Shoalhaven City Council
Nowra CBD Master Plan
C - Transport conditions review
Oblique view of the Nowra CBD looking north, showing the six-lane Princes Highway and significant amount of at-grade parking in the centre of town.

Prepared for Shoalhaven City Council by Arup Pty Ltd, January 2011

All oblique aerial photographs by Colin F Douch Aerial Photography, 2010

The drawings and maps in this report are based on GIS and CAD data provided by the Shoalhaven City Council in March 2010.
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Introduction

Purpose

This transport background report has been developed to support a 25-year Master Plan for Nowra CBD. It includes an assessment of existing conditions, and a review of a number of previous studies relevant to the construction of the Master Plan.

Nowra CBD is the commercial hub of the Shoalhaven Local Government Area. In 1981, 100 years after the original bridge construction, the highway that had passed through the town centre was moved in the East Street deviation, effectively bypassing the town centre, with the later effect of bisecting the town centre following approval of Stockland Nowra.

In reviewing the existing transport conditions of Nowra CBD, this report will address the road network, parking, connectivity, and active and sustainable transport.
Review of previous studies

Frequent transport studies and strategies have been undertaken by, or on behalf of, Council for the Nowra CBD. A number of these documents have particular relevance to the Master Plan and have been summarised below.

**Nowra CBD Transport Strategy**
*Eppell Olsen & Partners, 2003*

The CBD Transport Strategy has been largely superseded by the other documents. Issues not addressed in other documents relevant to the Master Plan include:

- Council investigations indicated that Stewart Place was an appropriate location to retain a bus stop facility, with further options for an interchange to be examined including accommodating a relocation of long stay buses. The existing interchange was upgraded in 2005-6 with new bus shelters and pavement.
- A feasibility assessment recommended the East Nowra Sub-Arterial (ENSA) including connections to Old Southern Road in the south and distribution of traffic at the northern end. The feasibility for the ENSA road was on the basis of:
  - Alleviating congestion at Kalandar Street, improving safety and avoiding the need for expansion to 4 lanes
  - Removing traffic from Kalandar Street and the highway by allowing direct access to / from Stockland from the east
- Improving traffic and safety on the highway, reducing the need to expand to 6 lanes
- Reducing traffic on rural lanes to the east of Nowra that would otherwise avoid Kalandar Street

**Nowra CBD (East) Road Network Strategy Review**
*Eppell Olsen & Partners, 2007*

The Nowra CBD (East) Road Network Strategy Review builds on the earlier Nowra CBD Transport Strategy and further investigates the operation of the Princes Highway between Moss Street and Plunkett Street and areas immediately to the east and west of the highway. A major driver for the study was the potential expansion of Stockland Nowra. It was also important to ensure a coordinated and agreed position for Council and the RTA regarding the strategy and in particular works on the highway through Nowra CBD.

Many traffic studies in addition to extensive modelling have been conducted to assess traffic conditions in the Nowra CBD. These have lead to a series of recommendations, which have been used in consent conditions for Stockland Nowra expansion proposals, and will be reflected in the Master Plan.

Key recommendations of the report included the adoption of upgrades noted in the 2003 strategy; in addition to the following:

- To provide signalised intersection at Junction Street and Princes Highway (all movements with exception of banned right turn into Junction Street from north).
- In conjunction with the highway / Junction Street traffic signals to provide a signalised intersection at Junction Street and Nowra Lane.
- In association with ENSA and east west connections, upgrade the Princes Highway intersections at Moss Street, North Street, Junction Street, Worrigee Street, and Plunkett Street.
- Signalise the Plunkett Street/Haigh Avenue intersection.
- Recommendation on traffic grounds to retain Junction Court to prevent excessive traffic use west of Nowra Lane, however with advice provided that if Council were to consider opening Junction Court for reasons other than traffic that One Way westbound should be the option adopted to mitigate adverse impacts of traffic.
- Redevelopment and expansion of existing car parking areas together with the development of a new site should be undertaken at the following locations:
  - The precinct of North Street, Nowra Lane, Jane Street overpass and the Princes Hwy
  - Osborne Street car park
  - Lawrence Avenue car park
  - Berry Street/Worrigee Street car park
  - Collins Way car park
- Include additional pedestrian crossing locations within the CBD at the following potential locations:
  - Worrigee Street between Lawrence Avenue and Kinghorne Street
  - Worrigee Street / Kinghorne Street
  - Nowra Lane/Junction Street
  - Worrigee Street/Berry Street
  - North Street/Bridge Road/Berry Street
  - North Street/Egans Lane/Graham Street
- Upgrade the Jane Street overpass to provide wider footpaths and better define connections extending from the overpass into Stockland Nowra and west to Kinghorne Street.

