Pedestrian Access and Mobility Plan - Small Towns and Villages

Stage 1 Study: Robertson PAMP

QEDptyltd

Wingecarribee Shire Council

Small Towns & Villages Pedestrian Access & Mobility Plan: Stage 1 Study – Robertson PAMP

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1 Introduction

As with all local councils in NSW, Wingecarribee Shire Council has a responsibility to provide safe, convenient and connected pedestrian routes that will encourage people to walk rather than use their cars. It also has a responsibility to ensure that people who do not have access to cars – particularly the young – are able to able to reach needed facilities in their everyday activities, and that as far as possible, people with a physical disability do not have their access impaired because of that disability.

In 2001 Council engaged Geoplan Urban and Traffic Planning to prepare a pedestrian access and mobility plan (PAMP) for its three main towns: Bowral, Mittagong and Moss Vale. While this has been implemented since its adoption, there has been no similar planning document for the remaining towns and villages.

Council has recently been offered a grant by the NSW Roads and Traffic Authority to prepare a PAMP for small rural towns and villages within the Wingecarribee Shire local government area. It has commissioned QED Pty Ltd to undertake this. This report covers the first of the towns, Robertson.

Council has also established a PAMP team to oversee the project, consisting of the following members:

- Jo Babb – Disability Aged Worker;
- Frank Perger – Traffic Engineer;
- James Shelton – Strategic Planner;
- Trevor Grant – Civil Design Officer (Project Manager); and
- Dominic Lucas – Design & Projects Manager.

This team met with the consultant team for an initial workshop and has reviewed documents produced as part of the project on an ongoing basis.

The objectives of a PAMP cover environmental, social and economic considerations. Some of these are to:

- make the most effective use of council resources by providing those facilities that are most needed in the community and that are planned in accordance with expected future development;
- improved access for mobility-impaired groups in the community, including older persons;
- improve safety by minimizing pedestrian dangers from dealing with road traffic;
- promote the use of public transport by making walking to trains and buses easy and convenient; and
- ensure that the provision of pedestrian facilities is integrated with other plans for a local area, such as land use, bike plans, recreation plans etc.

This report has the following structure:

- a brief introduction to the township of Robertson;
- an explanation of how the plan has been prepared;
- key findings from a site survey of the township;
- key findings from community consultation that has been undertaken;
- a proposed network and recommendations; and
- an action plan.

2 An introduction to the township of Robertson

The township of Robertson is known for its attractive scenery but damp climate. (It has the highest average annual rainfall in New South Wales.) The village appeals to tourists and to people who have moved there from Sydney because of the attractive village lifestyle. It has a resident population of about 1,150 people and is proving increasingly attractive to young families who are filling the new subdivisions that have been created, mainly in the north-eastern corner of the village.

Robertson straddles the Illawarra Highway (called Hoddle Street through the village), which connects Shellharbour, Wollongong and Kiama with the Southern Highlands and the Hume Highway.

Robertson is located just to the west of the Illawarra escarpment, 20 km to the east of Moss Vale. A map of the township appears as Figure 1, overleaf.

Robertson's grid street pattern has emerged as the village has developed. This has grown from a linear form, originally addressing the railway line and later addressing Hoddle Street, as the main transport thoroughfare. The rail and road alignments are generally low points in the local topography; the village rises fairly gently (although more steeply in places) to the north of Hoddle Street and south of the rail line.

Most of the shops, especially those that villagers would use regularly, are on the south side of Hoddle Street in the vicinity of Main Street; that is, toward the eastern end of the village. The primary school, on the other hand, is located about 600m west of the shops, also on the south side of Hoddle Street. The single pedestrian actuated crossing of the highway is outside the primary school (near Caalong Street).

The street grid pattern should provide numerous options for travelling between any two points. The grid pattern is however broken up, most notably by the railway and by Caalong Creek (most of which is in private hands, with an important exception being through Hampden Park). These form barriers to walking. Also the newer sub-divisions on the northern and southern edges are typically laid out as culs-de-sac, so enforcing longer trips that are more likely to be done by car.

It has been pointed out by the local school principal that housing tends to be located in three clusters: the north east quadrant referred to earlier, the north west quadrant (north of Hoddle Street and west of Caalong Street) and the south west corner (south of South Street and west of Belmore Falls.) The fact that the higher densities tend to be on the periphery of the township, away from each other and away from the shops and services, means that the town does not lend itself very well to utility walking. It also does not help that the people living in the first two clusters have to cross the Illawarra Highway (Hoddle Street) to access most of the shops and services, while residents in the third cluster have to cross the railway line.

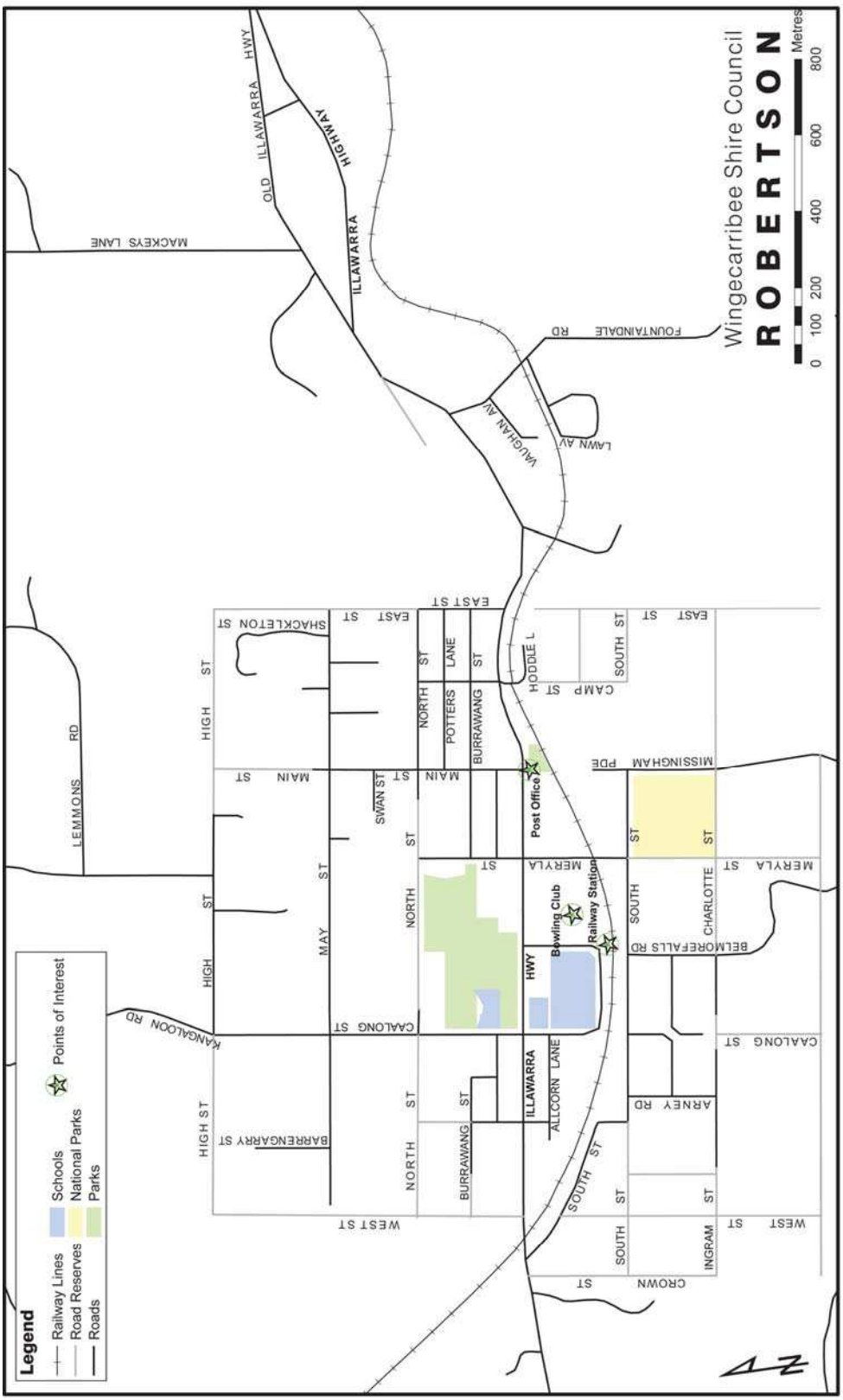

Figure 1: Map of Robertson

Public transport

Although located on the railway line between the Illawarra and Moss Vale, the only train service that stops is the Cockatoo Run, which uses Robertson as the terminus for its heritage steam train services.

Bus services comprise stops on CountryLink/ CityLink services connecting from Wollongong to Moss Vale and then by rail to Melbourne or Canberra (three a day from Wollongong, four a day to Wollongong); Murrays Coaches from Wollongong to Canberra (one a day each way); and Berrima Buslines services from Robertson to Moss Vale and Bowral, connecting at Bowral to rail services to Sydney (two a day each way, plus one a day to/ from Moss Vale only). The Berrima Buslines services run on school days only.

In addition there are several school services designed to bring children from outlying districts to the Robertson Primary School, and from Robertson to the high schools in Moss Vale.

Census data

Unfortunately data from the 2006 census is not yet available. Figure 2 provides data from the 2001 census.

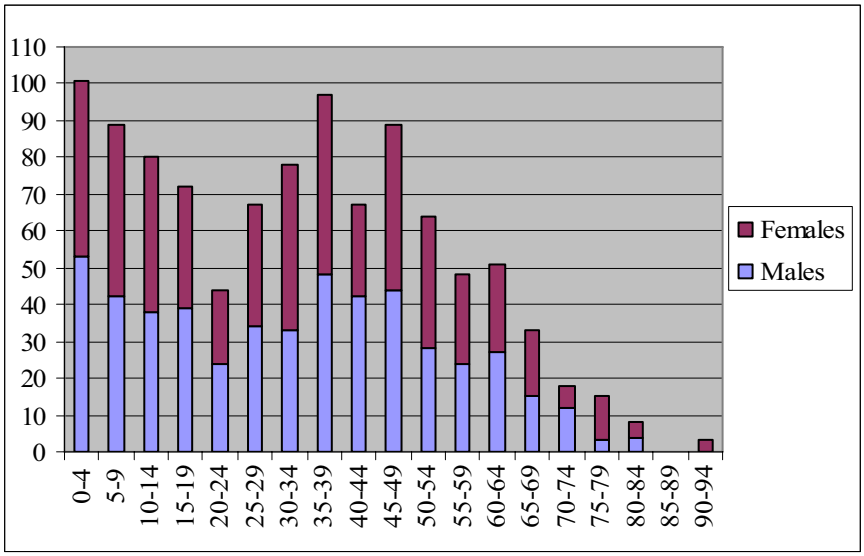

Figure 2: Robertson demographic data, 2001 census

In 2001 the village had 1,023 residents, of whom 270 (26%) were aged 14 or younger. This proportion is larger than the equivalent for NSW as a whole, which is 21%. 8% of residents were aged 65 or more, which is significantly less than the state wide equivalent of 13%. However the percentage of residents age 50 to 64 was the same as the state average – 16%.

The census form asks how people travelled to work on the day of the census. Of the 415 residents who went to work that day and responded to the question, 80% went by car, either as a driver or a passenger. 5% walked and 9% worked at home. To some extent the figures reflect the lack of local employment opportunities in the village, with the vast bulk of the workforce commuting elsewhere. Only 7

people (2%) caught the bus to work. Unfortunately the census does not ask how students got to school. However, see below, s. 5.

3 How the plan has been prepared

Research for this plan has had three phases, for which working reports were prepared and are included as appendices:

- review of background information (Appendix A)
- community consultation (Appendix B)
- site survey (Appendix C)

The main findings from this research are presented in Section 4.

The bulk of the community consultation took the form of a charette; that is, a workshop in which residents were invited to contribute their concerns and ideas after being provided with background information. Residents could come and go at any stage of the 4 hour period in which the charette was held. A total of 38 people filled in a response form that provided information about themselves, their issues and opinions. The form itself is included in the working report contained in Appendix B. The response rate would normally be considered fair to good for a town of this size, but given the timing of the event (20 December) and the fact that the township has recently been the subject of several other community consultations, the response rate should be considered fortunate.

Details of the management of charette are also provided in the working report. The working report notes that although the charette was a rich source of information, attendees could not be considered a true cross-section of the local community, with children under 16 and young adults particularly under-represented. Given the importance of children's interests as pedestrians, the principal of the local school was also interviewed.

A site survey was also undertaken. All roads and streets within the study area were reviewed to develop an understanding of the area, identify issues and opportunities, collect information about conditions such as road widths, and confirm the extent of roads and road reserves against mapping information. The site surveys undertaken do not represent an exhaustive engineering survey of all roads in Robertson. Rather, they:

- review issues and opportunities identified through consultation;
- confirm information collected through consultation about conditions affecting walking;
- collect information about road widths and profiles, types of construction, and locations of street trees and power poles in the road reserve to inform the design phase;
- identify informal walking routes ("goat tracks"); and
- develop an overall understanding of the local walking conditions.

4 Key findings

4.1 Background information

The review of background information mainly provided information to help formulate concepts and support the direction of thinking for the PAMP, rather than to give rise to key findings.

However, the crash analysis has identified that through Robertson (East Street to South Street), Hoddle Street would qualify as a Black Spot under state government guidelines, based on its history of casualty crashes for rural roads. Most of these crashes occurred between East Street and Main Street.

4.2 Community consultation

4.2.1 Things liked about the area

- the village (or rural or country) atmosphere of Robertson;
- Hampden Park and/or Caalong Creek
- aspects related to the natural environment: trees, scenery, green space, open space, tree plantings.
- safety: traffic, lack of traffic and personal security; and
- the lack of engineering infrastructure: unkerbed streets, lack of concrete paths.

The number of responses specifically mentioning concrete paths and being 'un-engineered' was surprisingly high and may point to a sensitisation of the community in response to the proposal to provide a concrete path through Hampden Park. No comments mentioned the Hoddle Street (Illawarra Highway) footpaths negatively and the need to extend these footpaths was instead mentioned a number of times in other comments and during the charette.

There is a clear desire to maintain the village "feel", without the normal infrastructure attributes of a modern suburb.

Other attractive aspects of Robertson included lack of light pollution (lighting of Hoddle Street is discussed in the site survey report), the community and its diversity, specific streets including Hoddle Street and Main Street, the railway precinct and built form/ heritage, the overall amenity of routes ("pretty", "nice"), the grid layout of streets (lack of culs-de-sac or dead ends) and ease of parking.

4.2.2 Attitudes to proposals for pedestrian infrastructure

The pedestrian infrastructure proposals were:

1. A path through Hamden Park following the Caalong Creek

2. An extension of the footpath along Caalong Street to the showgrounds
3. A footpath along the Illawarra Highway to Fountaindale Road.
4. A path to Fountaindale Road using the railway alignment.

In each case respondents were asked to indicate whether they:

(a) supported the proposal

(b) supported the proposal, but with an amendment

(c) rejected the proposal, but recommended an alternative

(d) simply rejected the proposal.

Figure 3 graphs the responses.

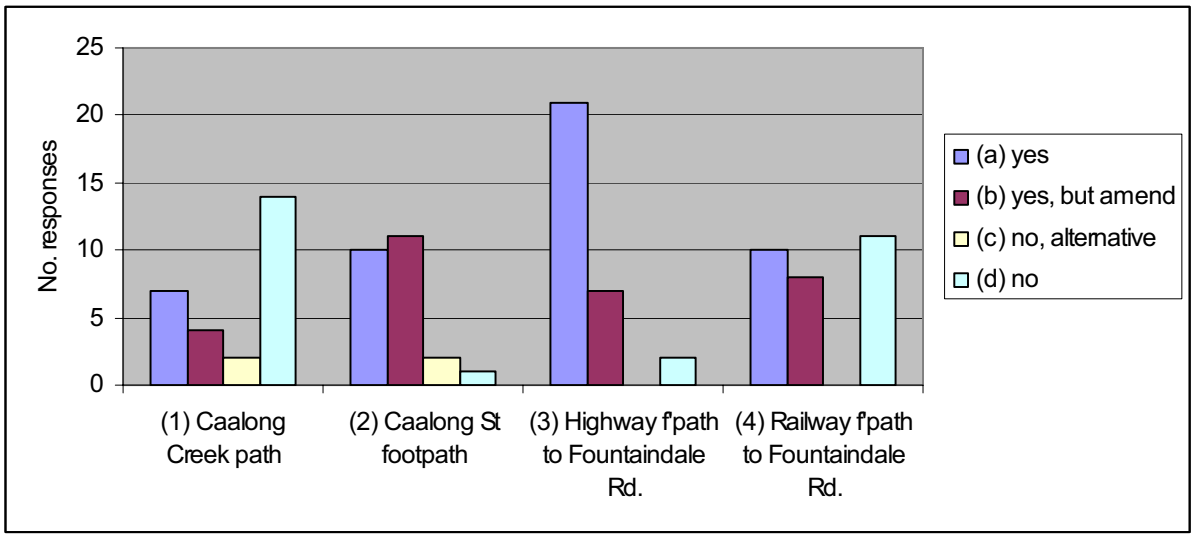

Figure 3: Responses to proposals

It should be reiterated that the people who attended the workshop were only a small proportion of the total population and could not be considered to be representative. On the other hand they are the people most likely to be concerned and active about walking issues and pedestrian infrastructure.

Figure 3 indicates that the footpath to Fountaindale Road along the highway is the most popular proposal, and that the proposed path along Caalong Creek is the least popular. All nine respondents whose main walking route (see s 4.2.4) including the post office to Fountaindale Road along the Illawarra Highway supported option (3) unconditionally.

On the other hand, the eleven respondents whose main walking route included Hampden Park/ Caalong Creek were much more divided about the Caalong Creek option, with seven saying no, two yes and one each for an amendment and an alternative. While the Hampden Park/ Caalong Creek proposal was generally opposed, few negative comments were received (one doubted the need for it). Instead, the positive comments about the lack of engineered infrastructure/ concrete paths in Robertson probably provide a better insight into reasons for opposing the proposal. Amendments/ comments included protecting tree plantings, and not having a straight grid aligned path (with a connection from

Meryla Street to Caalong Street being one proposed alternative). One supporter of the proposal noted that the Caalong Street path had a higher priority.

The twelve respondents who included Caalong Street on their main walking route were also divided about the Caalong Street footpath. Although there was overwhelming support for some sort of route, almost as many recommended an amendment (five) as those who supported the proposal unconditionally (six). Amendments/ comments included reducing the visual impact and number of switchbacks (e.g. by using North Street), placing a seat half-way, extending to High Street and providing a ramp (presumably instead of steps, this then being a comment on the original proposal rather than that presented at the charette).

Overall, then, there is strong support for a path along the Illawarra Highway to Fountaindale Road, although the details of this need further development and consultation. Of the suggested amendments/ comments, two wanted the path extended to the post office, while other amendments were protection from traffic, subject to clarification of details, with landscaping and not just a concrete path, lower priority than access paths in the village, and if the railway option is not feasible.

The objections to having the path run alongside the railway included feasibility, the diversion created and cost, with amendments/ comments including signage to direct walkers to the path and continuing the path along the Old Illawarra Highway/ to the post office/ to South Street/ past Ranelagh House.

4.2.3 Other comments

11 respondents provided comments. Generally, these related to the need to improve access in/ through Robertson, in terms of general network development and issues of crossing the rail line and addressing the South Street problem (see site survey report for a more detailed assessment of this.) Path standards were also raised, in terms of maintenance and width (enough for wheelchairs, strollers and bicycles), as was dog walking/ management at rail crossings, an opportunity for car parking at Meryla Street and the pedestrian/ vehicle conflict at the main oval entry.

4.2.4 Routes most used

Attendees at the charette were asked to indicate the walking routes that they used the most. A map indicating this appears overleaf, as Figure 4. Most streets (and numerous road reserves) are used to some degree, while Hoddle Street either side of Meryla Street is the most-used street.

Respondents were asked what the most popular places they walked to were. The local shops were easily the most important destination, reinforcing the route pattern revealed in Figure 4. The only other significant single destination was the local park/oval.

As noted in s. 3, the long-standing principal of the local primary school (Mike Reilly) was also interviewed to gain an understanding of the routes most likely to be used by children. (A report on the interview is included in the Consultation Working Report.)

Two thirds of the 160 students who attend the school travel by bus, most of these from outside the township. As school buses stop outside the school on Hoddle Street, with pedestrian signals to cross Hoddle Street, their direct home/ school pedestrian access needs are generally catered for within Robertson. The access needs of the other third will depend on their particular bus stop locations. Apart from on Wallangunda Street and Fountaindale Road, no bus shelters or formal bus stop locations were observed in Robertson.

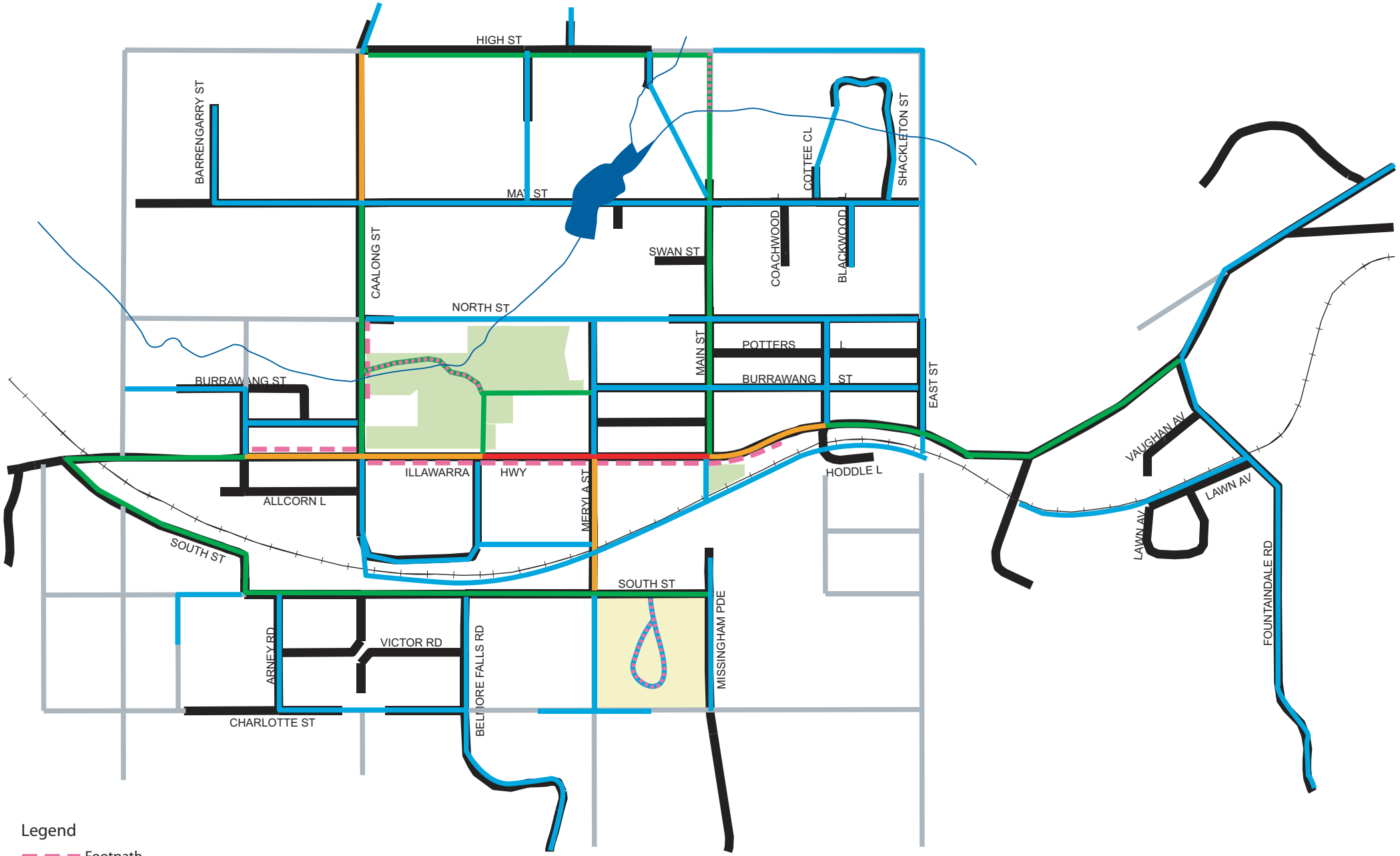

Figure 4: Popular pedestrian routes

Wingecarribee Shire Council - Robertson
Pedestrian Access and Mobility Plan
Results from Workshop Feedback Form
Preferred Walking Routes

QEDptyltd

A large number of children live in the new housing developments in the north east corner of the village; that is, the area bordered by East, High, Main Street and North Street. The most direct route to the school from this area would pass through Hampden Park/ Caalong Creek recreation area, which would also be a trip generator outside school hours. Children from the north east quadrant would also be expected to walk to the shops on Hoddle Street, most of which are at the eastern end. As with the charette findings, Main Street is most likely to be used for such trips to/ from home; Hoddle Street for such trips to/ from the school.

