Bowral Parking, Traffic and Transport Strategy

Post Community Engagement of 6-6-12 to 1-8-12

As adopted by Council 12 December 2012

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Strategic and Assets

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1. Background to the Bowral Parking, Traffic and Transport Strategy

Council engaged High Range Analytics Pty Ltd to build a transport micro-simulation model of the Bowral Town Centre. The NSW Roads and Traffic Authority (RTA now the NSW Roads and Maritime Services - RMS) provided part funding for this project. RMS reviewed and approved the project brief prepared by Council.

The model utilised information derived from the Shire Wide Strategic Network Model – TRACKS to determine trip links to areas outside of the Bowral town micro-simulation model.

Figure 1.1 below shows the extent of the survey and Bowral Town Centre micro-simulation model:

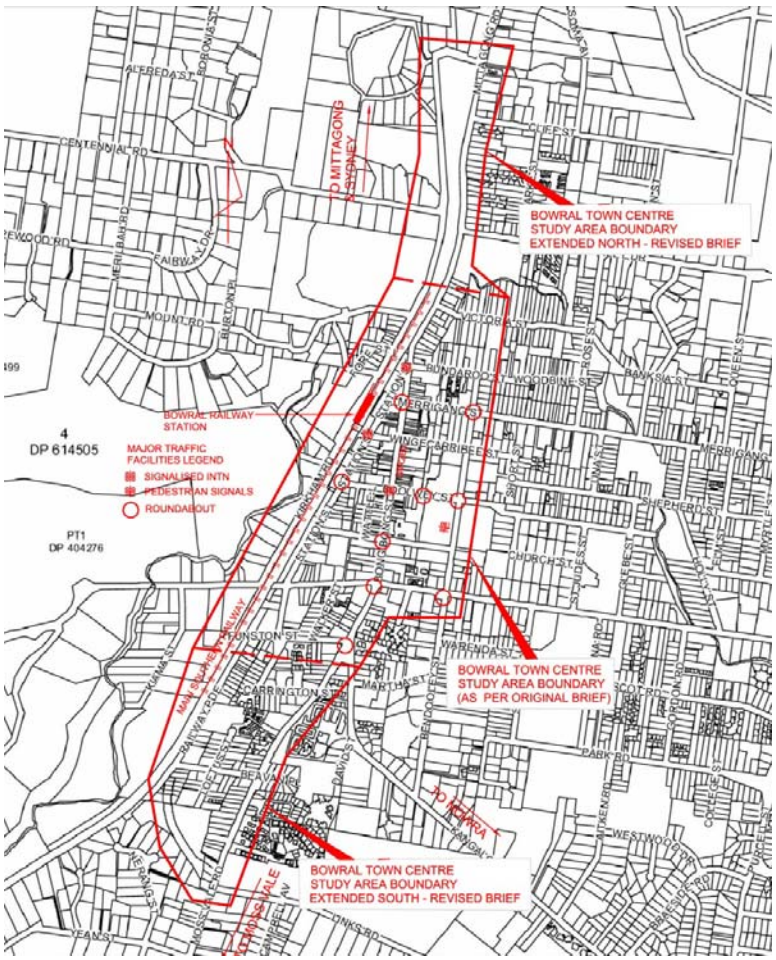


FIGURE 1.1 – STUDY AREA

The process also included intensive and extensive traffic data collection, which included:

1.1 Selection of a survey date and time that was representative of normal weekday peak traffic found during a regular non-school holiday period. The

actual survey was conducted on Friday 30 April 2010 between 2:30pm and 6:00pm.

1.2 Travel time surveys by a vehicle fitted with a Global Positioning System (GPS) logger over several runs along several routes during the survey period.

1.3 Manual survey of approach queues at a number of intersections during the survey period.

1.4 Simultaneous survey of 31 intersections (turning and through movement counts), 14 carpark access/egress points. Survey identified separate volumes for light, heavy (trucks 12.5m and longer) and buses.

1.5 Survey of parking changeover (on street and off street) at a number of locations.

1.6 Survey of interruptions to traffic flow at 2 key marked pedestrian crossings (Bong Bong St – near Wingecarribee St and Bendooley St – near Bowral Library).

1.7 Recording of actual signal timings at the existing traffic signals in the town and comparison of this against signal SCATS data.

1.8 Update of the 2005 parking survey.

1.9 Bus timetables were included in the model.

The above data was used to create and validate the micro-simulation model, using RMS approved software – "Paramics" ("Paramics" is a specialised traffic and transport micro-simulation computer programme developed by Quadstone Paramics – Edinburgh, Scotland).

Network details were derived from Council's Graphical Information System (GIS) network layers and review of aerial photographs of high resolution and ground field checks. The base model was independently audited by GTA Consultants (Sydney) in accordance with RMS guidelines.

It is concluded that the base model is an accurate reflection of the traffic and transport activities as they occurred during a non eventful "normal" weekday, non-school holiday period on Friday 30 April 2010 and is considered suitable to assess the effects of changes to the physical network, the management of the network (e.g. parking regulations, changes to regulatory traffic facilities, etc.) and evaluate the impacts of increased vehicular activity that is associated with changes in development within the town centre.

2. Findings of the survey and Scenario Testing in the Paramics Micro-simulation Model:

2.1 Considering the Paramics Model data

Viewing the calibrated Bowral Town Centre Paramics model, and the data it has provided, has enabled a very clear insight into how the Bowral Town Centre operates. In the past, we would tend to consider changes to the way we park and the performance improvements, say, to the modification of an intersection, independently. In less complex areas, calibrated analytical models, such as SIDRA Intersection (Signalised and Unsignalised Intersection Design Research Aid computer programme – SIDRA Solutions – Melbourne, Australia) are usually adequate. However, many parts of Bowral have become too complex to continue with this method as part of a primary assessment process. We need to consider the interactions of parking, transport and traffic over the wider network in order to plan and provide for the future parking, traffic and transport needs of the town.

The Paramics model of the Bowral Town Centre is now the best tool Council and the RMS has to assess impacts of changes to the network and undertake a whole of system analysis. It should be noted that SIDRA has still been used to undertake analysis checks of intersections using data provided by the Paramics model for selected locations.

2.2 Bowral Town Centre – a destination

High Range Analytics Pty Ltd have concluded, after examining the base data and the performance of the network, simulated in the model, that approximately 75% of the traffic heading south toward Bowral on Mittagong Road and approximately 75% of the traffic heading north toward Bowral on Moss Vale Road during the Friday evening peak period, have Bowral town centre as a destination as either a single purpose trip, multi-purpose trip or a brief lay by.

Bowral for most vehicles on approach roads have Bowral Town Centre as a destination (i.e only 25% want to bypass the town centre) during the Friday evening peak period.

This information is crucial when considering options to provide traffic relief in Bowral. As High Range Analytics has advised: options that provide roads away from the town centre (e.g. Kirkham Road) will have low usage and be ineffective in reducing congestion (as well as being extremely costly). This is consistent with Council's previous modeling using the Shire Wide TRACKS Strategic Model. "TRACKS" is a strategic traffic and transport modeling computer software developed by Gabites Porter Consultants – Christchurch, New Zealand.

2.3 TRACKS – Council's Existing Strategic Transport Network Model

TRACKS is used widely by the RMS. RMS has provided regular grant assistance to Council to develop and maintain its TRACKS models since about 1995.

Until 2004, Council's TRACKS model was a 3 town model and excluded the freeway. The 3 town model was then expanded to become a Shire Wide Model in order to assess the impacts of growth throughout the shire and to assist in determining future road infrastructure asset requirements.

Council's Shire Wide TRACKS Model actually includes a number of models from existing base year 2008 (based on data from the 2006 Census and updated traffic counts) through to 2031. Council is in the process of collecting data to update the models to reflect the data in the 2011 Census.

In order to appreciate the background to the Bowral Town Centre Paramics micro-simulation work undertaken, a simplified explanation of the TRACKS model and the processes required to develop the model, which is the basis of the Paramics model, is provided:

- The TRACKS models are based on network data derived from Council's GIS layers, and include all road speeds, road function (i.e. local road/ arterial road, etc., regulatory traffic controls e.g. "STOP" and "GIVE WAY" signs, turn bans, roundabouts and traffic signals). The current TRACKS models have been built by Gabites Porter – Christchurch, New Zealand.

- The model begins as an "unloaded" (i.e. without traffic applied) network which consists of a system of links (the roads) and zones (clusters of land use data – e.g. residences, schools, factories, commercial, financial etc.). Other data such as the employees per house hold, vehicles per household etc. are included in land use files for each zone (approximately 300) in the Shire Wide Network. The zones are distributed through the model, consistent with Census Collection Districts. Additional zones are added which include parking data (for example) and specific land uses (e.g. commercial, industrial, schools etc) in specific locations throughout the model, reflecting uses throughout the Shire. Whilst the TRACKS model contains many trip purposes, a key purpose is work, and the journey to work is a significant purpose. Whilst models can be built around weekend activity, this has not been undertaken by Council. It is advised that for the purposes of strategic modeling within the Wingecarribee Shire, the peak weekday models that Council has developed, is suitable for determining peak loadings and trip distributions that can be applied to surveyed weekend peak traffic loads (e.g. Saturday midday shopping peak) for further analysis (e.g. SIDRA).

Whilst the model is validated, when Council needs to look at an area in detail, for example the Bowral Town Centre or the Moss Vale Enterprise Zone, additional traffic surveys are undertaken, including intersection counts, and then that area is further validated to finer tolerance levels against the additional surveys. This then improves the accuracy of the model and allows Council to better evaluate the impacts of additional development and the effectiveness of proposed network changes.

- The TRACKS programme, actually a suite of programmes, contains specific regression equations, derived from census data and associated collected traffic data, to "generate" traffic to create the model, the "loaded" network (for each specified period – e.g. AM or SP).

- Extensive validation, a complex process, is undertaken to adjust the model so that the TRACKS model is a close match to the actual traffic survey data taken throughout the Shire. In a strategic model such as the Shire Wide TRACKS Model, screen linesare defined, which cuts across roads at numerous locations, and the traffic shown in the model needs to match survey data at that those locations. The validation also looks at matching turning movements at intersections at numerous locations throughout the network. The model is validated until it meets acceptable international statistical standards. A graphical interface enables viewing of the model so that traffic volumes can be viewed at many roads or at each intersection, for example.

- Survey and validation also considers the traffic entering and leaving at the "ends" of the model (i.e the freeway to the north and south, the Illawarra Highway to the east, Nowra Rd to Kangaroo Valley, Wombeyan Caves Rd Rd to the west, Penrose Rd through Tallong and Wilson Dr to Thirlmere). Origin/destination surveys are undertaken at these locations so that the effects of through traffic and vehicles that leave and return are accounted for.

- The TRACKS model enables Council and RMS to assess changes to the network that is likely to occur if there is a significant network and or land use change (e.g. the effect of a new road, a roundabout or the introduction of additional housing, industrial land or commercial land, or perhaps the intensification of an activity). Traffic generation is determined by RMS guides, approved surveys of similar developments etc. The TRACKS model is adjusted until the traffic generated by the development matches that determined by the model, usually numerous iterations are undertaken until the model stabilizes and is statistically sound.