Key issues for the Master Plan

- Recommended implementation of ENSA.
- Highway upgrade (Moss Street to Plunkett Street) including associated works east and west of the highway agreed to by RTA and adopted by Council 24 July 2007; a key issue for the Master Plan is to include a northern access proposal and a new southern intersection to support the expanded ring road proposal.
- Recommended increase in parking.
- Increase pedestrian crossings indicated in this report as most of the potential additional locations have not been implemented; and there were some notable omissions including improved mid-block crossing opportunities on Berry Street and Kinghorne Street.

Improved pedestrian crossings are proposed for Worrigee Street

Figure 1: Administrative road hierarchy showing traffic signal locations
Junction Court Opening Options and Worrigee Street One Way Investigation
Eppell Olsen & Partners, 2007

As a supplement to the Nowra CBD (East) Road Network Strategy Review, Eppell Olsen & Partners investigated the options of opening Junction Court and converting Worrigee Street to a one-way street.

Traffic modelling previously undertaken in 2003 concluded that the opening of Junction Court, between Kinghorne Street and O’Connell Lane, to full two-way traffic, would lead to unacceptably high traffic volumes on Junction Street. Further modelling in 2007 investigated three options for this section of Junction Court:

- Open Junction Court (two-way).
- Open Junction Court (one-way eastbound).
- Open Junction Court (one-way westbound).

The modelling forecasts 2016 traffic volumes and includes an allowance for all future land use developments including Stockland Nowra expansion and ENSA is shown in the table below.

<table>
<thead>
<tr>
<th>Option</th>
<th>W of Kinghorne St</th>
<th>Betw. Kinghorne St and O’Connell Ln</th>
<th>E of O’Keefe Ave</th>
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<tbody>
<tr>
<td>Two-way</td>
<td>604</td>
<td>576</td>
<td>701</td>
</tr>
<tr>
<td>One-way eastbound</td>
<td>431</td>
<td>265</td>
<td>462</td>
</tr>
<tr>
<td>One-way westbound</td>
<td>509</td>
<td>253</td>
<td>583</td>
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Table 1: Junction Street Volumes

An option of Worrigee Street one-way eastbound between Princes Highway and Haigh Avenue was tested in isolation and in conjunction with one way westbound on Plunkett Street (and reverse directions) and the one way schemes were not recommended because of reduced accessibility. The traffic modelling suggested a 2016 traffic volume of 710 vph.

Relevant Outcomes and Actions

- Opening Junction Court would not be justified solely on traffic grounds based on the modelling and conclusions in this report.
- If Council were to consider opening Junction Court that one way westbound should be the option adopted.
- Any opening of Junction Court would require a detailed design study taking into consideration among other factors; pavement levels, pedestrian safety, traffic management, services vehicle access, investigation into whether the existing taxi zone can be retained or relocated, and investigations regarding safety at the intersection O’Connell Lane and Junction Street.

Nowra - Bomaderry Structure Plan – Strategic Direction
Shoalhaven City Council, 2006

The transport section of this Structure Plan Strategy document provides a high-level overview of transport conditions in Nowra - Bomaderry.

- Objectives include accessibility, affordability, public transport, safety, convenience, improvement and maintenance of road network capacity, urban consolidation, and a mode shift away from private vehicles.
- Problems with existing Princes Highway and collector roads include capacity and safety issues, and require significant capital investment.
- The Structure Plan concludes that there is no alternative alignment to the western bypass.
- Within the life of the Structure Plan (to 2036), there is a need for a western bypass however this is in addition to a significant upgrade of the existing highway alignment through Nowra / Bomaderry.
- Based on the Structure Plan traffic assessment; beyond 2036 there may be a need for an eastern bypass subject to conditions along the existing highway through the town centre and subject to seasonal traffic growth.
- 13-17% (approximately 15%) of total through-traffic use Shoalhaven Bridge, made up of 5% traffic travelling directly through (without stopping), and a further 8-10% travelling through after stopping at Nowra. This indicates a probable maximum shift of traffic to the Bypass of some 15%.