The south western corner of the village, south of South Street and west of Belmore Falls Road, also has significant numbers of school age children. However because of the barrier to direct travel posed by the railway line, these children are generally driven to school.

Caalong Street is another street used by children. The school is located at the end of it, and there are a number of streets that run off Caalong Street with new housing. It was noted that many of these children use the school bus service from Kangaloon, which is free.

4.2.5 Problem locations

Those attending the charette were presented with an aerial photograph of the village and asked to indicate were the problem locations are. They were asked to use a coded letter at each location to indicate the nature of the problem. Figure 5 is a photograph of the results. Further details of the process, included more detailed photographs and the codes, are included in the Community consultation Working report (Appendix B).

Figure 5: An indication of problem locations

Clearly, most problems are located along Hoddle Street/ the Illawarra Highway – which is also the most popular route. There is a reasonable consensus on many of the issues raised. South Street/ railway line/ Illawarra Highway appears as a particular problem location.

Access along Caalong Street and the Illawarra Highway east of the Old Cheese Factory – the subject of two previous proposals, as discussed in the preceding section – also clearly appear. Other problems are more distributed and probably reflect individuals' walking experiences, along less well-used routes.

The Consultation Working Report details the nature of the problems. They are also referred to below when discussing the results of the site survey.

4.2.6 Actions and priorities

Those at the workshop were also asked to indicate their priorities in terms of things that Council could do to encourage walking. Each individual was given six "votes" to distribute how they wished among the nominated items. They could add a new nomination and assign all their votes to it if they wished. The Consultation Working Report provides the full list of nominations, along with the numbers of votes in support of each. The list is long with 27 nominations. The high number of nominations tended to dissipate the vote. Table 1 includes only those that received more than ten votes:

Table 1: Recommended actions (charette)

How Council should improve walking	Votes
Path along main road to Fountaindale Road/ Ranelagh House.	28
Provide footpath the full length of Hoddle Street on one side (south).	24
Provide recreational walking routes	25
Complete path entire length of Caalong Street to High Street.	20
Proper footbridge over the creek to link Main Street with High Street.	13
Provide additional road crossings	13
Path from Post Office to Ranelagh House and on to Old Road.	12

Clearly the path to Ranelagh House (that is, to Fountaindale Road) was regarded as the priority, particularly given that the vote was shared with those supporting a nomination that the path should continue beyond Ranelagh House and on to Old Road.

The generally rural atmosphere and the numerous quiet streets encourage recreational walking. It is not surprising then, that recreation featured strongly in comments at the charette. The fact that "provide recreational walking routes" received the second highest number of votes at the charette probably reflects the enthusiasm for recreational walking that was evident in many participants at the charette. It is likely that the support for a proper footbridge over the creek to link Main Street with High Street would mainly have come from recreational walkers, although it would also provide a much better link from the new housing developments along High Street to the shops on Hoddle Street. Completing the path along Caalong Street would also provide this link, but it would be more circuitous.

4.3 Site survey

The site surveys were undertaken on Wednesday, 20 December 2006. A night-time review of Hoddle Street and streets intersecting with Hoddle Street was also undertaken, on the evening of Tuesday, 19 December 2006.

The Site Survey Working Report provides details of traffic management devices, road widths and street lighting. The following discussion is drawn from that document's issues analysis.

4.3.1 Pedestrian barrier: Hoddle Street

The benefits of the grid street pattern have been noted earlier, in s.2, as was the disbenefit of having housing clumped into clusters that were divided from each other by distance and by man-made and natural barriers.

The significant width of Hoddle Street (20 metres, kerb to kerb) plus relatively high traffic volumes forms a barrier to free and easy north-south movement, particularly for children under the age of 12, whose cognitive abilities are not as well developed as for older children and adults; and the aged or people with mobility restrictions, for whom travel speeds are lower and crossing times are higher.

There is only one designated crossing point of Hoddle Street, near Caalong Street, and footpaths are provided on Hoddle Street:

- from Camp Street to Caalong Street, on the south side; and
- from Caalong Street to a point about 20 metres east of Wallangunda Street, on the north side (this footpath is often referred to in this document as being from Wallangunda Street to Caalong Street, for ease of reference).

The footpaths on Hoddle Street are in reasonable condition, but are only about 1.2m wide.

Pedestrians from the area north of Hoddle Street thus face both a lack of designated crossing points and a lack of paths to the one formal crossing point when accessing services – which are predominantly located on the south side of Hoddle Street.

Vehicle speed in Hoddle Street is also relevant. Speed is a major factor for pedestrian safety as increased vehicle speed increases both the probability of an accident occurring and the severity of an accident. In particular, the probability of a crash between a pedestrian and a vehicle resulting in a pedestrian fatality is about 78% at a collision speed of 60km/h, compared to about 42% at a collision speed of 50km/h[1]. Pedestrians would be more aware that as speed increases, so does the distance or time between vehicles for it to be safe to cross the road. The general speed limit on Hoddle Street is 60km/h.

Only the central travel lanes in Hoddle Street are under the RTA's care and control, and are constructed to take highway level traffic. The parking areas, delineated from the travel lane by an edge line and raised retro-reflective

[1] *Road Safety Principles and Models: Review of Prescriptive, Predictive, Risk and Accident Consequence Models*, Road Transport Research, OECD, 1997.

pavement markers (RRPMs or 'cateyes'), are part of the Council road reserve and not constructed to the same standard. Maintenance is similarly differentiated. In some areas, the additional maintenance required for the travel lanes is leading to the travel lanes being built up over time, forming a lip between this and the parking areas. In places, this may form a trip hazard for pedestrians crossing the road, a drop-off for cyclists proceeding along the road, and an inconvenience for people with wheeled devices (strollers, wheelchairs, etc) crossing the road.

4.3.2 Problem location: Hoddle Street level railway crossing

Barriers to pedestrian accessibility is a particular issue regarding the rail line, due to recent fencing installed along the rail line to prevent pedestrian access along the corridor and to prevent pedestrians crossing the line except at designated points. While intended to improve safety, apparently as part of general Australian Rail Track Corporation (ARTC) policy, the full implications of this on pedestrian safety do not seem to have been adequately assessed or addressed for Robertson.

The lack of a designated crossing point west of Meryla Street naturally directs people from the south-west of Robertson to the South Street/ Hoddle Street level crossing. From a traffic safety viewpoint, this crossing point can only be regarded as deplorable for pedestrians. Figure 6 is a photo of the rail crossing taken from the west.

Figure 6: Hoddle Street railway crossing, east from South Street

There is very little verge adjacent to Hoddle Street at the level crossing. What available area is present has been used to provide W-profile guard rails on each approach to the level crossing. This results in a minimal available verge (of the order of 0.3m) located on the south side of Hoddle Street to the west of the level crossing, changing to the north side of Hoddle Street to the east of the level crossing, for pedestrians to use. For the short section within the level crossing, it is arguable whether either side offers an advantage in verge width. Once past the level crossing, a gravel verge on the south of Hoddle Street offers the best walking

conditions until the start of the footpath at Wallangunda Street – on the north side of Hoddle Street. (This footpath then changes to the south side of Hoddle Street at Caalong Street, with a pedestrian actuated crossing provided at this point.)

Hence pedestrians from South Street will tend to walk on the south side of Hoddle Street, with minimal to no width to provide separation protection from traffic, cross to the north side where conditions are similar, then cross back to the south side to use the gravel verge.

A schematic of this follows, as Figure 7.

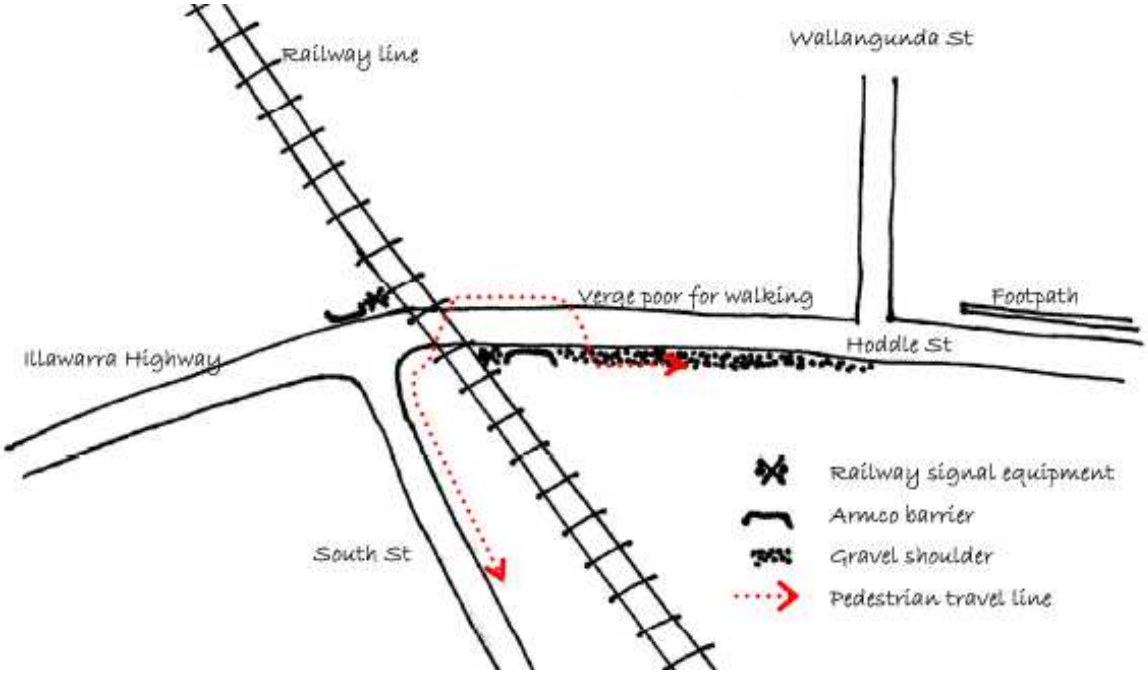

Figure 7: Schematic of South Terrace/ railway crossing

The alternative is simply to walk along the south side of Hoddle Street without any separation to traffic, from South Street until the level crossing is cleared. (Pedestrians would then have to cross Hoddle Street again to use the footpath from Wallangunda to Caalong Street before crossing back to the main footpath on the south of Hoddle Street. But most would simply use the verge for the Wallangunda Street to Caalong Street length.)

The situation is exacerbated by the lack of an 'entry statement' for Robertson before the level crossing and the lack of clear sightlines through the level crossing. That is, there are no environmental cues to drivers not familiar with Robertson (or the pedestrian activity likely at South Street) that they are entering the village and should expect to encounter pedestrian activity. As the level crossing coincides with a bend in the road, this lack of environmental cues includes not being able to see the main street of Robertson ahead in even fine weather, not to mention with sight distance reduced by the frequent fog and rain experienced in the village.

4.3.3 Pedestrian barrier: the railway line

The use of the South Street level crossing by pedestrians is thus undesirable, to say the least. However the alternative – to walk to Meryla Street and use the level crossing there – is a significant detour, particularly for children accessing the primary school. It is therefore not surprising that a large hole has been made in the railway fence roughly at Armstrong Crescent/ South Street intersection, where the fence line is close to the roadway, with a clear 'goat track' leading from this to the rail line.

Figure 8: Hole in railway fence with clear "goat track"

This issue is likely to increase in relevance as further development occurs in the area. An extension of South Street was observed in the site visit, providing access to currently undeveloped allotments. The road reserves established for Crown Street, West Street and Ingram Street also point to future development opportunity in the area.

4.3.4 Problem location: Eastern end of Hoddle Street

The eastern 'entry statement' at the other end of Hoddle Street is even more poorly defined than its western counterpart. Initial environmental cues (the pie shop, Fountaindale Road) provide an impression that Robertson will develop slowly, with additional streets and businesses building into a township, as is common elsewhere.

This is not the case: an undeveloped stretch of the Illawarra Highway is followed by Robertson proper, at the Old Cheese Factory (roughly opposite Camp Street), a high pedestrian location. This is located at a bend in the Illawarra Highway, more marked than on the western approach, with the additional traffic complexity of

well-used on-street parking at this location. Verges exist, but vary in width and are unsealed.

The photo that follows is of the Illawarra Highway about 100 metres west of the Old Cheese Factory. Note that this is also part of the route that would be used by a footpath to Fountaindale Road.

Figure 9: Illawarra Highway east of Old Cheese Factory

Currently, pedestrians walking to Fountaindale Road, Ranelagh House and beyond from Camp Street have to walk alongside the Illawarra Highway with no separation from traffic in a speed zone of 60km/h. (See Figure 10.)

Figure 10: Illawarra Highway, east from East Street

4.3.5 Caalong Creek

Creek lines in the area provide barriers to movement but also potential movement corridors. In this regard, Caalong Creek is the most significant.

The potential for these alignments to provide for movement appears to have been eroded by recent development. For example, development at the end of May Street, west of the dam does not provide for access to the dam (or, more accurately, an access corridor established around the dam.) A similar situation applies to Devonshire Road, although an opportunity for access may yet remain. Residents along Devonshire Road would thus have to walk north to High Street and along High Street to Caalong Street to head south, instead of being able to cut through from the end of Devonshire Road to May Street. This affects pedestrian permeability. (See also the following sub-section.)

In contrast, connections at the end of Shackleton Street and Cottee Close to the creek line have also linked these streets together.

4.3.6 Pedestrian permeability

An area with high-quality pedestrian permeability is one in which a pedestrian has (many) more access opportunities than motor vehicles, and where these provide for pedestrian access to be more convenient than vehicular access. In this regard, increased pedestrian permeability in Robertson is mainly brought about by informal measures, such as using undeveloped blocks and road reserves, cutting a hole in a fence to create a new crossing point of the rail line, etc.

The main street pattern in Robertson is a grid pattern, which provides nominally good permeability. However, this is only nominally the case because many street

reserves have not been developed and therefore do not provide active access opportunities. Also the permeability issues related to creek lines, the railway and Hoddle Street, each of which form both barriers and potential movement corridors, have been discussed above.

A more immediate threat to pedestrian permeability is in the form of new development. Most new development is occurring based around culs-de-sac and other dead-end streets, with no linkage between these and other streets. To some extent, this is currently being overcome through the use of undeveloped blocks in these new development areas, but movement will be hindered as these are developed.

This also applies to cyclists.

4.3.7 Existing footpaths

The only formal footpaths are on Hoddle Street, as previously described, and on the eastern side of Caalong Street.

The footpath on Caalong Street forms part of a plan to build a path to the showgrounds on High Street. It has been built to modern engineering standards and as a concrete path with a wider timber footbridge section over Caalong Creek. The path currently extends between the northern side of the Robertson Community Centre car park and North Street. A proposal to extend the path from North Street to High Street and thus the showgrounds has been the subject of recent community consultation.

Figure 11: Caalong Street path, overview

Figure 12: Caalong Street path showing footbridge

There is no designated path between the northern side of the Robertson Community Centre car park and the main pedestrian route of Hoddle Street, south of the Community Centre. Ignoring the lack of a designated pedestrian space and the issue of pedestrian/ vehicle interactions, the Community Centre car park could be considered to provide a sealed surface that can be utilised for walking, but this does not extend to Hoddle Street.

As the Caalong Street path is on the eastern side of Caalong Street and there is no footpath on the northern side of Hoddle Street east of Caalong Street, extension of the footpath to Hoddle Street would not in itself link to the main Hoddle Street footpath, although with the inclusion of a kerb ramp, it could link to the section of footpath between Caalong Street and Wallangunda Street.

4.3.8 Other issues

- There are a few verandas in Robertson that extend past the property line, over the footpath - some of which completely cover the footpath. One example is shown in Figure 13.
  These provide weather protection for pedestrians and would appear to be in keeping with the village atmosphere for Robertson. These could therefore be considered as a desirable form of development in Council's DCP for Robertson. If so, the veranda overhang over footpaths past buildings should be wider than the general footpath width, to allow for the placement in the weather

protected space of objects such as outdoor dining, 'A-frame' signage, planter boxes, etc, that may result.

Figure 13: Veranda over footpath outside Waters Shop, Hoddle St

- There are few other formal pedestrian facilities in Robertson and these do not link to form a network or even continuous routes. This leaves considerable scope for the improvement of walking through infrastructure development.
- The provision of bus shelters is generally poor. Access for people with disabilities does not appear to have been specifically addressed at any bus stop location[2].
- Footpaths or formed walkways are not being provided as part of new development.

[2] The Disability Standards for Accessible Public Transport 2002 (amended 2004) requires Council to have 25% of bus stops compliant with this legislation by 31 December 2007, with future milestones being 55% of bus stops compliant by 31 December 2012, 90% compliant by 31 December 2017 and 100% compliance by 31 December 2022.

5 The Pedestrian Network

It has been noted that pedestrian facilities in Robertson are fragmented and very limited. However it has also been noted that residents value the village feel and would not necessarily appreciate extensive provision of footpaths similar to those of established suburbs. Also, most streets in Robertson have very low traffic levels (fewer than 200 vehicles per day), allowing pedestrians to walk along the edge of a road relatively safely.

A pedestrian network has been developed for Robertson to carefully target those routes where formal pedestrian facilities would be most beneficial and would fill gaps in a functional walking (and cycling) network, without leading to an over-provision of infrastructure not in keeping with the village character. The network therefore addresses:

- streets that have vehicular and pedestrian levels that make sharing of the road reserve unsuitable without a formal footpath;
- where pedestrian levels are high and provision of facilities would improve the convenience and ease of the existing walking activity; and
- where there are clear pedestrian desire lines that are not part of the existing street network.

The proposed pedestrian network comprises primary, secondary and local access routes and essentially reflects a functional hierarchy approach, with the note that walking for utility and recreation overlap strongly within Robertson and generally have not been differentiated in the network.

It is recommended that the proposed network be adopted as the basis for providing walking facilities in Robertson, with appropriate design standards as discussed in this section. A diagram of the proposed network is shown overleaf, in Figure 14.

A description of the walking route hierarchy follows in summary form, followed by a more detailed description of the proposed routes, under hierarchy headings.

- Primary routes are those with the highest levels of walking activity. These are proposed along Hoddle Street/ the Illawarra Highway. The design standard is relatively high, aiming to create a convenience and ease of access suited to the walking that occurs along these routes. With local services located almost exclusively in Hoddle Street, these provide access to these services for residents and visitors alike, including from on-street parking to these services. Amenity considerations such as weather protection and streetscaping are most focused on these routes.
- Secondary routes provide for general access from the residential areas of the township to Hoddle Street (and vice versa). These are provided mainly for utility walking, but also capitalise on the primary routes to provide loops that can be used for recreation. While amenity is a consideration, this is mainly in the form of minimising the visual impact of routes on the existing streetscapes.
- Local access routes are short routes providing local linking opportunities to increase pedestrian permeability. These are focused on areas that do not (nor should have) vehicular access, particularly where the grid pattern has been compromised in some way. They tend to be locally very important to promote

convenience and reduce lengthy detours, but do not service a large proportion of the Robertson township and could be easily overlooked if not identified in the network.

- Trails are existing unsealed pedestrian paths. This are acknowledged in the network but there is currently no proposal to extend these further.

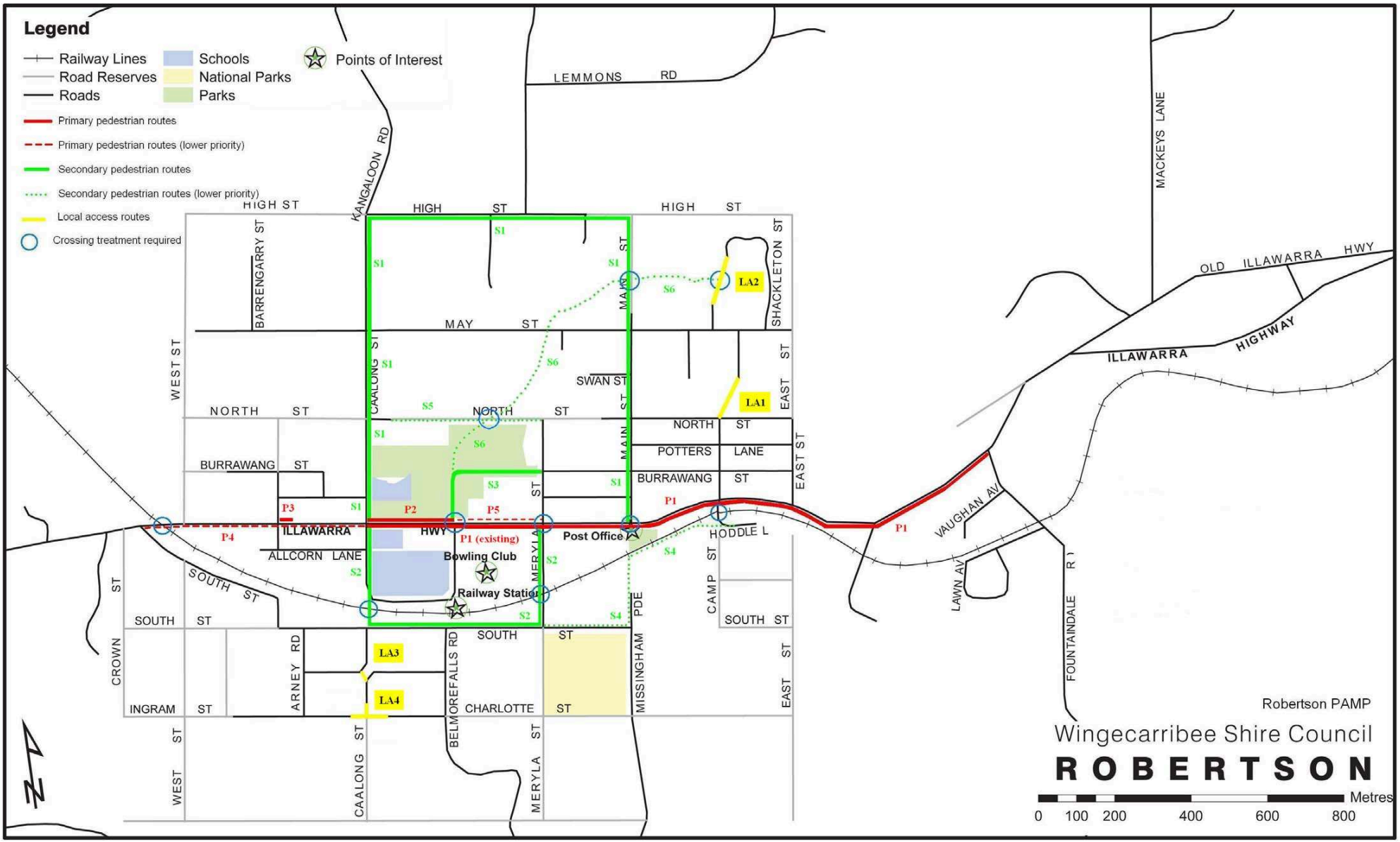

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Figure 14: Proposed pedestrian network

For reference later on in this document, routes are designated with a simple number system of P1, etc for primary routes, S1, etc for secondary routes and LA1, etc for local access routes.

