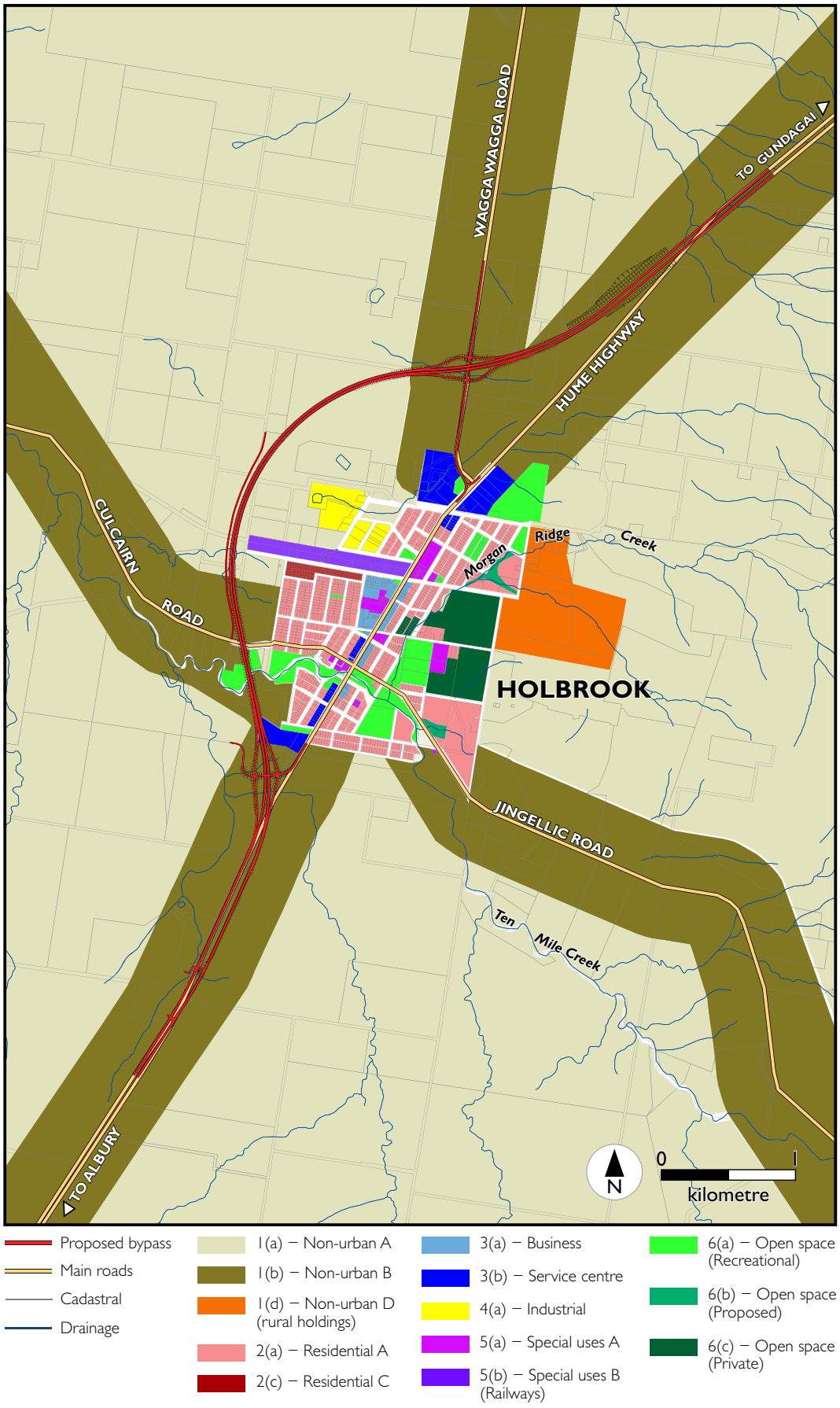


Figure 9-7 **Land use zones under the Holbrook Interim Development Order 1970**

Agricultural sector

Agricultural land use in the region is predominantly grazing of cattle and sheep with opportunistic cropping of winter cereals (triticale, winter wheat and oats) on arable land. The area is well supplied with water from creeks and springs, which can be pumped to tanks for gravity reticulation to troughs in paddocks. This supplements water for livestock supplied by farm dams. Irrigation for agriculture is not common in the Holbrook area.

The rural land capability in the locality varies from Class 1 (most suitable to cropping) through to Class 4 (mostly grazing land) as defined in the Rural Land Capability classification system defined by the NSW Department of Industry and Investment (see Figure 9-8).

Holbrook's economy has been traditionally based in the agriculture sector and the town characterises itself as an agricultural town. As such, the travelling stock routes and stock reserves within the town have played a prominent role in the past.

Based on information received from the Hume Livestock Health and Pest Authority there are a series of travelling stock routes that allow livestock to move on foot between agricultural areas to the west and east of Holbrook. These are used between six and eight times per year. From the west there are two travelling stock routes, along Wagga Wagga Road and Culcairn Road, directing livestock to the Wagga Wagga Road and Culcairn Road Travelling Stock Reserves respectively. These stock reserves are connected via a stock route running along the northern and western boundary of the former Town Common and then along Tip Road. Connectivity to agricultural areas east of Holbrook is provided by a travelling stock route that crosses Ten Mile Creek and the existing highway to the south of town and continues on and out of town via Jingellic Road.

The travelling stock routes and reserves are shown on Figure 9-9.

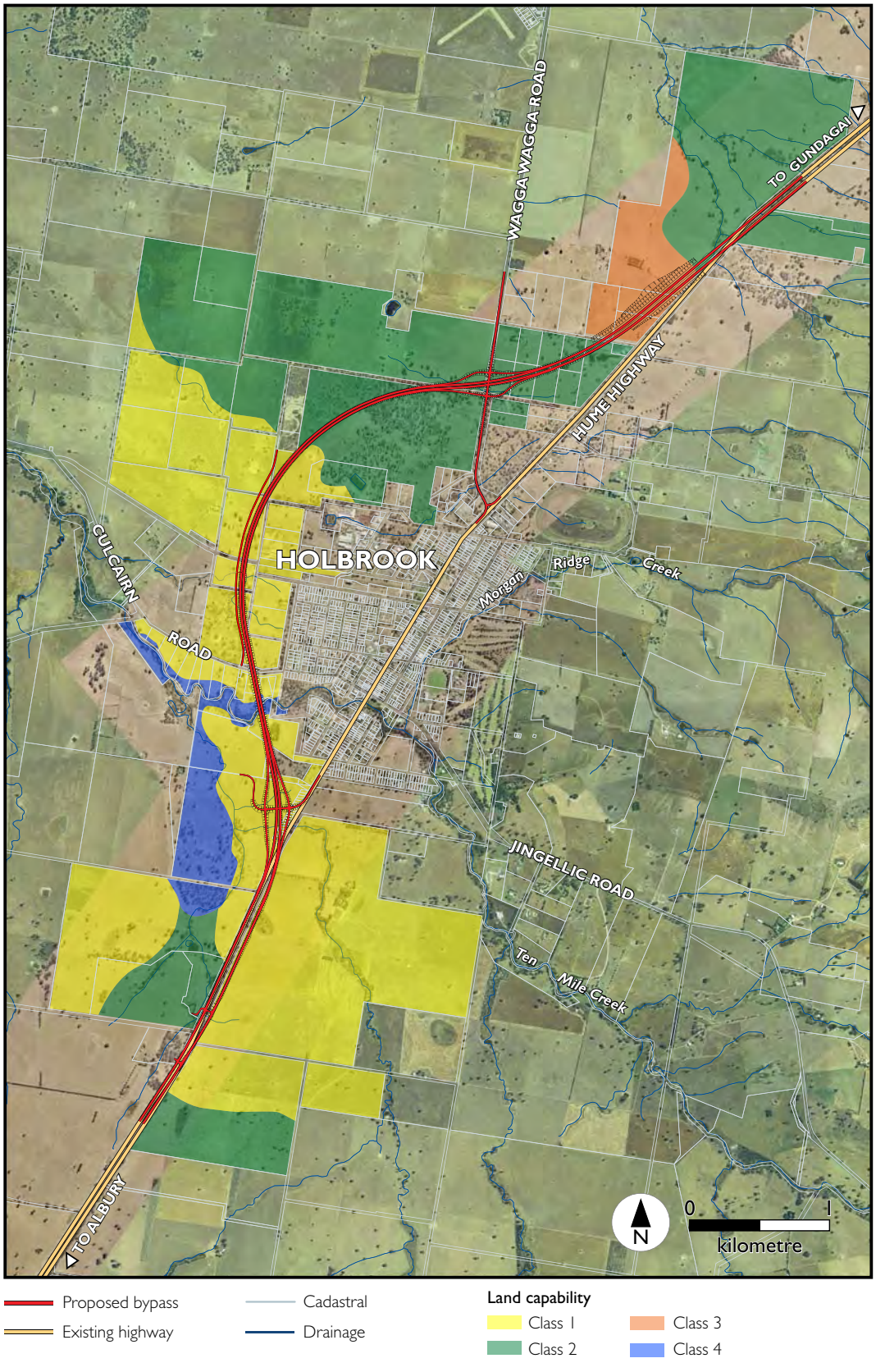


Figure 9-8 **Land capability on the locality**

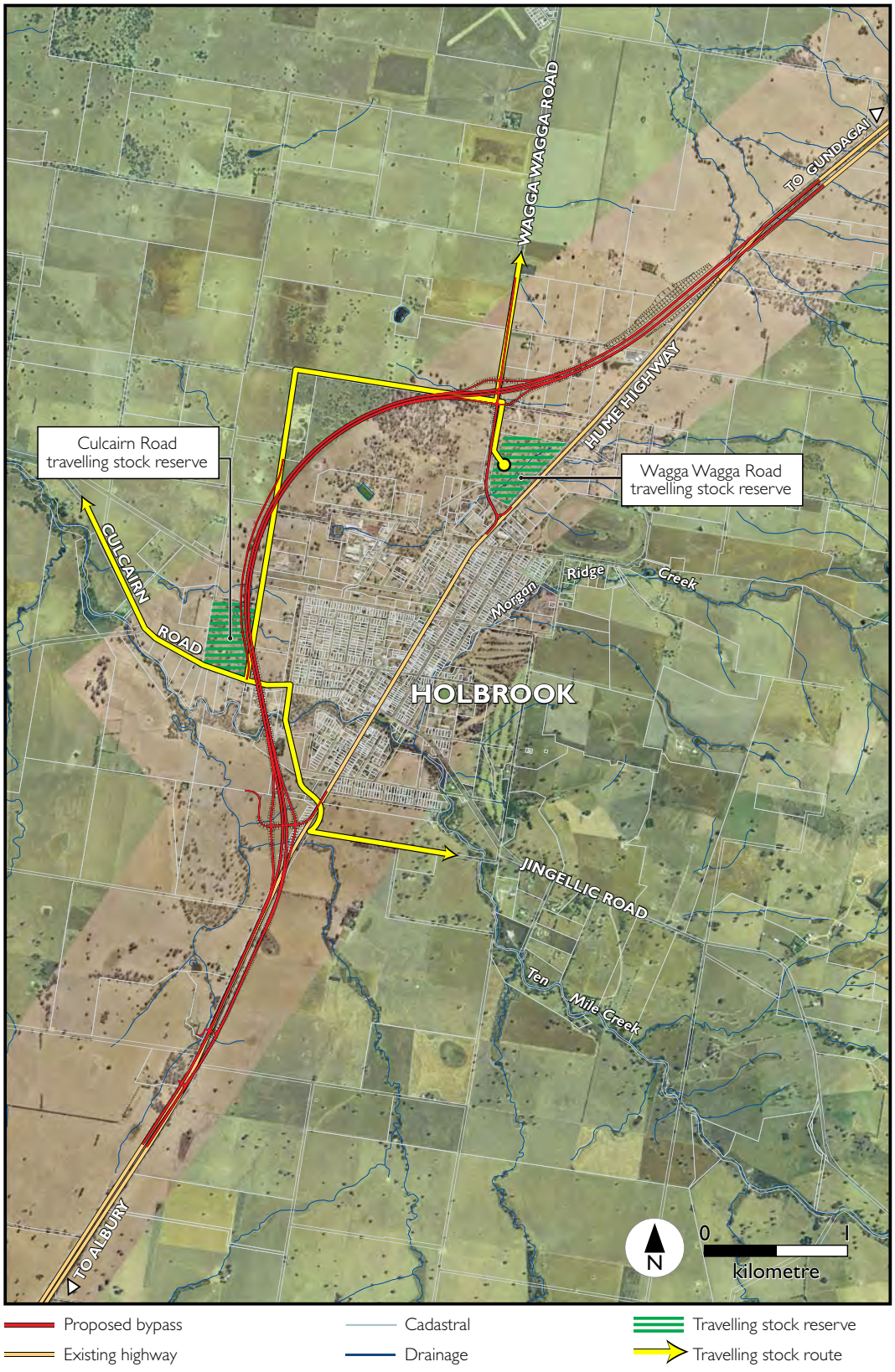


Figure 9-9 **Location of travelling stock routes and reserves in Holbrook**

Business profile

The town of Holbrook is an agricultural service centre supported by a rich agricultural hinterland. The business profile in Holbrook has developed to service the needs of the agricultural sector, the town and the Hume Highway. As a result of this diversity, and in combination with the comparative agricultural wealth of the region, the range of functions, services and facilities in town exceeds that which might be expected based on population size alone.

