04

future transport plan

4.1 INTRODUCTION

4.1.1 BACKGROUND

The Future Transport Plan provides recommendations for transport related upgrades and mitigation in the future years of 2020 and 2030 within the study area for the Northern Area Eurobodalla Shire Tracks modelling project. There is a major focus on the strategic road network especially:

- The Princes Highway.
- Beach Road.
- George Bass Drive.
- Link Road Bypass.
- North Head Drive.
- Dunns Creek Road.
- Tomakin Road.
- Broulee Road.
- Cullendulla Drive.
- South Head Road.

The modelled volumes used for the detailed analysis throughout this study are based on the average weekday AM and PM peak periods during the low season (i.e. low season for tourism) time of year; it was a requirement of the project that the TRACKS model be built and validated to this off-peak seasonal time of year, which for this project was May; building a model for the peak tourist season was outside the scope of this project. It needs to be recognised therefore that the modelled volumes analysed in this report will be exceeded on several occasions throughout the year and so cognisance must be maintained of this when reading the report and also incorporating the recommendations.

Given therefore that the modelling was carried out for the average peak time of day, but during the low season, we have provided additional comment at some locations where there may be other possible impacts during the peak season or high percentile scenario (e.g. 90th percentile). It should be noted that any comments relating to peak season or high (e.g. 90th) percentile scenarios have not been scientifically tested as part of the TRACKS modelling, and as such, any of these additional comments for peak season conditions will warrant further investigations. Similarly there may be some areas that could emerge as being an issue in a future peak season scenario, but because of the absence of detailed analysis for that time of year, may not have been picked up in this study.

Furthermore, and in relation to this, Council previously developed an Infrastructure Contributions Plan, which identified upgrades to infrastructure that are likely to be required in the future for the shire. It is envisioned that the recommendations here will supplement those previously outlined in the Infrastructure Contributions Plan.

4.1.2 FUTURE TRANSPORT PLAN KEY ISSUES

Given that detail has already been provided as to the main growth areas (see also Appendix 1-C for the Land Use Planning Report), the remaining part of the future transport plan is fully focused on the transport and infrastructure issues and how to mitigate them going into the future.

Further to this, in our discussions with Eurobodalla Shire Council it has been pointed out that there is a need for the future transport plan to determine solutions in the specific areas of infrastructure, operations and non-motorised modes. We have also provided mitigating recommendations for safety in relation to crashes; and all of the above may be incorporated into the Council's Infrastructure Contributions Plan.

4.2 ROAD NETWORK OVERVIEW

The bulk of our findings and recommendations directly relate to the road network and specifically the strategic road network in 2020 and 2030. What follows are mitigation measures that are recommended for implementation, based on the outputs and findings as detailed earlier in the future modelling section of the report.

4.3 2010 SCENARIO FINDINGS

Findings from the 2010 TRACKS modelling for each strategic road are detailed in the following sections. Comments are included for likely impacts as a result of the high season (90th Percentile) outcomes.

4.3.1 Princes Highway

Links

The midblock volumes along the length of the Princes Highway revealed no major issues when considering the average day peak hour volumes determined through the modelling. LoS results did drop to C in some areas, with this being acceptable.

With volumes factored up to the 90th percentile day it is possible that this LoS would increase to LoS D. The locations on the Princes Highway likely to experience this increase include:

- **Berrima Parade to Kings Highway Northbound** – this is rural road length and there is a reasonable case here to consider provision of a northbound overtaking lane along this length of the Highway.
- **Clyde Street to North Street Northbound** – at the location where the highway merges from two lanes to one for the approach to the Bridge. There may be a case for addressing this once the bridge is duplicated and it is recommended that cognisance be taken here of this and further analysis be carried out in the model with such a scenario included in a suite of potential upgrades.

Intersections

Most intersections along the Princes Highway are performing adequately during the 2010 scenario with the exceptions identified below. The intersections generally operate with spare capacity; however there are some turn movements which exhibit LoS results that could become a concern in the near future:

- **North Street** – This is showing an emerging need for the lengthening of the right turn bay on the Princes Highway. The LOS of C for both right turn movements at this junction is shows the possibility of increasing to Los D for the 90th percentile day. Note also that previous Paramics modelling here also recommended lengthening the right turn bay prior to 2020.
- **Beach Road** – This is also showing an emerging need for a lengthening of the right turn bay on the southern side of the intersection. Currently it is LoS D for the average day; again there is a likelihood that this may deteriorate to LoS E on the 90th percentile day. A similar situation is occurring on the left turn on the northern side of the intersection. It is recommended that this right turn bay be carried out prior to the year 2020.
- **Church Street** – The modelling is showing some current and emerging issues with the intersection. The LOS of the side roads is D for both the left and right turns having the potential to worsen for the 90th percentile day. In addition, the LoS of C along the Princes Highway may drop to a D during the 90th percentile day, and it is a recommendation that clearways be introduced at this intersection prior to 2020.