Issues such as the priority of routes or phasing of the network and different design criteria should be differentiated from the overall network proposed, as elements related to implementing the network.

5.1 Primary routes

These comprise footpaths on Hoddle Street, on the south side from Wallangunda Street to Fountaindale Road, and on the north side from Wallangunda Street to the entrance to Hampden Park. Primary routes are generally also high priority routes (with the exception of P4, as follows.)

There are existing footpaths for about half the length of these routes. The additional footpaths would be:

P1: Camp Street to Fountaindale Road (south side of Illawarra Highway)

This was easily the outstanding nomination for action at the community consultation. It is a relatively popular walking route, although on a dangerous stretch of the Illawarra Highway. A footpath will make this a much safer connection for people walking to and from the Fountaindale Road area and for walking to the tourist attraction of Ranelagh House.

P2: Caalong Street to the entrance of Hampden Park (north side of Hoddle Street)

Existing "goat tracks" show that this is well used. It would link a route from the north east quadrant through Hampden Park to the pedestrian actuated crossing opposite the Primary School, promoting safe walking to school. This would also link in to an extension of the Caalong Street path to Hoddle Street. (See Secondary routes).

P3: completion of the footpath from Caalong Street to Wallangunda Street (north side of Illawarra Highway)

The current footpath stops at the service station on the corner of Hoddle Street and Wallangunda Street. Completing the footpath will provide a link to the bus stop that is almost on the corner of Wallangunda and Hoddle Streets.

P4: Caalong Street to South Street (south side of Hoddle Street)

This is a medium term priority to provide a footpath for the entire length of Hoddle Street and serve those using South Street.

P5: Entrance of Hampden Park to Meryla Street (north side of Hoddle Street)

This is a medium term priority to extend the footpath on the north side of the popular Hoddle Street.

5.2 Secondary routes

The three main secondary routes would enhance the connection between residential housing, shops and the primary school, and also provide circular recreational routes.

S1: Main Street/ High Street/ Caalong Street, to the north of Hoddle Street

Main Street and Caalong Street carry the highest levels of vehicular traffic, apart from Hoddle Street. Speeds on these roads are also quite fast compared to shorter streets in which vehicle speed is limited due to the need to give way at intersections, stop or turn. Main Street in particular is a popular walking route and links the largest and fastest growing residential area with the shops. High Street forms the northern boundary of the town and is also an area of new housing that will generate pedestrian activity.

The route is along the eastern side of Caalong Street, southern side of High Street and western side of Main Street. This minimises road crossings for people using the path as a loop; makes use of the existing Caalong Street path (particularly the footbridge); and connects to the Hampden Park/ Caalong Creek trail. A pedestrian refuge should be provided in the vicinity of Main Street, to facilitate crossing Hoddle Street. Note that the section from North Street to May Street is currently being designed by Council, following consultation.

Currently, Main Street does not extend all the way to High Street, but there is a popular unsealed path linking the two. The construction of a formal footbridge where the path crosses Caalong Creek was a popular nominee for council action to promote walking and is part of the route proposal; while the popularity of the route is evident from the route results, which show two routes from the end of Main Street to High Street.

S2: Meryla Street, South Street and Caalong Street, to the south of Hoddle Street

A footpath along Caalong Street to South Street, including a pedestrian crossing of the railway line, will be a much needed asset for the people living in the south western corner of Robertson, in particular providing access to the primary school and to Hampden Park. Footpaths along South Street and Meryla Street will provide access to the shops for these people as well, and for people further east on Victor Road, Charlotte Street, Belmore Falls Road, Meryla Street and Missingham Parade.

The route is along the eastern side of Caalong Street, northern side of South Street and western side of Meryla Street. This minimises road and driveway crossings for people using the path as a loop, and for people who walk along

South Street before crossing to reach destinations in Armstrong Crescent, in Belmore Falls Road or along South Street.

A footpath along Meryla Street across the railway line was a popular nominee at the community consultation. A pedestrian refuge should also be provided at Hoddle Street near Meryla Street to link to the S1 route.

This route should also prove to be a popular recreational route.

S3: Burrawang Street to the entrance to Hampden Park, off Hoddle Street.

This route is already well-used and provides an alternative access to Hoddle Street from Burrawang Street, servicing people in the north eastern area and particularly those south of North Street.

Between East Street and Meryla Street, Burrawang Street provides a route parallel to Hoddle Street. (The route also continues to Caalong Street for people using the Hampden Park trail). From the reporting of popular routes, this route is as popular as the preceding secondary routes. Part of its popularity may be that it exists, in an informal sense. The access from Hoddle Street already exists, in the form of access to a car park, with part of the proposal is to formalise pedestrian/ vehicle interactions in an already-used area; the extension of Burrawang Street is kept mown to assist pedestrian access.

The access to the car park is also roughly opposite Yarranga Street, so the route also provides access to the railway precinct. A pedestrian refuge should be provided in this area to facilitate crossing Hoddle Street.

There is also a strategic role for this route, in that the Wingecarribee Open Space, Recreation, Cultural and Community Facilities Needs Study and Strategy has identified land at the northeast corner of Hampden Park as being not widely used and suitable for residential subdivision, to fund upgrades. This route would provide access from the new subdivision to Hoddle Street and east via Burrawang Street, in the event that this proceeds.

Burrawang Street also has potential as a local cycling route parallel to Hoddle Street. Given low traffic volumes and speeds generally, specific cycling facilities are not required in Burrawang Street, but development of this route would support cyclist access of Burrawang Street for east-west travel.

This route would also provide two short recreational routes: one via Hoddle Street/ Caalong Street/ Hampden Park trail and the other via Hoddle Street and Meryla Street. Rather than being used in a circular manner, as with the preceding routes, this would be used as alternative routes for trips to and from destinations, to provide variety.

Three other secondary routes are proposed, with lower priorities.

S4: extending the footpath from Meryla Street to Hoddle Lane

This has a low priority as it is only proposed if a foreshadowed closure of the rail crossing at Hoddle Lane is implemented. Should this occur, however, this will become a priority route, at a level with the two preceding routes. This

route would then be critical in preventing a significant pedestrian detour being created, being virtually a circular loop via Meryla Street to access local services and locations east of Hoddle Lane. The route needs to be accompanied by a pedestrian crossing of the rail line at Camp Street to provide access to Hoddle Street.

If implemented, this route should also prove to be a popular recreational route, linking to the path to Fountaindale Road.

S5: North Street extension.

This is proposed to formalise a currently informal route along the North Street road reserve, and is proposed to ensure that this desirable alignment is recognised and protected from development. As a connection from Caalong Street to Main Street, the route would enable people accessing facilities at either the Caalong Street end of Hoddle Street (notably the primary school) or the Main Street end of Hoddle Street (and further east, to Fountaindale Road) to avoid Hoddle Street in this area.

To some extent, this route is an alternative to providing a path in Hampden Park but also provides access to the Hampden Park trail. As such, it develops the functionality of this route while protecting the amenity of the popular Hampden Park.

The route would be particular beneficial for cyclists wanting to avoid Hoddle Street. It is already a popular recreational route, and with Caalong Street and Main Street provides a shorter loop than the Caalong / High/ Main Streets route.

S6: Caalong Creek alignment.

Off-road linear paths can be expensive to develop and maintain. However, the opportunity for informal walking corridors to develop/ be maintained and for future formal paths to be developed should be protected through planning requirements. From feedback received at the charette, the publicly accessible green space that results would be in keeping with attributes of Robertson valued by its residents: green open space and a village atmosphere.

A long-term route is proposed that would be particularly functional for people from the growing north east area to reach Hoddle Street via Hampden Park, and also overcomes a lack of direct routes between Caalong Street and Main Street north of North Street.

This route is proposed as long-term route because of the need to plan for its development, with some areas along the alignment being currently in private ownership. Otherwise, the priority for development of the route is as follows:

- First priority: North Street to Burrawang Street extension (i.e. linking in with the S3 route proposal)
- Second priority: Main Street to North Street
- Third priority: Shackleton Street/ Cottee Close to Main Street (in conjunction with linkage to the Shackleton Street/ Cottee Close local access route).

It would be desirable to link this route to May Street and possibly Devonshire Road in the longer term, but development already exists in this area and constrains the feasibility of this in the near term.

As a linear route along Caalong Creek, this would also be a popular recreational route.

5.3 Local access routes

There are four proposed local access routes.

LA1: From the cul-de-sac end of Blackwood Street, to North Street

Judging by the 'goat track' between the end of the cul-de-sac in Blackwood Street and North Street, near Camp Street, this is already used as a short cut, through empty blocks of land. If these blocks are developed without provision for access, people in Blackwood Crescent will face a reasonable detour to reach Hoddle Street – particularly locations east of Main Street.

The route proposal is therefore linked to development, but a path could be provided along the side of the two relevant blocks of land, minimising the impacts on these blocks. Council could:

- purchase the blocks, subdivide to enable the necessary width to be cut from them and on-sell the blocks;
- provide incentives through a DCP for this land, such as increased floor ratio allowances or rate rebates for a given time, to encourage developers to provide the desired route;
- accept construction of a public right of way in exchange for Section 94 contributions related to development of the land; or
- create an easement of access over the titles and develop the route itself. In this case, Council would have to compensate the developer for the loss of development rights to this land.

However it is achieved, this route will overcome a regrettable shortcoming of the sub-division.

LA2: From the cul-de-sac end of Shackleton Street, across the Caalong Creek to the end of Cottee Court.

This is already a popular informal short-cut, though difficult in wet weather when the creek is flowing. A pedestrian ford or (preferably) footbridge would connect short paths that already exist at both Shackleton Street and Cottee Court.

The priority for this route would increase significantly with development of the secondary route along Caalong Creek (S6).

LA3: Victor Road to Armstrong Crescent

With the development of a crossing point of the rail line opposite Armstrong Crescent, this route would provide for access over the rail line for people from Bellmore Falls Road and Victor Road, for destinations west of Yarranga Street.

As with LA1, the applicable land is privately owned, however in this case has already been developed. No houses are currently located on the route alignment; instead, the route should follow the property boundary, to minimise impacts on the relevant properties.

Mechanisms to achieve this route area as for LA1.

LA4: Charlotte Street

This route connects Charlotte Street to Victor Road, including connecting the eastern and western ends of Charlotte Street opposite Victor Road. The land between Charlotte Street east end, Charlotte Street west end and Victor Road is currently unoccupied and undeveloped, although it is not obvious whether this land comprises empty block/s or is an undeveloped part of a larger block.

This land is privately owned, as with LA1 and LA3. Mechanisms to achieve this route would thus be as for LA1.

5.4 Trails

There are two existing trails in Robertson. No new trails are proposed and works proposed for the existing trails are mainly for maintenance purposes.

T1: Hampden Park

This trail generally follows Caalong Creek through Hampden Park. A footbridge on the trail is in need of replacement. Shelter for the trail would also be appreciated by the community.

T2: Nature Reserve

This is a loop in the nature reserve. Signage to the loop would assist visitors in identifying its location.

5.5 Problem locations

Both the community consultation and the site survey have identified two outstanding problem locations that need to be treated as a priority. These are at either end of Hoddle Street. In addition, Hoddle Street itself has been noted as forming a major barrier to north-south pedestrian movement. These issues have been described previously and are not reiterated here.

It has also been noted that the section of the Illawarra Highway between East Street and South Street, and particularly between East Street and Main Street, has a level of casualty crashes to qualify as a Black Spot location.

A conceptual road profile for Hoddle Street has been developed, with entry statements at east and west, that attempts to address the vehicular crash history and pedestrian and cyclist use of this street. These are discussed in the context of the particular problems at these locations, as follows.

However, costs/ benefits for these treatments are difficult to obtain and it may not be possible to obtain Black Spot funding to implement these treatments.

The proposed road profile for Hoddle Street is compatible with the designation of primary walking routes along this street.

5.5.1 Eastern entry to Robertson

The recommended treatment is to provide additional delineation and shoulder sealing to address the vehicular crash types, and environment cues to the imminent high pedestrian area to reduce speeds and increase awareness. This should transition to the main Hoddle Street profile, described in s. 5.5.4.

The creation of a footpath on the southern side of the roadway (i.e. to the right of Figure 10), which is a previous infrastructure proposal, would be one means of providing the necessary environmental cues to motorists that they are entering a

pedestrian area, and at the same time provide easily the most popular facility nominated in the community.

However the path would not in itself be sufficient to encourage the safe driving necessary to reduce the level of casualty crashes, or to provide the necessary safety for people crossing the road in the vicinity of the Old Cheese Factory.

Unfortunately, the width of the highway at this point (seven metres) is not sufficient to install a pedestrian refuge – which would reduce lane widths to an unacceptable 2.9m – and traffic volumes do not warrant pedestrian signals (which would not necessarily be effective anyway, given poor sight distance).

The proposal at this location is therefore to:

- Create a flush median of approximately 800mm wide. This could be formed as a painted median, or using a contrasting pavement material. This would not be intended as a pedestrian crossing facility, but could improve the safety for people who cross in this area, in conjunction with the other measures proposed.
  It is not clear where the main Hoddle Street profile develops, but it is anticipated that a pedestrian refuge can be created at Main Street, to encourage crossing to occur at this more appropriate location.
- Provide an edge treatment using the same material as the median, to provide sealed shoulders while reinforcing the appearance of narrower lanes. The edge treatment would taper to the east with the available road reserve, giving west-bound motorists the impression of a narrowing lane and enhancing the 'entry statement' being created.
  The sealed shoulders should assist in reducing the 'off road on curve' and 'head on' crashes experienced at the location (by about 40%), while the increased delineation provided by a contrasting pavement would assist in reducing the 'off road on curve' crashes only (by about 15%).
- Impose a 50kph speed limit 50m east of East Street, with a "50km/h ahead" sign on the approach.
- Construct the footpath to Fountaindale Road as previously mentioned, in a pavement that contrasts to the edge treatment.
- Provide 'give way' signage and line-marking at East Street. The 'give way' line-marking in particular is proposed to improve delineation.

This treatment would be compatible with and a lead-in to the main Hoddle Street profile, which is described separately.

The Site Survey Working Report also raises the possibility of and issues arising from a formal entry statement, such as landscaping or sculpture, to provide further cues to motorists. However an action in this regard is considered beyond the scope of this plan.

5.5.2 Western entry to Robertson

Currently, pedestrians are forced to this location by fencing along the rail line. However the location is not necessarily on a direct (utility) pedestrian desire line

for most residents south of Hoddle Street, although it remains on an indirect (recreational) desire line.

The first priority is therefore to enable pedestrians to avoid the area by providing a formal pedestrian crossing of the railway opposite the Armstrong Crescent/ South Street intersection, where the current goat track/ hole in the fence indicates a clear pedestrian desire line. This desire line aligns with Caalong Street on the other side of the railway line. This would dramatically increase pedestrian accessibility to the western part of Robertson (including Hampden Park and the Primary School) for people living in the south western corner of Robertson.

As mentioned, recreational walkers will still want to use Hoddle Street at the point it is crossed by the railway. Pedestrians originating from new housing at the western end of South Street will also find this location the most convenient and attractive.

A medium term measure is therefore to create a pedestrian crossing of the rail line close to South Street/ Hoddle Street intersection, but set back from the south side of Hoddle Street, to line up with desire lines from South Street and to the east of the level crossing. This should be supplemented by a footpath on the south side of Hoddle Street, between Caalong Street and Wallangunda Street.

In the shorter term, a 50km/h speed limit should be provided for all of Hoddle Street, with 50km/h signage on the approach to the level crossing and supported by "50km/h ahead" signage to its west.

The Site Survey Working Report also raises the possibility of and issues arising from a formal entry statement, such as landscaping or sculpture, to provide further cues to motorists. However an action in this regard is considered beyond the scope of this plan.

5.5.3 Hoddle Lane level crossing

Currently, there are no major issues related to the Hoddle Lane level crossing. However, there is a proposal to remove the level crossing, constructing alternative access to Hoddle Lane for vehicles via Missingham Parade. Council has prepared a detailed design plan for this proposal but the work is unfunded.

For residents in this area, the removal of a crossing of the railway line would form a significant barrier and impose a long detour to access shops. The road reserves of Camp Street and East Street in this area may also indicate a potential for additional development that would be affected by the closure of Hoddle Lane.

Should the level crossing be removed, a pedestrian crossing of the rail line should be maintained or provided between the current location and East Street.

5.5.4 Hoddle Street

A concept design has been prepared by Councils' Design & Projects Section prior to this PAMP as a result of enquiries put to Councils' Traffic Committee. This concept sketch currently has no status with Council.

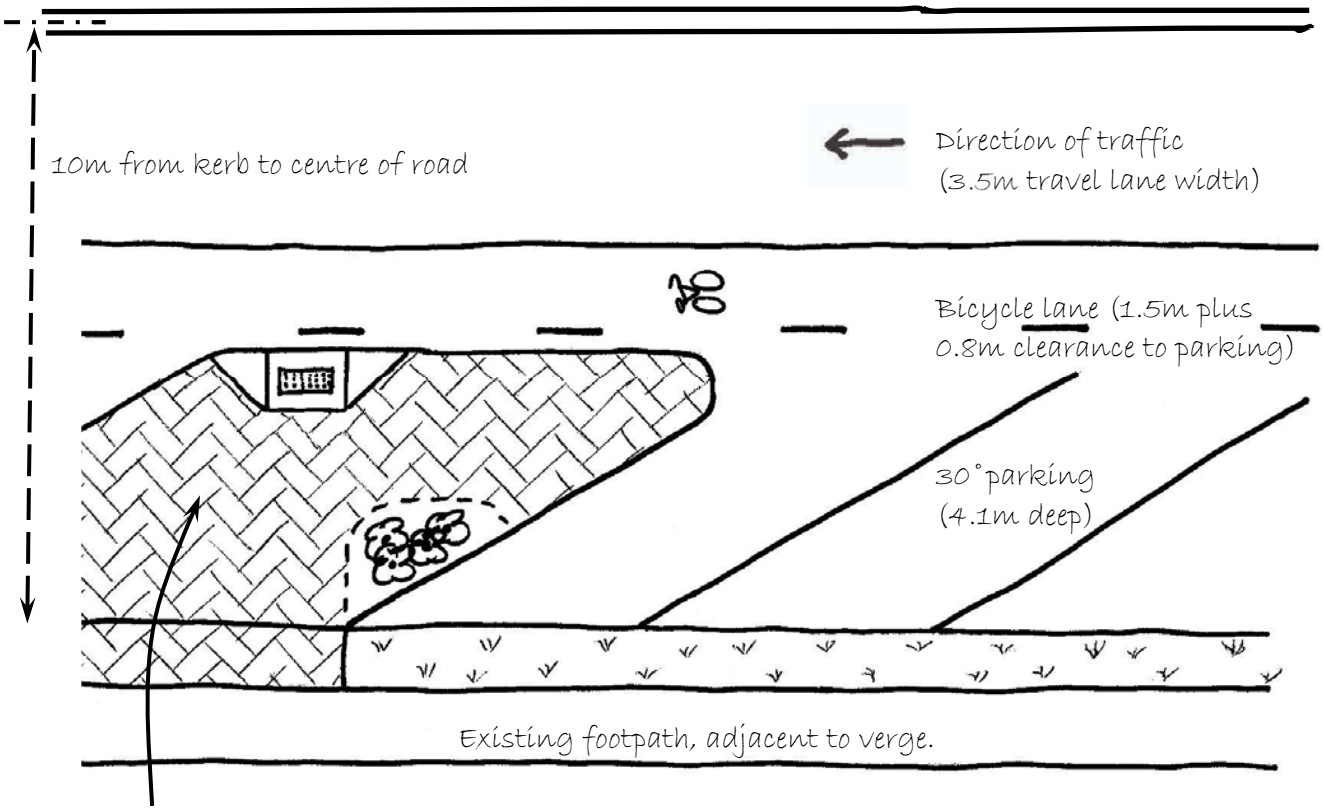
Based on this concept, a new concept design has prepared of a profile for Hoddle Street for the purposes of this PAMP. This is shown in sketch form overleaf, in Figure 15: Hoddle Street concept design - sketch.

The main concepts behind the profile are to:

- present a street environment that is compatible with its use and encourages adoption of appropriate driver behaviour (speed, awareness);
- reduce the crossing distance for pedestrians; and
- provide space for cyclists on-road.

These are discussed in more detail following the sketch.

Profile mirrored on other side of road



Kerb extension with kerb ramp.

- Paving extends to existing footpath.
- Landscaping provides tactile cue, aligned with edge of kerb ramp.
- Other edge of kerb ramp is aligned with pedestrian refuge.

Figure 15: Hoddle Street concept design - sketch

30º parking

This both formalises the available on-street parking and reduces the effective road width. Under the standards, 30º parking to a low kerb allowing overhang requires a lateral space depth of 4.1m, for medium parking turnover. A manoeuvre space of 3.0m is then required, but up to 2.5m of this is an allowable encroachment into the adjacent travel lane. The minimum required road width from face of kerb to the travel lane is thus 4.6m

Travel lane width

For buses and other heavy vehicles, a desirable minimum lane width is 3.2m. This is typically used in urban situations.

For an arterial road in a rural location, it is anticipated that the RTA would require a minimum travel lane width of 3.5m.

The absolute minimum travel lane width that would be trafficable by buses and heavy vehicles is 3.0m – but this is generally disliked by drivers. This width is more acceptable if there is no kerb adjacent to the travel lane, or vertical structures (e.g. veranda posts, street poles) that may clip mirrors, and in a 50km/h environment. This is most commonly seen in constrained urban situations.

Bicycle travel area

Adjacent to angle parking, a formal bicycle lane is created by a 1.5m lane plus 0.8m clearance to the end of parking bays. For 30º parking, the required with from the face of kerb is thus 6.4m.

Kerb extensions

Parking is not allowed within 10 metres from the nearest point of an intersecting road at an intersection without traffic lights, unless permitted by a parking control sign or on the continuing leg of a T-intersection.