The TRACKS model, having all the census, origin/destination data included, will show how traffic is distributed throughout the network (and that which will enter and leave the Shire). This is an important tool when assessing the impacts of proposed developments. Whilst TRACKS will indicate operating levels (i.e. Level of Service or LOS), other analysis, e.g. SIDRA, is undertaken to determine operating levels at finer detail. For most situations in the Shire, this is sufficient, however, as stated, Bowral needs the assistance of micro-simulation models due to its complexity. Moss Vale Town Centre is complex as well, and a base Paramics model for the town centre is nearing completion (as at March 2012).

- The Wingecarribee Shire Wide TRACKS Network, sits inside a more strategic network – The Illawarra Regional TRACKS Model. This is used to assist in building the Wingecarribee Shire Wide TRACKS Model.

Peak TRACKS models of the AM, PM (known as SP for Shopping/School Peak) and 24hr (which are estimates derived from the peak morning and evening models, and not used for intersection analysis) are included in the Wingecarribee Shire Wide TRACKS year models: 2008 (a minor update of the 2006 model), 2010, 2016 and 2031.

Infrastructure improvements, shown in future year models, reflected in the Moss Vale Enterprise Zone Road Infrastructure Plan and the Shire Wide Roads Plan has been determined through TRACKS modeling and follow up SIDRA analysis (using TRACKS generated traffic volumes).

Recommended network improvements are based on estimated increased traffic generation attributed to an increase in population and take up of residential land releases, the development of the Moss Vale Enterprise Zone, the Mittagong Northern Gateway, increase in retail development (derived from retail studies undertaken for strategic planning purposes). This work is substantially used as the basis of determining future impact on the network and enables the determination of developer contributions plans.

The models also include an OP or Off Peak scenario. Parking data is contained for the Bowral, Mittagong, Moss Vale and Bundanoon Town Centres. The parking data contains an inventory of available off street and on street parking in those centres. The inventory notes whether those spaces are unrestricted or time restricted. The parking utilisation surveys are taken at 8:00am, 9:00am and at 12:00pm (the OP model) and reflected in parking utilization files in the TRACKS models.

Strategic changes to parking in Bowral, within the TRACKS model has been undertaken and used in determining a parking supply target. Changes to parking management can also be modeled in TRACKS. Due to the complexities

of the town centre activities and the numerous choices and routes people can take, analysis at a micro level is best undertaken in a micro-simulation model, as Council has done in Paramics, however TRACKS provides a strategic direction.

This background on the TRACKS models is considered to be important in understanding how the Bowral Town Centre Paramics model relates to the shire and the region.

To relate the Bowral Town Centre Paramics model to the Shire Wide TRACKS model, a process known as a "sub-area" cut is undertaken within the TRACKS model. This process involves creating a graphical cordon within the desired peak TRACKS loaded network model, in this case, the 2008 SP model.

The cordon aligns with the extent of the Bowral Town Centre Paramics model and then a process is undertaken which extracts all the trip end data. This process leads to the development of a trip matrix of all zones within the Bowral Town Centre sub-area to and from each end zone within the Shire Wide TRACKS model. This data is used to tie the Bowral Town Centre Paramics Model to the Wingecarribee Shire Wide Model – so that the Paramics model does not operate as an entity is "space".

This process then ties the Bowral Paramics Model to the Shire Wide Model, so whilst the extent of the model is limited to the area shown in Figure 1.1 (above), it knows where those vehicles are coming and going to outside of the micro-*simulation model.*

2.4 Town Centre Road Classification and Function

Most roads within the Bowral Town Centre are classified as local roads, under the full care and administration of Wingecarribee Shire Council. A few roads, however, are classified roads under the NSW Roads Act 1993, these are designated "MR" – Main Road. Roads designated "RR" are Regional Roads which are not classified under the Roads Act, however are designated Regional Roads under agreements between the RMS and Council.

The roads that fall under these classifications are:

- MR260 – Mittagong Rd, Bong Bong St and Moss Vale Rd
- MR261- Kangaloon Rd
- RR7639 – Station St (from Bong Bong St (MR260), Funston St to Moss Vale Rd/Kangaloon S\Rd roundabout.

Modifications to the above roads require RMS concurrence, although traffic facilities such as traffic signals require RMS concurrence, regardless of road classification. It is an expectation that modifications to these roads meet

relevant road design standard requirements and RMS approval. In situations where standards cannot be met (e.g. due to physical limitations, avoiding items of cultural significance, etc.) modifications are discussed with the RMS and RMS concurrence is required.

All modifications to these roads ("MR" and "RR") must not compromise the main function of those roads. The relatively recent reclassification of Station St to RR7639, recognises the need to provide and enhance the Bowral Town Centre traffic relief function which Station St performs. Station St's main function is mobility, its secondary function is to provide access. Whilst it is acknowledged that access is still required, it must be balanced against the primary function of mobility (or movement).

Bong Bong St still remains the classified Main Road – MR260. Due to historic factors, the mobility function has deteriorated over the years such that access has become the main function of that road, although it still plays a role in regard to mobility.

Whilst it can be viewed that the classification of Bong Bong St and Station St places limitations on what can be modified, the reality is, that regardless of the classification, the functions as they currently exist needs to be preserved and enhanced, as the long term viability of the town centre is reliant upon it.

This document recommends a number of network changes, tested in the Paramics model, acknowledging the classification and functions of these key roads. Options may be suggested that compromise these key functions, these proposals may not satisfy the requirements to have two separate roads providing two separate key functions and are unlikely to receive support from RMS if they are compromised.

Through parking management and infrastructure improvement proposals, as listed further in this document, especially for Station St, the development of the Bowral Town Centre Distributor Road, is aimed to strengthen the main function of mobility. The Bowral Town Centre distributor road, as demonstrated in the Paramics model, will also enhance and facilitate access (via the high capacity roundabouts) throughout the town centre and increases overall system capacity to the point that it will be able to convey significant additional development, when implemented between Victoria St and Bowral St. This is of vital importance to secure the economic future of the town centre.

2.5 Town Centre Existing Road Network – limitations, congestion and parking supply options

High Range Anaytics advise that due to the restricted one lane network, high traffic load and restrictions at the critical sub network bounded by Station St, Bundaroo St, Bendooley St and Merrigang St, supply of additional parking must

be carefully considered. Consideration must be made of the additional traffic load placed on the network that is associated with the supply of that parking, and when large commercial developments are placed within the town centre and any associated network improvements.

The size of parking supply in each specific location under consideration must be considered carefully, and is reflected in various Scenario Options tested in the Bowral Paramics model. It is advised that a spread of additional parking areas over the wider Bowral Town Centre network will minimise adverse impact on network performance (i.e *don't put all your eggs in one basket*).

Overall, the current parking system in the core retail centre is operating at near 100% utilisation. This reduces to around an average of about 70-80% more distant to the core. On average, the parking system, during a normal peak weekday (i.e. not holiday time) is no more than 90% utilized over the whole town centre. In practical terms, this is considered to be operating at full saturation.

Identifying the location of available spaces cannot be readily achieved at these levels of parking utilisation, so town centre patrons reduce speed in the town centre in search of the elusive spaces, often circulating the road system, which increases overall congestion.

Additional parking is required immediately. Options that can supply, even limited additional parking, which is within available Council resources, should be pursued as a matter of urgency.

A parking system that operates at 80% utilization, whereby parking is neither under or over supplied is generally considered to be "optimum". Bowral Town Centre's current parking inventory is approximately 2500 parking spaces (of which approximately 1800 are off street spaces).

To increase the parking surplus from 10% to 20% a minimum 250 spaces are required, however it is recommended that 300 additional parking spaces be provided. Ideally these additional spaces should be provided over a maximum of 2 or 3 locations so that directing parkers to the additional spaces is straight forward and efficient.

It is also important that policies that require developments to provide adequate parking, as provided in Council's development policies be adhered to, so that 80% maximum utilization is maintained into the future.

The exercise to provide additional spaces is making up the shortfall, due to numerous historic factors, and should be seen as a one off "catch up".

2.6 Parking and public transport considerations

It is important to provide a parking system that also facilitates a more sustainable transport culture. For argument sake, should Council pursue a strategy that aimed to have 40% over supply of parking, this would encourage more travel by private vehicle and less travel by walking, cycling and public transport. In time that amount of spare parking capacity would encourage more vehicles in to the town centre and result in that generous surplus being eroded, as well as reducing the life of road infrastructure in terms of operational capacity.

2.7 Providing parking close to shops – practical considerations

The main part of Bowral where a parking undersupply is most problematic, for every day town centre patrons, is concentrated directly outside shops along Bong Bong St, between Merrigang St and Boolwey St. These spaces are regularly 100% utilised (as each space vacates, another vehicle often holds up traffic to take its place), stay duration is, on average, no more than 20 to 30 minutes in this area.

Parking utilisation is marginally less concentrated on Bong Bong St between Boolwey St and Banyette St and stay duration is generally, on average, between 30 minutes and 1 hour.

It should be noted that parking enforcement is effective at making sure that only a relatively small proportion of vehicles over stay the posted time limits and should be maintained.

Using time restrictions alone, little can be done to discourage town patrons from targeting this high demand area on Bong Bong St. However, a number of members of the community have indicated that it would be an unsatisfactory outcome for the town economy if patrons were discouraged, in an attempt to reduce congestion, by imposing a parking “fee”.

With consideration of what is important to the community and the overall economy (especially considering the importance of tourism) this approach has not been evaluated. It is important, nevertheless, to appreciate the adverse traffic impact “free” on street parking has on traffic distribution and congestion.

2.8 Parking behavior and impact on network traffic congestion

The parking and unparking manoeuvres causes traffic friction and is a significant cause of the longer travel times along Bong Bong St in particular. Pedestrians often cross Bong Bong St at numerous locations (not at designated crossing points) between slow moving vehicles. Whilst this may be seen as a benefit to trade, investigations into the safety of this practice have not been undertaken.

A percentage of town patrons, who drive, are prepared to circulate the network to try and capture a frequently vacated parking space on the main street. This activity increases vehicle numbers moving on the network and adds to the overall delays in the system.

The addition of extra parking spaces, off street, although required, will most likely not always be the parking area of first choice and is not likely to change. So, whilst parking supply may increase, relying on time limits alone to control parking, the perception will still be that there are insufficient parking spaces in Bowral.

2.9 Consideration of adverse impact induced travel demand

Council is cautioned that in an attempt to satisfy demand for parking, providing additional, easily identifiable and accessible spaces, could prove to be counter-productive as **the possible effects of induced travel demand should be considered**.

By making parking easier, this could actually encourage more town centre trips by vehicle thereby creating an even higher demand for parking and increase traffic within the town centre. Should this occur then the impact will reduce the benefit of the additional parking spaces provided.

Meeting parking demand is likely to be a frustrating and costly process.

Induced travel, in this context, is likely to be a proportion of people, who currently avoid Bowral in the afternoon peak, re-timing their trip back into the afternoon peak to take advantage of the additional parking, should it be provided. It is difficult to estimate how many people will adjust their travel patterns to take advantage of increased parking supply, however an allowance for this effect should be made.

2.10 Transport choice – Travel Demand Management Options

Other transport options, other than near total reliance on private vehicle transport, should also be pursued to provide a more balanced strategy. This could be effective in reducing the effects of induced travel demand.

For example, developments of 3000m2 or larger, could incorporate public transit facilities within their proposals (or possibly make a contribution towards transit facilities, or supporting infrastructure which would facilitate transit users: such as improved pedestrian facilities and bus shelter facilities).