There has been a stable maintenance of jobs between the 2001 and 2006 census period, however, businesses in Holbrook have recently experienced a number of challenges including significant downsizing of the Hyne Timber Mill (loss of 103 jobs in 2006), restructuring in the banking sector (closure of Westpac and downsizing of the National Australia Bank) and continued persistence of drought conditions. Holbrook was drought declared in 2001 and 2005 and has been drought declared since June 2006. Employment in highway related businesses accounts for 13 to 16 per cent or (296 workers) of total employment in the Holbrook UCL.

The Hume Highway duplication projects to the north and south of Holbrook have provided some direct and indirect economic benefits to the town in recent years. The Greater Hume Shire local government area (25.6 per cent), as well as the Murray SD (14.4 per cent), is dominated by the agriculture and forestry industry; however, in Holbrook, retail trade (15.2 per cent) and manufacturing (12.4 per cent) provide more employment, possibly due to an expanding economy and the town being the urban centre of the shire (refer Table 9-30).

Table 9-31 provides a time series analysis of industries of employment for the Greater Hume local government area between 1996 and 2006. During this period, the agriculture, forestry and fishing industry contracted by almost three per cent, while other industries including construction and health care and social assistance expanded.

Table 9-31 Time series profile of industry of employment in Greater Hume LGA, 1996-2006

Industry of employment	1996	2001	2006
Public administration and safety	5.4%	4.4%	5.6%
Construction	4.5%	5.0%	5.9%
Education and training	6.9%	6.7%	7.0%
Retail trade	8.7%	7.8%	9.0%
Health care and social assistance	7.0%	8.1%	9.1%
Manufacturing	9.6%	12.1%	10.1%
Agriculture, forestry and fishing	28.0%	29.6%	25.2%

Source: 2006 Census (ABS 2006), 2001 Census (ABS 2001) and 1996 Census (ABS 1996)

At a more local level, the 2006 Australian Bureau of Statistics Census identified that the most significant industry group within the Holbrook UCL was retail trade (15.2 per cent), followed by manufacturing (12.4 per cent), as shown in Figure 9-10. Of those employed in the workforce, 59.5 per cent were employed in a full time role and 29.5 per cent were employed as part time employees. As discussed in Section 9.4.1, the unemployment rate in Holbrook at the time of the 2006 census comprised 24 people (4.3 per cent), 21 of whom were seeking full time employment and three seeking part time employment at the time of the Census.

The remaining labour force was spread across a number of industry sectors, including: accommodation and food services (12.0 per cent); public administration and safety (11.1 per cent); agriculture, forestry and fishing (7.6 per cent); and other occupations (40 per cent). While this may reflect Holbrook's orientation to urban growth and the region's increasing industry base, the spread across the top five industries is fairly close, indicating a transitional process from the region's agriculture-dominated past. Figure 9-11 displays the most common occupations to be labourers (19.9 per cent) and managers (15.4 per cent), contrasting roles consistent with Holbrook's top industries of employment, Retail and Trade and Manufacturing.

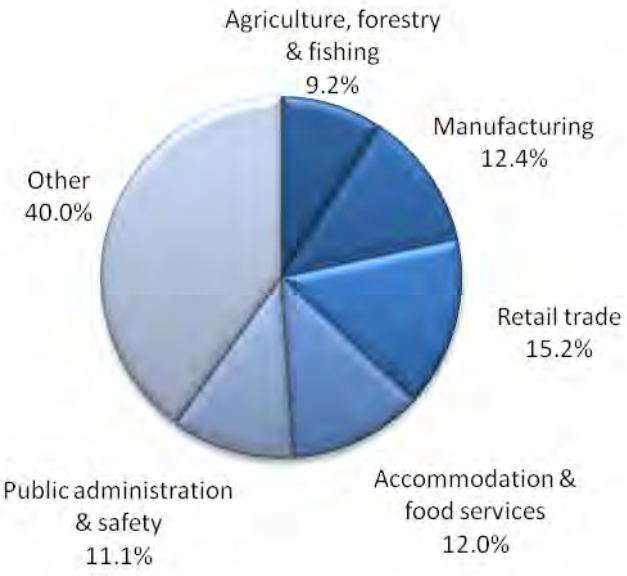


Figure 9-10 Top five industries in the Holbrook UCL (2006 ABS Census)

Figure 9-11 Top five occupations in the Holbrook UCL (2006 ABS Census)

Highway dependent businesses

Holbrook has become an important centre for stopping motorists and those staying overnight on the Hume Highway between Sydney and Melbourne. As a result, a percentage of jobs in Holbrook are supported by the highway (either directly or indirectly) and many businesses (especially the eateries, service stations and accommodation establishments) exist because of — or depend significantly on — highway generated trade.

An economic survey was undertaken of 40 businesses identified as highway dependent. The highway dependent businesses surveyed included a caravan park, motels, a pub, supermarkets/grocery stores, a butcher, a dairy goods wholesaler, a car dealer, a tyre retailer, auto repairers, service stations, a bakery, cafes/restaurants/bistros, a post office, clothing stores, newspaper, book and stationery retailers, a pharmacy, an antiques store, other retailers and museums. The median age of these businesses was five years and the majority are owner operated.

Highway dependent businesses in Holbrook at the time of the survey are shown on Figure 9-6. The geographical spread of businesses in Holbrook is of note, with only four out of the 40 surveyed businesses located south of Murray Street. The area between Murray Street and Hume Street contains a number of businesses that have closed since 2006, however, a number of new businesses have also opened in this timeframe. It is an area that attracts relatively few through stopping motorists. There is one business (a motel) located north of Wagga Wagga Road.

The area between Hume Street and Wallace Street is distinguished by the presence of a mix of business types that attract a high level of through stopping traffic and high levels of local traffic. At the Wallace Street boundary is the submarine precinct (café, museum, tourist information centre and HMAS Otway), which attracts the majority of through stopping traffic in Holbrook. Several businesses in this area that service the needs of highway travellers are currently for sale. The three businesses located further north of this area are all highway related, and therefore, are dependent on passing trade.

Of the surveyed businesses, many indicated that they have been affected by drought. However they also indicated that they had experienced an increase in turnover during the last five years, which could be largely attributed to the effects of the opening of the Albury bypass and spending by road construction workers on the Hume Highway duplication projects.

The contribution of highway generated trade to total turnover estimated by surveyed businesses is relatively high and is consistent with Holbrook being a major stopping location and overnight stay location for Hume Highway travellers. This suggests that highway generated trade constitutes an important component of the local economy of Holbrook, and that a significant proportion of jobs in the town are dependent on this trade.

All businesses surveyed were asked to estimate the extent to which they depend on passing trade. The responses revealed considerable variation in the relative importance of passing trade between the major business categories. Nineteen of the 40 surveyed businesses estimated that over half of their annual turnover is generated by those stopping or staying in town. This was particularly prevalent in the accommodation, service station, eateries and other retail business categories.

Non-highway dependent businesses

Other businesses in the town that are considered not directly dependent on highway trade include:

- Banks: Westpac, now located in the Post Office, and the National Bank of Australia.
- Personal services: hairdressers, physiotherapy.
- Business services: accountants/financial planners, solicitors, real estate agents, recreation and travel outlets, newspaper office.
- Agricultural services: Holbrook Wool Buyers and Holbrook Produce.
- Holbrook Mowers and Chainsaws.
- Auto services: panel beater.

Note that this is not an exhaustive list of all businesses in Holbrook.

All of the above businesses, with the exception of the panel beating shop, are located on the main street (Hume Highway) of Holbrook. Discussions were held with several of the above businesses, confirming their status as being local service providers with no dependence on passing trade.

Industry

There is an industrial area to the north-west of town. There are a number of small to medium industrial operations in this area, including the Hyne Timber Mill, which recently underwent significant downsizing, resulting in a loss of 103 jobs in 2006.

Council has recently purchased the former Town Common and is proposing to develop this site for industrial purposes.

Agribusiness

The agricultural properties in the Holbrook region vary in size from large (around 1500 hectares) to small (five hectares). The larger properties are generally commercial agricultural businesses generating most of the family income from agricultural enterprises on the property. There are multiple 'hobby' or 'lifestyle' farms, which produce a range of agricultural products to supplement non-farm income.

The project would directly affect 15 privately owned rural properties varying in size from large (greater than 200 hectares) to small (0 to 20 hectares), this includes 9 agribusinesses. Eight properties are less than 20 hectares in area and with the absence of any intensive agricultural production on these farms they could be considered to be non-commercial farms. They may, however, produce agricultural commodities such as beef and sheep meat. Two properties have areas larger than 200 hectares and these are mainly used for mixed cropping and grazing, providing income for the owner operators.

Some agribusinesses use additional land in the region through direct ownership, leasing or share farming to improve viability. The larger properties are generally commercial agricultural businesses where agricultural enterprises provide the majority of the income.

9.4.2 Social and economic impacts

Local community

The project would result in a number of changes in the vicinity of the proposed bypass and within the town of Holbrook. Potential impacts range from general amenity (for example noise, traffic and air quality — discussed below) to potential changes in the town's social profile resulting indirectly from changes to the town's business profile. Specific community impacts are discussed in the following sections.

Social profile

Following the opening of the proposed bypass, there is the potential for some highway dependent businesses to be affected by a reduction in customers. This may affect the business revenue and employment structure. It is predicted that that there would be some job losses in the highway dependent business sector once the project is in operation, potentially increasing the local unemployment rate, or leading to movement of people out of Holbrook in search of employment elsewhere.

Longer term employment opportunities may be provided through the Council's proposed development of an industrial estate on the former Town Common. Loss of jobs in the highway dependent business sector may be offset temporarily by employment opportunities associated with the construction of the project.

Business impacts are discussed in more detail further below.

Property acquisition

Land acquisition would affect properties on the western side of Holbrook. The project would result in the acquisition of approximately 75 hectares of land over 15 private properties plus land owned or administered by council and other government agencies. This would include:

- Nine agribusinesses.
- Five rural residential properties.
- One Travelling Stock Reserve and route (Crown land).
- Council land (former Town Common, Rural Fire Service depot, Holbrook caravan park).
- Holbrook saleyards.

Impacts on agribusiness, Travelling Stock Reserves and Holbrook saleyards are discussed further below.

In addition, there may be a need for acquisition of additional properties resulting from upgrades to Wagga Wagga Road, Culcairn Road, Tip Road and construction of the interchanges. This would likely result in minor edge effects. Impacts would be confirmed during detailed design, in consultation with the affected landowner(s).