- 50% of local traffic uses the bridge (a substantial drop from anecdotal volumes of 90%).

- Due to the local nature of traffic moving along the Princes Highway and Shoalhaven River Bridges, a western bypass is likely in the long term to provide only minimal relief to local roads.

- A bypass is not expected to solve all issues on the Princes Highway without introducing additional attractors to Nowra (calculated to attract only a maximum shift of 15% from existing highway traffic based on a good level of services and rest areas along the Bypass).

- A recommendation of a new signalised intersection located between Moss Street and Bridge Road, (relocate movements associated with existing traffic signal phase for Pleasant Way to the new signals to increase capacity of the highway / Bridge Road intersection).

- The Structure Plan recommends the introduction of ENSA to connect the east to the Princes Highway to reduce pressure on the Kalandar Street, Princes Highway through Nowra CBD and other rural roads to the east of Nowra. This is also being driven by additional development to the east of the Princes Highway.

- TRACKS modelling has shown that both the Princes Highway South Nowra and the Princes Highway through Bomaderry have limited capacity beyond 2016. By 2036, both of these precincts will be carrying 40,000 vpd on the Princes Highway requiring six lanes and traffic signals for management (as per current Princes Highway layout through Nowra, which carries approximately 35,000 vpd).

- Bike facilities (including associated amenities) should be included as a condition for consent with large developments, in addition to generally providing better cycling facilities.

- RTA recommended potential implementation of park and ride facilities with shuttle bus which may require bus priority lanes.

- Generally RTA support systems to encourage public transport use.

- System of pathways being developed (cycleways and footpaths) for both recreation use and connectivity.

- The Structure Plan recommends a network of new roads “Structure Plan preferred road network” based around providing Level of Service C conditions following development of all areas identified to be new release areas in the Structure Plan in addition to increased densities in existing zoned areas. Traffic modelling shows that failure to provide any of those roads compromises the integrity of other roads in the network.

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**Background Document**

The background to the Structure Plan includes a more detailed analysis of the network and trip analysis.

- Most trips in Nowra-Bomaderry are made by car (69% of work trips).

- Average car ownership is 1.5 / household.

- The fastest trip through Nowra - Bomaderry was measured at 15 minutes.

- There are seasonal fluctuations in traffic volumes, which peak around December.

- The Shoalhaven Bridge is vulnerable to breakdowns.

- No other road in NSW has a greater volume of traffic than the Princes Highway over the Shoalhaven River that is not a freeway or major metropolitan arterial road. This is primarily because there are no alternative routes and traffic is funnelled to one location to cross the river.

**Relevant Outcomes and Actions**

- The Structure Plan provides a comprehensive overview of transport issues in Nowra-Bomaderry.

- The western bypass alone is not an effective solution for removing through-traffic from Nowra CBD.

- To improve existing capacity issues, significant works and capital investment would be required.

- Need to safeguard the ENSA alignment.

- Need to safeguard other roads as per the Nowra-Bomaderry Structure Plan preferred road network including the recommended connections to Western Bypass to optimise the shift in traffic from the existing highway alignment.

- Need to safeguard road reservations to ensure future transport upgrade options remain viable.
This study has been undertaken to examine the parking supply and demand in Nowra CBD, and to support a contributions plan for financing parking supply in the area. Demand has been calculated based on 2-day surveys conducted during a short peak.

- There is a perception of parking shortfall, particularly during holidays and pre-Christmas.
- Council have previously changed time restrictions in the CBD over peak periods (e.g. pre-Christmas) to free up spaces for shopping and visitor traffic, and force commuter parking out of the CBD to peripheral locations with limited success.
- Parking spaces within the CBD have been lost due to safety and efficiency improvements, as well as changes in codes and landscaping.
- The report suggests evidence of an increase in infringements, on-street parking peripheral to CBD, and on vacant land.
- Based on intercept surveys and counts, 30% of Stockland patrons visit the western side of the CBD in the same trip.