4.3.2 Beach Road

Links

All of the road lengths along Beach Road indicate a satisfactory LoS both for the average day; cursory checks of the 90th percentile day appear similar. Accident statistics however indicate that there is a high incidence of rear end type accidents along sections of this road, indicating that there would be benefits to installing a central median particularly **between the Princes Highway and Country Club Drive** where conflicts with turning movements to/from driveway accesses is creating a conflict with through traffic.

Intersections

- **Orient Street** – modelling has identified emerging issues with this intersection. LoS D exists on some movements during the average day which is likely to worsen for the 90th percentile scenario. The required improvements for this intersection are listed in Section 4.4 below.
- **Flora Crescent** - modelling has identified emerging issues with this intersection. LoS C exists on some movements during the average day which again is likely to worsen for the 90th percentile. The required improvements for this intersection are listed in Section 4.4 below.

4.3.3 Other Roads

The modelling revealed that all road links along the following roads are operating well for both the average day and the 90th percentile day:

- **George Bass Drive.**
- **North Head Drive.**
- **Dunns Creek Road.**
- **Tomakin Road.**
- **Broulee Road.**
- **Culendalla Drive.**
- **South Head Road.**

The modelling also revealed that all intersections along the above roads are operating well for both the average day and the 90th percentile day.

4.4 2020 SCENARIO UPGRADE RECOMMENDATIONS

4.4.1 Overview

The 2020 models were developed both with and without the proposed South Batemans Bay Link Road. The Link Road was modelled as an extension to Glenella Road that provided a link between George Bass Drive and the Princes Highway. It included an extension of Herron Road that connected to the new Link Road. The intersection of The Link Road and the Princes Highway was positioned at the current location of the Ridge Road intersection south of Batemans Bay.

The models were developed to allow movement to/from the north only at this new junction with the Princes Highway as it is understood that this is the current proposal. The results indicated that the Link Road provided an alternative route for vehicles travelling to/from the southern suburbs of Batemans Bay and helped to reduce traffic along sections of Beach Road. A sensitivity test was also conducted that allowed all movements to occur at this proposed new junction.

4.4.2 Princes Highway

Links

The modelling has highlighted several issues with the Princes Highway:

- **Between Cullendulla Drive and North Street** is showing a LoS D northbound during the average day which shows possibility of increasing to D, E and F during the 90th percentile day. It also shows a LOS D across the bridge southbound which then converts to an F for the 90th percentile day. It is recommended that the following be installed before 2020:
  - Between Berrima Parade and North Street - four lanes (two northbound and two southbound) are required, this includes a new bridge over the Clyde River.
  - Between Cullendulla Drive and Berrima Parade - an additional length of northbound overtaking lane.
- **Between The Old Princes Highway and The Ridge Road** – The modelling shows LoS B and Los D for the average day which shows strong probability of increasing to LoS D and LoS E for the 90th percentile day. It should be noted that these volumes are without the introduction of the proposed Link Road that will likely increase these figures further. It is recommended therefore that:
  - Between the Ridge Road and The Old Princes Highway - two northbound lanes be installed. This recommendation stands with or without the Link Road bypass.
- **Between Shelley Road and Church Street** shows a likely LOS D in the 90th percentile day northbound indicating an emerging problem here. It is recommended that clearways be installed on both sides of the Highway between Shore Street and Queen Street.