Rural residential properties range in area from 4.5 to 16 hectares. These properties do not derive their primary income from agriculture. Impacts on the five rural residential properties would include minor edge effects on two properties, severance of one property and loss of a major proportion (greater than 50 per cent) of two properties. Additionally, there would be impacts to infrastructure such as dams, troughs and livestock shelters on three of these properties. Fencing on all five properties would be impacted. The Rural Fire Service depot would impacted by the project. The Holbrook caravan park would be subject to edge effects on the vacant part of the property.

Any infrastructure removed would be replaced in consultation with the affected landowner(s). The Rural Fire Service depot would be required to be relocated to a suitable location, in consultation with the Rural Fire Service, to ensure that access is adequate for continuing operations. Impacts on amenity are discussed further below. Acquisition would be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and the RTA's (1999a) *Land Acquisition Policy*.

Connectivity and severance

The project would result in changes to local travel patterns and incrementally longer travel distances to and from some properties.

In consultation with affected property owners, the project has been designed to minimise property severance as much as practicable. A total of six properties would be severed, including two government/council owned properties — the former Town Common, and Council depot. The concept design indicates that two agribusiness properties, one rural residential property and the saleyards would be severed to some degree. Further consultation would be carried out with property owners to develop and implement reasonable and feasible measures to mitigate severance impacts during construction and operation.

Access

The project would change, but not reduce, access to Holbrook for rural residences on the western side of the project. Access would be provided to maintain a connection to either local roads, Wagga Wagga Road or Culcairn Road for these properties. Tip Road would be realigned along the western edge of the proposed bypass to provide access via Culcairn Road to properties that are currently accessed off Tip Road, including the Holbrook Tip.

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

Amenity

Traffic

Construction works have the potential to cause temporary inconvenience to the community and interrupt travel on local roads, including Wagga Wagga Road and the existing highway to the north and south of town. This is due to changes in traffic movements and local access that would occur during construction, including increases in heavy vehicles on the road network, diversions and partial road closures (see construction traffic impacts as detailed in 9.5.3).

Standard traffic management measures would be employed to minimise short-term traffic impacts expected during construction. These measures would be identified in specific traffic management plans and would be developed in accordance with the RTA's *Traffic Control at Works Sites Manual* (RTA 2003a).

During construction, Wagga Wagga Road would be diverted onto a side track or traffic would be diverted via Anderson's Lane (a combination of these may be used depending on requirements) to allow for construction of the interchange at Wagga Wagga Road.

The project would provide a reduced travel time and less disrupted journey than travelling through the town. It is likely that travellers seeking a faster journey would use the project. It is also possible that some of the through vehicles that currently stop for a short time in Holbrook may use the proposed bypass because it may be more convenient for them to keep moving and stop at another location.

The project would result in a reduction in traffic using the existing highway through Holbrook. The traffic assessment considered a high diversion and low diversion scenario for traffic predicted to use the proposed bypass (refer to Section 9.5.4), as follows:

- For the high diversion scenario, about 54 per cent of light vehicles and 64 per cent of heavy vehicles would use the proposed bypass.
- For the low diversion scenario, about 45 per cent of light vehicles and 59 per cent of heavy vehicles would use the proposed bypass.

Fewer vehicles travelling along the main street of town would have direct benefits to the amenity of the town, through improved safety and road network performance along the main street and at local road intersections, as well as reduced air and noise pollution. Noise and air quality impacts are discussed below.

A detailed assessment of traffic and transport impacts is presented in Section 9.5 and measures to mitigate these impacts are identified in Section 9.5.5.

Noise and vibration

A total of 594 receivers were identified in 10 distinct noise catchment areas. Noise catchment areas include residential areas in and around the town of Holbrook as well as groups of isolated receivers further afield. Depending on the distance between the proposed bypass and receivers, noise impacts are expected to be experienced during the construction and operational phases of the project. Some non-residential receivers, including schools and churches, may also experience noise levels in exceedance of the criterion. The project noise assessment criteria are presented in Section 9.3.3.

Most construction activities are expected to exceed the criterion at receivers within 500 metres of the project during the daytime, and within one kilometre at night. Noisy construction activities, such as rock breaking and piling works, have the potential to result in elevated noise levels at sensitive receivers within one kilometre of the project during the daytime. The early morning sleep disturbance criterion is expected to be exceeded at receivers within 300 metres of the project.

The operation of a concrete batch plant and site compounds, including deliveries, also has the potential to generate noise that may exceed the criteria at some receivers. The location of the concrete batch plant and site compounds has not yet been determined. However, potential sites for these ancillary facilities would consider the potential noise impacts on nearby sensitive receivers.

Vibration levels are not predicted to exceed the damage or human comfort criterion at any receiver, as all receivers are more than 65 metres from construction activities. Some properties at the northern end of the project may experience overpressure or vibration impacts if blasting is required.

Construction noise and vibration impacts are further discussed in Section 9.3.5.

When operational, the project would result in increased noise levels at up to 60 receivers in five of the 10 noise catchment areas. The receivers that would be affected by increased noise levels as a result of traffic on the proposed bypass include a total of eight isolated receivers to the south-west and north-west of the project, and 52 village receivers in the residential areas on the western side of Holbrook.

Where criteria are predicted to be exceeded, operational noise mitigation would consider a combination of at road mitigation, including low noise pavements and noise walls for grouped receivers, and architectural treatments for isolated or small groups of receivers.

It is anticipated that traffic within the town of Holbrook would decrease. This would result in a reduction in traffic related noise in the town and particularly to receivers along the existing highway. Whilst noise levels are predicted to decrease in the centre of Holbrook due to fewer vehicles, a number of receivers in the noise catchments surrounding the existing highway would still experience acute noise levels.

Noise levels at some non-residential receivers would exceed the internal noise criterion when windows are open.

Operational noise impacts and mitigation are discussed in more detail in Sections 9.3.4 and 9.3.6 respectively.

Visual amenity and landscape character

The scenic quality of the landscape around Holbrook is generally moderate and is typical of the landscape along much of the Hume Highway. There are views available of distant hills to the south and north, with the Cromer Hills and Morgans Ridge clearly seen to the east. Within Holbrook the existing highway provides a wide streetscape, with few street trees and a variety of shops, cafes, historic churches, community facilities and accommodation services.

The most visually sensitive areas along this section of the highway are the residential areas within the immediate town area, and Ten Mile Creek. A total of 20 key viewpoints (refer to Table 10-10) were identified in four of the six distinct landscape units within one kilometre of the project.

The introduction of a highway into the rural to semi-rural/urban environments of the affected landscape units, including the removal of vegetation and construction of bridges and interchanges, would have a moderate to high impact on the landscape character of the affected landscape units. The project would potentially have a high visual impact on 11 of the 20 identified viewpoints and a moderate, or moderate to high visual impact on a further seven of the viewpoints. However, the visual amenity within the town (along the existing highway) would not change.

A draft urban and landscape design strategy has been developed for the project to mitigate visual and landscape character impacts and is shown in Figure 10-7. The strategy aims to reduce the impact of the project on the landscape and minimise visual impacts on identified viewpoints through a combination of vegetation plantings and landscaping to screen the more intrusive components of the project as well as emphasise the surrounding landscape where possible.

Air quality

During construction of the project, activities such as trafficking on unpaved roads, vegetation clearing, earthmoving and stockpiling, could potentially result in the generation of dust and particulate matter, which may affect the local ambient air environment. The generation of dust is likely to be worse during dry and windy conditions. Impacts on sensitive receivers are dependent on wind direction and the distance between receivers and the dust generating activities.

Vehicle emissions from construction plant and equipment may also affect the local ambient air environment during construction of the project, however, are unlikely to result in adverse air quality impacts.

During operation the main source of air quality emissions would be from vehicle emissions, including light and heavy vehicle exhaust fumes. Traffic volumes are predicted to increase over time, with a large proportion of traffic travelling along the proposed bypass to the west of Holbrook. The nearest receivers would be located approximately 65 metres from the passing traffic on the proposed bypass, a distance at which traffic emission concentrations have generally dissipated to acceptable levels.

There is likely to be an improvement in air quality in the centre of Holbrook due to the reduction of traffic on the existing Hume Highway.

Construction and operational air quality impacts and mitigation are further discussed in Section 10.5.

Land use

As described previously, land use in the vicinity of the project is classified as either agricultural, open space (recreation) or service centre zoned land. The project would require acquisition and rezoning of land currently zoned for these purposes. Impacts on agricultural land uses are discussed further below.

There is an industrial area located in proximity to the project. The proposed interchange located at Wagga Wagga Road would facilitate improved access to this area, whilst reducing the number of larger vehicles passing through the town.

In addition, Council has recently purchased the former Town Common and is proposing to develop this area for industrial purposes. The Wagga Wagga Road interchange would provide good access between this area and the highway, should it be developed for industrial or retail purposes.

The cumulative land use impact of the project would not have a significant effect on the future strategic land use planning for the Greater Hume Shire Council. The project would potentially have a positive impact on Holbrook through the provision of improved access to existing and potential industrial/commercial areas.

The agricultural sector

Fragmentation and loss of prime agricultural land

The project would require the acquisition of 76 hectares of predominantly agricultural zoned land. The land that would be directly impacted consists mainly of Land Capability Classes 1 to 3. The Rural Land Capability classification system defines Class 1 land as 'arable land suited to continuous cultivation', while Class 3 is defined as 'sloping land suitable for cropping on a rotational basis'. Twenty-six point five hectares of Class 1 land would be acquired for the purposes of the project. In addition, there is also likely to be a loss in agricultural production as a result of acquisition or management inefficiencies caused by severance of some of the properties.

The direct loss of land and indirect loss of production due to acquisition and severance equates to approximately 0.01 per cent of land in the Greater Hume Shire. Whilst there may be a significant impact on production on individual holdings (see Table 9-32), it is considered that the impact at a regional level would be minimal.

Holbrook saleyards

The project would directly affect the former Holbrook saleyards. The saleyards are no longer used for selling stock, with sales discontinued about eight years ago. The yards are, however, used on an informal basis by producers transporting stock, as a cattle assembly point about five times per week. The project would result in an impact on infrastructure, including impacts to the yards and access. The future use of the saleyards would be maintained through the provision of replacement infrastructure where required, in consultation landowners.

Travelling stock routes

The temporary access arrangements at the bridge over Culcairn Road, the works at Wagga Wagga Road and the construction of the project between these roads may need to take into consideration the maintenance of the connectivity of the travelling stock route. Depending on the timing of these works and the times when stock need to be moved there may not be any need for special provisions. Liaison with the Hume Livestock Health and Pest Authority (former Rural Lands Protection Board) would be continued throughout the design and construction phases of the project.

During operation, the travelling stock route would be maintained between Wagga Wagga Road and the Culcairn Road Travelling Stock Reserve. However, access to the Wagga Wagga Road Travelling Stock Reserve would be severed. The Livestock Health and Pest Authority has been consulted and advised that it is not necessary to provide an alternate travelling stock route for access to this stock reserve. However, this stock reserve would need to be relocated to a suitable location on the western side of the proposed bypass subject to the availability of suitable land. In addition, part of the Culcairn Road Travelling Stock Reserve would be acquired for the purposes of the project.

Changes to the Travelling Stock Reserves and routes would be further developed during detailed design in consultation with the Hume Livestock Health and Pest Authority and other relevant stakeholders.

Stock diseases and the impact of a revised road network on quarantined properties

The Livestock Health and Pest Authority were consulted during the preparation of this environmental assessment. There are no properties that are in quarantine for any stock disease within the area of the proposed bypass or any area in the vicinity of the project. The Livestock Health and Pest Authority considered that the project would not result in any impacts relating to stock disease issues. Access would be provided to 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.

Viability, profitability, productivity and sustainability of businesses

Construction

During construction, the project is likely to have 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, purchasing of local goods and services for construction as well as more regional economic benefits through the provision of specialised goods and services.