Kerb extensions provided in this area ensure that cars do not park where sight distance is poor, reduce the road width to be crossed by pedestrians and help ensure that people do not drive in the parking area/ bicycle lane when vehicles are not parked here.

With 4.1m angle parking and a 0.8m safety strip making up the general profile, kerb extensions could be provided at 4.6m and still allow width for a bicycle lane with clearance to the kerb, a 3.0m travel lane and a 1.2m painted median. The kerb extensions would then reduce the crossing distance over the existing distance by a total of 9.2m – a significant distance. If a 4.1m width kerb extension is preferred for aesthetic reasons, the reduction in crossing distance over the existing situation would still be significant, at 8.2m.

Kerb extensions could also be provided at mid-block locations, if this is where a pedestrian desire line exists. This is the situation shown in Figure 15 in the absence of more detail regarding cross intersections.

In conjunction with angle parking lengths, the additional area created by the kerb extensions can form passing locations for pedestrians where footpaths are generally narrow (a length of 3.0m is desirable for this purpose), opportunities to provide street trees (as long as these are outside of driver sight lines) or other landscaping, locations for seating, etc.

Kerb extensions at cross intersections can also be used to reduce crossing distances of these intersecting streets. If used in this way, by reducing the street width they increase the kerb width and provide additional kerb for parking or other uses.

Central median

A central painted median that separates the two directions of travel and enables a pedestrian to cross Hoddle Street in two stages is desirable, but cannot be provided in conjunction with 3.5m travel lanes, designated bicycle lanes and 30° angle parking.

There are three options that could be pursued that would enable a painted median and/ or pedestrian refuge to be provided within the Hoddle Street profile:

- varying the lane configuration along the road to enable formal refuge points to be provided at strategic locations, e.g. by changing angled parking to parallel parking in these areas;
- reducing the lane width to the minimum of 3.0m, to provide a 1.2m painted median along the length of Hoddle Street that could be used to provide a pedestrian refuge where desired; or
- providing an advisory bicycle facility rather than formal bicycle lane, providing a 3.2m travel lane, and using the additional road width to provide a 1.2m painted median.

The first option is recommended, given that kerb extensions will significantly reduce crossing distances and assuming a 50km/h speed environment can be adopted in conjunction with the Hoddle Street profile, to increase the ease of crossing.

The second option is the next preferred alternative, given that the minimum lane width would be provided between two linemarked areas (the bicycle lane and painted median) and assuming a 50km/h speed limit.

Finally, under the relevant guidelines[3], a bicycle advisory facility could be provided analogously with the case for parallel parking. Although not specified in the relevant guideline, a review of the discussion regarding vehicle positions on road carriageways in different speed environments and of the advisory lane width of 1.2m instead of 1.5m for parallel parking leads

[3] Austroads Guide to Engineering Practice, Part 14: Bicycles.

to the conclusion that an advisory treatment could be provided adjacent angled parking at 1.2m. In addition to the 0.8m clearance to the angled parking, this results in a minimum required width of 6.1m. Instead, a 6.2m width could be installed in addition to a 3.2m travel lane and 1.2m median. This is the least preferred approach given unfamiliarity amongst drivers and cyclists with cycling adjacent to angled parking.

Bus stops

Buses need a 'run in' and 'run out' distance to access bus stops. One way to minimise this is to construct kerb extensions aligned with front and rear door locations at bus stops. A bus needs 3.2m in which to parallel park.

Buses currently stop in Hoddle Street at the shops at the eastern end of Robertson, outside the primary school and Water's shop at the corner of Caalong Street. These locations could benefit from formal bus stops.

Overall, the recommended profile for the 20m total width of Hoddle Street is thus:

- 30° parking (4.1m width; 0.5m additional in which manoeuvring occurs);
- bicycle lane (0.8m safety strip + 1.5m lane width);
- 3.5m travel lane;
- 0.2m central line marking; and
- travel lane, bicycle lane and parking mirrored on the other side of the centre line (9.9m).

5.6 Network design concepts

The community attitude to new facilities has been discussed earlier. Basically, there is a clear community preference that where possible the village "feel" should be retained. However, this needs to be balanced against the functionality of the infrastructure proposed.

From average weather data, wet-weather considerations are a particular issue to be covered when designing facilities such as footpaths. Most streets in Robertson (the notable exception being Hoddle Street) do not have kerb and gutter and rely on green swales or similar to provide drainage.

It is recommended that the following design concepts be adopted in conjunction with adoption of the proposed pedestrian network.

These design concepts reflect the hierarchy contained in the pedestrian network, which in turn reflects usage levels and types of use. The concepts propose use of impermeable paved surfaces on most primary routes, and permeable paving with firm, level, unpaved shoulders on other routes, in an approach that minimises the visual impact of the infrastructure while providing routes that are adequate for their use.

These concepts do not outline standard design details, such as kerb ramps and tactile ground surface indicators. These should be provided in accordance with

the relevant Australian Standards, guidelines and legislation, and RTA standards and guidelines.

(Note, however, that RTA guidelines specifically exclude use of tactile ground surface indicators in kerb ramps. Under the Disability Standards for Accessible Public Transport, this does not support providing a continuous accessible path of travel to public transport stops. As tactile ground surface indicators are required at public transport stops, this gives rise to a potential inconsistency of use. For people who would use tactile ground surface indicators for guidance, a consistent application is crucial to their utility.)

5.6.1 Primary routes

P1: Camp Street to Fountaindale Road

This should be constructed in a pavement that contrasts with bitumen, to provide the environmental cues discussed for the eastern end of Hoddle Street/ the Illawarra Highway. Given the average annual rainfall and lack of kerb and gutter, a permeable pavement may provide desirable drainage characteristics.

The lower capital cost of a permeable pavement compared to concrete is offset by a shorter design life and higher maintenance costs, but is also easier to repair.

P2, P3: Hoddle Street footpaths

These should be constructed in concrete to match the existing footpath, with new sections constructed at a greater width of 1.8m to facilitate:

- high pedestrian activity
- sharing of footpaths with cyclists – notably child cyclists who are legally entitled to ride on footpaths
- commercial and shopping environments
- a stroller to pass a wheelchair or a couple to pass another pedestrian
- people to gather, e.g. at bus stops.

As a medium to long term priority, all existing footpaths should also be widened. These are currently provided at about 1.2m (with locally wider stretches), which is the general minimum width sufficient for most applications but not the listed uses.

The enhancement of existing footpaths is a lower priority than creating a usable pedestrian network, particularly as the existing facilities have significant design life remaining. This could increase in priority over time, for example due to:

- increased population or visitor numbers in Robertson;
- the ageing of Australia's population, leading to a greater use of mobility devices and the clearances these require; and
- an increase in walking activity.

In the absence of a general widening, localised widening of the footpaths to 1.8m can increase the functionality of the existing footpaths by providing for passing manoeuvres or for people to gather.

Similarly, on-street space for cycling will assist in providing safe access for cyclists in the absence of the wide footpaths required for sharing between cyclists and reasonably high pedestrian volumes.

These have been considerations in the design proposal for Hoddle Street.

Any increase in width should be considered with respect to the Robertson environment and could include measures such as retaining local 'squeeze points' past street trees, rather than proposing removal of such trees.

5.6.2 Medium-profile routes

These essentially comprise secondary routes located adjacent to roads.

The design concept proposed is a balance between the needs of pedestrians, cyclists and minimising the impact of the path created on the streetscape. This comprises a 1.5m permeable pavement located centrally, with 0.9m shoulders provided on either side. The edge of the shoulders should be separated from traffic by at least 1.0m. The rationale underlying this design concept is that:

- The 1.5m provides sufficient width for a pedestrian or cyclist to use if there is no other traffic on the path; for two pedestrians to walk side-by-side to pass another pedestrian; for a pedestrian to pass another pedestrian, including a stroller and a wheelchair, to pass each other.
- Although rain can be very heavy in Robertson, drainage is remarkably good and so a firm, level shoulder through which grass is allowed to grow should be passable provided that the grass is mown, as is currently the case.
- The shoulders provide additional space for cyclists to pass pedestrians or other cyclists. As the edge of the hard area is less defined than is the case for a paved surface, the overall facility width (3.3m) is greater than for a fully paved facility, but should present a less intrusive profile.
- As well as minimising run-off, a permeable pavement can be chosen to produce a more natural look than concrete and should cost approximately half the cost of concrete.

With the shoulders designed to form a sub-bed for paving if required, the paved section of the profile can be increased if pedestrian and cyclist volumes increase – and in line with community attitudes – up to the overall facility width, with little additional design work.

5.6.3 Low profile routes

These include all local access routes and secondary routes passing through areas with high environmental amenity.

The design concept is similar to medium profile routes, but the paved area is minimised to reduce the visual impact. This comprises a 1.2m permeable

pavement located centrally, with 0.9m shoulders provided on either side. Where relevant, the edge of the shoulders should be separated from traffic by at least 1.0m. The rationale underlying this design concept is that:

- 1.2m is sufficient width for a pedestrian, stroller or wheelchair to pass comfortably; for two pedestrians to walk side-by-side; or for a pedestrian to pass another pedestrian, and
- the width is narrow for a cyclist to use (though wider than single-track) but is considered acceptable for local linkages, while the firm shoulders provide for less constrained cycling or to pass other pass users.

Again, the paved section of the profile can be increased if pedestrian and cyclist volumes increase – and in line with community attitudes – up to the overall facility width.

5.6.4 Trails

The concept design proposed for the trails is to maintain the surface treatments at their current standards. It is recommended that Council engage with the community about the desirability of a shelter servicing the Hampden Park trail, and directional signage to both trails from Hoddle Street.

6 Non-infrastructure measures

In addition to implementing a pedestrian network, additional supportive measures will assist in achieving the objectives of the Robertson PAMP.

There are three recommended strategies to create a walking environment and culture in Robertson. These address planning and encouragement activities and are as follows. These have been numbered in order (but not necessarily priority) as NM1a, etc., standing for non-infrastructure measures.

6.1.1 NM1: Amend the Development Control Plan for Robertson

The purpose of this strategy is to ensure that pedestrian (and cyclist) permeability, amenity and modal needs are protected and enhanced in all future development.

The Western Australian document "Liveable Neighbourhoods" and its accompanying guidelines provide good guidance about measures that can be adopted in this regard. Initial actions to be implemented follow.

NM1a. Adopt the Robertson PAMP as the basis for local structure planning in providing pedestrian facilities.

NM1b. Review design requirements for internal access roads, where these roads also provide for pedestrian access. For example, in the absence of kerb and gutters, permeable paving (of a type that does not form a trip hazard) could be specified as a pavement material, to reduce run off; threshold treatments to reduce car speeds; planting of street trees to provide shade for pedestrians; etc.

NM1c. Require development adjacent to creek lines to provide access to creek lines at convenient/ suitable intervals and for a linear reserve adjacent to creek lines to be established and either maintained as publicly accessible open space, or handed to Council as open space. As this would coincide with environmental requirements adjacent to creek lines, this should not represent a significant loss to developers. For any linear corridor requirement additional to minimum environmental widths adjacent to creek lines, the value of land given to Council would be offset by the cost of maintaining such land, rather than Council providing any remuneration to developers for the land (as would probably be argued by developers).

NM1d. Encourage additional storage space to be provided in residential garages to stow a bicycle, by amendment of the Development Control Plan.

NM1e. Encourage developers to install employee and visitor bicycle parking rails, by amendment of the Development Control Plan.

NM1f. Provide incentives in the Development Control Plan to develop medium and longer term secondary and local access routes over private land, as noted for the relevant routes.

6.1.2 Undertaken encouragement activities

The purpose of this strategy is to inform residents of the development of routes and thus the network, and maximise use of the infrastructure being developed.

As some of the following actions are dependent on route creation, they can only occur following the completion of infrastructure. This is identified in the action plan. However, the commitment to such actions can be made immediately, so that appropriate planning for encouragement activities occurs alongside development of infrastructure.

NM2a. Develop links with community groups, schools, etc, to form a network of walking stakeholders. Seek and disseminate information through this network.

NM2b. Prepare maps of the pedestrian and cyclist networks and make available on the Council website. Prepare new maps every 2 years, i.e. updating as routes are implemented. Cost depends on the type of maps produced and funding (partly or fully) through advertising, grants, etc.

NM2c. Support a Safe Routes to School program at Robertson Primary School.

NM2d. Assess demand for adult bicycle training/ skills courses and conduct courses as appropriate.

NM2e. In conjunction with other Councils, support a Walk/ Ride to Work Day at a date compatible with the local climate.

NM2f. Advertise route completions in the local newspaper and through stakeholder networks. Encourage local groups (such as the CTC) to publicise route completions to their stakeholders and to hold an event celebrating the opening of the new facility.

NM2g. Liaise with the CTC to undertake research and disseminate information.

NM2h. Assess the support for a 'walking school bus' or 'bicycle train' program to Robertson Primary School. One variant of the walking school bus program trialled successfully in Adelaide was to map students' residential addresses in GIS and provide information to parents whose children live within walkable distance of the school that this is the case, plus advise (with parents' permission) the addresses of nearby children who could walk to school together.

NM2i. Support behavioural programs proposed by other organisations to support walking and cycling, if considered relevant to Robertson.

6.1.3 NM3: Provide leadership through Council processes

The purpose of this strategy is to use Council's position as the level of government closest to the community, and position within a network of local government organisations pursuing similar goals, to provide a lead role within the community in supporting and providing for walking and cycling.

NM3a. Undertake a complete review and update of the Wingecarribee Bicycle Plan. Access funding from RTA to support this action.

NM3b. Develop and adopt a signage strategy for the pedestrian and bicycle networks – names, signage, logos, colours, etc. – particularly for wheelchair accessible routes and trails, and compatible with tourism marketing goals.

NM3c. Develop and adopt a policy to manage the location of objects on footpaths (including outdoor dining) throughout the Council area.

NM3d. Develop and adopt a lighting strategy for pedestrian and cyclist facilities, taking into account local sensitivities.

NM3e. Provide a walking/ cycling link on the Council website to promote these modes. Enable maintenance requests to be submitted and establish performance criteria for addressing these, or means of incorporating into a maintenance plan. Use as a platform for issues and complaints to be registered.

NM3f. Undertake training of depot staff regarding construction and maintenance requirements for walking and cycling: accounting for DDA issues, cycle vehicle characteristics, etc.

NM3g. Liaise with service authorities and regular maintenance crews regarding maintenance and works requiring footpath reinstatement, to identify opportunities and to ensure that reinstatement works meet required standards.

NM3h. Monitor NSW and interstate experience, and report on Wingecarribee's experience, with walking and cycling encouragement programs to identify programs most likely to succeed in the local area and to access available funding opportunities.

NM3i. Undertake a review of Council PAMPs (Mittagong, Moss Vale, Bowral; and Small Towns and Villages) within 7 years of their adoption. Access funding from RTA to support this action.

7 Action Plan

The action plan presented in Figure 16, overleaf, uses the pedestrian network developed and the non-infrastructure actions suggested as a basis.

A number of notes/ provisos to the action plan exist and are detailed as follows.

- Pedestrian network items are listed by reference number. This reflects the functional hierarchy rather than priority per se, which is reflected in the timeframes.
- Cost estimates are order of cost only, based on a material cost per square metre. They do not include allowances for earthworks, fencing, lighting, signage, traffic management, design work, consultation, etc.
- In particular, an accurate cost for the permeable paving/ unpaved shoulder concept has not been obtained. It has therefore been assumed that the cost would be similar to the cost for a bitumen footpath of the same area, on the basis that the underlying structure is similar and the lower amount of permeable paving compared to bituminous material would offset the likely cost differential between bitumen and the permeable paving.
- The suggested timeframes for implementing actions are:
  - immediate – to the end of the 2007/08 financial year;
  - short-term: start of 2008 to end of 2012 calendar years (allows for some overlap with immediate actions)
  - medium-term: start of 2013 to end of 2017 calendar years
  - long-term: start of 2018 calendar year onwards.
- This format provides some flexibility in timeframes for actions. It should be noted that constructing infrastructure as part of other works will minimise construction costs and the timeframe/ priority for infrastructure provision should take into account programming of other works where possible, and where this does not undermine the timeframe for the action.
- Many of the non-infrastructure measure actions can be incorporated into existing Council staff activities, as long as this can be balanced against other competing demands. This includes such matters as review of the DCP.
- There is a variety of possible sources for funding that might assist Council in implementing the action plan, in addition to Council budgets. These should be sourced wherever possible.

Figure 16: Action Plan

ID	brief description	role in hierarchy	width (m)	shoulder (m)	length (m)	pavement type	# kerb ramps	# refuges	other	subtotal	timeframe	possible RTA funding
Problem locations												
	Hoddle Street concept design	Overarching, primary			1700	concrete footpath		3		$475,000	short-term (2008-2012)	State Road Refuges: 3x $25,000, 100% Kerb extensions: 12x $30,000, 100% Bike lanes: $31,500 (edge-lines, signs, logos), 50%
Pedestrian network												
P1	Illawarra Highway, Camp St. to Fountaindale Rd.	Primary	2.5	0.0	1250	permeable pavement				$438,000	immediate (to mid 2008)	State Road Shared use path: 50%
P2	Hoddle St., Caalong St. to Hampden Park car park	Primary	1.8	0.0	250	concrete	1			$86,000	immediate (to mid 2008)	State Road Kerb ramp: 1x $3,000, 100%
P3	Hoddle St., Wallangunda St. to Service Station	Primary	1.8	0.0	30	concrete	1			$11,000	immediate (to mid 2008)	State Road Kerb ramp: 1x $3,000, 100%
P4	Hoddle St., Caalong St. to South St.	Primary	1.8	0.0	580	concrete	4		railway crossing (details to be confirmed with RTA)	$200,000 + railway crossing	medium-term (2013-2017)	State Road Kerb ramps: 4x $3,000, 100% Railway crossing: TBA, 100%
P5	Hoddle St., Hampden Car Park to Meryla St.	Primary	1.8	0.0	210	concrete	1			$72,000	medium-term (2013-2017)	State Road Kerb ramp: 1x $3,000, 100%
S1	Main St., Hoddle St. to end of Main St.	Secondary	1.5	1.8	540	permeable pavement+ shoulder	9			$133,000	short-term (2008-2012)	Local road, n/a
S1	End of Main St. to High St. (path)	Secondary	1.5	1.8	250	permeable pavement+ shoulder			footbridge	$62,000	short-term (2008-2012)	Local road, n/a
S1	High St., Caalong St. to Main St.	Secondary	1.5	1.8	260	permeable pavement+ shoulder	4			$64,000	short-term (2008-2012)	Local road, n/a
S1	Caalong St., May St. to High St.	Secondary	2.0	1.8	310	permeable pavement+ shoulder	2			$98,000	short-term (2008-2012)	Seal is below 2.5m minimum shared use path width usually funded by RTA, but there is a precedent for RTA 50% funding a 2.0m path in a sensitive environment. There may be scope to discuss this path.
S1	Caalong St., North St. to May St.	Secondary	2.0	1.8	310	permeable pavement+ shoulder				under detailed design	short-term (2008-2012)	
S1	Hoddle to start of Caalong path (Caalong)	Secondary	2.0	1.8	80	permeable pavement+ shoulder	1			$26,000	short-term (2008-2012)	
S2	Caalong St., Hoddle St. to South St.	Secondary	1.5	1.8	280	permeable pavement+ shoulder	1		pedestrian maze	$69,000	short-term (2008-2012)	Local road, n/a
S2	South St., Armstong St. to Meryla St.	Secondary	1.5	1.8	470	permeable pavement+ shoulder				$116,000	short-term (2008-2012)	Local road, n/a
S2	Meryla St., South St. to Hoddle St.	Secondary	1.5	1.8	270	permeable pavement+ shoulder	1		pedestrian maze	$67,000	short-term (2008-2012)	Local road, n/a
S3	Hampden Car Park to Burrawang St. (new path)	Secondary	1.5	1.8	340	permeable pavement+ shoulder				$84,000	short-term (2008-2012)	Local road, n/a
S4	Missingham Pd. to Hoddle Ln. (new path)	Secondary	1.5	1.8	440	permeable pavement+ shoulder	1		pedestrian maze	$109,000	long-term (2018 onwards)	Local road, n/a
S5	North St. gap (new path)	Secondary	1.5	1.8	590	permeable pavement+ shoulder			footbridge	$146,000	long-term (2018+)	Local road, n/a
S6	North St to Hampden Park link	Secondary	1.2	1.8	490	permeable pavement+ shoulder				$100,000	medium-term (2013-2017)	Local road, n/a
S6	North St. to Main St. (new path)	Secondary	1.2	1.8	600	permeable pavement+ shoulder				$123,000	medium to long-term (2013-2018+)	Local road, n/a
S6	Main St. to Shackleton St. (new path)	Local access	1.2	1.8	260	permeable pavement+ shoulder	2			$53,000	long-term (2018+)	Local road, n/a
LA1	Blackwood St. to North St. (new path)	Local access	1.2	1.8	90	permeable pavement+ shoulder	2			$19,000	short-term (2008-2012)	Local road, n/a
LA2	Shackleton St. to Cottee Close	Local access	1.2	1.8	70	permeable pavement+ shoulder			footbridge	$15,000	medium-term (2013-2017)	Local road, n/a
LA3	Victor Road to Armstrong Crescent (new path)	Local access	1.2	1.8	30	permeable pavement+ shoulder	2			$7,000	long-term (2018+)	Local road, n/a
LA4	Charlotte St. gap (new path)	Local access	1.2	1.8	120	permeable pavement+ shoulder	2			$25,000	long-term (2018+)	Local road, n/a
LA4	Charlotte St. to Victor Rd. (new path)	Local access	1.2	1.8	30	permeable pavement+ shoulder	1			$7,000	long-term (2018+)	Local road, n/a

ID	brief description	subtotal	timeframe	possible RTA funding
Non-infrastructure measures				
NM1a	Adopt pedestrian network	-	immediate (to mid 2008)	
NM1b	Review design requirements for internal roads	Existing budgets	short-term (2008-2012)	
NM1c	Plan for creek line reserve and access to this	Existing budgets	short-term (2008-2012)	
NM1d	Amend DCP for residential storage for bicycles	Existing budgets	short-term (2008-2012)	
NM1e	Amend DCP for commercial parking for bicycles	Existing budgets	short-term (2008-2012)	
NM1f	Provide incentives in DCP to develop routes	Existing budgets	short-term (2008-2012)	
NM2a	Develop links with walking stakeholders	Existing budgets	short-term (2008-2012)	
NM2b	Prepare walking and cycling maps	$5,000 each	short-term (2008-2012)	
NM2c	Support the Safe Routes to School program	$5,000	medium-term (2013-2017)	
NM2d	Assess and conduct training/ skills courses	$2,500 + $2,000 each	short-term (2008-2012)	
NM2e	Support Walk/ Ride to Work Day	$5,000 p.a.		
NM2f	Advertise route completion and support events	Existing budgets		
NM2g	Liaise with CTC for research, information	Existing budgets		
NM2h	Assess walking school bus/ bicycle train programs	$5,000		
NM2i	Support relevant behavioural programs	-	as they arise	
NM3a	Review Wingecarribee Bicycle Plan	$50,000	immediate (to mid 2008)	bicycle planning: 50%
NM3b	Develop signage strategy	$10,000/ existing budgets	short-term (2008-2012)	
NM3c	Develop objects on footpaths strategy	$10,000/ existing budgets	short-term (2008-2012)	
NM3d	Develop lighting strategy	$10,000/ existing budgets	short-term (2008-2012)	
NM2e	Create a walking/ cycling link on the website	$2,000	immediate (to mid 2008)	
NM3f	Train depot staff in construction needs	$10,000	short-term (2008-2012)	
NM3g	Liaise with service authorities and crews	Existing budgets	ongoing	
NM3h	Monitor and report walking and cycling experience	Existing budgets	ongoing	
NM3i	Review PAMPs within 7 years:			
	Bowral, Moss Vale, Mittagong	$40,000	short-term (2008-2012)	pedestrian planning: 50%
	Small Towns and Villages	$30,000	medium-term (2013-2017)	pedestrian planning: 50%

Cost rates used

kerb ramp	$3,000
permeable paving (per square metre)	$190
concrete (per square metre)	$140
footbridge (minimum allowance)	$40,000
pedestrian maze	$6,000
pedestrian refuge	$2,500
kerb extension	$30,000
linemark, per linear metre (100mm wide)	$4
bicycle or pedestrian logo	$50
shared use path sign (installed)	$300
speed sign (installed)	$400
raised retro-reflective pavement marker (each)	$10
loosen & recompact shoulder (per square metre)	$10
cut/ fill (per cubic metre)	$35
new back-to-back kerb (per metre)	$100

Appendix A:
Background information review Working report

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Wingecarribee Shire Council

Review of Background Material: Working Document

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1 Introduction

This working document presents an overview of background information informing the development of the Small Towns and Villages Pedestrian Access and Mobility Plan (PAMP) for Wingecarribee Shire Council.

