve performance of the road network (level of service). ▪ The project would result in a shorter travel time and less disrupted journey.
Improve the reliability of travel on interstate and inter-regional corridors.	▪ The project would improve performance of the road network (level of service). ▪ The project would result in a shorter travel time and less disrupted journey.

Transport infrastructure capacity, efficiency and productivity

Completion of the project as part of the Hume Highway upgrade would enable the improvement of travel efficiency and driving conditions on this nationally strategic and export-oriented freight corridor. As described above, the project would result in improved travel efficiencies (through travel time savings and better network performance), a less disrupted journey and improved road safety. This would facilitate increased infrastructure handling capacity and improved transport productivity.

9.6.5 Management of impacts

Table 9-47 identifies the mitigation and management measures that would be implemented for traffic and transport impacts. These measures have been incorporated into the draft statement of commitments in Chapter 11.

Table 9-47 Traffic and transport management and mitigation measures

Potential impact	Mitigation and management measures
<i>Construction</i>	
Reduced speeds, traffic delays and disruptions during construction	▪ Incorporate traffic control measures into construction vehicle movements and works programs to minimise traffic and transport impacts on local roads and the existing highway. ▪ Ensure that highway users and local communities are provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.
Local road dilapidation	▪ Prepare pre- and post-construction road dilapidation reports for local roads likely to be used for construction. Repair any damage resulting from construction (not normal wear and tear) unless alternative arrangements are made with the relevant road authority.
<i>Operation</i>	
Local road access	▪ Maintain operation of local road accesses. Confirm the requirements for any changes to local access arrangements during detailed design in consultation with the relevant road authority and any affected landowners.