Surveys undertaken of local businesses for this study provide anecdotal evidence that there was an increase in local consumption of goods, including food items and supplies for construction sites, from highway construction personnel undertaking the Hume Highway duplications to the north and south of Holbrook. It was reported that spending from construction workers in Holbrook accounted for 10 to 15 per cent of turnover for the 2007–2008 period. As such, it is envisaged that the trend toward local purchasing would continue during the proposed bypass construction.

Operation

During operation of the project impacts are likely to be greater for highway-related businesses than those that rely on local trade. However, indirect impacts would be experienced by other local businesses and the community generally.

Previous studies of the impacts of highway bypasses have indicated a reduction in stopping traffic (ie typically short stops for fuel, food, rest facilities) 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, predominantly caused by the out-migration of population.

There are six motels located in Holbrook. Surveys indicate that only one motel owner anticipates being seriously 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 Garner 1996), as well as in the longer term. This is as a result of the improved environmental amenity of the town, which is appealing to both potential short-term and long-term stayers and the increased tourism potential of the town.

The project would alter patronage to businesses along the existing highway as traffic wishing to access these businesses would have to leave the Hume Highway and enter Holbrook via the Wagga Wagga Road interchange or the southern interchange. The extent of adverse impact due to the change in traffic patterns and access would largely be a function of reliance on passing trade. As indicated by the results of a stoppers survey undertaken for this assessment in April and May 2009, highway-related businesses anticipate a reduction of up to 40 per cent in the number of motorists who currently stop.

The 40 highway-related businesses surveyed expect that the following decreases in turnover would occur as a result of the project:

- 15 businesses expect turnover to decrease by less than nine per cent.
- Seven businesses expect turnover to decrease by between 10 and 19 per cent.
- Eight businesses expect turnover to decrease by between 20 and 39 per cent.
- 10 businesses expect turnover to decrease by over 40 per cent.

Businesses located on the existing Hume Highway north of Wagga Wagga Road are at particular risk, as all passing trade would bypass them.

The impact of the project on gross annual turnover in highway-related businesses is expected to be considerable. Information collected through survey data suggests that this reduction would be in the order of $4.7 to $7.4 million. The survey data also suggests that an estimated 73 to 90 jobs could be lost from the highway-related businesses following the opening of the project. This represents approximately 25 to 32 per cent of the 296 workers employed by the 40 surveyed Holbrook businesses in 2009, or 13 to 16 per cent of the total labour force in the Holbrook UCL.

The closure of some or all of these businesses could have a negative indirect impact on the community. The loss of employment caused by any businesses that close, or a decrease in individual business revenue, may see a reduction in spending at businesses that cater for the local community. Six non-highway dependent businesses in particular were found to service the needs of highway dependent businesses; mainly in food, beverage and hardware items.

These non-highway dependent businesses predominantly serve the needs of the local and regional population, with a portion of their revenue derived from sales to highway-related businesses. Assessment of the impacts of the proposed bypass on the six non-highway dependent businesses suggests that there is likely to be some reduction in casual staff positions, but would ultimately remain sustainable and profitable following the opening of the project.

Around 40 per cent of Holbrook businesses do not plan on making any changes in anticipation of the opening of the project, furthermore the majority of businesses anticipate a more competitive environment as a result of the proposed bypass, where it would be necessary to attract more local trade.

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 Holbrook. As has occurred with other bypasses, the proposed bypass may allow some businesses to capitalise on the improvements in amenity in the town and redirect trade towards local patronage, attracting more locals to shop in Holbrook, as the largest town in the Greater Hume local government area. 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. New business opportunities may also arise, especially in tourism and recreational based trade including gift shops, museums and promoting other attractions.

Viability, profitability, productivity and sustainability of agribusinesses

The project would directly affect nine agribusinesses, which obtain some or all of their income from agricultural activities, and the former Holbrook saleyards. Details of the likely impact on the nine directly affected agribusinesses are provided in Table 9-32.

Labour for each holding is mainly provided by the owner-operators with additional limited casual or contract labour for activities such as shearing and crop contracting. Only one agribusiness provided full-time employment in addition to owner-operator labour.

The removal of agricultural land is considered to have minimal impact on the continued need for employment of casual and contract labour on the affected properties. Therefore, there would be minimal impact on agricultural employment in the region.

As outlined in Table 9-32, there would be differing impacts on the nine directly affected agribusinesses with the extent of impacts on individuals influenced by the area and quality of land removed and whether productive land is severed. Infrastructure, including farm dams, bores and farm structures may be impacted, and there may also be loss of amenity on individual properties.

While production and amenity losses could be significant for individuals and these losses could negatively influence the profitability of individual holdings in the future, it is considered that the loss of land from construction of the project would have minimal impact on the viability, profitability, productivity and sustainability of agribusiness at a regional level. The project would result in the loss of less than one per cent of agricultural land in the Greater Hume Shire.

Table 9-32 Impact on individual agribusinesses

Property	Impact on agribusiness
1	This property is operated mainly as a livestock grazing enterprise, and a sharefarmer conducts cropping operations on the property. Approximately three per cent (of a total 340 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. There would be no impact to major infrastructure. The existing access off the Hume Highway may be impacted. The project would result in a reduction in productive land and could reduce the productive capacity. The project may result in an impact on the profitability and productivity of this agribusiness. There would not likely be any significant impacts on the viability or sustainability of this agribusiness.
2	This property is operated mainly as a livestock grazing enterprise and operates in conjunction with another property to the west of Holbrook. Approximately one per cent (of a total 130 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. The existing cattle yards and access may be impacted. The project would result in a minor loss of productive land and livestock carrying capacity. The project would not likely result in any significant impacts on the profitability, productivity, viability or sustainability of this agribusiness.
3	This property is used for livestock grazing. About six per cent (of a total of 16.5 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. An existing access and a machinery shed may be impacted. The project would result in a reduction in productive land and could reduce the productive capacity. The project would be unlikely to result in any significant impacts on the viability, profitability, productivity or sustainability of this property.
4	This property is used for livestock grazing and cereal production for hay. Approximately 43 per cent (of a total of 16 hectares) of the property would be acquired. The property would be severed by the project A bore, dam, hay shed and stand of trees that provide shelter for livestock may be impacted. The project would result in a reduction in arable land and could reduce the productive capacity. The project may result in an impact on the profitability, productivity and viability of this agribusiness. There would not likely be any significant impacts on the sustainability of this agribusiness.
5	This property is used for cropping and livestock production. Approximately two per cent (of a total of 350 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. Four dams used for livestock water and a shearing shed may be impacted. The project would result in a minor loss of agricultural land. The project would be unlikely to result in any significant impacts on the viability, profitability, productivity or sustainability of this agribusiness.

Property	Impact on agribusiness
6	This property is used for cattle grazing. Approximately 14 per cent (of a total of 43 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. Access and connection to the town water supply may be impacted, should this occur, access and connection would be reinstated. The project would result in a small loss to livestock carrying capacity. The project may result in an impact on the profitability and productivity of the agribusiness. The project would be unlikely to result in any significant impacts on the viability or sustainability of this agribusiness
7	This property is run as a cattle artificial breeding centre and for production of pastures. The breeding centre is an Australian Quarantine and Inspection Service accredited quarantine facility. Approximately 12 per cent (of a total of 126 hectares) of the property would be acquired. The property would be severed by the project. Small allotments that may have subdivision potential with building entitlements may be affected. The project would result in a reduction in livestock carrying capacity and could reduce the productive capacity. The project may result in an impact on the profitability and productivity of this agribusiness. The project may also result in an impact on the viability of the breeding centre as an Australian Quarantine and Inspection Service accredited quarantine facility. However, there would not likely be any significant impacts on the sustainability of this agribusiness as the business would be able to continue to operate following the project.
8	This property is used for cattle grazing. It also hosts a tree plantation corridor for native bird habitat. Approximately six per cent (of a total of 135 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. The tree plantation corridor and access may be impacted. The project would result in a minor loss of agricultural land. The project may result in an impact on the profitability and productivity of the agribusiness. The project would not likely result in any significant impacts on the viability or sustainability of this agribusiness.
9	This property is used for cattle grazing. It also hosts a tree plantation corridor for native bird habitat. Approximately two per cent (of a total of 182 hectares) of the property would be acquired. Impacts would be limited to minor edge effects and there would be no severance of the property. Access may be impacted. The project would result in a minor loss of agricultural land and minor loss of livestock carrying capacity. The project would not likely result in any significant impacts on the profitability, productivity, viability or sustainability of this agribusiness.

9.4.3 *Management of impacts*

Table 9-33 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, traffic and air quality are addressed in Sections 9.3, 9.5 and 10.5 respectively.

Table 9-33 Social and economic mitigation and management measures

Potential impact	Mitigation and management measure
Pre-construction	
Impacts on viability of directly affected agribusiness enterprises	▪ Undertake all property acquisitions required for the project in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and the RTA's (1999) *Land Acquisition Policy*. ▪ Undertake consultation with all affected property owners throughout detailed design and construction to develop and implement measures to mitigate impacts on land use viability, infrastructure and severance.
Impacts on travelling stock routes	▪ The travelling stock route through and around Holbrook would be maintained during operation of the project. This would be further developed during detailed design in consultation with the Hume Livestock Health and Pest Authority and other relevant stakeholders.
Impacts on viability of highway dependent businesses.	▪ Continue consultation with Greater Hume Shire Council throughout detailed design and construction to assist in developing strategies to encourage the continued viability of Holbrook.
Construction	
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/or 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 Holbrook during construction	▪ Locally source construction materials and other products and services as far as possible. ▪ Locally source ancillary services, such as accommodation, catering and office supplies.

Potential impact	Mitigation and management measure
Operation	
Maintain connectivity	▪ Provide access to connect rural residences on the western side of the project with the town.
Reduction in motorists stopping in Holbrook impacting the economic viability of highway-related businesses.	▪ Develop a signage strategy to provide appropriate signage on the Hume Highway on approach to Holbrook and near to interchanges to identify Holbrook as a stopping destination.

Initiatives to mitigate adverse impacts of the proposed bypass are in the process of being developed and implemented prior to its opening. The Economic Development and Social Plan of Greater Hume Shire, and the work of the Holbrook Business Forum, are examples of the level of pro-active engagement that is currently underway. In addition, the RTA and Greater Hume Shire Council have jointly funded an Economic Development Officer to work with Council and the local business community.

A signage strategy would be developed to identify Holbrook as a potential stopping destination along the Hume Highway. Appropriate signage would be placed within the Hume Highway road corridor on the approaches to Holbrook and would seek to 'brand' Holbrook as an attractive rest stop. Road signage for the project would be developed in consultation with the Greater Hume Shire Council and in accordance with RTA requirements. Signage would not be used to promote individual businesses or products.

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 could be further considered by Greater Hume Shire Council and the Holbrook Community and Business Forum. These opportunities 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 Holbrook through the development of a streetscape and heritage strategy.
- Develop a coordinated approach to design a 'vision' for Holbrook that captures community expectations and promotes the submarine identity for the town.
- Increase local business promotional activities for Holbrook (promote the town to attract local residents from the broader Greater Hume Shire area and other tourists).

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

9.5 Traffic and transport

A detailed traffic and transport assessment was undertaken for the project as presented below. This is supported by *Technical Paper 4 — Traffic and Transpor*t (Volume 2).

DGRs	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 9.5.1, 9.5.4, 3.3, 12.1.1 Technical Paper 4 (Volume 2)
Construction traffic impacts, including spoil haulage, and potential disruption to existing school bus services and travelling stock routes.	Section 9.5.3, Technical Paper 4 (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 9.5.4, Technical Paper 4 (Volume 2)
Traffic capacity for 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 9.5.4, Technical Paper 4 (Volume 2)
Opportunity for the provision of cycle way connections along the highway and to adjoining communities.	Section 9.5.4, Technical Paper 4 (Volume 2)

9.5.1 Assessment approach

Technical Paper 4 (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 from 15 to 21 November 2008.
  - Licence plate survey from 11am to 7pm on 1 April 2008 and 7am to 11am on 2 April 2008.
  - Travel time surveys were undertaken indirectly through licence plate origin/destination surveys. Vehicles were recorded at locations north and south of Holbrook, allowing travel times to be estimated.
- Traffic flow and pattern predictions were made into the future to assess the potential impacts of the project.