Due to time and budgetary constraints, an exhaustive review of all Council documents has not been undertaken. Instead, the review has focused on documentation identified by Council staff to be relevant and which has been provided to QED for this reason.

The Small Towns and Villages PAMP has been undertaken in two stages:

- Stage 1: Robertson Study
- Stage 2: Bundanoon and Villages Study.

The structure of this working document reflects this staging.

At the time of writing, traffic volumes and crash statistics have only been examined for Robertson; this report will be updated when information relating to Bundanoon and villages is available. This may include other documentation, as well.

The villages included with Bundanoon in the Stage 2 study are:

1. Avoca
2. Aylmerton
3. Balaclava
4. Balmoral Village
5. Berrima
6. Braemar
7. Burrawang
8. Colo Vale
9. Exeter
10. Fitzroy Falls
11. Hill Top
12. Medway
13. New Berrima
14. Penrose
15. Sutton Forest
16. Welby
17. Willow Vale
18. Wingello
19. Yerrinbool

This list has been amended from the original Brief for the project to exclude Canyonleigh and Kangaloon and include Avoca.

2 Traffic volumes

Traffic volume information is not extensive for the study area, reflecting the fact that these are towns and villages rather than cities and their traffic volumes are commensurate. With relatively low traffic volumes, traffic engineering issues such as road capacity are less commonplace and fewer traffic counts need to be commissioned as part of addressing such issues.

To provide some guidance in interpreting the traffic volume data that is available:

- A value of up to 3,000 vehicles per day is considered acceptable in most residential streets. For example, below this volume, specific bicycle facilities are not considered necessary.

- In urban situations, heavy vehicles typically make up 2%-7% of the traffic stream, with the lower end of the scale being more typical of local streets and the higher end of the scale more typical of arterial roads.

2.1 Robertson

Available traffic volumes were taken at different times over a period from 1992 to 2006. An annual growth rate for traffic was derived from counts along Hoddle Street/ the Illawarra Highway and applied to the most recent counts on other streets to produce a 2006-equivalent traffic volume for comparative purposes.

The only street with a traffic volume over 3,000 vehicles/ day is Hoddle Street/ the Illawarra Highway, at around 4,500 vehicles/ day.

The next most highly trafficked streets are Caalong Street, immediately north of Hoddle Street, at 950 vehicles/ day; and Belmore Falls Road, between South Street and Charlotte Street, at 360 vehicles/ day. Both of these streets continue outside of Robertson to provide access to other localities.

Counts were not available for streets providing access to the main residential areas of Robertson, notably South Street and Main Street.

Overall, traffic volumes are low and appropriate for the environment.

The proportion of heavy vehicles ranged between 5% and 14%, the latter on Belmore Falls Road, with about 8% on Hoddle Street/ the Illawarra Highway.

No traffic speed data was provided with traffic volume data.

3 Crash statistics

Five years of crash statistics were been examined for the study areas. This period is examined because it corresponds with RTA requirements for the identification of Black Spot locations.

However, it should be noted that less than 20% of non-fatal hospital admissions involving cyclists[1] and about 60% of non-fatal pedestrian admissions[2] are recorded in police statistics (on average; this may not be true of crashes in any one location). Hence the crash statistics examined probably under-report non-fatal pedestrian and cyclist crashes.

As this problem cannot easily be quantified or addressed, examination of actual conditions is an additional means of identifying potential problem locations more relevant to pedestrians and cyclists than motorists.

Formal road safety audits of identified problem locations are also an alternative avenue by which hazardous locations can be identified for consideration under both State and Federal Black Spot funding programs.

Crash statistics have been analysed by representing these on GIS mapping to show vehicle involved (car, pedestrian, bicycle), degree of injury sustained (property damage only, injury

[1] *The Effectiveness of Bicycle Helmets: A Review* (1995 revised edition), Dr M Henderson, 1995.
[2] *Bicycle Crashes and Injuries in Western Australia, 1987 to 2000*, Meuleners, Gavin, Cercarelli & Hendrie, Injury Research Centre, University of Western Australia, 2003.

or fatality) and location of crash. From this spatial overview, crashes are identified for more in-depth examination.

3.1 Robertson

No fatal crashes were recorded in the period under examination. Two pedestrian crashes, both resulting in injury, and no cyclist crashes were recorded in the period.

Most crashes in Robertson occurred along Hoddle Street/ the Illawarra Highway, as would be expected given higher traffic volumes, pedestrian volumes and speeds along this section of road than the other roads in Robertson.

Of the two crashes within the study area that did not involve Hoddle Street/ the Illawarra Highway, one was a property damage only crash on Main Street; the other a casualty crash involving a pedestrian on Caalong Street, north of North Street, at dusk. The pedestrian was walking with traffic.

Of the 8 crashes recorded east of East Street, 6 were property damage only and none involved pedestrians.

Between East Street and South Street intersections with Hoddle Street, six casualty crashes were recorded, including one pedestrian crash. Regarding these:

- all occurred on weekdays
- all involved vehicles travelling at or below the posted speed limit
- 5 occurred outside of holiday periods, the other occurring during school holidays
- 5 occurred in the section between East Street and Main Street
- 4 occurred at night
- 3 occurred in the wet and one in icy conditions
- two crashes involved light trucks
- two crashes were single-vehicle crashes
- one crash involved injury to two people, the others involved a single injury.

Crash types are relevant in identifying crash reduction or mitigation measures. The crash types, including vehicles types, were:

- pedestrian/ light truck: walking with traffic
- car/ car: crossing traffic
- car/ car: U turn
- car/ light truck: head on
- single car: run off road to right of a left turn bend, hit object
- single car: run off road to left of a right turn bend, hit object.

While these do not indicate one type of crash predominating, they do point to similar underlying issues consistent with observations on-site: visibility, delineation, difficulty in judging the curve.

4 Wingecarribee Open Space, Recreation, Cultural and Community Facilities Needs Study and Strategy

This document highlighted the need for a PAMP for the small towns and villages of Wingecarribee.

Excerpts from this document were provided. These comprised:

- Chapter 8: Community Needs and Opportunities – this includes break down into local as well as shire-wide needs and opportunities.
- Chapter 10: Strategy and Action Plan.

Of the towns and villages included in the scope of the PAMP, Chapter 8 analysis includes:

- Aylmerton
- Berrima and New Berrima
- Bundanoon
- Burrawang
- Colo Vale
- Exeter
- Hill Top
- Mittagong (Welby, Willow Vale, Braemar and Balaclava)
- Robertson
- Wingello
- Yerrinbool
- Rural precincts (Avoca, Balmoral, Fitzroy Falls, Medway, Penrose, Sutton Forest).

Overall, the focus on recreation in the Study and Strategy does not also cover walking and cycling for purpose.

This document notes that access and parking at Hampden Park needs improving, and also identifies that Council holds open space at the northeast corner of the park, which is not widely used and is suitable for residential subdivision, to fund upgrades.

5 Draft Developer Contributions Planning for Open Space and Recreational Facilities

This corresponds to the Wingecarribee Open Space, Recreation, Cultural and Community Facilities Needs Study and Strategy. As such, it does not cover walking and cycling for purpose in addition to recreationally.

6 Wingecarribee Bicycle Plan

A list of bicycle plan projects updated October 2003 appears to be the only available documentation relating to the Wingecarribee Bicycle Plan.

If this is the case, it is noted that a one or two sheet program is insufficient in itself to achieve an integrated network serving the needs of the community within a realistic timeframe.

The bicycle plan projects are prioritised from 1 (which appears to be highest) to 3.

There is a reasonably impressive list of 23 projects completed between approximately 1997 and 2003, comprising off-roads paths in Bowral, East Bowral, Mittagong and Burradoo. Four other projects were scheduled for 2004-05, and at least one of these had been commenced. Of the remaining projects:

- 13 are priority 1 – These comprise off-road paths only, in Bowral (2), Burradoo (2), Mittagong (1), Moss Vale (4), Robertson (3) and Welby (1). The Robertson proposals include the projects proposed for Robertson to date.
- 13 are priority 2 – These comprise 7 off-road paths and 6 shoulder-widenings, in Aylmerton (1), Bowral (1), Burradoo (4), Colo Vale (to Hill Top, 1), East Bowral (2), Mittagong (1), Moss Vale (2) and Willow Vale (1).
- 21 are 21 priority 3 – These comprise on-road projects only, in Bowral (11), Moss Vale (3) and Mittagong (7). Of these, 20 have a comment that insufficient road exists for an on-road path.

It is difficult to assess the bicycle plan on the basis of a single sheet of action plan priorities, but it seems inadequate for current requirements and in need of a comprehensive review. Indeed, in the absence of a more formal document, such the review would need to take the form of a new rather than reviewed bicycle plan. A few overview notes follow, but these reflect the use of a program for projects in place of a formal bicycle document; it is assumed that a formal document was initially prepared and these comments do not necessarily reflect this document.

- The plan is (not surprisingly) heavily biased towards the larger towns. This leaves the small towns and villages of Wingecarribee lacking in facilities.
- The plan is purely based on pathways. Bicycle parking is not included. It is not clear whether the program is balanced by non-infrastructure measures such as incorporation of requirements into relevant DCPs, but judging by development in the area, this is not the case. This leaves Council with a large budgetary requirement for developing the Shire's bicycle infrastructure, and a commensurately long timeframe for Shire residents before an integrated bicycle network is created.
- Without additional information, the priority for works cannot be varied, for example in response to works occurring in the area, in response to a new project, demographic changes in settlements, or if a project is infeasible.
- The date of completed works indicates that planning occurred under a different regulatory regime, as the main guidelines for design of bicycle infrastructure have been updated since 1997 (as have the Australian Road Rules). This may be one reason for the comments regarding infeasibility of projects and indicating a need for further feasibility assessment of many measures.
- Council appears to be implementing the plan in terms of priority, but (if feasible), the cost for constructing on-road paths (more accurately, bicycle lanes) is typically 1% of that of off-road paths. That is, the same funds could be used to construct either 100km of on road bicycle lanes or 1km of off-road path. There is no mechanism for implementing inexpensive, lower priority paths as part of the program. It is difficult to judge without additional documentation, but opportunities for quick, easy projects that can deliver real safety benefits do not appear to be incorporated into the program.

- Where bicycle lane projects are noted as being infeasible, there appears to be no assessment of an alternative, such as an advisory treatment, wide kerbside lane, etc, would be a feasible alternative. This leaves these projects apparently in limbo.
- It is generally accepted that bicycle plans need to be reviewed roughly every 5 years. An update of the status of projects is an insufficient form of review for a document guiding bicycle planning for the Shire; and the single sheet program would be too inflexible, high cost, and poorly prioritised to achieve an integrated network serving the needs of the community within a realistic timeframe.

7 Planning Requirements

The various DCPs have not been reviewed to assess the degree by which they encourage pedestrian-friendly development. Instead, the resulting development provides guidance to this.

Generally, new development was not observed to incorporate measures to facilitate or encourage walking (as mentioned previously). In particular, development forms observed include:

- cul-de-sac development without pedestrian or cyclist cut-throughs
- no particular provision of walking facilities in street layouts, or design of road space to facilitate sharing between pedestrians and vehicles (including cyclists) where volumes are low
- the provision of verandas for weather protection appears to be limited to older buildings
- there is no provision of bicycle parking outside commercial development.

As there is no Council-wide PAMP as yet, there would be no defined pedestrian network that developments must provide or enhance.

On this basis, Council's LEP and DCPs could be upgraded to incorporate measures encouraging walking and cycling.

8 Traffic Issues

Residents may raise traffic issues with Council through petitions, etc, which are generally referred to the traffic committee to examine. Progress on Council proposals are also discussed at the traffic committee meetings.

Council staff have identified issues raised at the traffic committee related to pedestrian access and provided these to QED.

8.1 Robertson

Nine separate issues raised regarding Robertson, some covering multiple topics. These provide some 'flavour' about issues in Robertson. General characteristics are:

- three included providing/ improving pedestrian crossings of Hoddle Street, with one noting that previous requests for a pedestrian crossing in Robertson have been denied as there are insufficient pedestrian and traffic volumes to meet the warrant
- three included crossings of the rail line, including one for 4 formal crossings following fencing of the rail corridor
- seven recreational path proposals are noted, being:

- along Caalong Street, from Hoddle Street to High Street;
- along the Illawarra Highway from Hoddle Lane (or Main Street) to Fountaindale Road;
- from Caalong Street to Hoddle Street via Hampden Park;
- along the Illawarra Highway from Fountaindale Road to the Old Road
- a general path network linking the southern side of the railway and northern residential areas with shops, services, school and oval
- a walkway from South Street over the rail line to the southern footpath in Hoddle Street

- potential construction of a new road from Hoddle Lane to Missingham Parade, to allow the Hoddle Lane/ Camp Street level crossing to be closed to vehicular (and presumably pedestrian) traffic
- funding received from the Country Passenger Transport Infrastructure Grant Scheme 2006 will enable a bus shelter to be constructed in Hoddle Street – location yet to be determined
- examination of concept design for kerb extensions and angle parking through Robertson.

9 Wingecarribee Social Plan 2005-2010

Excerpts of this document were provided, relating to:

- community care and support
- key issues for Wingecarribee Shire Council
- issues analysis and recommendations (part)
- community care and support – additional information.

While transportation is mentioned as an issue, the excerpts provided do not focus on the transport needs of people with disabilities or ageing communities. Transportation, including barrier free access and public transport, are mentioned.

Other relevant chapters were sourced separately:

- Chapter 7 discusses demographics in considerable detail.
- Chapter 3 discusses access and mobility.

The chapters are essentially stand-alone documents.

Key issues relating to access and mobility for Shire residents include:

- Equity of access to information and to Internet technology.
- Inadequacy of public transport services, particularly for rural communities.
- Mobility, safety and amenities for pedestrians and cyclists.
- Barrier free access for people with a disability, the elderly and persons with other mobility restrictions.

Chapter 3, section 3.2, covers actions for public transport, pedestrians and cyclists. Section 3.3 covers actions for universal access ("access for all", barrier free access).

10 2001 Census Data and Population Projections

While relevant, this type of data and its implications is covered in other documents.

11 Public Workshop Presentation and Notes - Robertson

These documents relate to the infrastructure proposals for Robertson and provide useful background to the proposals.

12 Concept Plans – Robertson

Concept plans for the Caalong Street proposal, footpath from Hoddle Lane to Fountaindale Road and a possible layout for 30º parking for Hoddle Street were provided for reference.

The Caalong Street and Hoddle Lane to Fountaindale Road concept plans provide background to understanding the two proposals presented to the Robertson community, and implications of community feedback on potential designs.

The 30º parking layout for Hoddle Street in particular provides information about street width kerb-to-kerb and reasonable travel lane width that can be used for concept design of solutions. This proposal features:

- a 1.2m lane provided adjacent to the kerb – it is assumed that this is intended as a bicycle lane;
- 30 parking, controlled by wheelstops, presumably to prevent impinging on the bicycle lane;
- two 3.9m vehicle travel lanes, separated by a double white barrier line.

From this, it is assumed that up to 7.8m (2x3.9m) in the centre of the road is currently constructed to a sufficient standard for highway traffic; i.e. this corresponds with the section of Hoddle Street that is under the care and control of the RTA.

The layout represents an attempt to provide facilities for all user groups, within a constrained road width. However, the design paradigm of kerbside facilities for cyclists does not produce an optimal solutions for cyclists, pedestrians or motorists, given the constraints:

- A 1.2m bicycle lane width is inadequate. A minimum width should be 1.5m, with a desirable width closer to 1.8m.
  - Gutters are typically 450mm wide. The 1.2m thus comprises concrete and bitumen areas, rather than a continuous cycling surface. The join between the concrete gutter and bitumen is a typical problem area for cyclists as differential movement and road resealing gives rise to a level difference between the two surfaces.
  - Debris from the road (gravel, etc) and landscaping (leaves, twigs, etc) will typically accumulate adjacent to the kerb. This would reduce the effective cycle lane width. At 1.2m, cyclists would be left with an insufficiently narrow width for cycling, or forced onto the loose surface created from debris, which also contributes to the likelihood of a puncture.
- Locating bicycle travel adjacent to the kerb presents a problem at intersections, where cyclists must either be directed back into the normal stream of traffic or will emerge unexpectedly at a point several metres from where general traffic is travelling.
- While kerb extensions can be provided at intersections to assist pedestrians crossing Hoddle Street, there is no provision for a median or pedestrian refuge centrally.
- 3.9m travel lanes are quite wide and may encourage inappropriate speeds.

Appendix B:
Community consultation Working report

QEDptyltd

Wingecarribee Shire Council

Robertson PAMP: Community Consultation Working Report

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17 January 2007

Job No: 06-226Y
Report No: 07-004

1 Introduction

Community consultation is considered to be a key element in preparing a Pedestrian Access and Mobility Plan (PAMP). The local community knows its streets and land uses and the barriers and opportunities to walking better than anyone else. The community in a disaggregated sense down to the individual is certainly the best source of information on what motivates people to walk, popular destinations and priorities for improvements to walking facilities – amongst other things.

By informing the community about projects underway, opportunities for involvement and processes being used, consultation is also an important tool for developing trust in a project and thus its outcomes, and building a sense of ownership when it comes to implementing these outcomes.

This report is a working report summarising the results of two key elements of community consultation undertaken to inform the development of the Robertson PAMP: a charette workshop and an interview with the Principal of Robertson Primary School, Mr Mike Reilly.

1.1 Charette Workshop

1.1.1 Approach

The approach undertaken for broad scale community consultation was a charette workshop, held from 4pm to 8pm on Tuesday 19 December 2006.

The word “charrette” means an intensive, creative, open working session based around a public workshop format. This form of public consultation was selected for the Robertson PAMP for two main reasons:

- The timeframe for consultation was tight, leading to a preference for a single public consultation session rather than series of forums or a community questionnaire; and
- Recent consultation regarding two walking/ cycling proposals for Robertson were likely to have sensitised the community to further community consultation activities. A charette-style workshop was considered the best means of dissociating from the previous consultation, to enable new information to be presented and gathered independently of the previous consultation outcomes.

Two alternative dates were proposed for the charette: Saturday, 16 December 2006 and Tuesday, 19 December 2006. Both dates were prior to the Christmas break, to facilitate preparation of the Robertson PAMP within required timeframes. The latter date was selected upon advice from Council's project manager, based on key stakeholder feedback regarding a preferred date.

The charette was advertised by direct mail-out of a flyer to households. About 480 flyers were mailed out. In comparison, the 2001 Census showed 360 privately occupied dwellings in Robertson. The difference in numbers probably reflects use of Council's data for the mail-out, which includes both owners and occupiers of dwellings. Flyers were mailed out on Friday 9 December, to be received at least one week before the charette.

The charette was also advertised through Council's regular section in the local newspaper. This ran on Wednesday 20 December, in the lead up to the charette.

Key stakeholder groups were also contacted and provided with a copy of the flyer.

A key method of collecting information from the charette was through a response form. A copy of this form is provided in the Appendix.

1.1.2 Charette format

The charette comprised seven board displays ('stations') located around the venue, with separation between the displays. Three facilitators were on hand to ensure that attendees completed an attendance sheet, explain the charette set up, provide any information and generally assist participants through the process. In more detail, the stations were:

- Station 1: meet and greet.

Located at the entry, this included information about the charette on a board. A facilitator welcomed participants at this station, explaining the set up and location of amenities; asking participants to complete an attendance sheet; and providing a response form and set of six sticky dots to participants.

- Station 2: background information

This displayed an aerial of Robertson and a map with the street network and points of interest (reserves, train line and station, etc) overlaid with traffic volumes and crash statistics, represented by vehicle (car, pedestrian, bicycle) and injury (property damage only, injury, mortality).

- Station 3: technical information

This presented some basic design information. This comprised walking and cycling guidance, mainly taken from Austroads Guide to Traffic Engineering Practice Parts 13 (Pedestrians) and 14 (Bicycles); and general traffic engineering guidance.

- Station 4: your walking experience in Robertson

This was the first station inviting participation from attendees. Firstly, an information sheet asked participants to refer to their response sheets and commence filling this out, including indicating most frequently used routes on a map in the feedback form.

A list of typical problems was then provided on a table, with space to add more, and an A1 aerial overlaid with the street network. Participants were asked to indicate problem locations by labelling a small arrow of paper with a letter corresponding to the problem type (A onwards) and sticking this to their problem locations. As problem locations began to accumulate, participants could indicate agreement with a previous suggestion by placing a tick on the arrow of paper. Over the course of the workshop, this built up of a profile of problem locations.

- Station 5: Improving walking in Robertson

This comprised an A1 sheet with a two-column table, with possible actions on one side and blank space on the other. Participants were asked to review the possible actions as a response to “How should Council improve walking?” and add any they thought were missing, then to place the sticky dots handed out at the entry point against actions as a response to “What should have the highest priority?”. Participants were limited to the six dots handed out at the entry point, but could place these wherever they wished - all six against one action, one against each of six actions, or any combination of these.

- Station 6: Particular projects

This station provided an opportunity for further feedback on projects already raised. The station presented three proposals, with the last proposals having two options. The proposals were:

- path through Hampden Park (option developed following previous consultation)
- path along Caalong Street (option developed following previous consultation)
- path to Ranelagh House – option 1 along the Illawarra Highway and option 2 following the railway line.

The response sheet then asked the question "Do you support this project?" for each project, with four possible responses: "Yes; Yes, but with amendment; No, I have a better alternative; No."

- Station 7: Next steps and farewell

This was an unmanned station with an information sheet presenting next steps and timeframes, and inviting comment at the "other comments" field on the response form. This was also where the response box was located, for people to return the response form.