Intersections

The following intersection upgrades along the Princes Highway are recommended prior to 2020:

- **Cullendulla Drive** – there is an existing safety concern for southbound vehicles along the Princes Highway making a left turn into this road. Prior to 2020 it is recommended that:
  - An 'AUL' type intersection treatment be installed at this location.
- **Clyde Road** - currently there is no designated right turn lane provided at this intersection for vehicles travelling south along the Princes Highway. The intersection is located in the vicinity of a southbound overtaking lane meaning that vehicles stopping to turn right block up the right hand fast moving lane. With the increasing traffic and reduction in available gaps in the northbound traffic stream to make this turn, there is a significant safety concern in the future. It is therefore recommended that prior to 2020 the following be in place:
  - The provision of a 'CHR' type intersection treatment – this should be done in conjunction with the duplication of the northbound travel lanes as described previously.
- **Berrima Parade** – is already a safety concern with existing accident records including a recent fatality at this junction. Sight distance to the south is poor and the existing seagull treatment is sub-standard. We therefore recommend that prior to 2020:

- This intersection to be relocated to the north to a location that has sufficient sight distance. A seagull intersection treatment may be provided at the new junction with works also incorporated into the duplication of the northbound travel lanes as described previously. The provision of a left turn acceleration lane for vehicles turning out of Berrima Parade and heading south would also help alleviate the problems identified at this junction in the 2030 scenario.

- **Clyde Street** – it is recommended that the following be implemented prior to 2020:
  - The construction of a new bridge over the Clyde River, which would provide an opportunity for the Bridge to be extended and be constructed over Clyde Street – with Clyde Street continuing under the bridge.
  - Clyde Street will have limited access to/from it directly from the Highway once the new bridge is operational. This will then solve the issues associated with this intersection identified later in the 2030 scenario.
- **North Street** – It is recommended that prior to 2020:
  - The northbound right turn lane is extended.
- **Beach Road** - It is recommended that prior to 2020:
  - The northbound right turn lane is extended.
- **Old Princes Highway** – It is recommended that the following be implemented prior to 2020:
  - Installation of traffic signals.
  - It is also recommended that a LATM scheme be installed in Bavarde Avenue between South Street and Gregory Street, in Pacific Street between South Street and Bavarde Avenue and in Gregory Street between South Street and Bavarde Avenue – to prevent each of these streets from being used for 'rat-running' purposes.
- **Link Road Bypass** (at existing Ridge Road intersection) – It is recommended that the following be implemented prior to 2020:
  - Upgrading of the intersection to make provision for all turn manoeuvres to/from the north and south at this junction. The modelling is showing that in order to get maximum benefit from this link road project all manoeuvres to/from the north and south need to be catered for. It is recommended that a seagull type intersection would be suitable but would require some realignment of the Highway to the north and south to ensure its safe operation.
- **Queen Street** – it is recommended that the following to be done prior to 2020:
  - Installation of traffic signals.
  - As part of the installation of signals at this junction it is recommended to install an LATM scheme in Shore Street and Ford Street to prevent this route from being used for 'rat-running' purposes.
- **South Head Road** - it is recommended that the following be implemented prior to 2020:
  - Installation of a roundabout.
  - This requirement is attributable to the developments that are occurring along South Head Road – in particular the Moruya East development.
- **Albert Street** - it is recommended that the following be implemented prior to 2020:
  - Installation of a roundabout.
  - This requirement is attributable to the proposed 10 Lot industrial sub-division to be located on the eastern side of the Highway adjacent to this junction.

4.4.3 Beach Road

Links

The mid block volumes along Beach Road in 2020 are showing no major issue with regard to Level of Service. It should be noted however that these Levels of Service on maintaining a free flowing road environment with limited influence from side street and property accesses. The length between Country Club Drive and Princes Highway has the largest traffic volumes with these levels having the likelihood of increasing significantly during the busiest holiday periods. Measures can be taken to limit side street access and direct property accesses along this length of road. The following is recommended to increase capacity and improve safety:

- **Between the Princes Highway and Country Club Drive** - the installation of a raised central median. One safety benefit here would be a reduction in conflict between turning movements to/from adjoining properties thus reducing the incidence of rear end type collisions that are prominent along this length of road. It is also n opportunity to limit movements to key intersections only.