9.5.2 Existing traffic and transport environment

Existing road network

The Hume Highway through Holbrook is a single carriageway road with one lane in each direction. The speed limit in the town is 50 kilometres per hour with a 40 kilometres per hour school speed zone covering approximately one kilometre in the centre of town.

Holbrook has the only set of traffic signals (for pedestrians) on the whole of the Hume Highway from Melbourne's Western Ring Road to the Sydney Orbital Network.

Aside from the Hume Highway, Holbrook is connected to Wagga Wagga via Main Road (MR) 211 (Wagga Wagga Road), Culcairn via MR331 (Culcairn Road) and Wantagong, Lankeys Creek, Jingellic and Tumbarumba via MR331 (Jingellic Road).

Existing traffic volume

Traffic volumes surveyed to the north and south of Holbrook were annualised to give indicative annual average numbers for 2008. The volumes were similar, with the north being slightly higher. Table 9-34 shows the average annual daily traffic (AADT) for existing traffic volumes north of Holbrook and Table 9-35 shows the AADT for existing traffic volumes south of Holbrook.

Table 9-34 Existing traffic volumes (AADT) north of Holbrook

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday	1610	1396	3006	1566	1391	2957
Weekend	1559	575	2134	1558	580	2138
Weekly (AADT)	1596	1162	2758	1564	1159	2723

Table 9-35 Existing traffic volumes (AADT) south of Holbrook

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday	1663	1482	3145	1427	1466	2893
Weekend	1506	609	2115	1350	544	1894
Weekly (AADT)	1618	1233	2851	1405	1202	2607

Traffic volumes change throughout the day. As shown for the north of Holbrook in Figure 9-12, the bulk of light vehicle traffic occurs in the afternoon. While total traffic volumes are higher during the afternoon, truck traffic builds steadily from a low at 4am to a peak around midnight.

Peak hour traffic volumes north of Holbrook are summarised in Table 9-36.

Table 9-36 Peak hour traffic volumes north of Holbrook

	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
Weekday midday peak	127	66	193	117	58	175
Weekday night-time truck peak	31	93	124	26	98	124
Weekend	145	21	166	149	22	171
Weekly	118	58	176	118	61	179

The peak traffic time for all vehicles is between 3pm and 4pm on weekdays and weekends. The peak volume of heavy vehicles occurs between 11pm and midnight due to Holbrook being located approximately halfway between Sydney and Melbourne. Trucks pass through Holbrook 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.

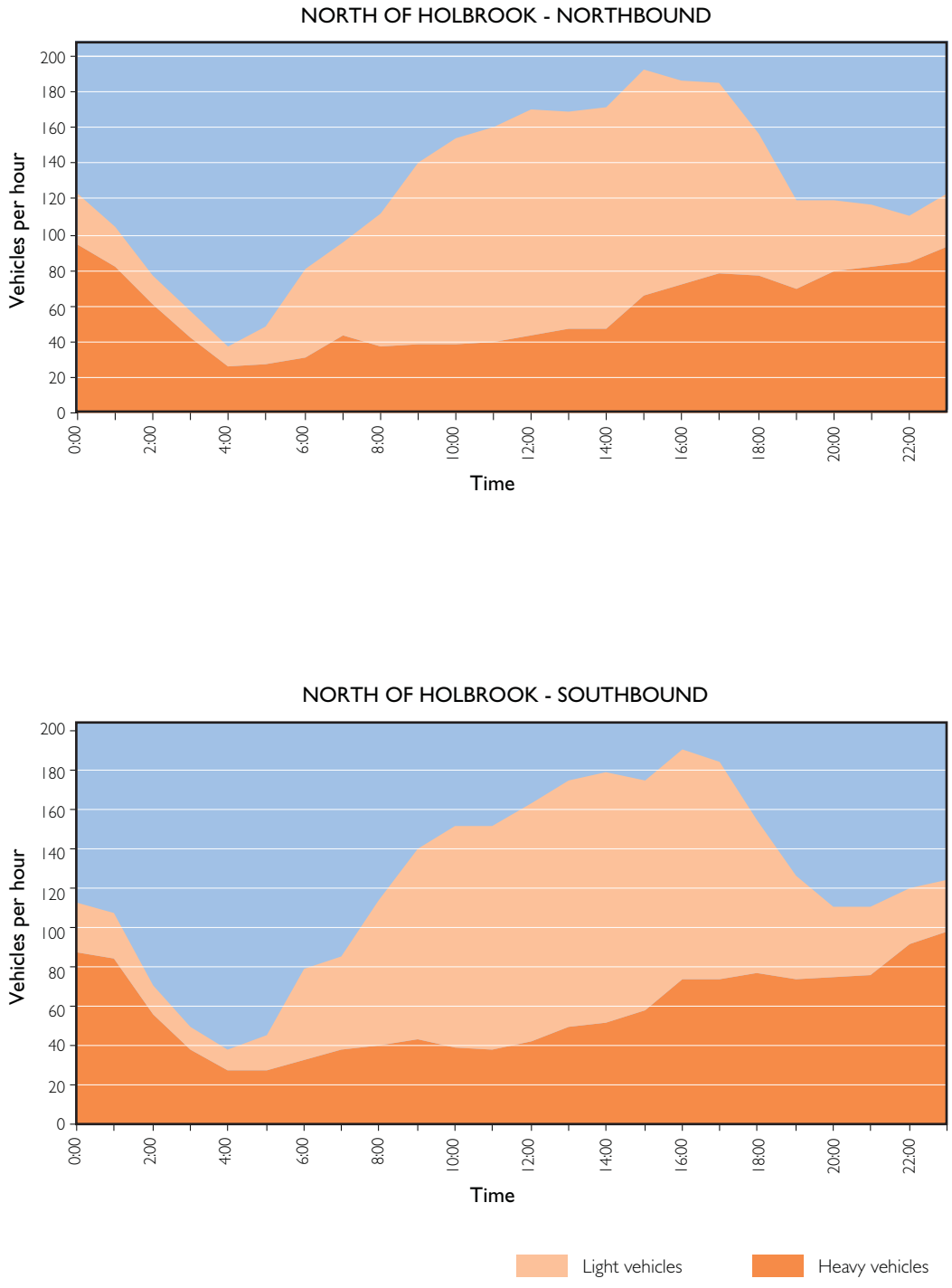


Figure 9-12 **Hourly change in traffic volume on the Hume Highway, north of Holbrook**

Travel times through Holbrook

Travel time surveys were undertaken indirectly through the licence plate origin/destination surveys. Vehicles were recorded at locations north and south of Holbrook, allowing travel times to be estimated. Plots of the distribution of travel time for light and heavy vehicles in both directions are included in Appendix C of Technical Paper 4. The travel times of vehicles that stopped in town were estimated by analysing plots of the spread of travel times and comparing this to the sign-posted speed limits.

The measured travel times in Holbrook were generally consistent, although they did show a spread of travel times especially for light vehicles. The distribution of travel times for heavy vehicles gave a clearer pattern. It is assumed that light vehicles would have a similar travel time to heavy vehicles or better.

For the northbound direction, it was found that 70 per cent of heavy vehicles had a travel time through Holbrook of four minutes or less. Travel times longer than four minutes occurred less frequently and were widely distributed. For light vehicles, only 50 per cent of vehicles had a travel time of four minutes for less.

For the southbound direction, 75 per cent of heavy vehicles had travel times less than six minutes. For light vehicles, 60 per cent of vehicles had a travel time of less than six minutes.

Vehicles that stopped for only a few minutes were included as through trips. Trips with a travel time of up to 10 minutes could only have stopped for a short amount of time, and therefore, it is unlikely that they would have had substantial business in Holbrook. Vehicles with travel times longer than 10 minutes were assumed to have stopped for a sufficient length of time to not be considered as through trips.

Travel patterns

The results of the licence plate survey have been assessed to determine how much traffic is travelling to each of the other points, and how much is stopping in town. Due to the interchange proposed at Wagga Wagga Road and the Hume Highway bypass, the travel patterns on the regional roads — Wagga Wagga Road and Culcairn Road are also important.

The results of the origin/destination survey are shown in Figures 9-13 to 9-16.