1.1.3 Attendance/ responses

Thirty-four people attended the charette and provided feedback through response sheets, as well as at stations 4 and 5. A number of people also took response sheets from the charette, for the use of people unable to attend on the night. One person requested a response sheet prior to the charette as she was unable to attend on the night. For this reason, analysis of response sheets was delayed until 2 January 2007, to enable receipt of mailed-in responses. Four mailed-in response sheets were received, the last on Thursday 11 January 2007.

It should be recognised that attendees of the charette and indeed any voluntary responses from consultation will represent a "community of interest" of the group being consulted, rather than being representative of the overall community. An obvious example of this is that responses to a survey will typically be those of adults rather than children. This, incidentally, is why consultation with the Principal of Robertson Primary School has been undertaken separately.

Considering factors that were likely to reduce response rates, the charette attendance was considered fair to good. Such factors include:

- Previous consultation on walking and cycling proposals, and possible involvement of interested people through other stakeholder groups
- Inclement weather for the duration of the charette
- Proximity to Christmas, including availability of late-night shopping on the night of the charette
- "Consultation fatigue" generated by surveys and consultation being undertaken by other groups.

Notably, the Robertson Transport Project undertaken by the CTC with funding from the NSW Ministry of Transport included a survey distributed by letterbox drop, focus group meetings that included a further survey, and a Transport Expo. The final report regarding this project became available on the day of the charette and does not include response rate information from the surveys, presenting information as percentages of responses instead.

However, there is an opportunity to source this information for comparative and other purposes.

Similarly, charette attendees advised of a community survey regarding what makes Robertson attractive/ special. As this question was also asked in the response sheet ("What are the things you like about the area?"), this would provide one means of quantifying how representative the responses received in the charette are in relation to the broader community.

2 Charette Response Form Information

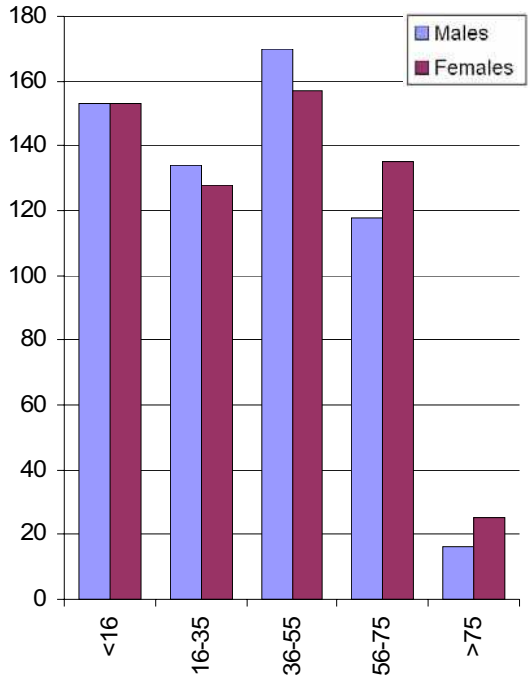
The charette format was quite flexible, including both response forms and workshop information. Although all charette participants returned response forms, these were not all comprehensive.

2.1 General demographics

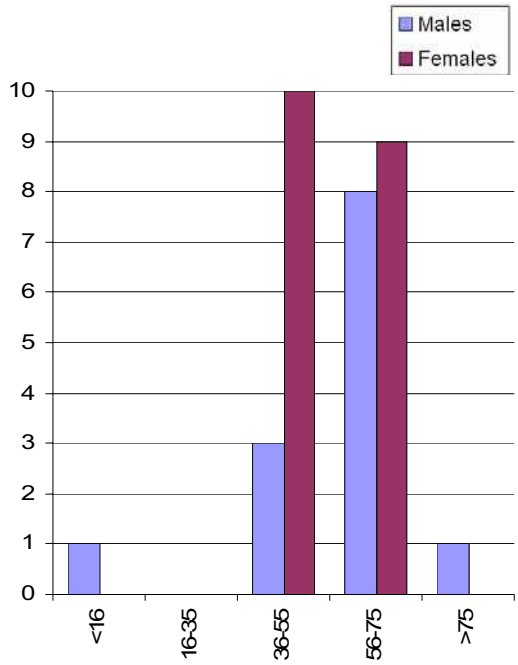
Of the 38 responses received, all respondees provided age information and 32 provided information about their gender. This is summarised as follows

Age group	Male	Female
Under 16	1	0
16-35	0	0
36-55	3	10
56-75	8	9
Over 75	1	0
Total	*13*	*18*

This is clearly unrepresentative of the general Robertson population. 2001 Census data indicates a more even distribution through ages and genders. The respondents are compared with 2001 Census data in the graphs below, adjusted so that the female 36-55 age category is similarly sized in both graphs. (In this comparison, 5 years has been added to ages from the 2001 Census to adjust for the age of this data. No adjustment has been made to for new residents aged under 5 years, who would not be expected to participate in the charette in any case.)



Age distribution, respondents



Age distribution, Robertson (excluding ages 0-4 years)

Assuming that the response rate for 36-55 age group for women is representative of the Robertson community, the 56-75 age group for both genders and >75 age group for men could also be considered representative of the general Robertson community. All other age groups are significantly under-represented. Of particular concern is the lack of any feedback in the 16-35 age group, which is most likely to include parents using strollers.

The under 16 age group is also poorly represented. While consultation with the Principal of Robertson Primary School will assist with issues related to the 5-12 year age group, this still leaves teenagers significantly under-represented.

The particular needs of these demographics should be kept in mind as additional to the responses received.

36 of 38 respondents provided residency information. The majority of respondents (30) lived in Robertson, with 4 living elsewhere in Wingecarribee Shire Council area, 2 from outside Wingecarribee.

33 respondents reported owning a car and 19 reported owning a bicycle.

Two respondents reported a mobility restriction and three reported using a pram (stroller), shopping cart or similar that influenced the way they move in Robertson. Of these, one was male and four female.

2.2 Method of travel

All respondents answered this question.

Most (35) respondents nominated car as driver as being their most common method of travel, although 2 nominated walking and one bus. The bus nomination came from the only

respondent in the under 16 age group, pointing again to the need to keep in mind the different issues of age groups not well represented by respondents.

30 people indicated a second most common method of travel. Perhaps not surprisingly, walking dominated responses, with 18 people nominating walking as their next most common method of travel, followed by 10 nominating car as passenger and one nominating cycling.

The third most common method of travel was answered by 22 respondents and was more mixed:

Third most common method of travel	No. of responses
Walk	8
Bicycle	7
Car as passenger	5
Car as driver	1
Train	1

Although car travel clearly dominates as a primary mode, walking is still an important modal choice. The importance of walking as a mode would be more important for those aged under 16, who cannot drive.

Public transport was not an important mode choice, although again this is likely to be different for the under 16 age group. Train and bus modes are likely to be associated with walking to/ from the train station or bus stop.

2.3 Most-used walking routes

33 people provided their walking routes. The results from this are shown in the diagram overleaf.

25 respondents indicated their residential location using the grid reference system. These showed a good spread between South Street and Mackeys Lane, including Fountaindale Road, and High Street to Charlotte Street.

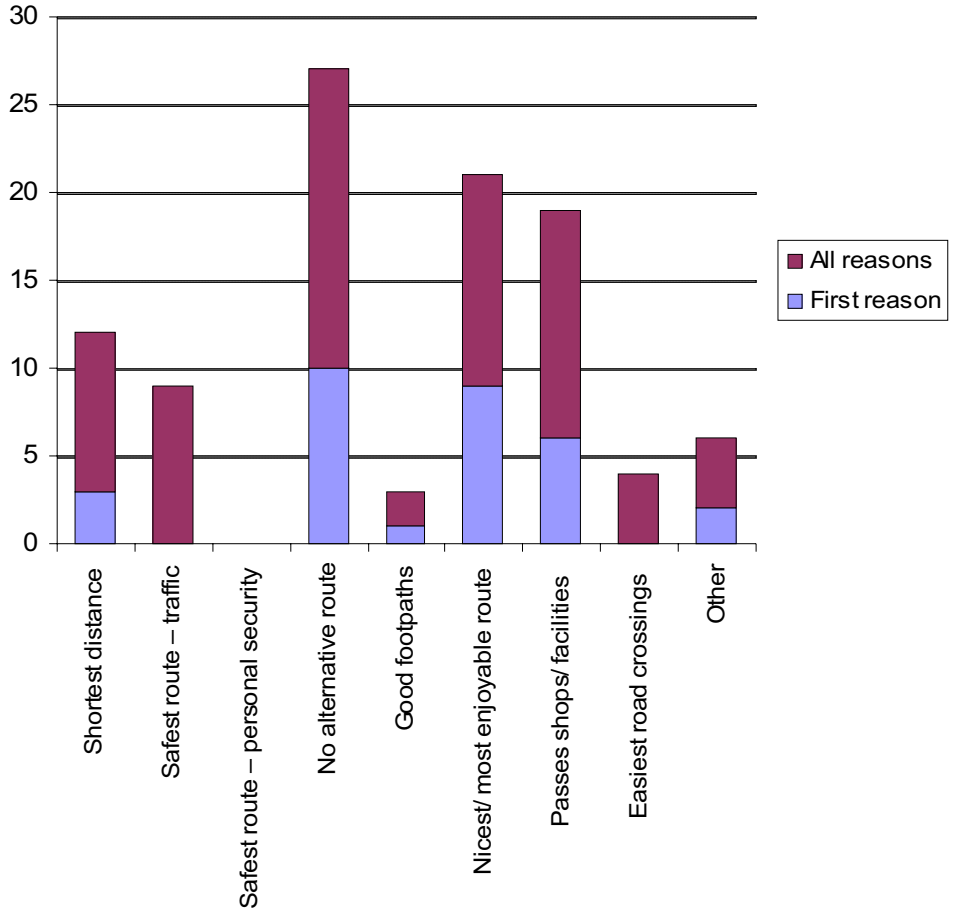
Most streets (and numerous road reserves) are used to some degree, while Hoddle Street either side of Meryla Street is the most-used street.

For the under 16 age group, walking to the Robertson Primary School, to catch buses on Caalong Street or to visit local shops would probably lead to similar patterns. The desire lines related to schools are more focused on Caalong Street, but the lack of crossing points of the rail line would have a similar effect on children as on adults resident south of the rail line.

2.4 Route use

35 respondents nominated a main reason, although four people did not prioritise their responses to these questions.

Excluding the non-prioritised responses from first reasons, the following graph presents first (main) reason and total reasons.



The two most important factors influencing primary route choice were that no alternative route is available, and the amenity of the route. These would not always coincide in route choice, of course. The other notable reason for primary route choice is that the route passes shops and/ or facilities. With shops and facilities generally located along Hoddle Street, this points to the continuing popularity of Hoddle Street as a route.

When looking at other reasons, these three factors remain dominant but route length and traffic safety become important – the latter more so if 'easiest road crossings' is considered to be a traffic safety factor. 'Other reasons' included recreation, walking the dog, longest route (for exercise) and easiest route.

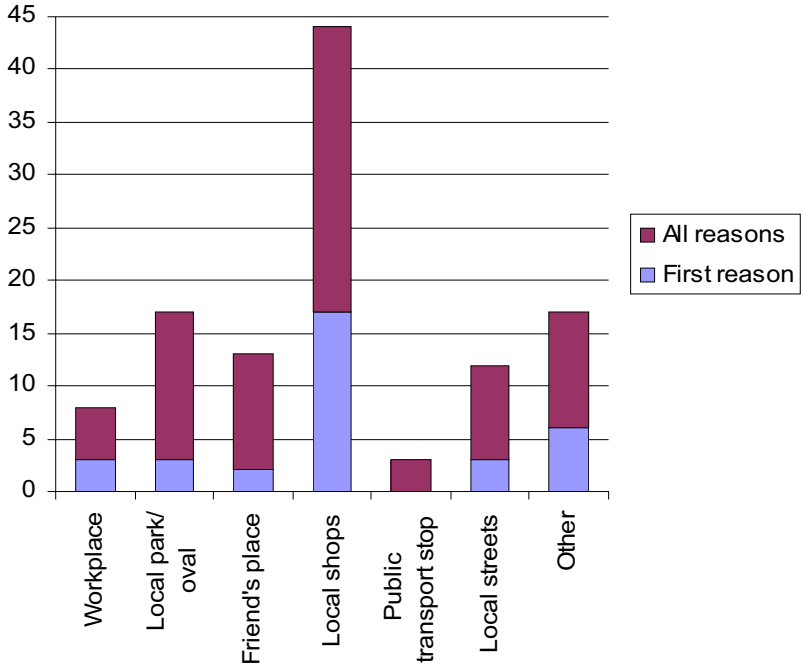
The lack of any nominations for personal safety/ security could reflect a lack of night-time walking, which is when personal safety usually becomes more of an issue, or a confidence in personal safety generated by the village atmosphere.

The low level of nominations for "good footpaths" may reflect the lack of footpaths generally, rather than footpath quality not being important to respondents.

2.5 Destinations

36 respondents nominated a main destination, with two people not prioritising their responses to these questions.

Excluding the non-prioritised responses from first reasons, the following graph presents first (main) reason and total reasons.



The overwhelming destination for walking is local shops, correlating with the previous response about route choice. Given the small sample size, the next four responses - local park, friend's place, local street and other (mainly recreation/ exercise) attracted similar levels of nominations as main destinations.

The low rate of nominations for public transport stop should be treated with some caution, noting that the main demographic that might use public transport heavily – the under 16 age group – is under represented in the charette feedback.

2.6 Things liked about the area

32 respondents listed at least one aspect of Robertson in this area, and one listed five aspects. Other responses ranged between these numbers.

One respondent pointed to a survey of things liked about Robertson, apparently being undertaken by the CTC. This would be a good resource to review, to ascertain how typical the responses received through the response are relative to the broader Robertson community.

The most common responses (14 to 17) related to:

- the village (or rural or country) atmosphere of Robertson;
- Hampden Park and/or Caalong Creek
- aspects related to the natural environment: trees, scenery, green space, open space, tree plantings.

The next most common responses (8 and 9) related to:

- safety: traffic, lack of traffic and personal security; and
- the lack of engineering infrastructure: unkerbed streets, lack of concrete paths.

The number of responses specifically mentioning concrete paths and being 'un-engineered' as attractive aspects of Robertson was surprisingly high and this may point to a sensitisation of the community in response to the proposal to provide a concrete path through Hampden Park. No comments mentioned the Hoddle Street footpaths negatively and the need to extend these footpaths was instead mentioned a number of times in other comments and during the charette.

Other attractive aspects of Robertson included lack of light pollution (lighting of Hoddle Street is discussed in the site survey report), the community and diversity of this, specific streets including Hoddle Street and Main Street, the railway precinct and built form/ heritage, overall amenity of routes ("pretty", "nice"), the grid layout of streets (lack of culs-de-sac or dead ends) and ease of parking.

2.7 Previous proposals

27 respondents commented on proposal 1 (path through Hampden Park), 24 on proposal 2 (path along Caalong Street), 30 on proposal 3 (path to Fountaindale Road along the highway) and 29 on proposal 4 (path to Fountaindale Road along the railway line), as follows:

- Proposal 1: 7 yes, 4 yes with amendment, 2 no with alternative and 14 no. (Of the 11 respondents who showed their main walking route and this included Hampden Park/ Caalong Creek, and who answered this question: 2 yes, 1 yes with amendment, 1 no with alternative and 7 no.)
- Proposal 2: 10 yes, 11 yes with amendment, 2 no with alternative and 1 no. (Of the 12 respondents who showed their main walking route and this included Caalong Street, and who answered this question: 6 yes, 5 yes with amendment, 0 no with alternative and 1 no.)
- Proposal 3: 21 yes, 7 yes with amendment, 0 no with alternative and 2 no. (Of the 9 respondents who showed their main walking route and this included the Post office to Fountaindale Road along the Illawarra Highway, and who answered this question: all yes.)
- Proposal 4: 10 yes, 8 yes with amendment, 0 no with alternative and 11 no. (Of the 6 respondents who showed their main walking route and this included the Post office to Fountaindale Road along the Illawarra Highway, and who answered this question: 4 yes, 1 yes with amendment, 0 no with alternative and 1 no.)

Overall, then, there is strong support for a path along the Illawarra Highway to Fountaindale Road, although the details of this need further development and consultation. Of the suggested amendments/ comments, two wanted the path extended to the post office, while other amendments were protection from traffic, subject to clarification of details, with landscaping and not just a concrete path, lower priority than access paths in the village, and if the railway option is not feasible.

The objections to having the path run alongside the railway included feasibility, the diversion created and cost, with amendments/ comments including signage to direct walkers to the path and continuing the path along the Old Illawarra Highway/ to the post office/ to South Street/ past Ranelagh House.

For the Caalong Street proposal, there were no real negative comments. Amendments/ comments included reducing the visual impact and number of switchbacks (e.g. by using North Street), placing a seat half-way, extending to High Street and providing a ramp (presumably instead of steps, this then being a comment on the original proposal rather than that presented at the charette).

The Hampden Park/ Caalong Creek proposal was generally opposed, although few negative comments were received (one doubted the need for it). Instead, the positive comments about the lack of engineered infrastructure/ concrete paths in Robertson probably provide a better insight into reasons for opposing the proposal. Amendments/ comments included protecting tree plantings, and not having a straight grid aligned path (with a connection from Meryla Street to Caalong Street being one proposed alternative). One supporter of the proposal noted that the Caalong Street path had a higher priority.

2.8 Other comments

11 respondents provided comments, usually one or two but one provided a list of six suggestions. Generally, these related to the need to improve access in/ through Robertson, in terms of general network development and issues of crossing the rail line and addressing the South Street problem (see site survey report for a more detailed assessment of this.) Path standards were also raised, in terms of maintenance and width (enough for wheelchairs, strollers and bicycles), as was dog walking/ management at rail crossings, an opportunity for car parking at Meryla Street and the pedestrian/ vehicle conflict at the main oval entry.

3 Charette Workshop Information

Apart from the response sheet, there were two main locations at which charette attendees could provide feedback: at Station 4 and Station 5, described earlier.

34 people attended the charette, compared to the 38 response forms received.

3.1 Station 4 – Problem locations

Photographs of the aerial with coded responses from Station 4 are provided on the following pages, with the photograph below being a key showing the overall results. The following three photographs are close up photographs presenting more detail of the west, mid and east areas respectively. These are cropped to present information most clearly; areas excluded from the photos did not attract comment.

The tabs on each photograph are labelled with a key to problems. Ticks indicate agreement with an issue by subsequent charette attendees. The problems and their keys are listed below. Issues A to O were provided as possible issues for people to consider, with issues P onwards provided by charette attendees.

A Hard to cross road	B Poor lighting
C Hard to see traffic coming	D Uneven footpath
E Footpath too narrow	F Overgrown trees, shrubs, tree roots
G Permanent obstruction in footpath (light, pole, etc)	H Pedestrian signals slow to respond
I Traffic doesn't give way	J No footpath/ no pedestrian route (e.g. through a dead end)
K Not passable by wheelchair/ pram	L Temporary obstruction in footpath (sign, tables, etc)
M Tree litter on footpaths	N No cyclist route
O Poor drainage when it rains (path becomes muddy, puddles form, etc)	P Needs proper path

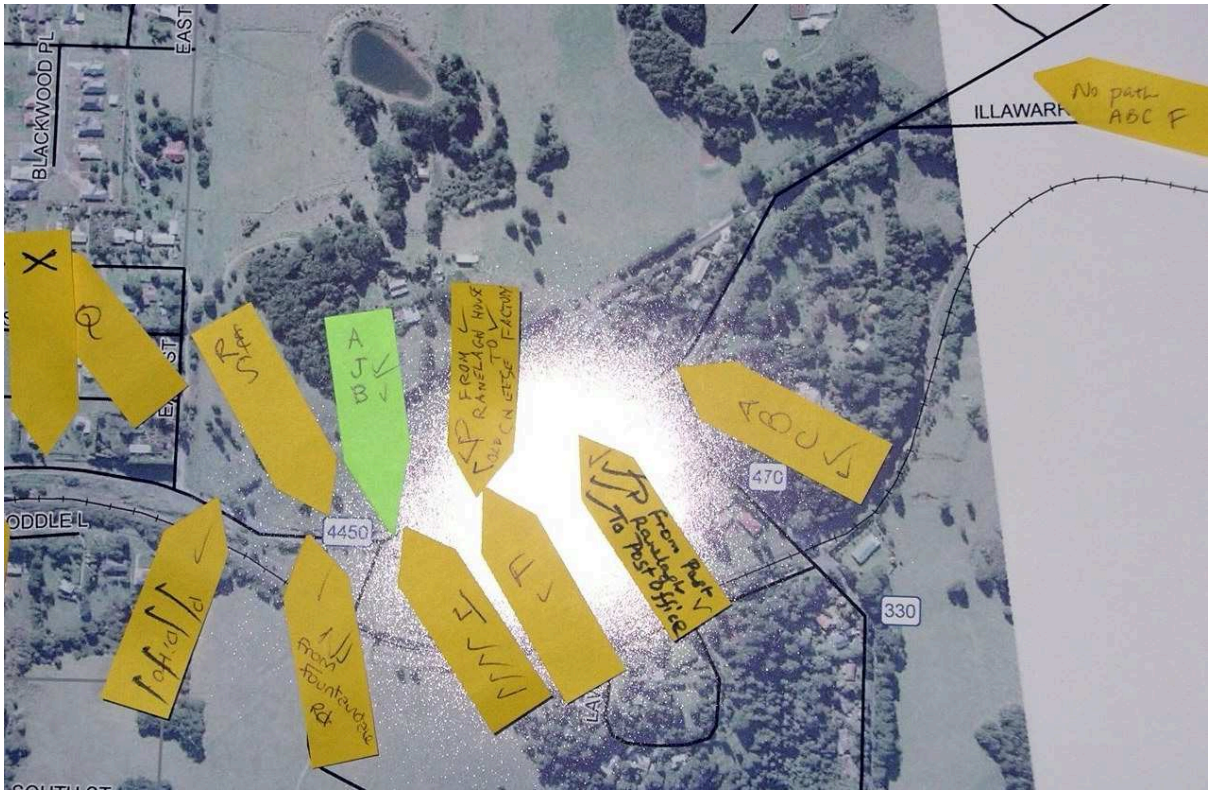
Q When vacant blocks get developed, walking access from North St to May St and Shackleton Ave will be blocked. Many school children and others go through the vacant blocks.

R Traffic travelling too fast.	S Trucks too big/ fast.
T Highway speed limit (should be 50km/h)	U Ridge between trafficked lane and parking area, Hoddle Street, due to differential maintenance. Creates pedestrian trip hazard/ obstacle.
V Potholes/ poorly maintained Council road surface.	W No footpath in front of Park.
X Inadequate pedestrian crossing, north to south of railway.	Y No shelter from rain in Park.

Not all of these problem types were used, although all problem types added by charette attendees (issues P to Y) were used.

Problem locations: west (roughly edge of study area to Caalong Street)

Problem locations: mid (roughly Caalong Street to Hoddle Lane)



Problem locations: east (roughly Hoddle Lane to edge of study area)

Clearly, most problems are located along Hoddle Street/ the Illawarra Highway – which is also the most popular route. There is a reasonable consensus on many of the issues raised.

South Street/ railway line/ Illawarra Highway appears as a particular problem location.