Intersections

Additional intersection upgrades recommended along Beach Road are:

- **Perry Street** –the existing roundabout be replaced with signals prior to 2020, to include the following:
  - A right turn lane for vehicles turning into Perry Street.
  - Two straight through lanes on both Beach Road approaches.
- **Orient Street** – be upgraded prior to 2020 to include the following:
  - A right turn lane for vehicles to turn right into Orient Street south.
  - A left turn lane for vehicles to turn left into Orient Street south.
  - Two straight ahead lanes on both Beach Road approaches.
- **Flora Crescent** - it is recommended that this be upgraded prior to 2020 and to include the following:
  - A right turn lane for vehicles to turn right into Flora Crescent.
  - A left turn lane for vehicles to turn left into Flora Crescent.
  - Two straight ahead lanes on both Beach Road approaches.
- **Catlin Avenue/Country Club Drive** – The provision of right turn lanes is difficult to achieve at this location due to the existing creek. It is recommended that this intersection have the following turn bans placed on it prior to 2020:
  - A right turn ban be installed for vehicles wanting to turn right into Country Club Drive – this should be installed during peak hours in the first instance and then monitored to determine if full time banning is required.
  - A right turn ban be installed for vehicles wanting to turn right into Catlin Avenue – again this should be installed during peak hours in the first instance and monitored to determine if full time banning is required.
  - The above turn bans should be installed in conjunction with the roundabout at Hanging Rock Place mentioned below – this new roundabout and the existing one located at Bavarde Avenue will allow U-turns to occur downstream from the signals for vehicles wanting to access Catlin Avenue and Country Club Drive.
- **Hanging Rock Place** – With the Hanging Rock Reserve becoming a regional sporting facility with many new facilities planned it will increase demand for movements in/out of Hanging Rock Place. It is recommended that the following to be done prior to 2020:
  - The installation of a two lane roundabout at this junction.

4.4.4 George Bass Drive

Links

The 2020 modelling shows that **all links along George Bass Drive** are operating reasonable well. Cursory checks of the 90th percentile reveal a likelihood that this would be the case then also, for 2020. From a safety perspective, there are 2 improvements that will help to improve this road; it is recommended that the following be implemented for safety enhancement:

- **Surf Beach Avenue to Beach Road – Northbound**:
  - Two lane section to be extended through to Beach Road roundabout to prevent the existing need for vehicles to merge into one lane coming out of the roundabout and then de-merge back out into two lanes shortly afterwards.
- **Grandfathers Gully Road and Denise Drive**:
  - This stretch has a high accident history including a recent fatal. The bends should be realigned with the provision of adequate shoulders.

Intersections

It is recommended that the following intersection upgrades along George Bass Drive be implemented prior to 2020:

- **Link Road (Glenella Road):**
  - A two lane roundabout should be provided at this junction to coincide with the Link Road Bypass being built through to the Princes Highway.
- **Various intersections between Grandfathers Gully Road and Ridge Road:**
  - This stretch of road runs through Malua Bay and contains several intersections that have little or no intersection treatments currently. It is recommended that these intersections be progressively upgraded with AUR or CHR type intersection treatment on a case by case basis to be determined by monitoring of future conditions.
  - The upgrades of these intersections should be done in conjunction with programmed reconstruction work along this length of road and in association with the Grandfathers Gully Road to Denise Drive realignment mentioned above.
  - The provision of adequate intersection treatments along this length of road will help maintain capacity of this road during busy periods. It also has the potential to mitigate the number of accidents occurring as a result of turning movements.

4.4.5 Link Road Bypass

Links

The following recommendation is made for implementation prior to 2020:

- The provision of a 2 lane road way (1 lane in each direction) providing a link between George Bass Drive and the Princes Highway. This will help alleviate traffic flow issues along Beach Road during busy times of the year.

Intersections

It is recommended that the following intersection works along the Link Road Bypass be implemented in conjunction with the development of the route:

- **Curtis Road** – installation of a CHR type intersection treatment.
- **Heron Road** - extended through to the Link Road with a CHR treatment provided.

4.4.6 Tomakin Road

Intersection

The intersection treatments along Tomakin Road are operating well in the 2020 model. No improvements required for 2020 scenario however due to the increases in traffic volumes the intersection with **Dunns Creek Road** and its existing BAR treatment will have some emerging safety concerns

4.4.7 Cullendulla Drive

Links

The modelling has revealed that **all links along Cullendulla Drive** are operating well for both the average day and cursory estimates of the 90th percentile day.

Intersection

Due to the increased traffic volumes, there is potential for safety issues to emerge at the **intersection of Cullendulla Drive with the Princes Highway**. It is recommended that an AUL treatment be installed for vehicles turning left into this road heading southbound along the Princes Highway.

4.4.8 South Head Road

Links

The modelling has revealed that **all links along South Head Road** are operating well for both the average day and cursory estimates of the 90th percentile day.