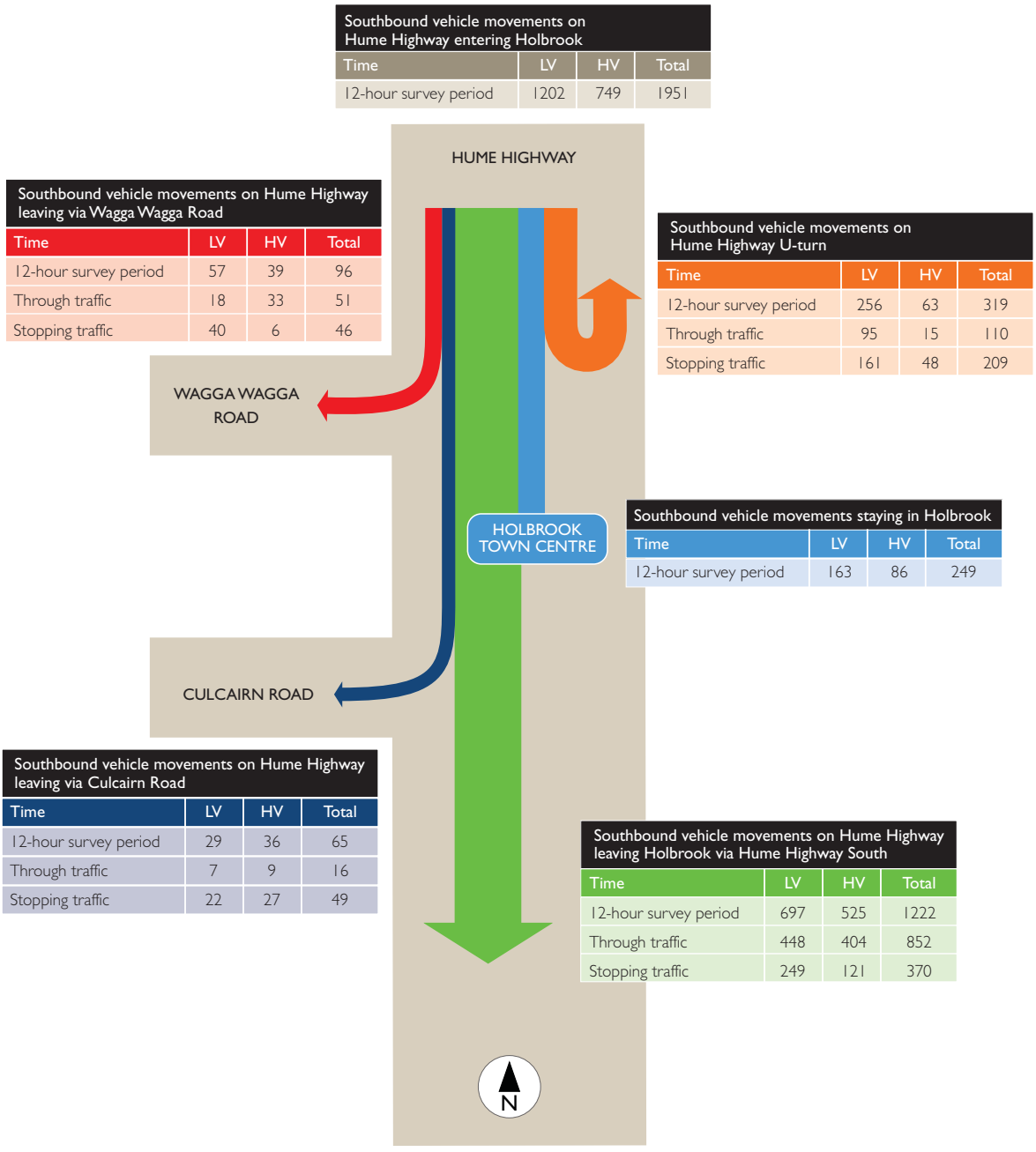
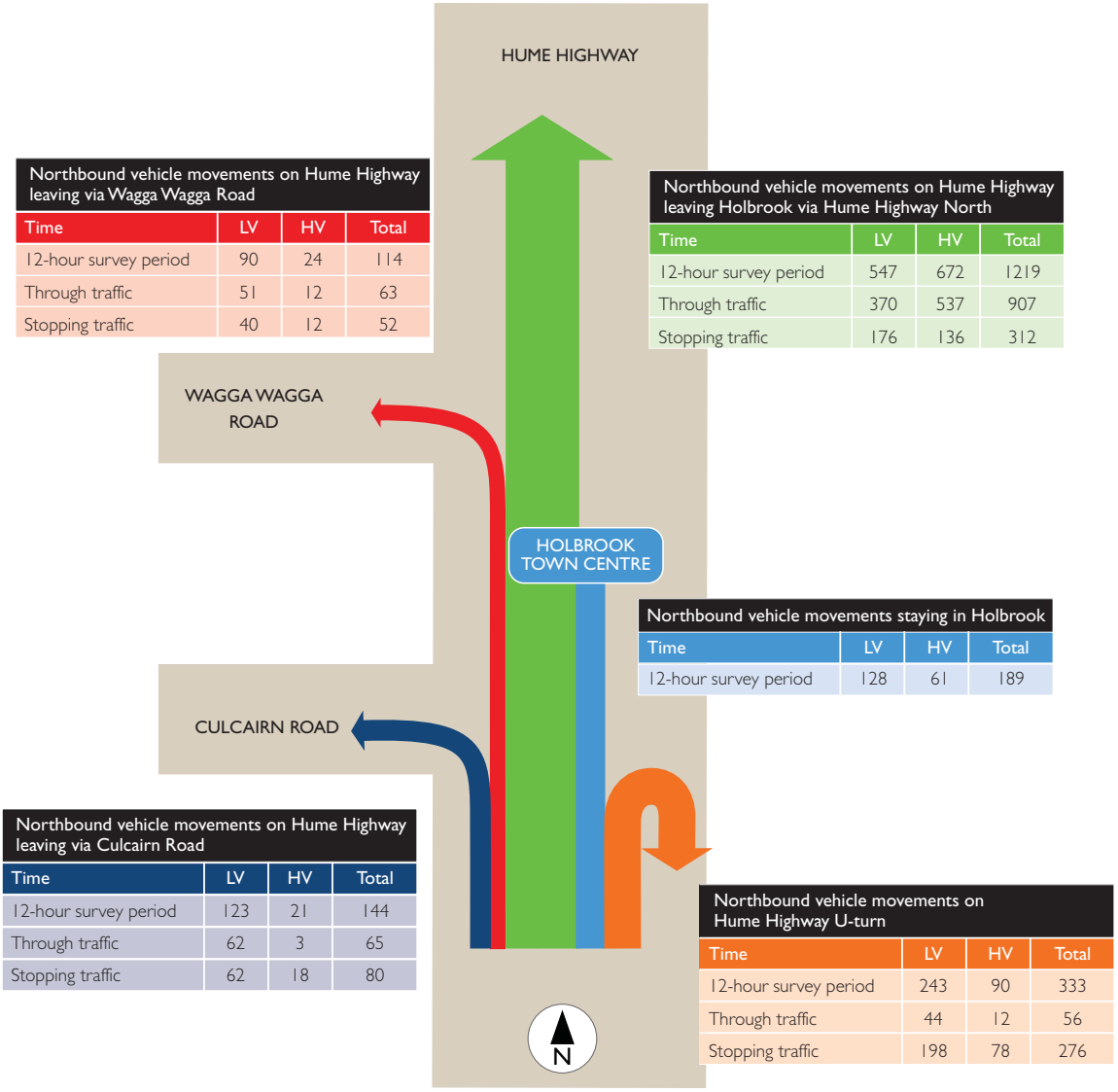


Figure 9-13 **Destination of trips entering Holbrook on the Hume Highway (southbound)**



Northbound vehicle movements on Hume Highway leaving via Wagga Wagga Road

Time	LV	HV	Total
12-hour survey period	90	24	114
Through traffic	51	12	63
Stopping traffic	40	12	52

Northbound vehicle movements on Hume Highway leaving Holbrook via Hume Highway North

Time	LV	HV	Total
12-hour survey period	547	672	1219
Through traffic	370	537	907
Stopping traffic	176	136	312

Northbound vehicle movements staying in Holbrook

Time	LV	HV	Total
12-hour survey period	128	61	189

Northbound vehicle movements on Hume Highway leaving via Culcairn Road

Time	LV	HV	Total
12-hour survey period	123	21	144
Through traffic	62	3	65
Stopping traffic	62	18	80

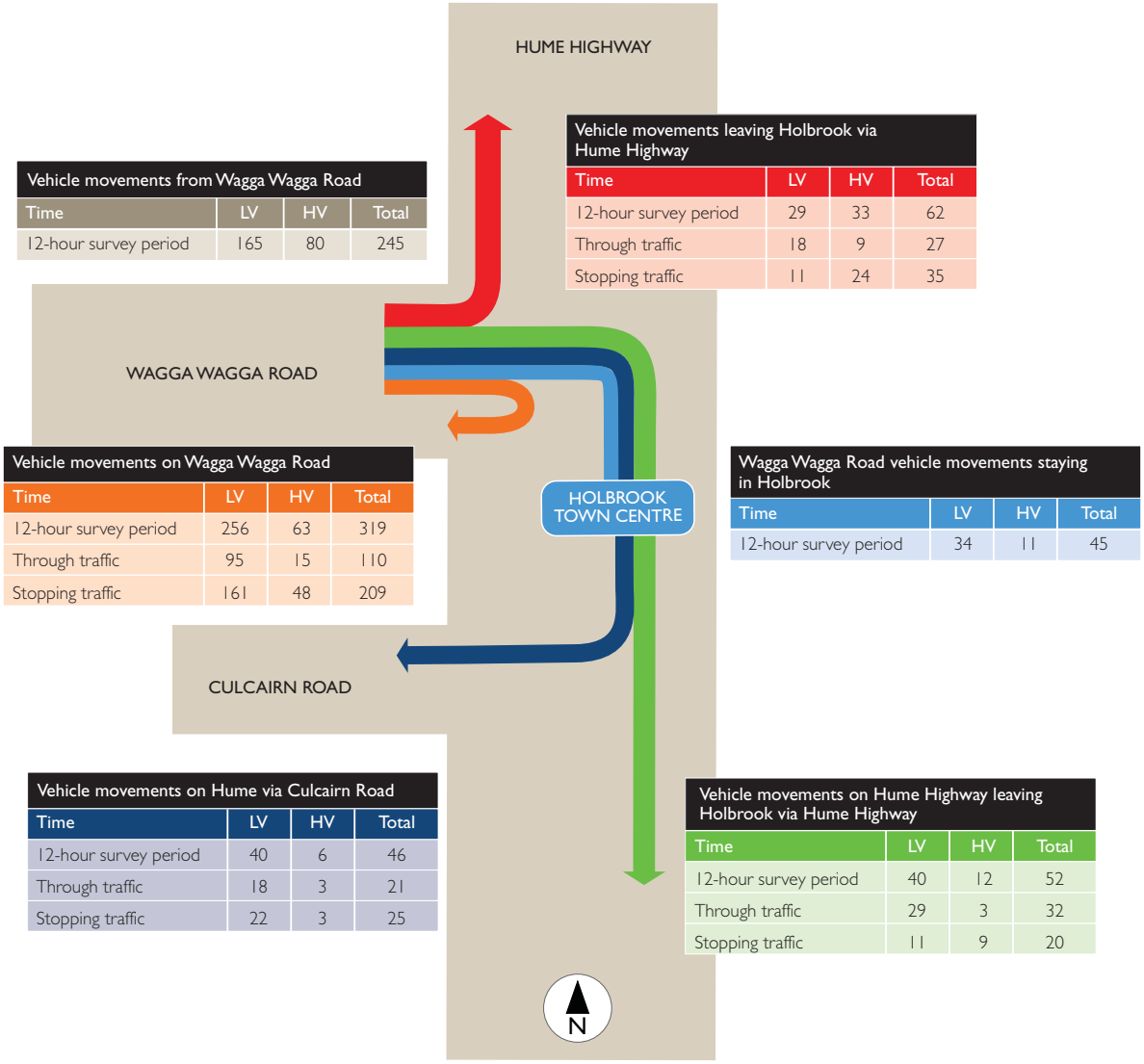
Northbound vehicle movements on Hume Highway U-turn

Time	LV	HV	Total
12-hour survey period	243	90	333
Through traffic	44	12	56
Stopping traffic	198	78	276

Northbound vehicle movements on Hume Highway entering Holbrook

Time	LV	HV	Total
12-hour survey period	1131	868	2000

Figure 9-14 **Destination of trips entering Holbrook on the Hume Highway (northbound)**



Vehicle movements from Wagga Wagga Road

Time	LV	HV	Total
12-hour survey period	165	80	245

Vehicle movements leaving Holbrook via Hume Highway

Time	LV	HV	Total
12-hour survey period	29	33	62
Through traffic	18	9	27
Stopping traffic	11	24	35

Vehicle movements on Wagga Wagga Road

Time	LV	HV	Total
12-hour survey period	256	63	319
Through traffic	95	15	110
Stopping traffic	161	48	209

Wagga Wagga Road vehicle movements staying in Holbrook

Time	LV	HV	Total
12-hour survey period	34	11	45

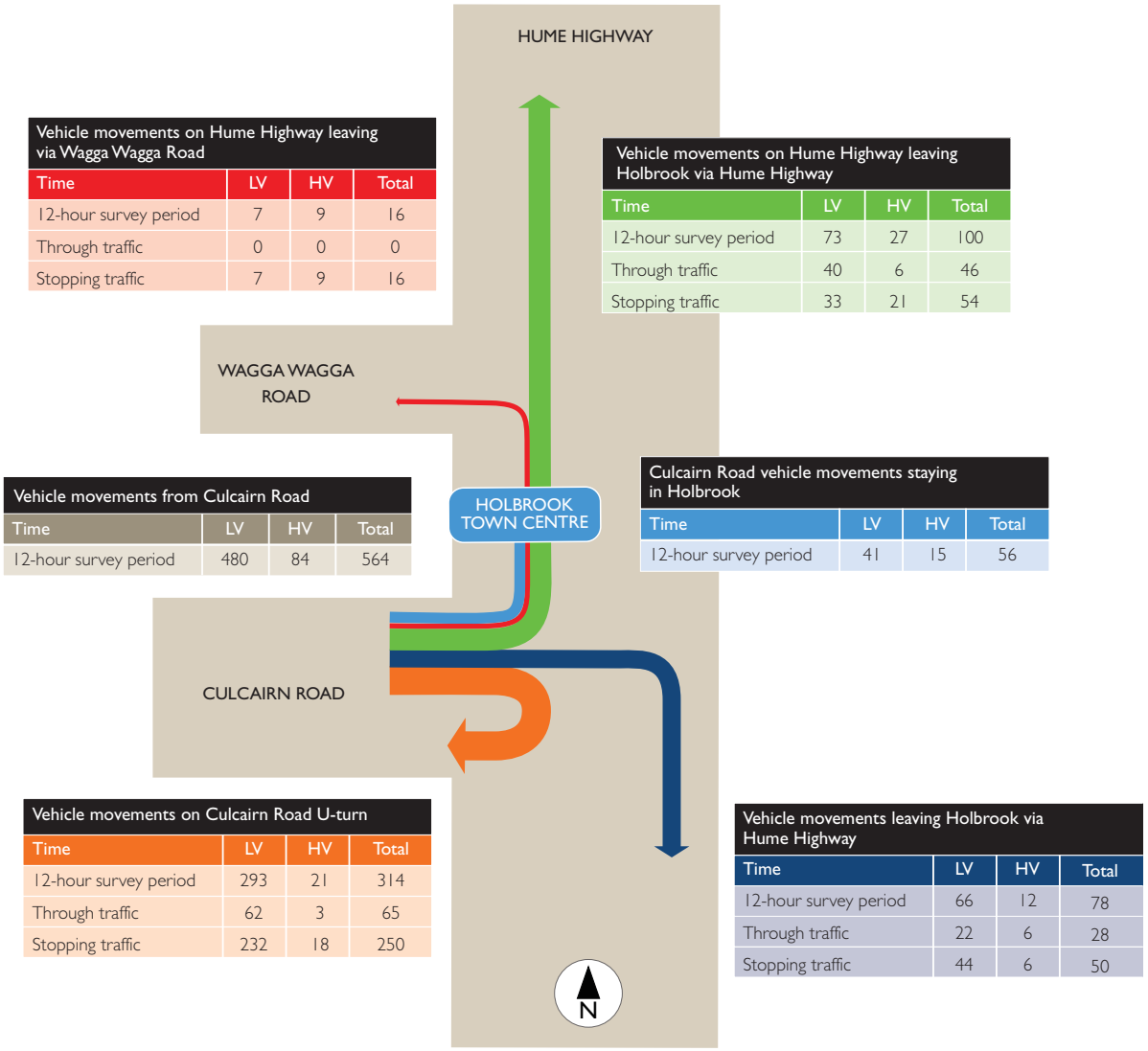
Vehicle movements on Hume via Culcairn Road