Access along Caalong Street and the Illawarra Highway east of the Old Cheese Factory – the subject of two previous proposals, as discussed in the preceding section – also clearly appear.

Other problems are more distributed and probably reflect individuals' walking experiences, along less well-used routes.

3.2 Station 5 – Actions and Priorities

The following table presents responses collected at this station, ranked by number of nominations received. In recognition of the relatively low number of attendees, the actions have been grouped according to number of nominations:

- ranking 1: > 24 nominations
- ranking 2: 21 to 24 nominations
- ranking 3: 17 to 20 nominations
- ranking 4: 13 to 16 nominations
- ranking 5: 9 to 12 nominations
- ranking 6: 5 to 8 nominations
- ranking 7: 1 to 4 nominations.

How Council should improve walking	Nominations	Rank
Path along main road to Ranelagh House.	28	1
Provide footpath the full length of Hoddle Street on one side (south).	24	2
Provide recreational walking routes	25	2
Complete path entire length of Caalong Street to High Street.	20	3
Proper footbridge over the creek to link Main Street with High Street.	13	4
Provide additional road crossings	13	4
Path from Post Office to Ranelagh House and on to Old Road.	12	5
Continue East Street as a walking path to May Street.	7	6
Provide kerb ramps to help people with prams or in wheelchairs to get on/ off footpaths, e.g. at intersections	5	6
Provide more encouragement, for example by: ▪ supporting events featuring walking ▪ encouraging the school to adopt a green travel plan for students ▪ supporting a "Walking School Bus" for the school	6	6
Provide footpath along Meryla Street from highway to South Street.	6	6
Link Illawarra Highway to High Street via Main Street.	6	6
Provide more lighting for footpaths	2	7
Make walking routes more attractive	4	7
Provide walking maps/ signage	2	7
Provide seats/ benches	8	7
Make footpaths wider: ▪ in areas with lots of pedestrians and activity ▪ around schools, where children ride on footpaths ▪ near bus stops ▪ everywhere	2	7

How Council should improve walking	Nominations	Rank
Ensure a clear path of travel is maintained along footpaths, e.g. with no seating or signage provided in this area	1	7
Good pedestrian crossing at highway over railway	3	7
Cycle path stage 1 should link North Street to playing fields, not Hoddle Street	3	7
Provide street lighting south of railway line.	2	7
Provide recreational cycle paths.	3	7
Link south side of town to north with path/s over railway.	4	7
Provide pedestrian signal crossing at Missingham Parade/ Post office.	2	7
Provide pedestrian overpass at South Street to rear of Rural Fire Service (Wallangunda Street).	4	7
Provide walking and cycling path from Mackeys Lane to Robertson.	1	7

4 Robertson Primary School

The Robertson Primary School is located on the south side of Hoddle Street, to the east of Caalong Street, and caters for children from kindergarten to year 6. The catchment of children for the school includes Robertson, but also children from nearby areas that lack a primary school.

The following is a documentation of an interview held with the school's Principal, Mr Mike Reilly.

The school had 160 enrolments in 2006. Enrolments have been declining from a peak of 224, but are expected to increase again in the next few years, particularly with students from the north-east (Shackleton Street) of Robertson, which is the fastest growing area in Robertson.

4.1 Travel characteristics

The Principal estimates that of the 160 current enrolments, travel modes for students to/ from school are:

- 110 by bus
- 30 by private car
- 15 walk
- 5 cycle.

The estimate of five cyclists is on the high side, with the school recently giving away a bike rack to the CTC. (The school now has only 2 racks, not under cover.)

Most of the 110 bus travellers come from outside the township. There are four bus routes that use local streets:

- Burrawang Street
- Caalong Street (Kangaloon)
- Meryla Street (Belmore Falls)
- Macquarie Pass, taking in Fountaindale, Jamberoo, McGuinness and Murrays Roads, and Mackeys Lane.

Up to 50 students catch the bus from inside the NSW government subsidy boundaries. This subsidy provides free transport for students living over 1.6km radius/ 2.4km walking distance from their school, but students who live along a route already serviced by a bus can similarly access free transport, despite being within the distance limit. This latter provision thus creates a disincentive to walking to school for up to 50 students, although these students would walk to the bus stop. students on Caalong Street also catch the bus as it is too dangerous to walk.

About every four years snow prevents buses getting through.

The school is proud of its environmental credentials, but has a low record of active transport mainly due to weather, the spread out nature of development and the barrier to north-south movement posed by Hoddle Street.

4.2 Walking route needs

The town does not lend itself very well to utility walking as it is spread between three clusters, and most people live on the other side of the Illawarra Highway (Hoddle Street) from most of the shops and services.

An obvious route would connect students in the newly growing north-east area with the school, via Hamden Park.

Although the catchment for children from the south-west is less, the presence of a fence along the railway directing children to the South Street/ Hoddle Street/ railway level crossing poses a safety concern for walking.

(NB The site survey identified some potential for additional development in this area, which would exacerbate this problem.)

4.3 Programs

Robertson Primary School has not had a Safe Routes to School program for 6-7 years. Most of the focus is on bus education: boarding buses, etc.

Bike Ed is conducted every year by Police and Citizens Youth Centre.

The school also participates in the annual Walk Safely to School day, but few are involved and this mainly reinforces the perception of danger. (Strict escorting requirements for children are required.)

They may be interested in the concept of a walking school bus.

The Principal suggested that a Council officer visit the school and in particular the senior classes, to talk about walking and cycling issues. The senior students are a resource that

could be used to encourage ideas about getting more active transport. Given the RTA have an official with this role, perhaps this should be handled in conjunction with the RTA.

4.4 Particular Issues

Robertson Primary School has not had a incident involving personal security in Mr Reilly's time at the school.

The school currently has no students with physical disabilities. One student had Downs Syndrome, but was driven to school.

Traffic safety has been an issue. The school managed to get a pedestrian crossing installed outside their premises, despite traffic numbers on Hoddle Street being below guidelines, because of rainy, foggy conditions.

(As the warrant for a pedestrian actuated crossing was not met, it was difficult getting RTA and Council approval for this. They tried various other measures first: zig-zag line marking, flags and parents stopping vehicles. Signals have now been in place since 1994.)

The main street of Robertson is the first bit of straight road since before the bottom of the Macquarie Pass, for people travelling up from the Wollongong/ Shellharbour area. It is also very wide (approx. 20m between kerbs, with 3.5m travel lanes). It is therefore tempting for motorists (driving through Robertson rather than stopping in Robertson) to accelerate on reaching Robertson (and travel at least at the speed limit, if not exceeding this). Mr Reilly noted the speed of trucks passing through the town: up to 120kph at night. He would like to see street trees used to create a canopy effect (as at Harrietville) as an environmental cue to slow vehicles down.

Mr Reilly noted that weather mitigates against walking: 85 inches pa, though drying out in recent years.

The route of the Wingecarribee Shire's cross-country run that is held in the town every year could be affected by any concrete paths, which the runners could not use. (Soft surfaces cushion against impact when running and are less likely than hard surfaces to cause injury for runners.)

Mr Reilly suggested that if paths are to be made of concrete, they be ochre coloured, with motifs, as at the school (More attractive, less obtrusive than bright white concrete.)

Appendix: Charette feedback form

Small Towns and Villages Pedestrian Access and Mobility Plan

Walking workshop feedback form

Council has commissioned QED Pty Ltd to develop a PAMP for Robertson, as the first part of a broader PAMP for the Shire's small towns and villages, to guide Council in providing for walking and walking. We are seeking your input through this workshop and are providing this feedback form to assist you in responding to the workshop content. We know you're busy with Christmas coming up and thank you for your time. Feel free to complete as much or as little of this feedback form as you want – but the more information we receive, the better we can plan for your needs.

The outcomes of the workshop plus the other data shown and a review of walking routes used will be used to identify a pedestrian network, to guide Council in identifying and prioritising works into the future. An action plan will then be developed, identifying locations where work is required to ensure that these areas are safe, convenient and meet current standards.

We hope you enjoy this workshop and look forward to receiving your feedback.

1 About you…. *(Please tick the responses that apply to you)* Are you … ❑ Male ❑ Female

What is your age? years, or ❑ Under 16 ❑ 16-35 ❑ 36-55 ❑ 56-75 ❑ Over 75

Do you live in… ❑ Robertson ❑ Wingecarribee Shire Council ❑ Elsewhere .....

Do you own a … Bicycle? ❑ Yes / ❑ No Car? ❑ Yes / ❑ No

Optional questions: *please answer if you would like to advise us about the following:*

- Do you have a restriction, limitation, disability, or use a mobility device that affects the way you move? ❑ Yes
- Do you use a pram, shopping cart, etc, that affects the way you move? ❑ Yes

2 What is your most common method of travel? *(please number from 1 to 3, with 1 being the most common method of travel).*

❑ Car (driver) ❑ Bus ❑ Bicycle ❑ Train

❑ Car (passenger) ❑ Wheelchair/ scooter ❑ Walk ❑ Other: .....

3 Referring to the map of Robertson provided overleaf, please show your most-used walking route(s).

*(Please mark your destination with * if it appears on the map.)*

If your house appears on the map, what is the grid reference for your house?

(e.g. the Robertson Community Centre is located at G7).

4 Why do you use this route/ these routes? *(please number from 1 to 3, with 1 being your main reason)*

❑ Shortest distance ❑ No alternative route ❑ Passes shops/ facilities

❑ Safest route – traffic ❑ Good footpaths ❑ Easiest road crossings

❑ Safest route – personal security ❑ Nicest/ most enjoyable route ❑ Other: .....

(why.....)

5 When walking, what are your most common destinations? *(please number from 1 to 3, with 1 being your main destination)*

❑ Workplace ❑ Friend's place ❑ Public transport stop ❑ Other: .....

❑ Local park/ oval ❑ Local shops ❑ Local streets

6 What are the things you like about the area? *(In dealing with the issues raised earlier, we want to make sure we don't spoil things that you like. If relevant, you can mark the locations (1,2,3,4) on the map.)*

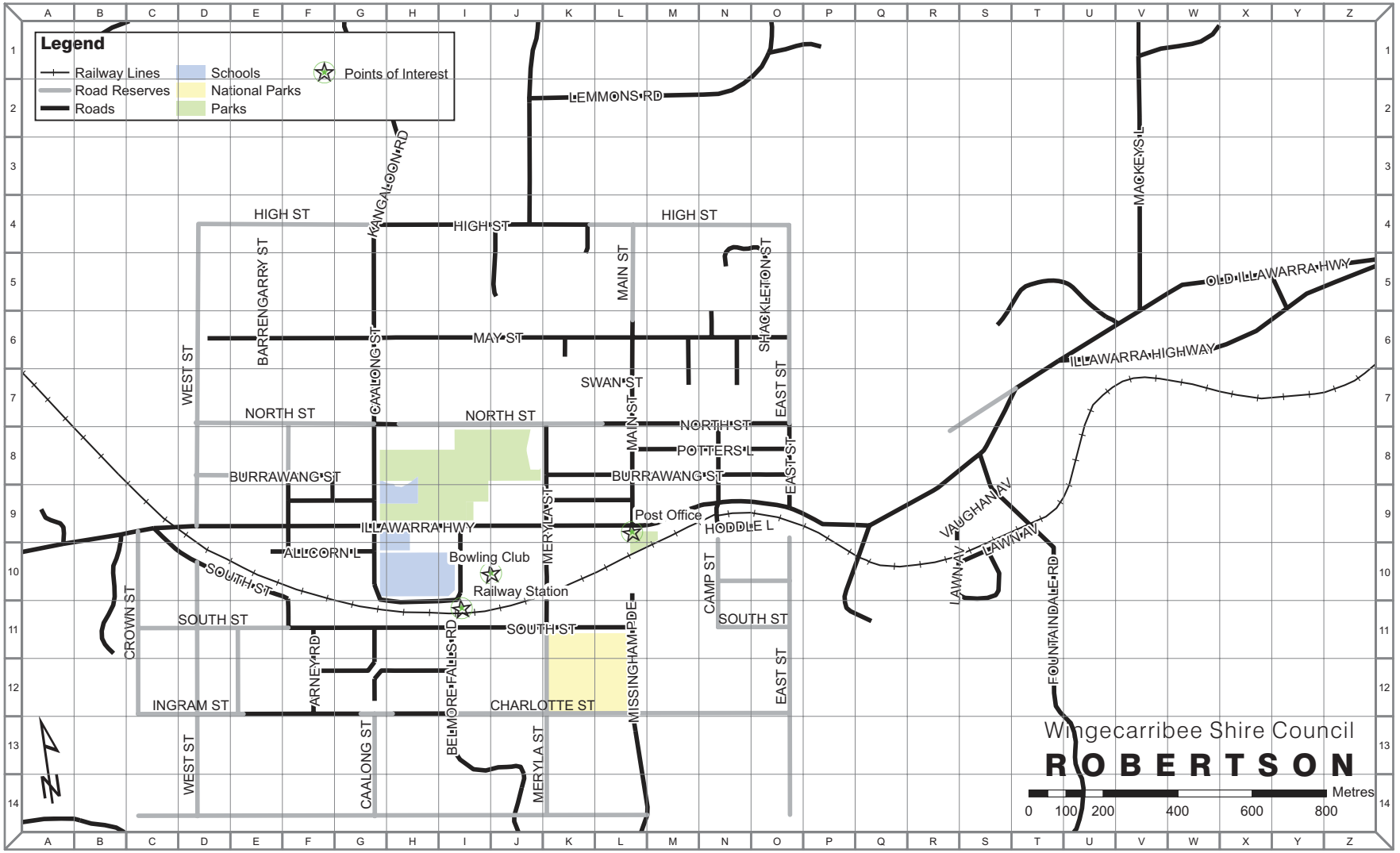
1 .....

2 .....

3 .....

4 .....

P.T.O.



8 Do you have any other comments?

Thank you for participating in the Robertson PAMP workshop.
Please place this feedback form in the response box provided.

7 Station 6 presents four shared use paths proposed for Robertson. Please indicate your level of support for each of the proposals by either ticking or filling out the relevant cell in the following table.
Do you support the proposal?

	Proposal 1	Proposal 2	Proposal 3	Proposal 4
Yes				
Yes, but with the following amendment:				
No, I have a better alternative:				
No				

Appendix C:
Site Survey Working report

QEDptyltd

Wingecarribee Shire Council

Robertson PAMP:
Site Survey Working Report

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18 January 2007

Job No: 06-226Y
Report No: 07-003

1 Introduction

The study area for the Robertson Pedestrian Access and Mobility Plan (PAMP) is shown in the map overleaf. (This diagram also shows traffic volumes and crash information for the last 5 years.)

Consultation was undertaken to identify the issues and opportunities for walking in the study area. This comprised:

- discussion with Council staff
- charette workshop
- interview with the principal of Robertson Primary School.

The results of this consultation are documented in a separate report.

Following this consultation, all roads and streets within the study area were reviewed to develop an understanding of the area, identify issues and opportunities, collect information about conditions such as road widths, and confirm the extent of roads and road reserves against mapping information.

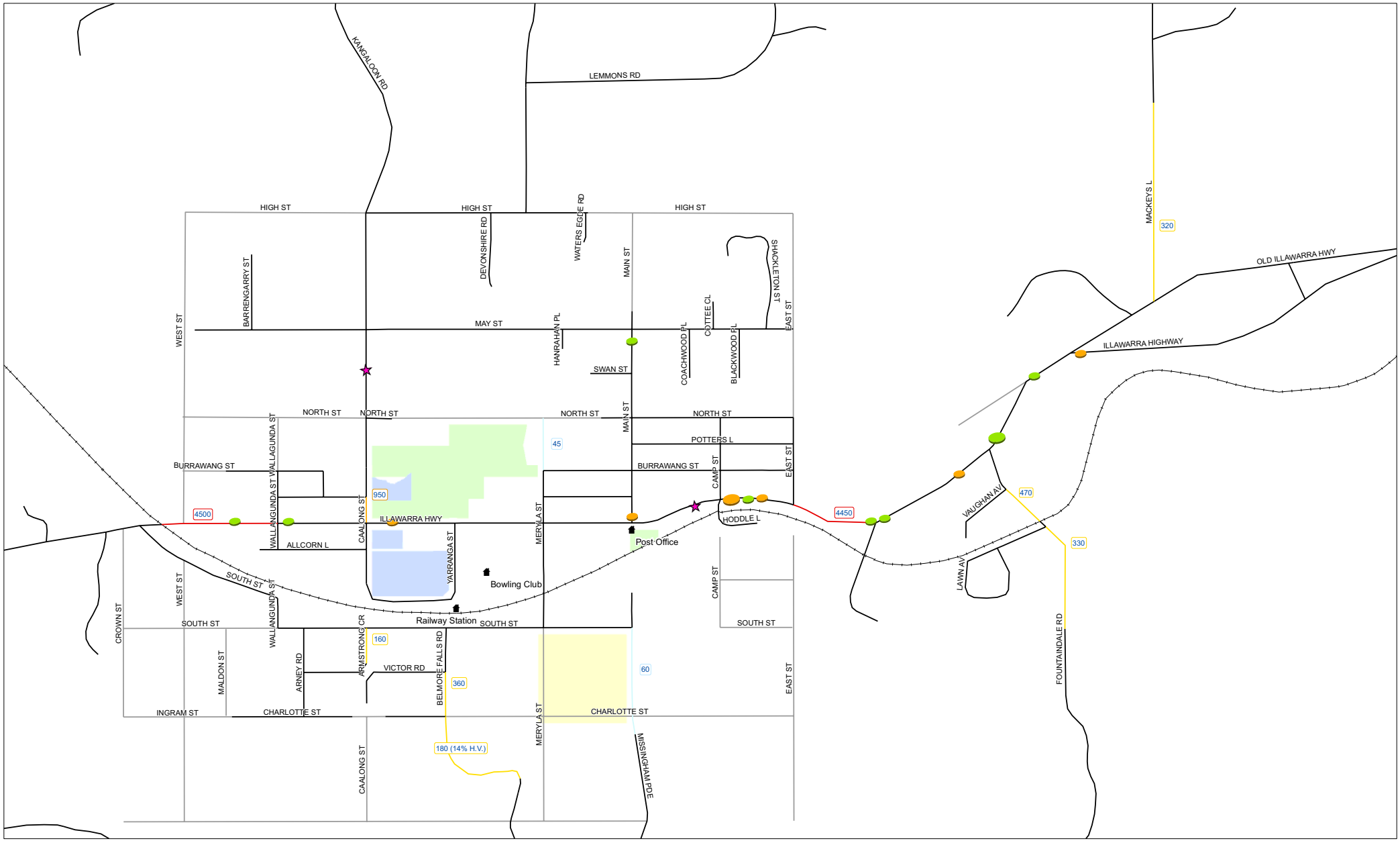
The site surveys undertaken do not represent an exhaustive engineering survey of all roads in Robertson. Rather, they are intended to:

- Review issues and opportunities identified through consultation
- Confirm information collected through consultation about conditions affecting walking
- Collect information about road widths and profiles, types of construction, and locations of street trees and power poles in the road reserve to inform the design phase
- Identify informal walking routes ("goat tracks")
- Develop an overall understanding of the local walking conditions.

The site surveys were undertaken on Wednesday, 20 December 2006, by Fay Patterson and Ian Radbone. A night-time review of Hoddle Street and streets intersecting with Hoddle Street was also undertaken, on the evening of Tuesday, 19 December 2006.

This report is a working document that briefly documents the results of the site surveys.

While the site surveys were principally aimed at walking, cycling conditions were also reviewed in recognition of the shared use of many pedestrian facilities.



0 100 200 400 600 800 1,000 Metres

Legend

- Points of Interest
- Road Reserves
- Railway Lines
- Schools
- Parks
- National Parks

Roads (Traffic Counts 1992 -2006 using 1.6% p.a. growth factor)

- No Count
- 0 - 99
- 100 - 499
- 500 - 1000
- > 1000

Frequency and Type of Crash

- 1 Crash
- 2 Crashes
- Injury
- Property Damage Only
- Pedestrian Crash

Wingecarribee Shire Council - ROBERTSON

2 Traffic management devices

The following traffic management devices were observed:

Give way signs, at the following locations (traffic on the first street listed gives way to traffic on the second street listed and the sign is located on the leg of the intersection listed):

- Wallangunda Street/ Hoddle Street (north and south legs)
- Caalong Street/ Hoddle Street (north and south legs)
- Meryla Street/ Hoddle Street (north leg)
- Main Street/ Hoddle Street (north leg)
- Burrawang Street/ Camp Street (east leg)
- Burrawang Street/ Main Street (east and west legs)
- Burrawang Street/ Meryla Street (east leg)
- North Street/ Main Street (east and west legs)
- May Street/ Main Street (east leg)
- Victor Crescent/ Belmore Falls Road
- Fountaindale Road/ Illawarra Highway

Stop signs, at the following locations (traffic on the first street listed gives way to traffic on the second street listed):

- South Street/ Hoddle Street
- Belmore Falls Road/ South Street
- Meryla Street/ South Street
- Camp Street/ Hoddle Street

Speed limits:

- Streets generally had 50 km/h speed limits off Hoddle Street
- Illawarra Highway, east of rail crossing: 60km/h limit for eastbound traffic
- Caalong Street, near Hoddle Street: school zone (40km/h during school hours)
- Hoddle Street, near Caalong Street/ pedestrian actuated crossing: school zone (40km/h during school hours)
- Yarranga Street, near Hoddle Street: school zone (40km/h during school hours).

Other:

- Access road to Bowling club, off Meryla Street: one-way
- Burrawang Street/ Meryla Street (west leg): no horses sign, facing east
- Camp Street, south of Hoddle Street: level crossing/ stop signs either side of rail line
- Fountaindale Road, at Illawarra Highway: no through road
- Fountaindale Road, near Lawn Avenue: rail crossing
- Hoddle Street, near Caalong Street: pedestrian actuated traffic signals
- Hoddle Street, near South Street: level crossing with boom gates either side of the rail line
- Swan Street: no through road
- Victor Crescent (north and south legs), at Belmore Falls Road: no through road
- West Street, at South Street: no through road.

3 Road widths

Road widths were measured for the larger roads and estimated for smaller or dead-end roads. As many roads do not have well-defined road edges, however, there is a degree of inaccuracy in measurements associated with most roads, in the order of ± 0.1m.

An initial attempt was made to measure road verges, however this proved difficult due to the terrain and vegetation growing in the verge and the results of questionable use without additional information about grade, etc, so this was discontinued. If relevant, examination of a reasonable aerial photograph should be able to provide indicative measurements. More accurate information could be obtained by correlating road boundaries to cadastral information.

A note was also made of the side on which side power poles are located, in case this should become relevant when installing facilities. As the location of poles varied within the road reserve, a measurement of centrelines of poles was not made.

Road width results are presented over the next four pages, alphabetically by street and with street sections presented north to south and west to east.