As public transport can reduce the need for individual car travel, it should reduce the need for parking. Should developments incorporate transit facilities, options such as reducing the parking provision by up to 5% could be considered as a

possible incentive to incorporate public transport facilities within their developments.

It is suggested that if public transport (i.e. town bus services) can penetrate and be located close to where people need to shop, eventually it is possible to reduce single car trips into the town centre, even if there is eventually a modest reduction of even only a few percent, that would be a good outcome.

Even a modest reduction in car trips will have a noticeable impact on reducing congestion and extending the life of key infrastructure, including major intersections and parking facilities.

The public transport system in the town centre does not penetrate close enough to key locations and is not equitable. Network improvements, such as the development of the Bowral Town Centre distributor Road (discussed below) will help distribute the traffic load across the network. Buses were removed from the main street a few decades ago, reclaiming parking spaces (this may have provided some initial relief to parking, however, it has not solved the problem).

As town centre congestion eases over time (due to the benefits of road improvements and provision of additional parking), a more equitable service could be provided by reintroducing buses into Bong Bong St (buses now have lower emissions than a few decades ago) to address some of the inequities experienced.

Whilst it is acknowledged that traditional bus bays occupy 45m of kerb, displacing about 7 or 8 parking spaces, an alternative approach is suggested. An option, that allows the bus to stop in traffic along Bong Bong St (it stops and starts regardless now), and allow passengers to access from a kerb extension occupying only 1 parking space, is recommended to be further investigated. This is similar to the way trams operate on Melbourne streets, however the blisters will offer passengers protection as they alight (whereas in Melbourne, tram passengers must rely on kerb side traffic to stop). To reduce delays, tickets could be pre-purchased from local shops.

Further, these bus stop facilities should be provided at 4 locations in each direction along Bong Bong St (between Merrigang St and Bowral St) to ensure direct access to numerous shops is provided. It is considered important, as advised by High Range Analytics, that bus stops be provided in each direction to reassure bus patrons that it is a full return service (i.e. they won't be left stranded). This will assist in encouraging greater use of public transport and affecting a decrease in private vehicles entering the town centre.

As carbon reduction is now a federal objective, it would be reasonable to assume that local government, at some stage, will need to demonstrate how their policies will reduce carbon emissions within town centres. It could be

argued that should developments make well thought out provision for public transport then car trips could be reduced and a reduction of say, up to, 5% in parking provision could be offered, as previously discussed.

2.11 Bowral Town Centre Distributor Road (formerly known as the Bowral Traffic Relief Route)

The Paramics model tested the Bowral Traffic Relief Route (Station St upgrade and realignment concept), developed as an option over 10 years ago by Council engineers. The model also tested the proposal in several stages, as it would need to be broken down due to the high cost to implement

Bearing in mind that the traffic survey data (as distinct from the model) has identified that 75% of traffic approaching Bowral from the north and south have the town centre as a destination during Friday evening peak, then the notion of a bypass, or a road specifically designed to relieve traffic, is now known not to be the primary benefit of the road.

The model indicates that the proposal will function as a town distributor road. This provides improved access to a greater part of the Bowral Town Centre network. This improved, wider access, in turn, assists in spreading the traffic load, so that it will not as highly concentrate in a particular location, which currently causes delays within the town centre and most noticeably at the Merrigang St/Bong Bong St intersection. The Bowral Town Centre Distributor Road still provides and enhances mobility, however, indirectly facilitates access throughout the town centre via the high capacity roundabouts at each end of the town centre.

From an economic growth perspective, better access to a wider part of the network will make future development more viable than perhaps it would be if the distributor road was not to be provided.

As the Shire grows, the town will most likely expand through re-development of several larger sites throughout the town centre. The town centre distributor road is evaluated as being key to efficiently distributing the associated traffic.

The northern part of the distributor road, the roundabout as proposed at the intersection of Bong Bong St, Station St and Bundaroo St is shown in the model to be a high capacity roundabout. As the road improvements progress to Bowral St the distributor function takes full effect.

Minor improvements, which are considered urgent to relieve existing congestion, have been tested in the Paramics model. The improvement is the opening up of Bundaroo St to the signals at Mittagong Rd (requiring those signals to be modified), primarily to enable a direct turn onto Mittagong Rd. It is important to note that whilst traffic is expected to transfer from Merrigang St to Bundaroo St,

the congestion currently experienced will not reform in Bundaroo St as that northern part of the system will function more efficiently.

Unless the existing signals are modified to permit access from Bundaroo St to Mittagong Rd and Station St are undertaken, or the large roundabout (Stage 1 of the Bowral Town Centre Distributor Road) is constructed (in lieu of this), then the model indicates that the network cannot support significant increase in development or provide a facility such as a multi-deck carpark in Merrigang St.

An application for funding (which includes a favourable Cost/Benefit analysis) to construct the essential modifications has been lodged with the RMS. Whilst the RMS are very supportive of the proposal (after viewing the model on several occasions), a decision to provide the funding has not yet been made, however funding in the 2013/2014 financial year is possible.

The Paramics model also evaluated the benefits of other network improvements, including the duplication of the Wingecarribee St rail over bridge and the opening up of Victoria St to Rose St (new bridge over Mittagong Creek). This is considered to be of benefit to the community and visitors to the number of existing and future developments in Victoria St.

The opening up of Victoria St will reduce the need for vehicles having to double back along the long cul-de-sac (in effect reducing traffic movements and volumes) as well as providing an alternate access for emergency vehicles needing to access Victoria St or trying to gain access to the north of Bowral in an emergency situation. It is understood that a number of residents in Victoria St have reservations regarding this option and that significant community consultation will be undertaken before a further recommendation is made.

The model showed that a Bowral Town Centre Distributor Road would provide wider network efficiency improvements. The additional system capacity will be necessary for future generations to convey increased development within the Bowral Town Centre as existing, somewhat underutilized land, is redeveloped within the commercially zoned land in the town centre.

It is also recommended that a local sized roundabout be constructed at the intersection of Bendooley St and Bundaroo St, as well as pavement reconstruction in Bundaroo St, between Bong Bong St and Bendooley St.

Further investigations are underway, considering options to improve pedestrian access at the Merrigang St/Bong Bong St intersection. Whilst traffic signals are generally disliked by some members of the community, they are considered to be the best long term treatment at this location and provide better time separation between pedestrians and traffic and are better suited at this busy location, where pedestrian volumes are high and there is significant queuing of vehicles.

There are a number of challenges, as installing signals at Merrigang St/Bong Bong St will need to be synchronized with the nearby signals at Bong Bong St/Station St and the modified access to Bundaroo St. Options are being developed for testing in the Paramics model and for comment by the Roads and Maritime Services. Also, closely spaced signals and roundabouts are problematic. Further testing will assess the suitability of proposed signals at Merrigang St/Bong Bong St with the ultimate recommended roundabout construction at the intersection of Bong Bong St/Station St/Bundaroo St. It is expected that the results of this proposal will be presented during Council approved community consultation sessions, expected during April/May 2012.

3. The WINGECARRIBEE SHIRE PARKING STRATEGY:

3.1 Strategy Overview

The parking strategy is aimed to provide sufficient parking to meet the normal parking demands in the town centre for workers and shoppers with an oversupply target of approximately 20% (i.e. operating at a peak of 80 to 85% parking utilsation throughout normal days i.e. not targeted to meet holiday demand).

Whilst it would be ideal to provide parking within the town centre for both workers and shoppers, the town has limitations in this regard. The layout of the town and the limited amount of land suitable for car parking within the core of the town centre will require that the parking supply, for both key users, are rationalized, within the town centre.

Generally, short term parking, as that generally required by “shoppers” and clients of professional offices, should be located close to the commercial operating precinct. Long term, or “all day” parking should be located towards the perimeter of the town centre. However, a limited supply of all day parking should be provided closer to the commercial precinct areas to cater for vulnerable groups and a parking permit system (in addition to Mobility Parking Permits) should be investigated to ensure that the spaces are used equitably.

The highest demand for parking in the Bowral Town Centre is along Bong Bong St, as people prefer to minimize walking distance from park to shop. Considering the established “strip” shopping along Bong Bong St, the street space allocation for most shops is no more than 1 to 2 parking spaces, however, many shops will generate the need for perhaps 3 to 6 spaces (or more). With this in mind, providing spaces to meet the demand for all shops, adjacent to the shops, in the main street cannot physically be met.

As parking is “free”, and the community has indicated a desire for it to remain so, off street parking needs to be made more attractive to attempt to discourage this practice.

Options that have been considered to try and influence a change in parking behavior include:

- Reducing on street time restrictions to 30 minutes, and lengthening off street parking time limits to 3 hours (where some may be currently limited to 2 hours).
- Providing well laid out, easy access off street parking spaces and enhancing pedestrian connectivity to the town centre (pedestrian refuges, covered walkways, or possibly, in the future, a town centre circulating bus).

However, recent surveys of on street parking, in the high demand area of Bong Bong St (between Merrigang St and Boolwey St) show that parking stay is, on average, around 20 to 30 minutes, despite most parking being limited to 1 hour, so a reduction in time will not likely effect any real change. Similar results are found in off street spaces, whereby many vehicles leave well before the end of the time limit. In both cases, it is acknowledged that there are some vehicles that do exceed the time limit. Regular enforcement is effective in minimizing this.

The supply of parking also corresponds with an associated traffic generation on the road network. It is important that the supply of additional parking is considered in conjunction with network traffic capacity, **the 2 elements of parking and traffic are linked**.

Whilst the provision of say, 300 or even 500 spaces in a single multi-deck carpark facility may sound attractive, from a parking perspective, the supply of these numbers in one location in the Bowral Town Centre are likely to cause severe traffic congestion issues which could impact across the wider Town Centre network. As discussed previously, the single lane in each direction network and the geometric limitations of key intersections have capacity limitations that need to be considered.

The traffic micro-simulation modelling of the Bowral Town Centre has enabled the determination of the optimum level of parking supply at a particular location, however it relies upon certain traffic improvements being also undertaken.

Whilst not desirable, the provision of all day spaces for workers must be, at least in part, moved further away from the shopping precincts. As available land is limited in the town centre, better use of existing assets must be made. Better use of unused on street parking within close walking distance to the town centre is recommended. To make these areas safer and attractive for use, improvement works must be undertaken.

An example of how on street parking can be enhanced is Kirkham Rd, between Wingecarribee St and the pedestrian level crossing at Bowral St. By improving the eastern side of Kirkham Rd by; providing a 2.5m shared path (pedestrians/cyclists), improved street lighting, kerb and gutter and shoulder sealing, and improved pedestrian crossing facilities at the Wingecarribee St bridge. This proposal also provides a section of the bicycle path as included in the *Wingecarribee Bicycle Strategy* (available on Council's web site: http://www.wsc.nsw.gov.au/services/roads-traffic/wingecarribee-shire-council-bicycle-strategy).

The length of Kirkham Rd that can be upgraded to facilitate on street parking is about 560m and a comfortable parking bay length is 6.5m (can be reduced to 6.0m), this then would accommodate approximately 90 spaces.

The enhanced facility could encourage better on street parking utilization along the western side of Kirkham Rd, this could comfortably accommodate about 35 more additional spaces (allowing for current parking and driveways).