Intersection

The **intersection of South Head Road with the Princes Highway** requires a single lane roundabout to be installed. This is as a result of the development occurring along South Head Road, in particular the proposed Moruya East Village development.

4.5 2030 SCENARIO FINDINGS

Following on from the 2020 modelling and recommendations, the 2030 model runs have the associated recommendations below. As was with the case for 2020, the 2030 model was developed both with and without the proposed South Batemans Bay Link Road.

Again, the Link Road was modelled as an extension to Glenella Road that provided a link between George Bass Drive and the Princes Highway. It was included as an extension of Herron Road that connected to the new Link Road. The intersection of The Link Road and the Princes Highway was positioned at the current location of the Ridge Road intersection south of Batemans Bay.

4.5.1 Princes Highway

Links

In the 2030 scenario (with the above 2020 improvements made) the congestion issues regarding the mid block LoS have been moved south to the Mogo and Moruya areas. It is recommended therefore that the following upgrades along the Princes Highway be in place prior to 2030:

- **At Mogo Northbound** – the modelling shows that this operated adequately during the average day; however with increased traffic during busy holiday times the Level of Service may drop to unacceptable levels during the 90th percentile day. This indicates that further investigation is required in this area.. There may be a need for the RTA to consider an additional northbound lane through Mogo, subject to more rigorous 90th percentile checks.
- **At Moruya** – The modelling indicates some unsatisfactory LoS through Moruya both for the average day and therefore the 90th percentile day. With rat running occurring along Ford Street, it is possible that LoS may drop below D, which is currently experienced on an average day in 2030. The problems that are likely to result from this scenario would adversely affect the intersection with Church Street & Queen Street. The modelling suggests that further analysis needs to be undertaken within the urban area of Moruya and that additional future micro-simulation modelling may be required to determine solutions to future traffic needs.

Intersections

Recommendations for intersection upgrades along the Princes Highway prior to 2030 are:

- **Tomakin Road** – it is recommended that this intersection be upgraded to a roundabout.
- **Church Street (Moruya)** - implement clearways along the Princes Highway on approach to the intersection to provide additional capacity.

4.5.2 George Bass Drive

Links

The following recommendation for George Bass Drive is made for implementation prior to 2030:

- **Beach Road to Sunshine Bay Road** – the modelling suggests that this length of George Bass Drive is approaching capacity during busy periods. This section is relatively easy to duplicate with much of the earthworks already done. It is recommended that this part of George Bass Drive be upgraded to 2 lanes in both directions prior to 2030 – this will include the widening of the Joes Creek culvert.
- **Illabunda Drive to Annetts Parade** - The modelling is suggesting that further analysis should be given to providing additional overtaking opportunities along this section of George Bass Drive. The LoS along this section is C in the average day, with a likely drop during the 90th percentile. This may be a concern in the future and warrants further investigation for possible treatments such as the provision of overtaking lanes.

Intersections

The following intersection upgrades along George Bass Drive are recommended prior to 2030:

- **Calga Crescent** – The installation of a 2 lane roundabout at this location will help vehicles coming and going from Calga Crescent. It will also provide a U-turn facility.
- **Various intersections between Grandfathers Gully Road and Ridge Road**:
  - It is recommended that the progressive upgrade of intersections treatments through Malua Bay continue (as specified above in the 2020 scenario).
- **Kuppa Avenue and Silvan Street** – The installation of a roundabout at this intersection would increase safety for vehicles making turns at this junction and also act as a speed control.
- **Tomakin Road** – The modelling suggests that this intersection is significantly over capacity in 2030 with a LOS of F for the average day. It is recommended that:
  - A roundabout be installed at the intersection with a 4th leg connecting to Sunpatch Parade.
- **Ainslie Parade** – remove the intersection altogether with the main access to Tomakin being via the 4th leg of the roundabout listed above.

4.5.3 North Head Drive

Intersection

No issues detected in the modelling – however the problems being experienced along the Princes highway in Moruya may have an impact upon the North Head Drive intersection. Further investigation needs to be carried out here.

4.5.4 Dunns Creek Road

Intersection

- **Tomakin Road** - The intersection with Tomakin Road should be upgraded to a CHR to improve safety and capacity.

4.5.5 Tomakin Road

Intersection

The following intersection upgrades along Tomakin Road are recommended prior to 2030:

- **Princes Highway** – installation of a roundabout.
- **Dunns Creek Road** – upgrade to a CHR.
- **George Bass Drive** – installation of a roundabout.