Time	LV	HV	Total
12-hour survey period	40	6	46
Through traffic	18	3	21
Stopping traffic	22	3	25

Vehicle movements on Hume Highway leaving Holbrook via Hume Highway

Time	LV	HV	Total
12-hour survey period	40	12	52
Through traffic	29	3	32
Stopping traffic	11	9	20

Figure 9-15 **Destination of trips entering Holbrook from Wagga Wagga Road**



Vehicle movements on Hume Highway leaving via Wagga Wagga Road

Time	LV	HV	Total
12-hour survey period	7	9	16
Through traffic	0	0	0
Stopping traffic	7	9	16

Vehicle movements on Hume Highway leaving Holbrook via Hume Highway

Time	LV	HV	Total
12-hour survey period	73	27	100
Through traffic	40	6	46
Stopping traffic	33	21	54

Vehicle movements from Culcairn Road

Time	LV	HV	Total
12-hour survey period	480	84	564

Culcairn Road vehicle movements staying in Holbrook

Time	LV	HV	Total
12-hour survey period	41	15	56

Vehicle movements on Culcairn Road U-turn

Time	LV	HV	Total
12-hour survey period	293	21	314
Through traffic	62	3	65
Stopping traffic	232	18	250

Vehicle movements leaving Holbrook via Hume Highway

Time	LV	HV	Total
12-hour survey period	66	12	78
Through traffic	22	6	28
Stopping traffic	44	6	50

Figure 9-16 **Destination of trips entering Holbrook from Culcairn Road**

The traffic movements in Holbrook (as determined from the licence plate survey) are described as follows:

- Of southbound traffic, 37 per cent of light vehicles and 54 per cent of heavy vehicles are considered through (traffic recorded leaving the town again with or without stopping) traffic.
- For northbound vehicles, 33 per cent of light vehicles and 62 per cent of heavy vehicles are considered through traffic.
- For both northbound and southbound traffic, 15 per cent to 21 per cent of vehicles enter the town, stop and then keep going.
- For Wagga Wagga Road and Culcairn Road, the majority of traffic is staying traffic, that is, traffic going to/from Holbrook or has business in the town.

The proportions of vehicles making each movement are shown in Table 9-37.

Table 9-37 Proportion of stopping, through and U-turn vehicles

Traffic movement	Northbound		Southbound	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Straight through town — no stopping for a substantial length of time.	33%	62%	37%	54%
Through town with stop for any length up to 12 hours.	16%	16%	21%	16%
Stopped in town for longer than 12 hours (staying).	11%	7%	14%	12%
To Wagga Wagga Road.	8%	3%	5%	5%
To Culcairn Road.	11%	2%	2%	5%
Came into town, completed their business and went back out ('U-turn').	21%	10%	21%	8%

These proportions were considered when estimating how much traffic would divert to the project. It has been assumed that the travel patterns measured during the day are applicable during the night.

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 level of service (LoS) is a qualitative measure used to describe the potential for delay during traffic operation, usually in peak demand situations. LoS is designated by assigning ratings from A to F, with A the best and F the worst. An LoS D or better is considered acceptable.

The estimated LoS at peak times in Holbrook was determined from estimates of the volume to road capacity ratio, as summarised in Table 9-38.

Table 9-38 Road LoS in Holbrook at peak times

	Annual highest hourly volumes		Volume/ capacity ratio	LoS
	Northbound	Southbound		
50th highest hourly volume	349	442	0.46	D
Weekday peak hour	193	175	0.20	B
Weekday night-time truck peak	123	124	0.18	B

Note: 50th highest hourly volume = the 50th largest hourly traffic volume recorded across the entire year, ranked from highest to lowest. This measure is often used as an upper bound for road design.

Table 9-38 indicates that traffic conditions on the highway through Holbrook are acceptable. Conditions are worse during the night-time due to the high volume of traffic, but are still acceptable.

Crash history

Table 9-39 compares crash rates on the single carriageway section of the highway around Holbrook for the five years from 2002 to 2006 with divided sections of the highway between the Sturt and Olympic highway and typical two-lane rural main roads.

Table 9-39 Comparison of crash data

Location	Rate per 100 MVKT[1]			
	Fatal	Injury	Tow-away	Total
Single carriageway section, Holbrook.	1.0	12.0	15.0	28.3
Divided carriageway sections, Sturt Highway to Olympic Highway.	1.1	7.9	15.6	24.6
Typical two-lane rural main roads.	1.4	14.2	17.2	32.8

Source: Connell Wagner (2004)

Note: 1. MVKT = million vehicle kilometres travelled.

Table 9-39 shows that the rate for crashes resulting in injuries on the highway around Holbrook is higher than the divided carriageway sections of the Hume Highway between the Sturt Highway and the Olympic Highway, and approaching the typical crash rate for a two lane rural main road.

Cyclist facilities

Due to the large distances between towns and the small population surrounding Holbrook, the number of cyclists using the existing Hume Highway is likely to be low. Long distance cyclists may stop in Holbrook to rest and use the facilities.

Public transport, including school bus services

Long-distance bus services between Sydney and Melbourne use the existing highway. These services stop in Holbrook when requested. School bus services operate on the Hume Highway in the morning between 7.30am and 8.30am and in the afternoon between 3pm and 4.30pm. Buses stop at selected locations along the Hume Highway and along Culcairn Road.

9.5.3 Construction traffic and transport impacts

The majority of the bypass can be constructed without affecting the movement of traffic on the existing highway. Temporary roadworks would be required during construction to tie the existing road network into the construction works.

Construction programming and temporary roadworks

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. Locations at which temporary roadworks are likely to be required include the northern tie-in to the existing highway, Anderson's Lane, the intersection of Wagga Wagga Road, Tip Road and the Southern interchange. Temporary roadworks may be constructed under traffic and could result in some short-term traffic impacts to users of the existing road network.

There may need to be temporary diversion of traffic to facilitate construction. For example, Wagga Wagga Road would be diverted onto a side track or traffic would be diverted via Andersons Lane (a combination of these may be used depending on requirements).

Vehicle numbers

The number of vehicles associated with the construction activities would change with different phases of construction, mainly due to changing numbers of construction workers on site and delivery requirements.

While the number of construction personnel would change during the course of construction, a maximum workforce of 300 people is anticipated on site at any one time. It is anticipated that the average number of staff and site vehicles across the two year construction timeframe would be around 200. These vehicles would be parked at the site compound. Some of these vehicles may be driven to and from Wagga Wagga.

Haulage of externally-sourced select fill from quarry sites would involve additional truck movements on local and regional roads. Based on indicative fill requirements, haulage needs would equate to an average over a one year period of approximately 270 movements per day.

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 considered as an in or an 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. On average, vehicle movements would be expected to be approximately:

- Staff vehicles — 470 trips per day.
- Delivery of equipment — 40 truck trips per day.
- Delivery of materials — 90 truck trips per day.
- Movement of earthworks —270 truck trips per day (Based on a total of 80000 truck movements).
- Construction movements outside site boundaries — 100 truck trips per day.

Based on the above, construction activities are expected to generate an average over two years of approximately 320 light vehicle and 500 heavy vehicle trips per day on public roads. This represents an increase of approximately 13 per cent of daily traffic and 20 per cent of weekend volume. These increases would be perceptible above normal daily fluctuations in traffic. However, during the weekday and weekend midday peak, traffic levels would remain within the capacity of the road with road performance on the existing highway remaining at LoS B. There would be a small increase in delay at some intersections.

Spoil and fill haulage

As outlined in Section 6.3.1, the project is not likely to generate excess spoil as it would require a net import of fill material. If spoil haulage is required, vehicles would use the proposed construction haul roads and the existing road network.

Haulage from quarry sites would involve additional truck movements on regional roads. Existing regional quarry locations are identified in Figure 6-2. Based on these locations, it is likely that haul routes may include the existing Hume Highway, Wagga Wagga Road, Jingellic Road and Culcairn Road. In the event that new quarries are established for the project, the impact of haulage movements on local/regional traffic would be assessed and the relevant road authority would be consulted, if required.

Access impacts

Site compound

Section 6.6.1 discusses the criteria for the selection of the site compound location(s). A site compound and a concrete batch plant would be required during the construction of the proposed bypass. No specific locations for the site compound and concrete batch plant are proposed at this stage. Siting of these facilities will be considered during detailed design and will be determined based on environmental constraints (as discussed in Section 6.6.1).

Access from the site compound to the existing road network would be required. The location of this access would have regard to the capacity and safety of the surrounding intersections. Vehicles arriving at the site in the morning would do so during a time of lower traffic volumes. Vehicles leaving the site compound during the early evening are likely to experience higher traffic volumes on the highway.

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

Construction access

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

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

A number of temporary roads and two temporary crossings of Ten Mile Creek would be required to provide alternative access to the construction area. A major haul road would be constructed along the length of the project and would be required specifically to access cut and excavated areas. The major haul road would also provide an alternative access when carriageways are unavailable for traffic (eg after paving). Minor haul roads would be required to access certain key areas of the project. Generally, these would be all weather access and up to 15 metres wide.

Two temporary creek crossings would be required over Ten Mile Creek. These crossings would be located on either side of the Ten Mile Creek bridge construction area. These crossings would be up to 15 metres in width to cater for a two-way heavy haul road.

Local roads

The local road network is described in Section 9.5.1. During construction, some temporary changes to access arrangements may be needed for local roads in and around Holbrook, including Anderson's Lane and Tip Road.

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). Fences and gates would be adjusted as required.

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.

Public transport

School bus services operate on the Hume Highway in the morning between 7.30am and 8.30am and in the afternoon between 3pm and 4.30pm. Buses stop at selected locations along the Hume Highway and along Culcairn Road. Local bus operators and the community would be contacted to ensure that safe alternative arrangements are made for school bus stops around the northern and southern tie-in works, and around Culcairn Road and Wagga Wagga Road. Access to Holbrook, including along the existing highway, Wagga Wagga Road and Culcairn Road would be maintained throughout construction. These services would be maintained.

Pedestrians and bicycles

Access to all local and regional roads would be maintained throughout construction through temporary roadworks, side-tracks and diversions as described in Section 9.5.3. Access would therefore be maintained for pedestrians and cyclists using the local and regional road network. Pedestrian activity would likely be limited to the residential and commercial centre of the town of Holbrook and is, therefore, unlikely to be affected by construction of the project. Any temporary changes to access arrangements would be undertaken in accordance with RTA requirements, including advanced notification of the community.

Travelling stock route

There are two travelling stock routes for transporting livestock by foot into Holbrook from the west, via Wagga Wagga Road and Culcairn Road, which direct livestock to the Wagga Wagga Road and Culcairn Road Travelling Stock Reserves to the north and south of town respectively. The Wagga Wagga Road and Culcairn Road Travelling Stock Reserves are linked via a travelling stock route that runs along the northern and western boundary of the former Town Common and along Tip Road.