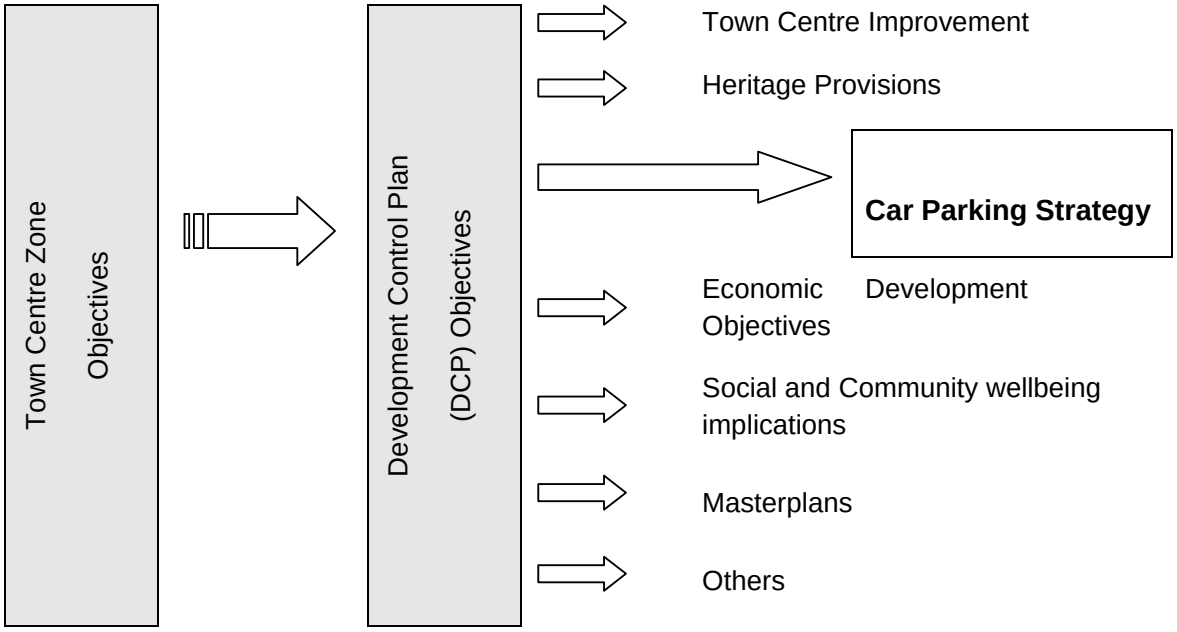
Currently, safe access to the western side of the railway line at the Wingecarribee St bridge (southern side) is not possible for pedestrians. It is recommended that the project be further enhanced by the construction of a separate light weight pedestrian/cycle bridge with path connections to the existing signals at the intersection of Wingecarribee St/Station St, which provides signalised cross walk connections to the town centre. This option also would link up to the recently upgraded pedestrian railway level crossing at Bowral St. This project would also require the construction of connecting paths to the roundabout pedestrian splitter islands at the Bowral St/Station St roundabout, at the southern end of town. The existing painted splitter islands will eventually be upgraded to raised concrete splitter islands when the Bowral Distributor Road is constructed.

This option could then free up around 125 town centre spaces (noting that a multi-deck 300 space car park is estimated to cost about $9.0m -$30,000 per space, avoiding comparable immediate expenditure of $3.75m based on 125 x $30,000, less the cost of the Kirkham Rd improvements estimated to cost about $700,000).

3.2 Over Arching Wingecarribee Shire Town Centre Parking Strategy Objectives

3.2.1 Introduction

This strategy is not a stand alone strategy applying to Car Parking. The Strategy has direct links with other objectives and strategies that apply to town centres. Termed in this way, the Car Parking Strategy fits into the overall objectives of the town centres in the following way:



The Shire's Town Centres share the same town planning zone, being "Local Centre", thus this strategy must have due regard to the aims and objectives of that zone. These aims and objectives are set out in the shirewide LEP and further objectives are set in the Development Control Plans (DCP) that apply to the towns and villages.

3.2.2 Objectives of 'Local Business' Zones are:

(a) To provide a wide range of retail, business, office, entertainment, community and other suitable land uses which serve the needs of the local and wider community.

(b) To encourage appropriate employment opportunities in accessible locations.

(c) To maximise public transport patronage and encourage walking and cycling.

(d) To generally conserve and enhance the unique sense of place of each business centre precinct by ensuring that new development integrates with the distinct urban scale, character, cultural heritage and landscape setting of those places.

(e) To provide opportunities for a compatible mix of residential living above retail, commercial, recreational, cultural and community activities at street level.

(f) To ensure that adequate provision is made for infrastructure that supports the continued and strengthened viability of each business centre including public car parking, traffic management facilities, public transport facilities, cyclist

facilities, pedestrian access paths, amenities, facilities for older and disabled people and general public conveniences.

(g) To maximise the efficient use of land within the core area of business centres to promote more compact and accessible places.

(h) To ensure that development has proper regard to the environmental constraints of land and minimises any off and on site impacts on biodiversity, water resources and natural landforms.

(i) To ensure that new development has regard to the character and amenity of adjacent and nearby residential areas.

The DCPs that apply to the town centres also include more specific aims in relation to vehicle and pedestrian functions, such as:

(a) Improvement of traffic and parking management within the Town;

(b) Minimisation of vehicular/pedestrian conflicts;

(c) Provision of a safe and accessible network of pedestrian links throughout the Town; and

(d) Improvement of connections to public transport facilities.

It is likely that Council will introduce town centre improvement plans for some if not all of the town centres. The car parking strategy and the town centre improvement plans must integrate to achieve their respective aims.

3.3 Where Does This Strategy Apply?

This Strategy applies to the main town and village centres of:

- Bowral;
- Mittagong;
- Moss Vale;
- Bundanoon;
- Robertson, and
- Berrima

It should be noted that so far, only supply and demand data exists for Bowral, Mittagong, Moss Vale and Bundanoon. This fact does not preclude the aims and objectives of this strategy applying to Robertson and Berrima.

3.4 Car Parking Strategy Aims

The aims of the Car parking Strategy are to:

- provide an adequate supply of short and long term car parking spaces that are conveniently located and are easily accessible to support the desired growth of the Town/Village Centre;
- develop an integrated public and private car parking network, which is flexible to accommodate changes in car parking demands over time, however does not detrimentally affect the environment, traffic or pedestrian flows;
- ensure that the provision of car parking facilities does not diminish the urban character, cause a loss of building stock or result in a poor urban design outcome;
- ensure that an over supply of car parking does not occur that discourages alternative forms of transport and actively promote these other sustainable modes of transport within the Town/Village Centre;
- Council will pursue a sustainable transportation policy, with regards to providing additional parking spaces, of demand management as opposed to endeavoring to meeting unsustainable demand satisfaction, a balanced and sustainable approach;
- control and manage the car parking supply/demand balance through ownership of properties for the establishment of publicly available parking facilities;
- ensure accessibility for residents to properties and to manage long-term (non-residential) parking in these areas;
- ensure the efficient use of parking spaces for smaller development sites; and
- apply car parking controls and standards that reflect the shires aging population, car ownership and dependency, and numbers of people with a disability.

3.5 Car Parking Demand and Future Supply

3.5.1 Existing Car Parking Situation – A snap shot

A survey was **undertaken** on 3rd March 2005 of parking inventory and utilization of Bowral, Mittagong, Moss Vale and Bundanoon town centres. The Bowral inventory and utilisation survey was partially updated as part of the Bowral Paramics Model study in April 2010.

The April 2010 review found that spaces that were near fully utilized in 2005, remained so in 2010, however, spaces, such as the underground levels of the Woolworths car park in Banyette St, the Library underground carpark, and the roof top car park in

Boolwey St had moved from about 60% utilsation to 80% utilsation. The decrease in available spaces is consistent with the Gabites, March 2007 TRACKS report (Appendix C).

The surveys were undertaken by physical ground surveys of surface and underground car parking facilities. Aerial photography was also utilised. Council acknowledges that this is only a snap shot of car parking on a certain day and that there may have been better or worse days to undertake such a survey. The important point to be made is that certain assumptions and trends can be made from the survey data to inform this strategy.

The tables shown under provides a summary of the survey results at noon, distinguishing between on-street, off-street and long stay areas.

Table 1 Numbers of spaces utilised and available spaces (2005), where:

Taken spaces are shown first (x) and available spaces second (y) e.g. x/y

	On-street	**On-street**	**Off-street**	**Off-street**		
Location	**3 hrs or less**	**Free all day**	**3 hrs or less**	**Free all day**	**Private**	**TOTAL**
Bowral	336/378	204/283	1/4	381/530	979/1275	**1890/2470**
Mittagong	96/127	126/403	22/41	170/336	203/437	**617/1344**
Moss Vale	95/146	77/115	96/108	216/367	134/194	**628/945**
Bundanoon	10/16	76/267	0/0	2/15	65/159	**153/469**

Table 2 Percentages of spaces utilised and available spaces 2005

	On-street	On-street	Off-street	Off-street		
Location	**3 hrs or less**	**Free all day**	**3 hrs or less**	**Free all day**	**Private**	**TOTAL**
Bowral	89%	75%	25%	72%	77%	**76%**
Mittagong	76%	29%	55%	51%	46%	**45%**
Moss Vale	65%	67%	89%	67%	60%	**66%**
Bundanoon	62%	22%	0%	13%	39%	**28%**

3.5.2 How much are our Car Parking spaces worth?

The preceding section on existing car parking conditions provides a snap shot of the amount of spaces available in the public street, public off street spaces and privately provided spaces (within development sites) which is over 5,000 car parking spaces (Bowral, Mittagong, Moss Vale and Bundanoon). It is important to know what these existing spaces are worth.

Public On-Street Car Parking areas are generally provided as parallel parking to an existing street. The construction of these spaces is around $3,000 per space (assuming all other infrastructure is available or in good order). There are other non financial values such as the value of having a convenient and central car parking location, the community and/or social value of being able to park close to a destination, the environmental value of (both positive and negative) of having parking spaces.

There is also the opportunity cost of car parking spaces (what you could provide if they did not exist) such as:

- an additional travel lane;
- greater pedestrian and/or cycleway access;
- greater public space on footpaths;
- greater lease areas for commercial use (e.g. outdoor dining), and
- priority areas for public transport, delivery services, disabled parking etc.

Public Off-Street Car Parking areas are generally provided as larger car parking 'stations' holding anywhere between 40 to over 100 spaces. These spaces are often located in the business zones and could be used for retail/commercial development.

Privately Provided Car Parking areas are not uncommon. These are provided as underground, multi level and 'at grade' spaces. Some spaces are provided at the front and others at the rear of the development sites. Some car parking areas hold 2 or 3 spaces and others hold hundreds of spaces. These areas are usually constructed in the business zones and could also be used for retail/commercial development. This strategy discusses the optimum use of business land and car parking later in the document.

These different types can **generally** be provided per space at the following indicative construction only rates (as at February 2012):

- At grade $ 3,000 per space
- Multi-level (above ground) $30,000 per space
- Underground $45,000 per space

Perhaps the value of the existing spaces are better determined or explained by the opportunity cost of the alternative uses of these spaces. In any case, car parking spaces and the ability to access our core commercial areas are highly valued by the local community and visitors alike, hence it is imperative that developments provide or pay for the spaces they generate.