- 80 CBD west employees are parking at Stockland Nowra based on survey data and indexed for growth.
- Total 5,927 spaces in Nowra CBD: 4,753 off-street, 1,174 on-street including Stockland Nowra (828) and other Stockland-owned land (420).
- In 2005 the average off-peak weekday occupancy based on surveys was 72%, although this figure shows high variation across different areas of the CBD.
- Retail core spaces are generally restricted to 2 hours (86%), and remaining spaces (14%) are 3 hours. Commercial fringe parking is largely unrestricted (81%).
- Nowra has a high proportion (2.2%) of disabled spaces compared with Australian requirements (1%). Ageing population and additional requirements for specific land uses (i.e. medical centres, supermarkets etc) should be considered if considering a policy requirement for provision of disabled spaces in addition to minimum Australian standards.

- Section 94 contributions will be requested for parking in the CBD retail core, in lieu of private parking. Outside this area, DCP 18 is in effect.
- RTA maximum recommendation for retail parking supply is 6.1 per 100m² Gross Floor Area, and for most town centres a rate of 4.1 per 100m² is recommended (based on metropolitan surveys).
- In absence of Council's own extensive survey and analysis Council's DCP 18 is based on RTA rates i.e. 1 space per 24m² for retail space consistent with a rate of 4.17 per 100m².
- RTA recommends for general office space a rate of 1 space per 40m² Gross Floor Area (based on metropolitan surveys).
- In absence of Council's own extensive survey and analysis Council's DCP 18 is based on RTA rates i.e. 1 space per 40m² for general office space.
Key issues for the Master Plan

- Calculation of parking demand and surplus/deficit in this report does not include on-street parking.
- A significant proportion of on-street parking may be lost in future to ring road development, provision of pedestrian facilities and other regulatory changes.
- In the west CBD, off-street parking supply = 3,534. Based on short-term surveys measuring peak daily occupancy, demand = 4,116, resulting in a shortfall.
- East supply = 828, demand = 762. It is noted that on vacant Stockland land north of Junction Street there is informal overflow parking for up to 400 cars, however this may be lost to future development of that site.
- Occancy rates for the west are all higher than 80% for survey days, except O’Keefe Avenue (Ex - serviceman’s club and east).
- Stockland Nowra had 78-90% occupancy in the standard parking area, and 31 - 40% on previously AMP-owned land.
- Demand calculations based on DCP18 and floor space indicate 722 more spaces are required, and the TRACKS model calculation suggests 774 additional spaces are required.
- Non-commercial uses are not included in DCP 18 calculation.
- The supply assessment does not take account of CBD fringe parks.
- While this report generally recommends an increase in parking supply, a disconnect between the road network and parking as well as attractors such as retail seems to be a key issue.

For the total CBD, retail floor space is 56,640m² GFA.

The western side of the CBD has 40,600m² GFA of retail floor space, and 1,885 off street car spaces.

The report concludes that retail floor space and parking demand were closely related, and recommend an increase in supply of 582 spaces to address existing deficiency and an additional 140 spaces in future to satisfy future additional floor space demand (total additional 722 off street spaces).
Existing conditions

Road Network

The Princes Highway divides East and West Nowra, providing access over Shoalhaven River. Although the highway is the only State road in Nowra (south of the Shoalhaven River) and connects the north and south NSW, within the Nowra-Bomaderry area it primarily serves local traffic.

Nowra CBD is laid out in a grid pattern of major roads with connectors midblock. In the CBD Core, there are several laneways providing access to rear blocks and car parks.

The main shopping strip of the western side of the CBD is Junction Street, although Kinghorne Street is the primary north south road.

Bridge Road is a key historical access to Nowra CBD and Berry Street is a major north south connection populated with retail, cafes, and civic buildings. Berry Street is frequently used by through-traffic travelling north south due to its connection to Albatross Road.

Existing access to Stockland Nowra is poor for traffic accessing from the east with traffic having to queue to access the highway, travel across the highway and then enter Stockland Nowra via Jane Street.