4.5.6 Other Roads

The modelling revealed that **all links and intersections along the following roads** are operating well for both the average day and for the cursory estimates of the 90th percentile day with no improvements required for 2030 scenario – provided that the issues in the 2020 scenario have been addressed:

- Beach Road.
- Link Road Bypass.
- Broulee Road.
- Cullendulla Drive.
- South Head Road.

4.6 SUSTAINABILITY IN THE STRATEGIC CONTEXT FOR NON CAR MODES

4.6.1 CURRENT MODAL SPLIT

The 2006 Census was conducted in August 2006 which asked for demographic information on the population of people that were counted on Census Night, otherwise referred to as 'enumerated data'. The 'Enumerated Data' represents where people were counted on Census Night (8 August 2006), which may not be where they usually live. This population figure generally includes overseas visitors and visitors to the area from within Australia, but excludes Australians overseas.

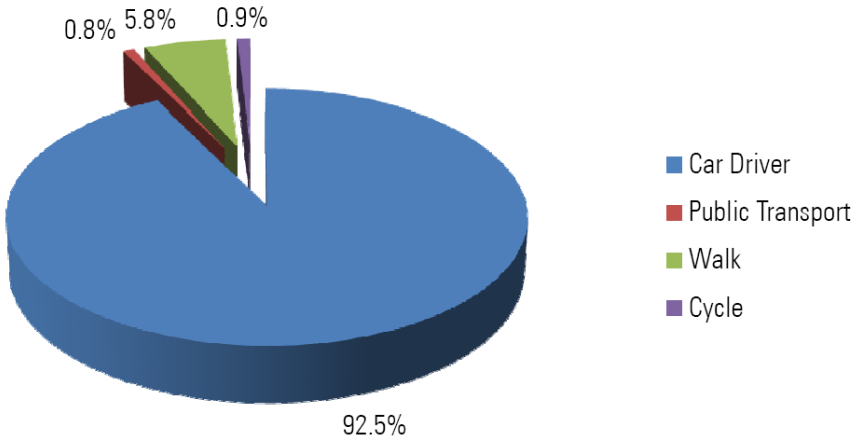
Data was collected in Eurobodalla Shire LGA on peoples' method of travel to work. This was derived from the Census question, 'How did the person get to work on Tuesday, 8 August 2006?' and relates only to persons aged 15 years or more. This data reveals the principal modes of transport used by people to get to work. In the case of Eurobodalla Shire LGA:

- A significant majority of respondents said they used a **private vehicle to get to work (70.5%)**.
- Only a small proportion used alternative modes to access work, including:
  - Public transport (0.6%).
  - Walking (4.4%).
  - Cycling (0.7%).

The remaining respondents said they did not go to work (13.5%), followed by those who said they work from home (6.5%) and other minor categories. These figures would likely mostly represent the retiree population in the Eurobodalla Shire LGA.

If we just consider those who worked the mode share can be considered as shown in Figure 4.1.

Figure 4.1 Adjusted Journey to Work Mode Share for Eurobodalla LGA 2006



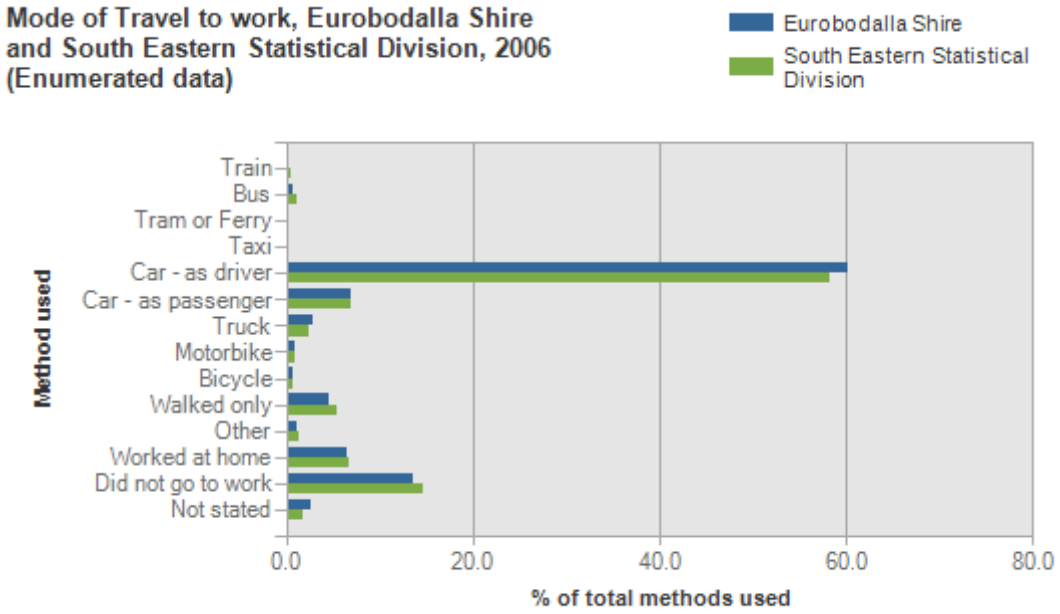
In comparison, a slightly lower proportion of South Eastern Statistical Division (SESD) respondents said they used a private vehicle to get to work (70.5%), whilst a slightly greater proportion used alternative modes to access work, including public transport (1.3%), walking (5.4%); except for cycling, which had a smaller percentage of respondents (0.5%). There was a slightly greater proportion of SESD respondents which represented those who did not go to work (14.7%), and those who said they work from home (6.7%).