3.5.3 Car Parking Demand Predictions

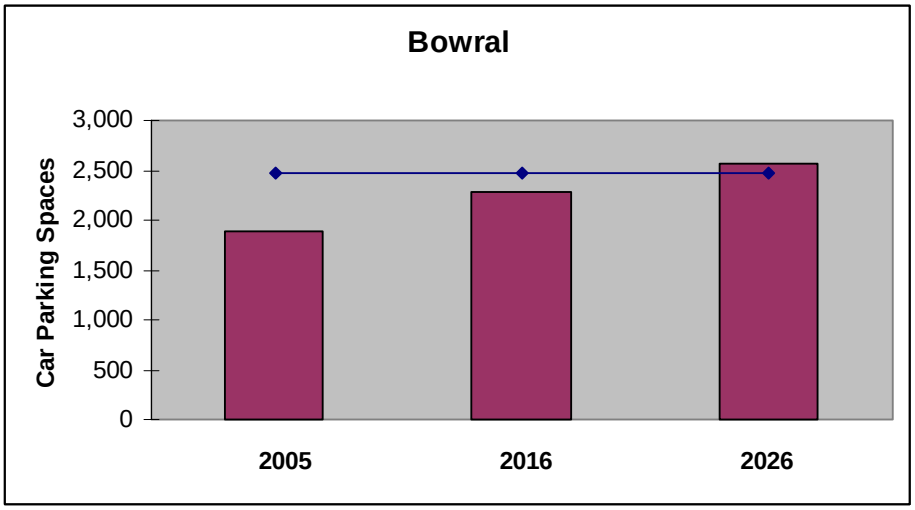
The methodology for predicting demand is set out in full in the March 2007 report by Gabites Porter titled "Wingecarribee Transport Network Deficiencies 2005 – 2026". As a simple explanation, the car parking model takes the total amount of cars coming to the CBD and allocates them a space nearest to their destination considering length of stay and purpose of the trip. It also included the added number of cars on the traffic network trying to park close to their destination.

The graphs below identify the car parking demand for the whole of the commercial area. Council note that there will be areas where demand for spaces may outstrip supply and thus create a localised issue. The following chapter on car parking strategy options will discuss the best ways to address these issues.

Bowral

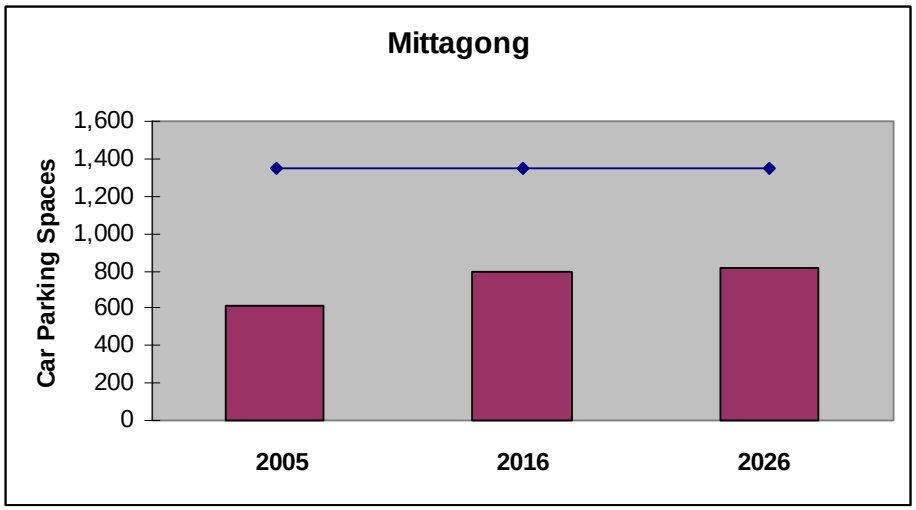
The projected car parking demand shows that by 2026 demand will exceed supply without the provision of more space or a reduction in demand (other modes of transport). Given the industry standard and legal precedent is that a utilisation of 85% or over is considered to be 'practically full', strategies to address this demand should be in place as soon as possible. Whilst it is acknowledged that the provision of ultimate strategy is beyond the immediate means of the community, other interim strategies should be put in place.

Also note that in many locations within Bowral the utilisation (at February 2012) is over 90% and up to 100%. The spare spaces (i.e. less than 85%) are located on the outskirts of the town centre. See Figure 1 – Appendix A.



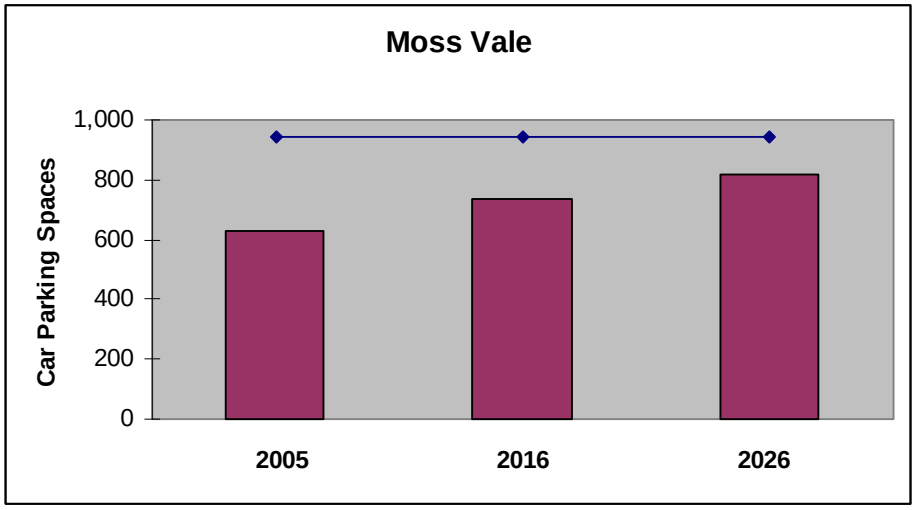
Mittagong

The projected car parking demand shows that by 2026 there should not be issues in with a lack of car parking spaces. See Figure 2 – Appendix A (to be produced).



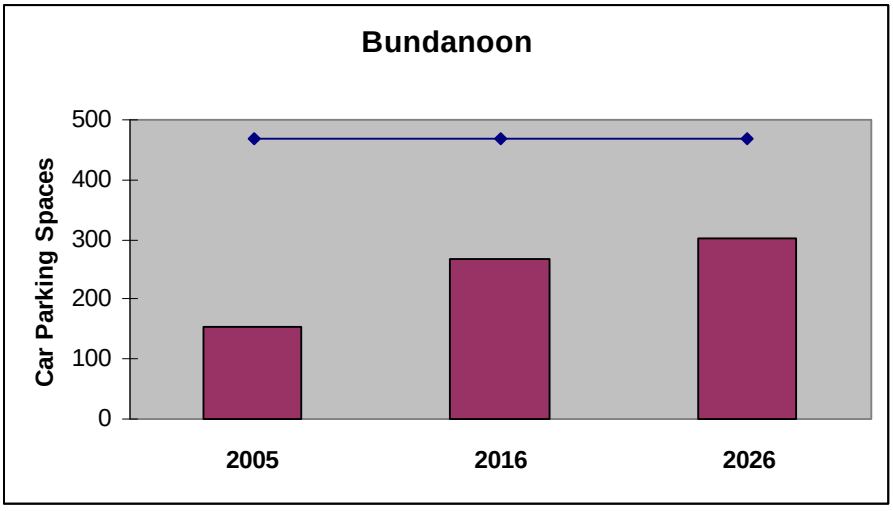
Moss Vale

The projected car parking demand shows that by 2026, demand for spaces are beginning to catch up with supply. Given demand for spaces of over 85% is considered to be 'practically full', strategies to address this demand should be in place in the short to medium term. See Figure 3 – Appendix A.



Bundanoon

The projected car parking demand shows that by 2026 there should not be issues in with a lack of car parking spaces. See Figure 4 – Appendix A (to be produced).



3.6 General Car parking Strategy Objectives

This section has used the Canadian Victorian Transport Policy Institute publication titled "Parking Management – Strategies, Evaluation and Planning" (2006) as a resource for

the suggested car parking strategies. This document is considered to be a car parking management best practice guideline for Australian conditions.

The document provides options for many different scenarios/conditions, from city centre, inner ring city, suburban, regional centre and larger town conditions. Wingecarribee Shire Council has adopted those conditions and approaches that best describe the characteristics of our towns and town/village centres. The following car parking strategy options are therefore provided under:

3.6.1 Principles

The above mentioned Victorian Transport Policy Institute document provides for ten general principles that assist with decisions about parking management. These are proposed to form the backdrop to the decision making process in this strategy and why some strategies are preferred over others:

Parking Management Principles

These ten general principles can help guide planning decision to support parking management.

1. *Consumer choice.* People should have viable parking and travel options.
2. *User information.* Motorists should have information on their parking and travel options.
3. *Sharing.* Parking facilities should serve multiple users and destinations.
4. *Efficient utilization.* Parking facilities should be sized and managed so spaces are frequently occupied.
5. *Flexibility.* Parking plans should accommodate uncertainty and change.
6. *Prioritization.* The most desirable spaces should be managed to favor higher-priority uses.
7. *Pricing.* As much as possible, users should pay directly for the parking facilities they use.
8. *Peak management.* Special efforts should be made to deal with peak-demand.
9. *Quality vs. quantity.* Parking facility quality should be considered as important as quantity, including aesthetics, security, accessibility and user information.
10. *Comprehensive analysis.* All significant costs and benefits should be considered in parking planning.

3.7 General Strategy Options

The Victorian Transport Policy Institute publication titled “Parking Management – Strategies, Evaluation and Planning” (page 23) summaries the options available and their ability to reduce demand for spaces and traffic. The table under has reproduced the strategies relevant to Wingecarribee Shires characteristics.

Strategy	Description	Typical Reduction	Traffic Reduction
Shared Parking	Have each parking space serve multiple users and destinations	10-30%	
Parking Regulations	Regulations that favour higher value uses such as service vehicles, deliveries, customers, quick errands and people with special needs	10-30%	
Remote Parking	Provide off-site or urban fringe parking facilities	10-30%	
Smart Growth	Encourage more compact, mixed, multi-modal development to allow more parking sharing and use of alternative modes	10-30%	✓
Walking and cycling Improvements	Improve walking and cycling conditions to expand the range of destinations serviced by a parking facility	5-15%	✓
Mobility Management	Encourage more efficient travel patterns, including changes in mode, timing, destination and vehicle trip frequency	10-30%	✓
Parking Pricing	Charge motorists directly and efficiently for using parking facilities	10-30%	✓
Improve Pricing Methods	Use better charging techniques to make pricing more convenient and cost effective	N/A	✓
Unbundle Parking	Rent or sell parking facilities separately from building space	10-30%	✓
Bicycle Facilities	Provide bicycle storage/parking	5-15%	✓
Improve User Information and Marketing	Provide convenient and accurate information on parking availability and price, using maps, signs, brochures and electronic communication	5-15%	✓
Improve Enforcement	Ensure that parking regulation enforcement is efficient, considerate and fair	N/A	
Overflow Parking Plans	Establish plans to deal with periods of peak parking demand	N/A	
Parking Facility Design and Operation	Improved parking facility design and operations to help solve problems and achieve parking management objectives.	N/A	

3.8 The BOWRAL PARKING STRATEGY :

3.8.1 All parking throughout the town centre will be controlled by time (maintaining the "status quo"), with the exception of Station St which will move to, when Station St is upgraded to 4 lanes (the distributor road), AM and PM "Clear Way" conditions between Banyette St and Merrigang St, Mon to Friday, at this stage these restrictions will not be required on Sat/Sun.