Figure 2: Road Network
Existing conditions

Traffic Volumes

Figure 3 is a representation of the study area context, including 2010 volumes from several AADT locations.

Within the Nowra-Bomaderry area – specifically at the Shoalhaven River Bridge – traffic volumes local to the area are higher than the regional volumes. This suggests bias toward local traffic using the Princes Highway at this location.

Results of origin-destination surveys used in the Structure Plan confirm this assessment, concluding only 5% at this point is through-traffic that does not stop in Nowra, and a further 10% of traffic eventually passes through after stopping Nowra. This data reinforces the idea that the Princes Highway functions as a local road, servicing primarily the Nowra-Bomaderry and greater northern area, further supporting the minimal impact that the western bypass would have on reducing existing demand.

Figure 4 shows average daily volumes from cordon traffic counts and estimates from turning movement counts (RTA and Council data) in Nowra from 2000-2009 and factored where appropriate to 2010 levels. This identifies that there are some issues with capacity at certain pinch-points along the highway, particularly the Kalandar Street and Bridge Road intersections. These problems become critical when other constraints are applied, such as a breakdown or crash occupying a lane, or holiday conditions dramatically increasing traffic on the highway.
Figure 4: Traffic volumes estimated and actual, 2010
Existing conditions

Parking demand

A 2007 CBD Parking report assessing Section 94 Contributions examined parking demand and supply in the CBD, concluding that there was a significant shortfall in unrestricted off-street spaces, particularly in the CBD West. This analysis was conducted using DCP 18 parking rates and land use, a TRACKS model, and parking occupancy surveys.

Figure 5 shows parking occupancy on a standard weekday between 12-1pm. An estimated 80 spaces are used in Stockland for CBD West workers, according to survey data.

The supply did not take into consideration the use of on-street, or peripheral off-street parking, and used the DCP as the only source of demand. Parking occupancy levels were assessed over a 2 typical weekdays during the parking peak, showing a significant proportion of off-street parking spaces were occupied (>80%) however, on-site observations by Arup in 2010 indicated a relatively high number of available spaces outside of this peak.

Additional regulatory measures could be considered to manage parking occupancy. In place of increasing the quantity of car parks typical measures include staff and time restricted spaces, or car sharing and car pooling schemes.

Circulation, landscaping, and car park design measures are other factors to consider in determining how to improve the efficiency of existing parks.

Parking supply

The majority of spaces available in the CBD core are time restricted to 2 (86%) or 3 hours (14%), however outside the core many are unrestricted (81%).

As the majority of car parks are at-grade, the land required to accommodate car parking in the CBD is under pressure to be reconsidered for a different land use. Costs associated with moving the car parks underground could be prohibitive and would require further investigation to determine feasibility.

On-street parking supply is approximately 1,175, and plays a substantial role in providing short-term parking for retail; however, it can be expected that on street parking stock will be gradually depleted over time. This is especially the case around the periphery of the CBD to improve efficiencies and resolve safety and pedestrian issues, and this must be taken into consideration in determining additional parking requirements.

There are also staff parking spaces available at Stockland and a small number at the O’Keefe Ave northern car park, reducing the potential for staff from the western side of the CBD to park in the east.

The number of motorists parking all day on vacant land in and around the CBD also masks latent demand for car parking that needs to be taken into consideration in determining timing of upgrades as this stock of parking will be gradually depleted as land is developed.
Figure 5: Car parking supply and occupancy (main CBD off street car parks only)

Legend
- < 60% Occupancy
- 60-69% Occupancy
- 70-79% Occupancy
- 80-89% Occupancy
- 90-100% Occupancy
- No Occupancy Data

Data source: Section 94 Contributions Plan Review
NOWRA CBD PARKING ANALYSIS 2007
Occupancy values average two day peak hour (11am-12pm) figures November 2005
Walking

In Nowra, the primary method of transport is by private vehicle. Facilities are provided for pedestrians; however, there are a limited number of formal pedestrian crossings in the Nowra CBD. This is particularly the case for the Princes Highway where the number of crossing facilities and the distances between them are inadequate, effectively resulting in a barrier to east-west pedestrian movement.