Figure 4.2 shows the 2006 mode share for journey to work movements in the LGA, compared with the South Eastern Statistical Division. For a full comparison of journey to work data, refer to Table 4.1.

There were no major differences in travel to work data when comparing the 2006 Census data for Eurobodalla Shire and the South Eastern Statistical Division.Figure 4.3 shows that the most significant changes in the method of travel to work by resident population in Eurobodalla Shire between 2001 and 2006 were for the following categories:

- Car - as driver (+1,475 persons).
- Did not go to work (+126 persons).
- Walked only (+88 persons).
- Car - as passenger (+72 persons).

Figure 4.2 Journey to Work Mode Share 2006



Source: Australian Bureau of Statistics, 2006 Census of Population and Housing (Enumerated)

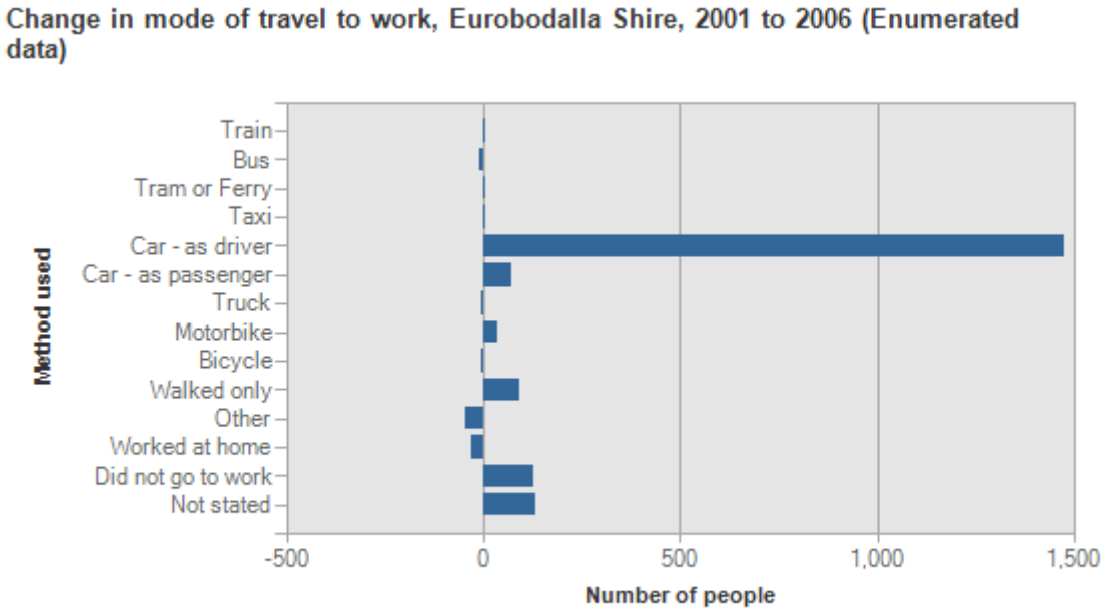
Table 4.1 Journey to Work Modal Data 2001-2006