3.8.2 On street parking time restrictions throughout the town centre can remain unchanged, but not lengthened (especially along Station St as this road needs to maintain its effectiveness as a traffic movement route).

On Bong Bong Street there is no benefit to reduce parking to 30 minutes as parking turns over an average every 25-30 minutes in the peak demand areas.

As opportunities arise along Station St (i.e. as adjacent property is re-developed), parking should become unrestricted (to prevent parking friction from adversely impacting on traffic efficiency) or removed to enable future intersection and road improvements to be implemented. Discussed further in Sec. 4, as Station St is upgraded to form the Town Centre Distributor Road,

3.8.3 All on street parking throughout the Bowral Town Centre remains "free".

Note: As parking remains "free" it is expected that traffic congestion on Bong Bong St will not ease due to parking friction. This is regardless of whether additional parking is provided in off street locations, or Station St is upgraded, as Bong Bong St is a major destination and, as such, willl remain the most desirable place to park by many town centre patrons.

3.8.4 Overall, an additional 250 spaces are required throughout the town, desirably 300. Position is sensitive to wider road network improvements and due to other land uses, and system restrictions, should not be overly concentrated in any one location.

Preliminary cost estimate: $9.0m – based on 300 space multi-deck carpark at Merrigang St..

The additional parking can be provided as shown on Figure 5 – Appendix A, in the following manner:

A 100 spaces (max.) can be added to a possible redevelopment of land within the town centre, desirably near the core (*over and above the additional parking required for the potential increase in floor area that might be proposed)*

Oxley Mall has been modelled as a possible example as it is located in the core of the town centre. It is a "hypothetical"

possibility. A similar approach could be taken at other potential sites, however, would be subject to further micro-simulation modelling.

B Merrigang St multi-deck – an additional 150 to 210 (maximum) spaces to be provided (total 240 to 300 spaces including the replacement of the additional spaces) - recommended to be not provided until a long term easing of congestion in that precinct can be implemented *(the modification of the traffic signals at the intersection of Station St/Bong Bong St to enable direct access of Bundaroo St to Station St/Mittagong Rd)* - this may need reassessment if a large development in that part of the network is proposed (i.e. it may prove be too much traffic for the northern town centre sub-network).

Important to note:

Options A (including possible future expansion of Oxley Mall as a "hypothetical" test case example only) and B have been tested in the Bowral Town Centre Paramics model, which also included possible future increased development in Victoria St (to full development potential), associated traffic signals at Victoria St/Mittagong Rd, signal modifications at Station St/Bong Bong St to open up Bundaroo St to turning movements out to Station St and Mittagong Rd).

The Paramics model indicates that with the network improvements listed above (triggered by the Victoria St development currently being constructed), that the road system will adequately cope with the increase in development at Oxley Mall (as an example only) plus the additional parking (above that required by a possible future development proposal, up to 250 spaces spread between the Oxley Mall precinct and Merrigang St), however the congestion levels in the precinct will return to similar levels currently being experienced.

Town Centre additional development beyond this level was tested, however, the network improvements beyond that discussed will be required to convey significant additional development.

The ultimate development of the Bowral Town Centre Distributor Road (discussed in Sec. 4) will cope with high levels of development throughout the Bowral Town Centre.

3.8.5 Kirkham Rd (eastern side) between Wingecarribee St and Oxleys Hill Rd – provision of 90 high standard on street parking spaces, plus the construction of a light weight pedestrian/cycle bridge over the main

southern railway (parallel to the existing railway over bridge – on the southern side – subject to ARTC approval).

Preliminary cost estimate: $700,000.

See Figure 5 – Appendix A for proposal overview on town centre aerial photograph.

Ultimately, the Bowral Town Centre Distributor Road (upgrade of Station St – Stage 1 as discussed in Sec. 4 below) will remove approximately 60 public all day parking spaces plus 26 rail commuter parking spaces, of which 43 will be replaced (i.e. nett loss of 17 spaces) adjacent to Memorial Park on the disused Station St pavement and in the Merrigang St cul-de-sac head - to be confirmed in the final design process. It is proposed to provide replacement rail commuter parking in Kirkham Road, within close proximity of the Bowral Railway Station (subject to discussion and approval of ARTC).

The Kirkham Rd on street parking option, to replace the Council parking loss in Station St, opposite Memorial Park, has been identified that will provide an immediate parking benefit (whilst awaiting for the more costly multi-deck carpark to be built) as well as addressing the future parking loss due to Stage 1 of the Bowral Town Centre Distributor Road, at an immediately affordable cost.

It is acknowledged that the location of these spaces are located further away from the town centre, however will be of high quality and are within acceptable walking distances for all day parking use. The light weight pedestrian/cycle bridge will provide safe and direct access to this parking.

The proposed parking and pathway improvements in Kirkham Rd will also have direct access to the recently upgraded pedestrian rail level crossing at Bowral St. These works also form part of the Wingecarribee Bicycle Strategy.

Works will require suitable upgrade of lighting, installation of wide concrete footpaths (shared path), kerb and gutter construction, minor pavement widening and improved pedestrian crossings at the Wingecarribee St rail over bridge This section, eastern side alone, will accommodate about 90 parking spaces.

The improvements should also see an increase in the utilization of kerb side parking on the western side of Kirkham Rd (estimated conservatively at 35 spaces), so the number of quality spaces that will become available in this precinct should be about 125 spaces.

In the interim period (i.e. before construction of Stage 1 of the Bowral Town Centre Distributor Road), it is recommended that half the spaces occupied by all day parkers (i.e. about 30) in the railway parking area near the Station St/Bong Bong St traffic signals could then be time restricted (i.e. 3 hour limit) to provide additional parking for shoppers and

tourists. The final balance will need to be determined by monitoring utilization.

This option will provide an immediate increase in town centre parking supply as well as addressing the ultimate loss of parking once the distributor road is built.

As the projects (Kirkham Rd on street parking and Stage 1 of the Bowral Town Centre Distributor Road) will be separated by possibly about 10 years, it should be noted that a further replacement of the carpark loss, by the town centre distributor road, will not be required, and this should be noted in order to not burden the project cost with the need to cost replacement of that parking again in the future.

3.8.6 Accessible parking spaces must be provided in accordance with Council's Development Control Plan with regards to development applications and the provision of community infrastructure.

Council will provide additional spaces on public roads and within public car parks through the Local Traffic Committee (as is the current practice) on as needs basis.

3.8.7 All new development must meet their parking and loading requirements as outlined in the Development Control Plan.

Should a development require anything less than 6 parking spaces on site, careful consideration should be given to ensure that those spaces will be easily found by customers, not used exclusively as an "executive" carpark, and have good design form (easy to get in and out).

If the provision of spaces are deficient in any of these areas, then it is recommended that a contribution to future off street parking, as outlined in the appropriate Developer Contributions S94 Plans be made in lieu of the spaces (so the 250-300 spaces could increase in number if this occurs frequently). If a parking contribution is paid, then consideration should be given to allowing an increase GLFA (which may increase parking contribution as well).

3.8.8 To ensure that a possible option to provide a further multi-deck facility (to provide options for a central parking facility when developments cannot, or choose not, to provide onsite parking), a second multi-deck site should be identified and preserved for possible future use. The most appropriate reserve site is building on the existing Wattle Lane public carpark site.

3.8.9 As may become required, the provision of on street parking will become secondary to addressing safety issues and improving intersection capacity. Through modelling and analysis, capacity requirements can be "fine tuned" to minimize any possible future parking loss.

3.8.10 Parking along the current alignment of Station St needs to become long stay parking (at locations where it currently is time restricted) as opportunities arise (e.g. re-development).

Station St traffic efficiency must be maintained and will be eroded if short stay parking creates parking friction as currently exists along Bong Bong Street.

As Station Street is reconfigured to 4 lanes as proposed (see Sec. 4 – Town Centre Distributor Road), then parking between Boolwey St and Bowral St will move to an offline service road. When this Stage is implemented, the offline parking can be made short stay (as it will be clear of the through movement traffic stream).

On street parking between Wingecarribee St and Bundaroo St will be removed once the high capacity roundabout is built. The full offset to this loss is provided as discussed in 4.4.3 (Kirkham St on street parking proposal), however new offline parking (33 spaces) will be provided adjacent to Memorial Park, utilising the current Station St pavement (under the existing Pinoak trees).

Additional parking will also be provided at the formed cul-de-sac head in Merrigang St, adjacent to the Station St deviation, netting approximately an additional 7 spaces in Merrigang St between Bong Bong St and Station St.

The main impact to parking on Station St will be between Wingecarribee St and Boolwey St, and to a lesser extent between Wingecarribee St and Merrigang St. As traffic volumes along Station St or the new Bowral Town Centre Distributor Road increases over time, where parking currently exists, this will be banned during the weekday morning and afternoon peak period (i.e. “Clearway” conditions will be imposed), however these restrictions will not apply on public holidays and weekends. Evaluation of delays at the time will need to be carried out to determine when morning and afternoon “Clearway” restrictions should be applied.

The parking changes on Station St, between Wingecarribee St and Boolwey St will not need to come into effect until Stage 1 (roundabout at Bundaroo St) and Stage 2 (Station Street is reconstructed to enable 4 lane trafficable pavement between Wingecarribee St and Bendooley St) of the Bowral Town Centre Distributor Road becomes functional.

3.8.11 Signage showing locations of off street parking should be increased in size and the number of spaces provided on signs. Advanced off street parking location signs should be provided on the approaches to the town centre on Mittagong Road (north of Victoria St) and on Bong Bong St and Station St (south of Bowral St).

Preliminary cost estimate: $15,000

3.8.12 Parking surveillance of the Town Centre must be maintained. Enforcement of parking time restrictions is an essential component of the parking strategy to ensure that the objectives of the strategy are preserved. The visibility of patrolling uniformed Council Rangers is a continuing reminder that adherence to parking time limits is important and reduces the incidence of over staying in a timed parking space.

3.8.13 Pedestrian Access and Mobility Plans should be periodically updated to identify ongoing improvements as additional car parks come on line. A safe and efficient pedestrian connection between parking areas, shops and public transport will also assist in making more distant parking spaces attractive to be used.

3.8.14 Off street parking should be promoted as "Smart Parking" spaces to encourage the targeting of these spaces as a first preference to on street parking. Signs to major spaces should also display the number of provided spaces. This will be of significant benefit to tourism in particular.

3.8.15 Off street parking access points should ensure good sight lines to traffic and pedestrians. Traffic facility improvements such as pedestrian refuges at larger parking areas should be provided to provide safe and efficient access points for users.

See Figure 14 – Appendix A for a pedestrian refuge example in Staion St near Boolwey St.

3.8.16 Plans showing parking locations should be provided at the Visitor Information Centre and the Civic Centre Council Customer Service Counter and other appropriate locations. See Figure 7 – Appendix A, "Bowral Off Street Parking Guide".