Pedestrian crossing facilities have been documented in the Shoalhaven Pedestrian Access and Mobility Plan (PAMP) and Nowra CBD Strategy, which also identify some locations where improvements are required. More facilities are required for safe pedestrian movement, and this is taken into consideration in the Master Plan.

Existing pedestrian facilities are shown on Figure 6. Parts of the CBD West Core are highly permeable for pedestrians, with a number of arcades providing quick access to the rear of blocks and car parks. Connectivity between these arcades should be encouraged by providing adjacent formalised crossings wherever possible.

Connectivity

Connectivity between the eastern and western sides of the CBD, an issue discussed frequently in the background material, is a requirement of the LEP for developments east of the highway, and is indicated as a priority in the briefing documents for this Master Plan. All modes of transport need to be addressed in this case, including walking, cycling, and vehicular movements.

Sustainability

Both the Master Plan brief and the background documents suggest that sustainability is a critical issue for Nowra. Sustainability means addressing economic and social as well as environmental factors.

Environmental sustainability includes the need to prioritise walking, cycling and public transport - wherever possible - over the private vehicle, which will in turn increase the lifespan of the road network by reducing congestion.

Junction Street has a high pedestrian activity character including a number of these arcades, however without signage or speed reduction to facilitate pedestrian movement. Resulting conditions mean that vehicles may not slow down in this area, making it potentially unsafe for pedestrians who have no formalised crossings mid-block.

Issues with connectivity across the highway can be resolved by one of two options: the installation of a signalised, at-grade intersection or the provision of a grade separated crossing. Pedestrian fencing is a safety issue along the highway where gaps in the fence are being filled in to discourage crossing at unsafe locations.

The RTA program also includes additional pedestrian legs to be signalised over the next 12 months (improvements undertaken to address deficiencies at Moss Street, Womijee Street, and Plunkett Street). These upgrades will bring the intersections into compliance with RTA guidelines that require signalised crossings on all legs and maximise safe pedestrian crossing points.

Roundabouts can also provide a barrier for safe pedestrian access without the inclusion of a formal crossing, and some pedestrians do not feel safe crossing, particularly the elderly, young children, and the less mobile. Standards require roundabouts to be designed to include safe pedestrian access on each leg.

Blister treatments and pedestrian refuges can assist pedestrians and can also provide a traffic calming effect; however if they are not obvious to drivers (for example some of the smaller refuges in Nowra), it is unlikely they will have a substantial impact on traffic.

Walking is a fundamentally equitable method of travel, and should be encouraged in the CBD along with other forms of active transport, such as cycling.
Examples of “Pedestrian facilities” from Shoalhaven Pedestrian Access and Mobility Plan (Image source: Google Streetview)

Legend
- Roundabouts
- Signalised intersection
- Limited pedestrian legs at intersection
- Slip lane crossing
- Zebra pedestrian crossing
- Blister treatments
- Pedestrian Refuge
- Vehicular and pedestrian bridge
- Green open space
- Outer study area boundary

Figure 6: Pedestrian crossings map
Cycling

The Shoalhaven Bicycle Strategy was released in 1997, reviewed in conjunction with the PAMP in 2000, and was ultimately incorporated into the PAMP document along with other accessibility strategies in 2007. It promotes a “cycle friendly” Shoalhaven City with a realistic network of cycleways. Although paths and facilities are provided for cycling in other areas of the LGA, they are not extensive in Nowra CBD, with cyclists required to share roads with traffic. The bike plan proposes a series of shared paths; however, few have been implemented.

A small amount of bike parking is provided within the Nowra CBD. Cyclists in Nowra are subject to many of the same safety issues as pedestrians, and will require the implementation of further facilities and pathways to improve cycling amenity in the CBD and encourage cycling as an alternative mode of transport.

Cycling route signage

Bike lock-up rail on Junction Street

Bicycle stencil on Stuart Street (Source: Google Streetview)
Public Transport and Taxis

Bus arrival times at Bomaderry Station are linked to train departures. Bomaderry (Nowra) is the terminus of the South Coast line and 16 services leave the station Sydney-bound (change at Kiama) each weekday, 18 arriving from the north. Bus routes and frequencies are indicated in Figure 30.