Street	At (cross-reference location)	Seal type (no edge treatment unless noted otherwise)	Width (metres)	Power pole location	Other comments
Alcorn Lane	Wallangunda St to Caalong St	Unsealed	2.8m	South	
Armstrong Crescent	Arney St to South St	Sealed	Approx. 6m	East	
Arney Street	South St to Charlotte St	Sealed, approx. 0.3m gravel shoulder	5.4m	East	
Barrengarry Road	May St to end	Sealed, new with concrete strip approx. 0.1m wide	Approx. 6m	West	Steep, falls from road
Belmore Falls Road	South St to Victor Cres	Sealed	Approx. 6m	West	
	Victor Cres to Victor Cres	Sealed	Approx. 6m	West	
	South of Victor Cres	Sealed, 60km/h	Approx. 6m	West	
Blackwood Place	May St to end	Sealed, new, laid back gutter (0.6m) either side	6.0m	West	Cul-de-sac
Bowling Club access road	Yarranga St to Meryla St	Unsealed			One-way, east to west
Burrawang Lane	Wallangunda St to Caalong St	Sealed	2.5m-3.0m seal, 6.0m between property boundaries		
Burrawang Street	West St alignment to Wallangunda St	Unsealed	Approx. 3.8m	South	
	Wallangunda St to east end near Caalong St	Unsealed	Approx. 3.8m	South	
	East end near Caalong St to Caalong St	No formed path to waterways, but possible access to creek?		Access through wetland area	
	Caalong St to Meryla St (Hampden Park)				
	Meryla St to Main St	Sealed			
	Main St to Camp St	Sealed	5.5m	North	
	Camp St to East St	Unsealed	5.0m	North, but only western half of street	Curving
Caalong Street	North of High St to High St	Sealed	5.3m	East	
	High St to May St	Sealed	5.3m	East	
	May St to North St	Sealed	5.3m	East	
	North St to Creek/ Barrawang St alignment	Sealed	5.3m	East	Passes through cutting at North St
	Creek/ Burrawang St to Burrawang Ln	Sealed, with kerb and gutter (0.45m)	16.6m	East	Seal disintegrating at bridge
	Burrawang Ln to Hoddle St	Sealed, with kerb and gutter (0.45m)	16.6m	East	
	Hoddle St to Alcorn Ln	Central seal, gravel either side	5.8m seal, gravel parking east side; overall width approx. 16.6m	East	
	Alcorn Ln to end	Unsealed	Approx. 6m	East	Cars park on verges either side
Camp Street	North St to Potters Ln	Sealed	5.4m	East	
	Potters Ln to Burrawang St	Sealed	5.4m	East	
	Burrawang St to Hoddle St	Sealed	5.5m	East	
Charlotte Street	West St alignment to Arney St	Sealed, approx. 0.3m gravel shoulder, trees close to road on S	5.6m	North	

Street	At (cross-reference location)	Seal type (no edge treatment unless noted otherwise)	Width (metres)	Power pole location	Other comments
	Arney St to end	Sealed, laid back gutter (0.6m) N side	Approx. 3m-3.5m	North	
Coachwood Place	May St to end	Sealed, new, laid back gutter (0.6m) either side	6.1m	West	Cul-de-sac
Devonshire Rd	High St to end	Sealed, laid back gutter (0.6m) both sides	5.1m	East	
	Road end	No formed path to waterways, but possible access to creek?		None	Check cadastre for ownership
East Street	North St to Potters Ln	Unsealed	3.4m with 0.3m to 0.5m dirt shoulder	None	
	Potters Ln to Burrawang St	Unsealed	3.4m with 0.3m to 0.5m dirt shoulder	None	
	Burrawang St to Hoddle St	Unsealed	3.4m with 0.3m to 0.5m dirt shoulder	None	
Fountaindale Road	Illawarra Hwy to Lawn Ave	Sealed			Bus shelter near hwy
High Street	Caalong St to Devonshire Pl	Sealed	6.4m	South	
	Devonshire Pl to Lemmons Rd	Sealed, with kerb and gutter (0.45m) S side only	8.8m	South	
	Lemmons Rd to new (unnamed) street	Sealed, with kerb and gutter (0.45m) S side only	8.8m	South	
	New street to end	Sealed, with kerb and gutter (0.45m) S side only	8.8m	South	
	East of end	New sealed street, concrete edge S side	8.8m	None	Under construction
Hoddle Street (Illawarra Highway)	South St to West St alignment	Sealed		South	Armco barrier on approach to rail crossing, E and W of rail
	West St alignment to Wallangunda St	Sealed		South	Wide gravel area S side
	Wallangunda St to Caalong St	Sealed, with kerb and gutter (0.45m)	20.0m kerb to kerb, wide sealed parking both sides of travel lanes approx. 7m	South	Footpath N side from Caalong, part-way to Wallangunda
	Caalong St to Old Cheese Factory	Sealed, with kerb and gutter (0.45m)	20.0m kerb to kerb, wide sealed parking both sides of travel lanes approx. 7m	South	Footpath S side, parking off edgeline
	Old Cheese Factory to Old Illawarra Hwy	Sealed	Approx. 7m	None	Nominal verge with vegetation, both sides
Lawn Avenue	Fountaindale Rd to end	Sealed			Train platform north side of rail line, for Ranelagh
Lemmons Road	High St north	Sealed	6.1m	West	Ditch either side of road
Mackeys Lane	Old Illawarra Hwy north	Sealed			Rolling, a bit
Main Street	Path: High St to end Main St	Dirt track through grassed area, fence on east and posts on west to bank to creek	Approx. 3m between fence and post line	On West, well away from alignment	
	Path to May St	Unsealed	6.4m	East	
	May St to North St	Sealed	6.4m (W verge approx.	East	
	North St to Burrawang St Burrawang St to Hoddle St Hoddle St to South St	Sealed	6.4m (W verge approx. 12.4m)		
Maldon Street	South St to end	Sealed	5.6m		

Street	At (cross-reference location)	Seal type (no edge treatment unless noted otherwise)	Width (metres)	Power pole location	Other comments
May Street	West St alignment to Barrengarry St	Sealed, new	5.2m	Zig-zag north to south	
	Barrengarry St to Caalong St	Sealed	Approx. 6m	Zig-zag north to south	
	Caalong St to end	Sealed, new with concrete strip approx. 0.1m wide	6.1m	North	
	End east	Private driveways, no access to dam			
	Dam to Main St	Sealed, new with concrete strip approx. 0.1m wide	6.7m (N verge approx. 11.6m, S verge from 1.8m at Main St to 11.3m, line of street trees at approx. 3.8m)	North	
	Main St to Coachwood St	Sealed	5.7m	North	
	Coachwood St to Cottee Cl	Sealed	8.6m	South	
	Cottee Cl to Blackwood Pl	Sealed, laid back gutter (0.6m) N side	7.9m	South	
	Blackwood Pl to Shackleton St	Sealed, laid back gutter (0.6m) N side	7.9m	South	
Meryla Street	North St to Burrawang St	Unsealed	5.3m, widens to up to 5.5m at Burrawang St intersection	East	
	Burrawang St to Hoddle St	Sealed, poor condition E edge	5.0m, widens to up to 5.5m at Burrawang St intersection	East	
	Hoddle St to South St	Sealed	Approx. 5.3m, widens at Hoddle St intersection	East	
Missingham Parade	End near rail line to South St	Unsealed	3m	East	Possible power easement parallel to railway
	South St to West St alignment	Sealed, extensive flat verges either side, poles vary in location	4.9m	East	
	South of West St alignment	Unsealed	Approx. 4.9m	East	
New road (unnamed)	Subdivision: May St to Cottee Cl	Sealed, new	Approx. 3m	Unknown	Council plans?
New road (unnamed)	High St to end	Sealed, new with concrete strip approx. 0.1m wide	Approx. 6m	None	
North Street	West of Caalong St (nominal road alignment)	No visible alignment, trees and grass			
	Caalong St to park	Unsealed, row of trees S side	2.5m-3.0m	North	
	Park to Meryla St (nominal road alignment)	Wide grassed alignment, tree lined		None	
	Meryla St to Main St	Sealed	4.7 (N verge approx 9.6m)	North	
	Main St to Camp St	Sealed	6.9m	North	
	Camp St to East St	Unsealed			
Old Illawarra Highway	Illawarra Hwy to end	Sealed			
Potters Lane	Main St to Camp St	Unsealed, tyre tracks between property boundaries	5.8m between boundaries	None	
	Camp St to East St				
Shackleton Street	May St to end	Sealed, laid back gutter (0.6m) both sides	7.0m	East / north	Curvilinear
	Path: end Shackleton St to end Cottee Cl	Short, starts as wide concrete path, fence east and large tree west. Ends unformed at creek.	Approx. 3m	None	Starts over side entry pit.
South Street	Hoddle St to South St	Sealed	5.4m	South	
	West St alignment to South St	Unsealed	5m	None	Access to future development

Street	At (cross-reference location)	Seal type (no edge treatment unless noted otherwise)	Width (metres)	Power pole location	Other comments
	South St to Arney St	Sealed	5.4m	South	
	Arney St to Armstrong Cres	Sealed	5.4m	South	Gap in railway fence opposite Armstrong
	Armstrong Cres to Belmore Falls Rd	Sealed	5.4m	South	Crests near railway station, above station height
	Bellmore Falls Rd to Meryla St	Sealed	5.4m	South	
	Meryla St to Missingham Pd	Sealed	5.4m	South	Car park for reserve, S side, unsealed
Swan Street	West end to Main Street	Sealed	5.5m (N verge approx. 4.4m, S verge approx. 5.4m, significant trees both verges)	South	
Vaughan Avenue	Fountaindale Rd to end	Sealed			
Wallangunda Road	Burrawang St to Burrawang Ln	Sealed, deep ditch to W	5.8m	East	
	Burrawang Ln to Hoddle St	Sealed, deep ditch to W	5.8m	East	Narrow footbridge to bus shelter
	Hoddle St to Alcorn Ln	Sealed	5.8m	East	
	Alcorn Ln to end	Unsealed	5.8m	East	Access to fire station only
Yarranga Street	Hoddle St to Railway Station	Sealed, significant trees either side	Approx. 6m	East	School zone, access to Meryla via bowling club

4 Night-Time Conditions

A lack of light pollution was identified as one positive characteristic of Robertson by residents, so a brief review of Hoddle Street and streets and roads intersecting Hoddle Street was undertaken to determine the accuracy of this and its implications on the adequacy of lighting for walking at night.

Hoddle Street itself has some street lighting, however this is dedicated to lighting the travel lanes rather than the footpath. Given:

- a wide parking area between the kerb and the travel lanes;
- trees located between the footpath and kerb in many areas; and
- no dedicated lighting of footpaths,

this results in a low lighting level along footpaths. However this low base level of lighting is increased by the relatively high levels of spill lighting generated by businesses located along Hoddle Street and directed along footpaths in particular. Overall, this leads to pools of higher and lower levels of lighting along footpaths that could be considered to be lit overall.

Given the existing level of lighting, footpath lighting along Hoddle Street could probably be addressed to provide a more consistent and overall higher level of lighting with little increase in light pollution. Conversely, little additional lighting would be required to the existing spill lighting to provide a consistent and sufficient level of lighting for walking. Any increases in lighting levels could alternatively be achieved using lighting focused along footpaths rather than through increased street lighting.

For roads and streets off Hoddle Street, lighting appears minimal and is again focused on lighting of travel lanes rather than of footpaths.

Newer roads and streets are being provided with street lighting, presumably at a level compliant with the relevant Australian Standard (AS 1158) and at a higher level than for established streets, due to the need to allow for the decreasing efficacy of luminaires (light bulbs) over time.

5 Issues Analysis

5.1 Village form

Robertson has developed with a linear form originally addressing the railway line and now addressing Hoddle Street, as the main transport thoroughfare. The rail and road alignments are generally low points in the local topography; the village rises fairly gently (although more steeply in places) to the north of Hoddle Street and south of the rail line.

Both Hoddle Street and the rail line form barriers to free and easy north-south movement, the former due to traffic and the latter due to a lack of designated crossing points for convenient travel.

This is a particular issue regarding the rail line, due to recent fencing installed along the rail line to prevent pedestrian access along the corridor and crossing except at designated points. While intended to improve safety, apparently as part of general Australian Rail Track Corporation (ARTC) policy, the full implications of this on pedestrian safety do not seem to

have been adequately assessed. Namely, the lack of a designated crossing point west of Meryla Street naturally directs people from the south-west of Robertson to the South Street/ Hoddle Street level crossing. From a traffic safety viewpoint, this crossing point can only be regarded as deplorable for pedestrians.

There is very little verge adjacent to Hoddle Street at the level crossing. What available area is present has been used to provide Armco barriers on each approach to the level crossing. This results in a minimal available verge (of the order of 0.3m) located on the south side of Hoddle Street to the west of the level crossing, changing to the north side of Hoddle Street to the east of the level crossing, for pedestrians to use. For the short section within the level crossing, it is arguable whether either side offers an advantage in verge width. Once past the level crossing, a gravel verge on the south of Hoddle Street offers the best walking conditions until the commencement of the footpath at Wallangunda Street – on the north side of Hoddle Street. (This footpath then changes to the south side of Hoddle Street at Caalong Street, with a pedestrian actuated crossing provided at this point.)

Hence pedestrians from South Street will tend to walk on the south side with minimal to no width to provide separation protection from traffic, cross to the north side where conditions are similar, then cross back to the south side to use the gravel verge. (They may then cross to the north side to use the footpath to Caalong Street before crossing back to the south side at Caalong Street, although it is likely that many would simply use the verge for the Wallangunda Street to Caalong Street length.) The alternative is simply to walk along Hoddle Street without any separation to traffic, from South Street until the level crossing is cleared.

The situation is exacerbated by the lack of an 'entry statement' for Robertson prior to the level crossing and the lack of clear sightlines through the level crossing. That is, there are no environmental cues to drivers not familiar with Robertson (or the pedestrian activity likely at South Street) that they are entering the village and should expect to encounter pedestrian activity. As the level crossing coincides with a bend in the Illawarra Highway/ Hoddle Street, this lack of environmental cues includes not being able to see the main street of Robertson ahead in even fine weather, not to mention with sight distance reduced by the frequent fog and light rain conditions experienced in the village.

The use of the South Street level crossing by pedestrians is thus undesirable, to say the least. However the alternative – to walk to Meryla Street and use the level crossing there – is a significant detour, particularly for children access the primary school. It is therefore unsurprising that a significant hole has been opened in the railway fence roughly at Armstrong Crescent/ South Street intersection, where the fenceline is close to the roadway, with a clear goat track leading from this to the rail line.

This issue is likely to increase in relevance as further development occurs in the area. An extension of South Street was observed in the site visit, providing access to currently undeveloped allotments. The road reserves established for Crown Street, West Street and Ingram Street also point to future development opportunity in the area.

Possible actions to address the issue:

- Provide a pedestrian crossing of the rail line close to South Street/ Hoddle Street intersection, but set back from Hoddle Street, preferably on the south side (to line up with desire lines from South Street and to the east of the level crossing). However the rail line is built up from South Street, with the terrain dropping away from this height quickly and the crossing point would need to be built up somewhat to provide a convenient crossing. Short-term action, medium cost.
- In conjunction with a redesign of the Hoddle Street, negotiate with the Roads and Traffic Authority to reduce the speed within Robertson proper to 50km/h, with signage appropriately located. Short-term action, low cost.
- Provide a pedestrian crossing of the rail line at Armstrong Avenue/ South Street, to Caalong Street. (Or South Street/ South Street to Wallangunda Street, but this appears less conducive.) Short-term action, medium cost. Alternative to South Street/ Hoddle Street location.
- Provide a pedestrian overpass of the rail line, in recognition of increased train traffic related to the development of an intermodal site in Wingecarribee. Medium-term action, high cost.
- Provide a footpath on the south side of Hoddle Street, between Caalong Street and Wallungunda Street. Short-term action, low to medium cost.
- Provide an 'entry statement' (e.g. landscaping or sculpture) to provide environmental cues to motorists that they are entering Robertson, in addition to signage. Short-term action, medium cost. Could be complicated by developing the appropriate entry statement, necessary public consultation, availability of land adjacent to the Illawarra Highway, gaining the support of the Roads and Traffic Authority, need to avoid creating roadside hazards, etc.

The eastern 'entry statement' is perhaps even more poorly defined than its western counterpart, as initial environmental cues such as the pie shop and Fountaindale Road provide an impression that Robertson will develop slowly, with additional streets and businesses building into a township, as is common elsewhere. This is not the case: an undeveloped stretch of the Illawarra Highway is followed by Robertson proper, at the Old Cheese Factory (roughly opposite Camp Street), a high pedestrian location. This is located at a bend in the Illawarra Highway, more marked than on the western approach, with the additional traffic complexity of well-used on-street parking at this location.

Possible actions to address the issue:

- Provide a pedestrian refuge at the Old Cheese Factory (roughly opposite Camp Street), with advance signage for motorists before the bend in the Illawarra Highway. As the refuge would occupy width that is currently trafficked, an issue would be the need to reconstruct part of the parking area to a higher standard to maintain traffic lane width through this area. Under poor visibility (e.g. fog) conditions, a refuge may also pose a hazard to motorists unless constructed as part of a larger streetscape upgrade separating the eastbound and westbound traffic lanes – which would have associated with it a number of issues as well as a high cost implication.
- Provide an informal pedestrian refuge at the Old Cheese Factory, with advanced signage for motorists indicating that pedestrians cross at this location, rather than that a pedestrian facility exists in this location. This would reduce the cost and could overcome safety implications of a formal refuge, but provide a lower level of protection to pedestrians.
- Negotiate with the Roads and Traffic Authority to reduce the speed within Robertson proper to 50km/h, with signage appropriately located. Short-term action, low cost.

- Line-mark parking in the vicinity of the Old Cheese Factory, to reduce unexpected traffic movements in this area.
- Provide an 'entry statement' (e.g. landscaping or sculpture) to provide environmental cues to motorists that they are entering Robertson, in addition to signage. Short-term action, medium cost. Could be complicated by developing the appropriate entry statement, necessary public consultation, availability of land adjacent to the Illawarra Highway, gaining the support of the Roads and Traffic Authority, need to avoid creating roadside hazards, etc.

Creeklines in the area provide barriers to movement but also potential movement corridors. In this regard, Caalong Creek is the most significant. The potential for these alignments to provide for movement appears to have been eroded in recent development. For example, development at the end of May Street, west of the dam does not provide for access to the dam (or, more accurately, an access corridor established around the dam.) Similarly for Devonshire Road, although an opportunity for access may yet remain. Residents along Devonshire Road would thus have to walk north to High Street and along High Street to Caalong Street to head south, instead of being able to cut through from the end of Devonshire Road to May Street. This affects pedestrian permeability. (See also s. 5.2.) In contrast, connections at the end of Shackleton Street and Cottee Close to the creekline have also linked these streets together.

Linear paths can be expensive to develop and maintain. However the opportunity for informal walking corridors to develop/ be maintained and for future paths to be developed should be protected through planning requirements. From feedback received at the charette, the publicly accessible green space that results would be in keeping with attributes of Robertson valued by its residents: green open space and a village atmosphere.

To some extent, a similar case applies to the railway reserve, which is (obviously in places) used by pedestrians. For Council development of a path along the rail corridor, ARTC also requires Council to both lease the rail land to be used and construct fencing between this land and the rail line. There is a clear need for these requirements to be negotiated with ARTC, possibly using arguments about the maintenance cost taken on by Council, the fact that ARTC is already providing fencing and any Council cost contribution towards this should reflect the amount that would have been spent in any case by ARTC, positive publicity for rail resulting from use of the rail corridor, enhanced access to stations, enhanced access for ARTC maintenance vehicles using formed paths (where relevant), etc.

5.2 Pedestrian permeability

An area with high-quality pedestrian permeability is one in which a pedestrian has (many) more access opportunities than motor vehicles, and where these provide for pedestrian access to be more convenient than vehicular access. In this regard, pedestrian permeability in Robertson is mainly brought about by informal measures, such as using undeveloped blocks and road reserves, cutting a hole in a fence to create a new crossing point of the rail line, etc.

The permeability issues related to creeklines, which form both barriers and potential movement corridors, is discussed above.

The main street pattern in Robertson is a grid pattern, which provides nominally good permeability. However, this is only nominally the case because many street reserves have

not been developed and therefore do not provide active access opportunities, and because of barriers along these alignments, such as creeks.

A more immediate threat to pedestrian permeability is in the form of new development. Most new development is occurring based around culs-de-sac and dead-end streets, with no linkage between these and other streets. To some extent, this is currently being overcome through the use of undeveloped blocks in these new development areas, but movement will be hindered as these are developed.

This also applies to cyclists.

Possible actions:

- Amend the DCP for Robertson to require that pedestrian (and cyclist) permeability be protected and enhanced in all development proposals. This could include establishing a pedestrian and cyclist structure plan or similar, or wording regarding the form of streets. The Western Australian document "Liveable Neighbourhoods" and accompanying guidelines provide good guidance in this regard.
- Offer bonus plot ratio provisions for future development that established pedestrian linkages. This provision relates to allotments already created, and redevelopment on sites already developed (although the latter is likely to only function in a long-term context.) Again, this could be based on a pedestrian and cyclist structure plan.
- Require development adjacent to creek lines to provide access to creek lines at convenient/ suitable intervals and for a linear reserve adjacent to creek lines to be established and either maintained as publicly accessible open space, or handed to Council as open space. As this would coincide with environmental requirements adjacent to creek lines, this should not represent a significant loss to developers.

5.3 Other issues

- There are a few verandas in Robertson that extend past the property line, over the footpath - some of these completely over the footpath. These provide weather protection for pedestrians and could be considered as a desirable form of development in Council's DCP for Robertson. This would appear to be in keeping with the village atmosphere for Robertson.
- There are few other formal facilities in Robertson and these do not link to form a network or even continuous routes. This leaves considerable scope for the improvement of walking through infrastructure development. This will be examined in the main PAMP document.
- The community approach to new facilities is discussed in the community consultation report. From average weather data, wet-weather considerations are a particular issue to be covered.
- The provision of bus shelters is generally poor. Access for people with disabilities does not appear to have been specifically addressed at any bus stop location.
  The Disability Standards for Accessible Public Transport 2002 (amended 2004) required Council to have 25% of bus stops compliant with this legislation by 31 December 2007, with future milestones being 55% of bus stops compliant by 31 December 2012, 90% compliant by 31 December 2017 and 100% compliance by 31 December 2022.
- Footpaths or formed walk ways are not being provided as part of new development. This leaves Council with an increasing issue in how it will provide for walking, as areas are developed. The approach to this needs to be determined with Council. One option for

low-traffic volume streets may be use of the roadway for walking, with threshold treatments and other traffic devices to ensure that excessive speed is not reached in these areas.

6 Site Visit Photos

Photographs taken during the site visit are not included in this document due to the impact of these on the document, in terms of file size. Also, they are more clear when viewed in colour at the photograph file size. As such, they have been cut to disk and accompany this document.

Photographs were mainly taken at intersections and have been named using the following three-part naming convention, where possible:

- Street 1, described using the first part of the street name only. That is, the descriptor "street", "avenue", etc is generally omitted, but is included for minor streets where this avoids confusion i.e. "Burrawang Ln" is used for Burrawang Lane vs "Burrawang" for Burrawang Street);
- at street 2, naming convention as for street 1; and
- letter of cardinal point (i.e. N=north, S=south, E=east, w=west) showing the direction being viewed.

Hoddle Street has been abbreviated to "hwy" for Illawarra Highway, as a general convention to minimise name length.

Other descriptions have been used where necessary to clarify locations. These should be self-evident.

Few night-time photographs were taken due to the difficulty of capturing images at night and were taken at a low resolution only.

A brief informal site visit was also taken following the inception meeting, on the way through Robertson. Some photographs were taken at this time and are also provided.