3.8.17 Safety audits of existing carparks should be undertaken periodically and should be improved to correct pavement deficiencies, ensure lighting is adequate (night inspection), and pavement marking and signage is in good order. Improvements to pedestrian pathways within car parks should be assessed and improved to address any vehicle/pedestrian conflict.

3.8.18 Bicycle racks should be provided with consultation with bicycle groups. The type of rack chosen should meet the approval of the bicycle groups.

3.8.19 Loading zones are vital for a number of businesses, especially where they do not have access to loading docks (for example).

The provision of loading zones is considered, as requested, by the Local Traffic Committee. This procedure should be maintained.

3.8.20 The design of multi-deck structures should have consideration to the visual impact on the streetscape. Council's Urban Planner should provide input regarding design form and compatibility with the streetscape to ensure a high quality architectural outcome.

4 The TRAFFIC NETWORK IMPROVEMENT STRATEGY:

Proposals, listed below, are shown on Figure 5 – Appendix A, "Bowral Parking, Traffic & Transport Strategy – Key Construction Elements".

4.1 Priority 1: Traffic Signal modification at Bong Bong St/Station St/ Bundaroo St

The existing roundabout at Merrigang St/Bong Bong St to be removed. Geometric modification and traffic signalisation of the intersection is to be provided – see Figure 16 for preliminary concept layout. The facility will provide signalised pedestrian cross walks on each leg of the intersection.

The work will also include signal offset timings (co-ordination) with the existing signals at Bong Bong St/Station St.

Work associated with this project also includes the removal of 6 on-street parking spaces in Station St, located on the western side of Station St on the southern approach to Merrigang St. The parking lane is to be reconstructed to arterial road standard to the requirements of the RMS.

The works are required to address pedestrian safety issues at the Merrigang St/Bong Bong St intersection, and to address the likely adverse impact that would likely occur during peak periods by a platooned arrival pattern from the traffic signals at Victoria St/Mittagong Rd as identified in the Paramics simuation. The Vicroria St/Mittagong Rd signals are expected to be built and become operational in 2013.

The Station St work to convert the parking lane to a travel lane is required to minimise the likelihood of the north bound traffic movement being delayed due to traffic that will likely queue to turn right into Merrigang St, as identified in the Paramics simulation.

The Victoria St signals are imminent and the RMS have also required that the expected impact must be addressed, by providing suitable treatments simultaneously. Based on this the work is considered to be **urgent** and actions to Fast Track the works are required.

Preliminary cost estimate: $450,000

This project will also provide additional network capacity in the northern entry precinct as outlined in the High Range Analytics Pty Ltd Report – "Bowral: Analysis of Bong Bong Street's intersection with Merrigang Street draft" – September 19, 2012 as outlined in *5.0 Test B – Existing Conditions plus Signals at Bong Bong and Merrigang Street and Victoria Street Changes*

5.1 Outline
This is the base model (network and traffic as surveyed on 30 April 2010) with:

- *The conversion of the current mini roundabout at the intersection of Bong Bong and Merrigang Street to signals,*
- *The approved land use development at the intersection of Victoria Strret and Mittagong Road, and*
- *Traffic signals introduced at the intersection of Victoria Street and Mittagong Road*

Plus
(Traffic) Demand (Generated) Case B:

- *Additional demand at Oxley Mall area (as provided in concept plans dated Sep 2011)including additional retail floor space and public car parking.*

The development of the Bowral Town Centre Distributor Road (refer sec. 4.3) below identifies infrastructure that will provide significant system capacity to convey traffic generated well beyond the limits of the Merrigang St/Bundaroo St signalization works and is considered essential to facilitate future Town Centre growth.

If required, the project outlined in 4.3 - **Traffic signal modification at Bong Bong St/Station St/Bundaroo St – reserve project**, can be installed as an alternative to Stage 1 of the Bowral town Centre Distributor Road to convey limited additional traffic beyond that outlined above.

4.2 Victoria St/Mittagong Rd traffic signal construction

Facility is a condition of development determined by the RTA and is being constructed at full cost by the developer on the south eastern corner of Victoria St.

Property acquisition – a corner property splay is required at the north eastern corner of Mittagong Rd and Victoria St. Council has been advised that this is currently being undertaken by the developer.

4.3 Traffic signal modification at Bong Bong St/Station St/Bundaroo St – reserve project

This project is considered to be a reserve, interim option, that could be pursued if required (discussed below).

The existing traffic signals at Bong Bong St/Station St be modified to open up traffic movements at Bundaroo St.

Preliminary cost estimate: $350,000

The works would also require the reconstruction of Bundaroo St (see 4.6), and the construction of a local roundabout at Bundaroo St/Bendooley St (see 4.7).

The option to undertake these works should be considered as a viable reserve, interim option (provided the alternative works to signalise the Merrigang St/Bong Bong St signals are constructed as outlined in 4.1). The capacity limitations are discussed in 4.1.

The preferred long term construction of a high capacity roundabout at this location should be pursued if possible.

Council, if required due to increased development generated traffic, beyond the additional capabilities identified for the Merrigang St/Bong Bong St signalisation works can consider the benefits of this project, which may prove to provide sufficient additional capacity (dependent on the size and location of future developments it may consider) should funds or other obstacles prevent the ability to implement the long term treatment.

4.4 Bowral Town Centre Distributor Road

Proposal shown on Figure 6 – Appendix A.

Station Street to be upgraded progressively to 4 lanes between Bundaroo St (transition to proposed traffic signals at Victoria St) and Bowral St over the next 10 to 12 years (sooner if possible) in 2 or 3 stages.

As a general requirement it must be noted: The proposal will include a continuous median, where applicable, to prevent right turn movements in and out of intermediate driveways – this median is not shown on the preliminary drawings. The requirement to provide a median to prevent right turn movements is a standard procedure to be applied to all developments (even along the existing alignment) to ensure that the movement efficiency of Station Street and the ultimate Bowral Town Centre Distributor Road is not adversely affected by adhoc right turn movements (which can cause significant system delays).

To provide for these movements, the large roundabouts at the northern and southern ends of the distributor road provide safe and efficient “u” turn facilities.

Key intersections need to be designed in accordance with that modelled in the Bowral Town Centre Paramics Model. This road will become the Bowral Town Centre Distributor Road and is essential to meet the extra demands of traffic that will be loaded onto the network as significant sites are developed in the town centre and to assist in circulating traffic around the town centre.

The Bowral Town Centre Distributor Road is key to addressing the estimated impact of future significant development (or re-development) within the Town Centre. This will ensure that developments are viable by enabling traffic to move efficiently to and from the developments and to and from the major Town Centre feeder roads.

4.4.1 Stage 1 of the Bowral Town Centre Distributor:

Stage 1 geometric layout shown on Figure 10 – Appendix A.

Large roundabout at the intersection of Station St/Bong Bong St/Bundaroo St, including a road deviation through the existing car park (opposite Memorial Park) to Wingecarribee St.

Note: Stage 1 can be built in lieu of the Station St/Bong Bong St/Bundaroo St signal modification (refer 4.1), as these improvements will be removed in the future. Stage 1 is part of the ultimate infrastructure. Immediate funding for this project is not available, nor is RMS grant funds available. As the issues are considered urgent, it is recommended that 4.1 be implemented.

Preliminary cost estimate: $4m (however can potentially be reduced to $3.3m should replacement parking be provided as per Sec. 3.2.5 – Kirkham Rd on street parking proposal valued at $700,00 be implemented).

Property acquisition – property is required from State Rail Authority (part Lot 3 DP 808842 - which will remove part of the rail commuter car park). Previous discussions indicated that the SRA would require parking adjacent to Bowral Railway Station on Kirkham Rd to be upgraded to compensate for this loss, other details were not finalized.

4.4.2 Stage 2 of the Bowral Town Centre Distributor Road:

Stage 2 geometric layout shown on Figure 11 – Appendix A.

Widening and realignment of Station St, to form 4 lanes, between Bowral St and Wingecarribee St. The proposal also includes a large roundabout at Bowral St (noting that the existing roundabout at the intersection of Bowral St/Station St is an

interim configuration) and the formation of a service road/parking area between Bowral St and Boolwey St.

Preliminary cost estimate: $3m

Property acquisition – a wide reserve of land between Station St and the railway boundary is required between Boolwey St and the Old Milk Factory complex (Lot 2 DP 814859) owned by Rail Infrastructure Corporation is required. The existing carpark will be replaced by a safer facility capable of providing more parking spaces.

4.4.3 Stage 3 of the Bowral Town Centre Distributor Road – Optional – required if town centre expands to west of the railway line

Stage 3 geometric layout shown on Figure 12 – Appendix A.

Note: expansion of the town centre to the west of the railway line was undertaken as a modeling Scenario Option in the Bowral Paramics model. Whilst network improvements can be undertaken to support this growth, a number of other planning issues need to be identified and addressed. As such it is a hypothetical consideration undertaken for the purposes of testing changes to the traffic network. As the carpark that is shown in Figure 12 is somewhat remote from the town centre, its suitability as a "shopper" or short stay carpark needs to be further investigated.

The proposal is to duplicate the Wingecarribee St rail over bridge (parallel to the existing bridge), including traffic signals at the intersection of Kirkham Rd/Station St.

Preliminary cost estimate: $3m

Property acquisition –

1. Corner property splay may be required at the south western corner of Wingecarribee St and Station St (however modifications to buildings will not be required).
2. Property acquisition (or agreement) is required from the Australian Rail Track Corporation (ARTC) to accommodate the bridge and approach roadworks.

This option will assist in reducing traffic congestion in this part of the network, however cannot support significant additional development on the western side of the railway line until the Bowral Distributor Road is completed between Bowral St and Victoria St (Stages 1 and 2).

The intersection of Kirkham Rd and the 2 x 2 lane Wingecarribee St bridges would require signalization (operating as a 3 way "T" intersection.

Once Stages 1 and 2 of the Bowral Distributor Road are completed, then significant additional development can be supported by the network.

To clarify, prior to adding significant development on the western side of the railway, Stage 1, 2 and 3 of the Bowral Distributor Road must be in place. At this stage, a 4th leg can be provided at the Wingecarribee St/Kirkham Rd intersection.

A scenario option which included a 300 space multi-deck car park and significant additional retail development was tested successfully in the Bowral Paramics model with all stages of the Bowral Distributor Road in place. A scenario that included the development with only part of the distributor road in place showed significant traffic congestion in the town centre, and as such, is not recommended.

However, the proposal has additional benefits as it provides access assurance for connection to each side of the railway line.

It is considered that this proposal is likely to have the least visual impact than other possible bridge crossing locations in the Bowral Town Centre.

4.4.4 Stage 4 of the Bowral Town Centre Distributor Road –

Extension of the Bowral Town Centre Distributor Road between Bowral St and the junction of Moss Vale Rd and Links Rd (following Railway Parade and existing "Local Roads" zoned land behind Loftus Street)

Stage 4 geometric layout shown on Figure 13 – Appendix A.

Preliminary cost estimate: $5m

This proposal is a long term requirement. The Paramics model indicates long term benefits in terms of providing overall system capacity.

It is recommended that this a low priority and must follow Stages 1 and 2 of the Bowral Town Centre Distributor Road

4.5 Victoria Street – Mittagong Creek road and pedestrian bridge (through connection to Queen St.

Preliminary cost estimate: $500,000

This project should not be undertaken until the traffic signals are modified at the intersection of Bong Bong St/Station St to open up movements from Bundaroo St to Mittagong Rd and Station St (refer sec. 4.1).