Over December and January, the Summer Bus is run as a late night initiative to reduce drink driving and promote pedestrian safety. It connects local establishments with the town centre and residential stops within the Nowra -Bomaderry area. Other Summer Buses also run in other Southern NSW centres.

The CBD taxi rank is situated at the eastern end of the pedestrianised Junction Street. Another taxi rank is located at the middle entrance to the Stockland Nowra. A taxi zone is also situated on Junction Street in the centre of Nowra CBD, and it is understood that in recent times the taxi association has requested Council to consider additional taxi zones in Nowra CBD.

Existing Mode Split

Journey to work data for the 2006 census indicates that the majority of residents in the Nowra-Bomaderry area travelled to work by car (86.7%) - in the Structure Plan this is listed as 69%, however when journey to work by car is recalculated to exclude non-workers and those who worked from home, the result is higher).

There is a low population using public transport (approximately 1% in Nowra Bomaderry). Cycling however is relatively high for a regional area at 1.5%, and 5.5% of residents walking to work.

Figure 7: Bus route and frequency information, taxi ranks
Future considerations

Growth and Demand

By 2036, Nowra CBD could grow substantially in terms of retail, supply and population in the Nowra-Bomaderry area is predicted to expand to 44,100 by 2036 (as adopted by Council in 2008). Through traffic can be expected to continue to grow in the future, even with the implementation of the Western Bypass, which would be likely to result in only a small reduction of this growth.

In order to accommodate this growth, transport provisions will need to consider traffic and parking, as well as provide effective alternatives to the private vehicle.

Western Bypass

This alignment would provide an additional Shoalhaven River crossing to the west of Nowra, and with the intention of removing through-traffic from the existing Princes Highway.

As there is insufficient through traffic to justify construction of this alignment as a bypass alone; to ensure it works effectively it would require several connections to growth areas envisaged under Nowra-Bomaderry Structure Plan and include requirement for good connections to and from Nowra CBD.

The western bypass is not included in any programmed works and unlikely to occur in short to medium term.

Additional River Crossing

Preliminary assessments have been undertaken to determine the viability of providing additional river crossings to address capacity constraints from the existing bridge and adjoining roads, regardless of whether the Western Bypass proceeds.

This issue has been the subject of extensive investigation, including RTA and Council studies. Key issues that will need to be investigated further include:

- Placement east or west of existing bridge.
- Connection to Ilaroo Road.
- Connection to Bridge Road or alternative connection to CBD.
- Connection to Pleasant Way and the area to the east.
- Potential public transport crossing of the River.

East Nowra Sub Arterial (ENSA)

The proposed East Nowra Sub Arterial (ENSA) is a road intended to reduce traffic congestion on Kalandar Street, the Princes Highway through Nowra CBD, and on rural lanes east of Nowra. It will also offer significantly improved accessibility for Stockland traffic coming to/from the east (removing this traffic from Kalandar Street and the highway).

East and West CBD are connected by ENSA through signalised intersections at North and Junction Streets. The RTA supports the need for ENSA and associated works at the highway, however there is no funding commitment to build the road at this stage by either party.
Main Road 92

This road is being upgraded and sealed between Nerriga and Hames Road, south of Nowra, and was due for completion late 2010. (Bright orange section yet to be completed on the figure below) It should provide improved connectivity for freight, heavy vehicle, and overall traffic between the ACT region and Nowra.

The impact from this upgrade is expected to be minimal, based on the Environmental Impact Statement from the RTA for this project, with only up to approximately 1,400 potential additional drivers if all possible upgrades were implemented. With the existing upgrades, the amount of additional traffic generated is approximately 660.