From the Culcairn Road Travelling Stock Reserve a travelling stock route heads east along Culcairn Road and Railway Parade, before crossing Ten Mile Creek and heading towards the existing highway, crossing the highway south of Macinnes Street and continuing east along a reserve road and out of town via Jingellic Road.

The travelling stock routes and reserves are shown on Figure 9-9.

9.5.4 Operational traffic and transport impacts

Local access

All local road access would be maintained during operation of the proposed bypass. 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 Holbrook

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

The existing highway would be closed at the northern end (with the construction of a cul-de-sac), with access to the north provided via Wagga Wagga Road and the Wagga Wagga Road interchange.

Travel patterns

Hume Highway

The project would provide a shorter travel time and less disrupted journey than travelling through the town. It is likely that travellers seeking a faster journey would use the proposed bypass. It is also possible that some of the through vehicles that currently stop for a short time in Holbrook may use the proposed bypass because it may be more convenient for them to keep moving and stop at another location.

High and low diversion scenarios have been applied for the assessment. This has been based on the stoppers survey carried out for the project (refer Section 9.4) and the post-opening report on the Karuah bypass of the Pacific Highway titled *The Economic and Social Impacts of the Karuah Bypass: the 1 Year Report* (Rowe and Phibbs 2005). The following assumptions have been applied for the two scenarios:

- High diversion scenario forecasts (greater use of proposed bypass):
  - Light vehicles: the results of the Karuah bypass study indicated that 90 per cent of current stoppers would use the bypass.
  - Heavy vehicles: the results of the stopper survey for the economic assessment for this project indicated that 34 per cent of stoppers would use the bypass.
- Low diversion scenario forecasts (reduced use of proposed bypass):
  - Light vehicles: the results of the stopper survey for the economic assessment for this project indicated that 42 per cent of stopping light vehicles would use the proposed bypass.
  - Heavy vehicles: it has been assumed that all heavy vehicles that currently stop in Holbrook would continue to stop following project opening.

Wagga Wagga Road

Through traffic travelling between Wagga Wagga Road and the southern entry of the Hume Highway could potentially use the proposed bypass as it would save over two minutes travel time. It has been assumed that stopping traffic using Wagga Wagga Road would continue to stop in Holbrook, as they would have fewer alternative stopping locations. It is noted that the number of vehicles making this movement is small — only four per cent of traffic on the highway.

Culcairn Road

There is less chance that traffic travelling from the Hume Highway north of Holbrook to Culcairn Road will use the project, loop around the town and use the Southern interchange. The route using the Wagga Wagga Road interchange and the existing highway is approximately 30 seconds faster when the school speed limit is not in operation. When it is in operation the travel times are comparable. For this analysis, it has been assumed that traffic for Culcairn Road would continue to use the existing highway. The proportion of traffic from the northern entry of the Hume Highway to Culcairn Road is only one per cent.

Traffic volumes

If the project did not proceed, traffic volumes would continue to increase in Holbrook. The 2008 volumes have been factored up using a 2.8 per cent per annum growth factor for the design years of 2012, 2022 and 2032. Table 9-40 shows the forecast traffic volumes on the existing highway in Holbrook if the project did not proceed.

Table 9-40 Future AADT volumes south of Holbrook with no project

Year	Northbound			Southbound		
	Light vehicles	Heavy Vehicles	Total vehicles	Light vehicles	Heavy vehicles	Total vehicles
2012	1782	1297	3079	1747	1295	3042
2022	2349	1710	4059	2302	1706	4008
2032	3096	2254	5350	3034	2249	5283

If the project proceeds, the traffic volume would be shared between the highway and the project. The project would create additional capacity for future growth. Table 9-41 shows the forecast southbound volumes under the low and high diversion scenarios for the project and the existing highway to the north of Holbrook.

Table 9-41 Future southbound AADT volumes for the project and existing highway north of Holbrook

Year	Diversion scenario	Vehicle type	North of interchange	Project		Existing highway	
			Total AADT	AADT	%	AADT	%
2012	High	Light	1746	977	56	769	44
		Heavy	1295	768	59	527	41
	Low	Light	1746	802	45	944	54
		Heavy	1295	698	54	597	46
2022	High	Light	2302	1288	56	1014	44
		Heavy	1706	1012	59	694	41
	Low	Light	2302	1057	45	1245	54
		Heavy	1706	919	54	787	46
2032	High	Light	3034	1698	56	1336	44
		Heavy	2249	1334	59	915	41
	Low	Light	3035	1394	46	1641	54
		Heavy	2249	1212	54	1037	46

Table 9-42 shows the forecast northbound volumes under the low and high diversion scenarios for the project and the existing highway to the north of Holbrook.

Table 9-42 Future northbound AADT volumes for the project and existing highway south of Holbrook

Year	Diversion scenario	Vehicle type	North of interchange	Project		Existing highway	
			Total AADT	AADT	%	AADT	%
2012	High	Light	1782	914	51	868	49
		Heavy	1298	888	68	410	32
	Low	Light	1782	780	44	1002	56
		Heavy	1297	819	63	478	37
2022	High	Light	2349	1205	51	1144	49
		Heavy	1710	1170	68	540	32
	Low	Light	2349	1028	44	1321	56
		Heavy	1710	1080	63	630	37
2032	High	Light	3096	1588	51	1508	49
		Heavy	2254	1542	68	712	32
	Low	Light	3096	1355	44	1741	56
		Heavy	2254	1423	63	831	37

In general, through traffic and traffic for Wagga Wagga Road will use the bypass, while Culcairn Road traffic and traffic starting or finishing in Holbrook will use the existing highway. The through traffic that currently makes a stop in town is assumed to be split following the opening of the proposed bypass, either to use the proposed bypass and no longer stop in Holbrook or continue to stop in Holbrook, based on the assumptions mentioned earlier. The predicted total traffic volumes for the proposed bypass and the existing highway are presented in Table 9-41 and 9-42. They indicate that:

- For the high diversion scenario, 54 per cent of all light vehicles and 64 per cent of all heavy vehicles would use the proposed bypass.
- For the low diversion scenario, 45 per cent of all light vehicles and 59 per cent of all heavy vehicles would use the proposed bypass.

The assumptions made about stopping traffic only affect a small proportion (17 per cent) of the total traffic stream.

Travel times

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

Based on the surveyed travel times through Holbrook on the existing highway and the posted speed limit, it has been estimated that the travel time for vehicles to get off the bypass, travel through town and rejoin the bypass would be around six and a half minutes. The travel time on the bypass has been estimated as just over five minutes using the posted speed limit of 110 kilometres per hour, meaning that through traffic would receive a travel time advantage if they use the proposed bypass.

Compared to the travel time on the existing highway without the proposed bypass (six and a half minutes), through traffic will receive a minute and a half saving if the proposed bypass is built.

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 9-43 shows the LoS if the project does not proceed as well as the LoS on the project and existing highway if the project does proceed. This analysis has used the high diversion scenario to show the likely maximum conditions on the project.

Table 9-43 Future LoS with and without the project

	No project	With project	
	Hume Highway LoS	Existing highway LoS	Bypass LoS
2008			
50th highest hourly traffic volumes	D	-	-
Weekday midday peak	B	-	-
Weekday night-time truck peak	B	-	-
2012			
50th highest hourly traffic volumes	D	C	A
Weekday midday peak	B	A	A
Weekday night-time truck peak	B	A	A
2022			
50th highest hourly traffic volumes	E	C	A
Weekday midday peak	C	B	A
Weekday night-time truck peak	C	A	A
2032			
50th highest hourly traffic volumes	E	D	A
Weekday midday peak	C	B	A
Weekday night-time truck peak	C	B	A

The results indicate that, if the project does not proceed, the conditions on the existing highway are likely to slip into the unacceptable range (LoS E) during the highest traffic times of the year (eg long weekends and school holidays). If the project does proceed, traffic volumes would be split between the two roads. The average weekday peak and the night-time truck peak are likely to maintain acceptable conditions. The traffic conditions on the existing highway improve from LoS C to the borderline of LoS A/B. There is still a proportion of traffic that has a destination or origin in Holbrook, or which makes a stop in Holbrook.

Crash potential

The proposed bypass is anticipated to have a lower crash rate than the existing highway as it would be dual carriageway. This would provide safer overtaking opportunities, reducing the chance of a head-on collision. The reduction of traffic on the existing highway may also reduce the likelihood of crashes at intersections as there should be larger gaps in traffic.

The *Accident Reduction Guide, Part 1: Accident Investigation and Prevention* (RTA, March 2004) publication provides a list of percentage reductions for crashes when different treatments are used. Applying these reductions, the proposed bypass is anticipated to save eight crashes, including three injury crashes, over the 20 year period from 2012 to 2032.

The proposed bypass may take on the crash characteristics of the existing divided carriageway sections of the Hume Highway between the Sturt and Olympic highways. If this occurred, the crash rate would be 24.6 crashes per 100 MVKT, which is lower than the existing crash rate of 28.3 crashes per 100 MVKT.

Cycle facilities

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

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

Travelling stock route

As shown in Figure 9-6, a travelling stock route links the travelling stock reserves located around the town (Wagga Wagga Road Travelling Stock Reserve, Culcairn Road Travelling Stock Reserve and former Town Common). The proposed bypass would require the existing travelling stock route to be altered, however connectivity of the route would be maintained, except to the Wagga Wagga Road Travelling Stock Reserve. Any changes required would be further developed during detailed design in consultation with the Hume Livestock Health and Pest Authority and other relevant stakeholders with the aim of providing for continued use of Travelling Stock Reserves and routes.

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 9-44.

Table 9-44 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 (LoS). ▪ 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 for a lower crash rate than the existing highway. ▪ 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 (LoS). ▪ The project would result in a shorter travel time and less disrupted journey.

Traffic and transport objectives	Consistency with traffic and transport objectives
Improve the reliability of travel on interstate and inter-regional corridors.	▪ The project would improve performance of the road network (LoS). ▪ 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 duplication 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.

Potential major land use changes in the locality

The project is included in the draft Strategic Land Use Plan for Holbrook, which has influenced a number of planning responses, such as future land use planning and urban sub-division, the need for future residential areas and opportunities and potential increases in commercial and industrial activities.

Holbrook is currently zoned under the Holbrook Interim development Order 1970 (IDO) and has recently been amalgamated into the local government area of Greater Hume Shire Council. Council is currently preparing a revised LEP, known as the 'draft Greater Hume Shire Local Environmental Plan 2009', which includes Holbrook. This Plan proposes an 'RU5 Village Zone' for the majority of the Holbrook Town Centre surrounded by 'RU1 Primary Production'. Council has advised that this draft LEP will be gazetted in early 2010. It is not anticipated that the project would restrict any of the proposed future land uses under the Plan.

The former Town Common is currently zoned for agricultural purposes. Council has recently purchased this land with the aim of rezoning and developing it for industrial purposes.

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 land use changes have been identified that would be likely to affect traffic assessment outcomes.

9.5.5 Management of impacts

Table 9-45 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 9-45 Traffic and transport mitigation and management measures

Potential impact	Mitigation and management measures
Construction	
Reduce 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-construction and post-construction road dilapidation reports for local roads likely to be used for construction. Any damage resulting from construction (not normal wear and tear) will be repaired unless alternative arrangements are made with the relevant road authority.
Disruption to public transport, including school bus services	▪ Maintain operation of public transport, including school bus services. Confirm the requirements for any temporary changes during detailed design in consultation with local bus operators and the community.
Operation	
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.
Operation of the travelling stock route	▪ Adopt reasonable and feasible measures in consultation with Hume Livestock Health and Pest Authority to maintain the existing travelling stock routes.
Changes to operation of public transport, including school bus services	▪ Maintain operation of public transport, including school bus services. Confirm the requirements for any permanent changes during detailed design in consultation with local bus operators and the community.