The works are recommended to provide better management of traffic in Victoria St, due to the significant residential, educational and commercial (under construction and future potential) in the existing relatively long cul-de-sac.

Modelling indicates that the opening, once the Bundaroo St works are operational, will only attract small amounts of through traffic from the surrounding network. The ability for vehicles to enter from one end and leave from the other is expected to minimize the need for "U" turns at the cul-de-sac head, effectively significantly reducing total vehicle movements.

In terms of overall benefit to the Town Centre, the benefits are considered to be minimal (assuming that the other projects listed, especially signal modification at Bundaroo St – sec. 4.1. are realized). The project however, provides a safe emergency access alternative to the north of the Shire, to and from the town centre, if required.

The project can be enhanced for residents by installing raised threshold treatments at the junction of Victoria St and Queen St. Other benefits to the wider town centre include the provision of a safe alternate access for the northern part of the town centre in the event of an emergency.

The crossing will need to consider storm flows in Mittagong Creek, however, as a crossing for pedestrians must be maintained (as a minimum), a new crossing will offer an opportunity to reduce the adverse impact from storm water.

Whilst the project is recommended for consideration, significant community consultation, whereby all the positive and negative aspects of the proposal need to be identified, should be undertaken.

4.6 Bundaroo St reconstruction - Bong Bong St to Bendooley St

Preliminary cost estimate: $450,000

This work is required to convey the transfer of a large proportion of traffic currently on Merrigang St, which is expected to occur once the signals to include access from Bundaroo St to Mittagong Rd and Station St become operational (refer sec. 4.1).

4.7 Bundaroo St/Bendooley St - local sized roundabout construction

Preliminary cost estimate: cost is included in 4.6
This roundabout is required to assist in traffic management of the precinct and address safety issues once the signals at Bundaroo St become operational (refer sec. 4.1)

4.8 Bendooley St/Wingecarribee St Roundabout

Should land in the Oxley Mall precinct be re-developed, the additional traffic will require that a local sized roundabout (similar in size to that at Boolwey St/Bendooley St) be installed at Wingecarribee St/Bendooley St.

Facility would be a condition of development

5. The TRANSPORT STRATEGY:

Infrastructure elements of the Transport Strategy are shown on Figure 5 – Appendix A.

5.1 Boolwey St Bus Facility Upgrade

The Boolwey St bus facility (between Bendooley St and the mid block roundabout) to be significantly upgraded to provide improved shelter and room for bus patrons.

Preliminary budget estimate: $500,000

In order to reinforce the importance of bus transport in the Shire, careful architectural detail should be incorporated in the facility.

Council has been successful in obtaining a significant grant towards improving bus facilities throughout the Shire's villages (to be implemented over the next 2 years – 2012-2014) through the NSW Country Passenger Transport Infrastructure Grants Scheme (CPTIGS). This proposal is considered essential to providing an integrated service, complimenting the village improvements. It is expected that other funding opportunities will be sought to add to these facilities throughout the Shire in future years.
With regard to the Boolwey St existing site conditions: Adverse footpath cross fall is to be corrected and improved, pedestrian facilities to assist crossing Boolwey St is to be provided. The footway should be widened to enable pedestrians walking along Boolwey St a clear passage around the facility. It is recommended that discussion with the Department of Education are undertaken (i.e. Bowral Public School) in order to provided a facility that will be beneficial to the school and the general community.

To improve information to passengers, "real time" electronic bus arrival details should be provided (consultation with local operators is required).

A desire to close a section of Banyette St (adjacent to the Bowral Public School) has been debated on and off over a number of years. The Paramics model can be modified, subject to Council approval and fund allocation, to test this and assess the wider network changes. It is recommended that public transport, pedestrian and traffic management and infrastructure options be developed between the Department of Education and Council for further consideration.

5.2 Incorporating bus facilities into large retail & commercial developments

Public and private bus (e.g. retirement village buses, Wingecarribee Community bus, etc.) facilities should be incorporated in new development sites over 3000m2, and incorporated in the early stages of design of future developments.

This approach is aimed at rewarding passengers for taking public transport into the town centre by allowing them to wait in comfort, security and close to main entry points of developments. Direct access is also an important issue for the vulnerable members of our community.

The design of the bus facilities should have due regard to the impact on network safety and efficiency, conflict and vision of pedestrians and internal traffic management (if provided inside a development).

Where bus facilities are provided inside a facility, or adjacent to structures in the footway, sufficient head and lateral clearances should be provided and checked as necessary.

As well utilized buses can replace up to 25 to 40 private vehicle trips, a 5% parking provision offset should be considered and possible additional parking offset bonuses given further consideration to developers that show real effort to exceed this requirement.

5.3 Reintroducing buses into Bong Bong St

In order to improve bus penetration into the main street, bus waiting blisters be provided on each side of Bong Bong St, one pair in each block between Banyette St and Merrigang St is recommended.

These facilities will occupy one parking space at each location and require that the buses stop in traffic to enable patrons to alight. This reduces the footprint of the bus facility from the normal 45m to 6m in length. As traffic is slow moving in the main street, the delay caused by stopping will have minimal detrimental effect to traffic flow.

To speed up ticket transaction time, a system whereby tickets can be pre-purchased at shops such as newsagents, coffee shops, chemists etc should be investigated.

The travel times through the town centre can be modelled in the Bowral Town Centre Paramics model, and this delay should be then reflected in operators time tables.

Whilst buses remain physically large, the modern bus has lower emissions, are quieter in operation and are more suitable to built up areas than they were when buses were moved out of the main street some 20 years ago.

Buses need to move in both directions along Bong Bong St to provide an assurance to patrons that their needs will be met, thereby encouraging patronage.

5.4 Provision for cyclists

Cycling is a sustainable and valid form of transport. The Wingecarribee Bicycle Strategy should be incorporated into the Bowral Parking, Traffic and Transport Strategy.

Whilst the town centre road system, in its current form, presents limitations to providing dedicated bicycle lanes, enhancements should be pursued as a matter of procedure when network improvements are being developed. The current Wingecarribee Bicycle Strategy needs to be implemented in the town centre. Where physical limitations are encountered, then the bicycle strategy and this strategy need to be reviewed. Limitations will be identified during the survey and design stage of each project.

It should be noted that the Kirkham St upgrade, between Wingecarribee St and Bowral St (see 3.8.5) will include part of the cycle way identified in the bicycle strategy.

A significant increase in this mode of transport can be facilitated by means other than the provision of cycle ways or shared paths. People that would desire to cycle to work (within the town centre) will be more likely to do so should end of trip facilities be provided, as stated in the Bicycle Strategy.

Whilst facilities such as cycle racks within the town centre are useful, developments should be encouraged to provide change rooms, showers and secure lock up facilities within their developments.

With consultation with the various bicycle groups, community facilities and the location of those facilities should be discussed and investigated.

Full implementation of the bicycle strategy within the town centre is a challenge due to many issues, including geographical issues (e.g. steep terrain, narrow road reserves and conflict with high volume of vehicles). With regard to the challenges faced to implement a viable cycling

transport network, progress should not be hampered by limited town centre end of trip cycling facilities.

Provision of facilities should be developed with consultation with the various cycling groups within the Shire.

The Wingecarribee Bicycle Strategy shows proposed on road and off road bicycle paths as shown in Figure 15 – Appendix A. These will be looked at in detail for feasibility of incorporating them into network improvements (e.g. as indicated in the Kirkham Rd parking/shared path project outlined in 3.8.5 above).

5.5 Pedestrian facilities

Clear and safe pedestrian facilities and linkages should be developed linking off street parking areas with key pedestrian destinations.

Walking is an important and valid mode of transport. Linkages (e.g. footpaths, cycleways, shared paths) which extend beyond the town centre confines can also assist in reducing the number of cars that enter the town centre.

All facilities must be designed and constructed to meet Council and Australian Standards for access.

The use of motorized scooters is likely to increase. The needs of these users will be considered in town centre improvement projects. Ideally, footpath areas should be widened (where possible) and street furniture placed, or relocated, to provide safe and unobstructed access for these users.

Town centre improvements must also consider the needs of people with sight impairment. Consultation with bodies such as “Vision Australia” should be undertaken as a matter of procedure for all town centre improvements, especially where road crossing facilities are required. The provision of a clear and uncluttered streetscape would assist the needs of these members of our community.

5.5.1 Safer Pedestrian Crossing Strategy

A Pedestrian Safer Crossing Strategy be developed. The strategy will assess the requirements of pedestrians and their ability to cross with safety at reasonably spaced intervals throughout the Town Centre, and with particular attention given to:

I. Station St, between Funston St and Bong Bong St
II. Bong Bong St, between Bundaroo St and Funston St
III. Bendooley St, between Bundaroo St and Banyette St
IV.

5.6 Provision for taxis:

Whilst current provisions in the network appear to be satisfactory, as the town develops in the future, the needs of the community requiring access to private taxis are likely to change.

Proposed changes, or the requirement to provide additional taxi ranks will be considered by Council and the Local Traffic Committee (as is the current practice).

With regards to future developments, the specific needs to provide for access to taxis must be made early in the planning process.

The provision of these facilities should have due regard to impact on the network and general safety issues, including lighting and personal safety of passengers and taxi drivers.

The provision of taxi ranks should also consider access to public amenities, especially for taxi drivers.

Appendix A

Figure 1 Bowral Town Centre – Peak Parking Utilisation Map – Thursday 3 March 2005

Figure 2 Mittagong Town Centre – Peak Parking Utilisation Map – Thursday 3 March 2005 (pending)

Figure 3 Moss Vale Town Centre – Peak Parking Utilisation Map – Thursday 3 March 2005

Figure 4 Bundanoon Town Centre – Peak Parking Utilsation Map – Thursday 3 March 2005 (pending)

Figure 5 Bowral Parking, Traffic & Transport Strategy – Key Construction Elements

Figure 6 Bowral Town Centre Distributor Road (Station St 4 lane upgrade and realignment – Bowral St to Bundaroo St, and transition to Victoria St) – Geometric layout (to be refined to reflect Bowral Paramics Model)

Figure 7 Bowral Off Street Parking Guide

Figure 8 Bong Bong St/Station St signal modification proposal to open up turning movements to Station St & Mittagong Rd from Bundaroo St – Geometric layout

Figure 9 Not used

Figure 10 Stage 1 – Bowral Town Centre Distributor Road – Wingecarribee St to Bundaroo St – Geometric layout

Figure 11 Stage 2 – Bowral Town Centre Distributor Road – Bowral St to Wingecarribee St – Geometric layout

Figure 12 Stage 3 – Bowral Town Centre Distributor Road –Wingecarribee St Rail Overbridge Duplication - Geometric layout

Figure 13 Stage 4 – Bowral Town Centre Distributor Road – Links Rd (intersection of Moss Vale Rd) to Bowral St

Figure 14 Pedestrian Refuge & Car Park access traffic management proposal – Geometric layout – Station St (existing alignment) south of Boolwey St – Geometric layout

Figure 15 Wingeacrribee Bicycle Strategy – Bowral Bicycle Network

Figure 16 Merrigang St/Bong Bong St traffic signal proposal – Preliminary geometric Layout