Potential future projects (not developed or funded or programmed)

- Additional capacity for Shoalhaven River bridges – ongoing investigations by RTA both north and south of the river.
- Proposed relocation of movements associated with existing traffic signal phase for Pleasant Way to the new signals (extension of Hawthorne Ave) to increase capacity of the highway / Bridge Road intersection. This is being reviewed in light of potential grade separated treatment of Bridge Road.
- Proposed upgrade to Princes Highway and associated works (refer Nowra CBD strategy July 2007) between Moss Street and Plunkett Street – no funding confirmed by RTA however consent conditions require Stockland to undertake works on the highway at Junction Street and Plunkett Street.
- In conjunction with works to upgrade Junction Street and highway/Junction Street by Stockland as required by their consent; Council have allocated additional funds to complete additional lane works on northern side of Junction Street (additional lane for access to ENSA) and the proposed traffic signals at Junction Street / Nowra Lane.
- Consent conditions require Stockland to undertake works on Junction Street, Journal Street, Morton Parade and Plunkett Street in addition to LATM improvement works on East Nowra roads between Plunkett Street and Kalandar Street.
- Stockland DA conditions of consent require Stockland to reconstruct the existing bicycle path at the rear of the existing building to be relocated around the eastern perimeter of the new building.

Potential redevelopment of the Gateway Precinct (south of the bridge) site Princes Highway - Kinghorne Street to Forest Road South Nowra

The RTA is planning to upgrade 6.3 kilometres of the Princes Highway to four lanes between Kinghorne Street and Forest Road at South Nowra. This upgrade is likely to occur in the next few years.

Upgrading this section would link the existing four lane sections of the highway to the north and south, providing four lanes on the Princes Highway between Bomaderry and the Jervis Bay turnoff. It includes 3km of new shared path, will have a posted speed limit of 70km/h effecting continuous 70km/h speed zone through Nowra-Bomaderry.

Princes Highway - Gerringong to Bomaderry

This road upgrade will effectively bypass the Berry Town Centre to the east, with 4 lanes (median separated) and higher speed limit. The Berry Bypass is unlikely to have a significant impact on Nowra; however it may introduce some additional traffic that would have previously stopped in the Berry Town Centre and which may instead stop at Nowra.

The Gerringong to Bomaderry upgrade is unlikely to occur in the short to medium term.

North Nowra Link Road

The proposed North Nowra Link Road is a road intended to reduce traffic congestion on Illaroo Road as well as remove up to 30% of traffic from the intersection of Princes Highway / Illaroo Road.

Council has a budget to commence the works immediately however environmental concerns have prevented the Department of Planning from issuing an approval to Council to allow the project to commence.
Conclusions

Oblique view of Nowra looking south
Conclusions

Since the realignment of the highway, significant development has occurred, including the Stockland Nowra shopping centre, resulting in an attraction of traffic (pedestrian and vehicular) to the east and increased division between eastern and western sides of the Nowra CBD. Pedestrian and vehicular connectivity east west is difficult due to the significant traffic volumes and high-speed environment of the highway.

Many traffic studies in addition to extensive modelling have been conducted to assess traffic conditions in the Nowra CBD. These have lead to a series of recommendations, which have been used in consent conditions for Stockland Nowra expansion proposals, and will be reflected in the Master Plan.

Nowra is the regional centre for northern Shoalhaven and the Nowra CBD is used by surrounding communities for commercial and administrative needs, effectively meaning the Princes Highway becomes a local arterial road. As a result, short periods of capacity constriction can occur on the highway during peak use. The Shoalhaven River Bridge and adjacent intersections are particularly susceptible to higher traffic volumes.

A combination of local growth in the Nowra Region and background growth on the Princes Highway will lead to an increase of future traffic volumes through the CBD and highway, regardless of whether the Western Bypass goes ahead.

Parking has also become a concern for local residents with the perception of a significant shortfall in parking supply. Although this is somewhat supported by the 2007 parking study, it does not take into account on-street or fringe parking, and demand has been calculated on the basis of short peak surveys.

Active transport options are not prioritised or specifically encouraged in the CBD, with few bike and pedestrian pathways and crossings, wide roads, and high speed vehicular traffic in addition to a challenging topography.

To address the transport issues in Nowra CBD, the priorities and objectives need to shift gradually away from accommodating the private vehicle, to encourage more sustainable modes of transport. It is not always possible to improve capacity constraints by adding new lanes - the implementation of sustainable alternatives including walking, cycling, public transport, and parking management should be considered to reduce the demand on the transport network.

It is, however, essential to recognise the important role of the private vehicle in Nowra, and in future planning to accommodate the possible need for road improvements and expansion, in conjunction with planning for walking, cycling, parking, and public transport. The integration of all these modes will be reflected in the Master Plan.

Junction Street
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