Travel to work (includes multi-mode journeys)	Eurobodalla Shire						
	2006			2001			
Enumerated data	number	%	South Eastern Statistical Division %	number	%	South Eastern Statistical Division %	Change 2001 to 2006
Train	11	0.1	0.3	10	0.1	0.4	1
Bus	67	0.5	1.0	77	0.7	1.0	-10
Tram or Ferry	3	0	0	0	0	0	3
Taxi	15	0.1	0.2	10	0.1	0.2	5
Car - as driver	7,317	60.1	58.2	5,842	56.5	54.4	1,475
Car - as passenger	831	6.8	6.8	759	7.3	7.2	72
Truck	335	2.7	2.3	344	3.3	2.7	-9
Motorbike	107	0.9	0.8	72	0.7	0.7	35
Bicycle	80	0.7	0.5	81	0.8	0.6	-1
Walked only	539	4.4	5.4	451	4.4	5.6	88
Other	128	1.1	1.3	173	1.7	1.9	-45
Worked at home	792	6.5	6.7	822	7.9	8.0	-30
Did not go to work	1,643	13.5	14.7	1,517	14.7	15.7	126
Not stated	316	2.6	1.7	186	1.8	1.7	130
Total	12,184	100.0	100.0	10,344	100.0	100.0	1,840

Source: Australian Bureau of Statistics, Census of Population and Housing, 2006, 2001, 1996, and 1991.

NOTE: Table totals may not equate with other similar tables due to **randomisation** of small numbers.

Figure 4.3 Journey to Work Modal Change 2001-2006



Source: Australian Bureau of Statistics, 2006 and 2001 Census of Population and Housing (Enumerated)

4.6.2 POTENTIAL FUTURE MODAL SPLIT

Given there has been no significant public transport improvement or pedestrian and cycle infrastructure additions in the study area for some time, it is expected the trend towards car dependency will continue unless changes are made.

Given that the 2006 car mode share for those who travel to work, for the purposes of this study, is approximately 92.5%, it is estimated that once significant measures are adopted to reduce car dependency, including proposed travel demand management measures, active transport measures and public transport measures; the trend towards growing car dependency can be mitigated.

Under these circumstances, car mode share could be reduced to a mode share level of 87%, which would likely require a proportional increase of 5.5% in green travel modes (bicycle, walk-only and public transport) for trips to work.

4.6.3 MEASURES TO REDUCE CAR DEPENDENCY

Eurobodalla Shire's philosophy is for the development of sustainable communities, to ensure the area's ongoing viability and desirability. Provision of appropriate sustainable transport options and travel demand management tools are key components of this. The recommendations presented below demonstrate measures that will assist in actively reducing car mode share across the subject area.

Proposed Travel Demand Management Measures

Measure 1: Website/Community Portal

Establish community website/portal to facilitate promotion of public transport information, initiatives, events and activities for residents and workers. The website could provide links to local service providers as appropriate.

Measure 2: Resident Kits

Incorporate public transport information, including public transport route maps and timetables, hike and bike trail maps, fitness trail maps and sustainable community initiatives as part of Resident Kits. Sustainable community initiatives to be investigated may include car pooling, bike pooling, bike hire schemes, etc as appropriate. Kits are distributed to households as they move into the development.

Measure 3: Promotions

Promotion of public transport initiatives via Community Portal, Resident Kits, Community Events and Activities. Promotion of significant relevant sustainable transport events eg. 'cycle to work' day.

Measure 4: Public transport incentives

Investigate with State Government and local transport providers, public transport incentive schemes to encourage resident and worker take up of public transport.

Measure 5: Land Use/Transport Interaction

A mixed-use approach to all new major developments including incorporating a street and pedestrian framework based on a modified grid. The following key elements support this measure:

- Walking and cycling networks designed to provide for both commuter and recreation users linking key amenities within the shire, as well as providing access to existing neighbouring facilities.
- Engaging and active streets that provide a positive experience for the users particularly along primary pedestrian and cycle corridors.
- Crime Prevention Through Environmental Design (CPTED) principles applied to provide a greater sense of safety through passive surveillance of streets, parks and other areas of open space.
- Establish a sub network of lit paths to provide for safer walking and cycling after dark.
- Locate key amenities to maximise walkable access.
- Holistic approach to the design of new street networks, carefully balancing the needs for vehicle movement with the needs of pedestrians and cyclists. This has to be considered at all levels of the design from parking requirements and intersection function down to the detail of path materials and kerb radii to ensure the whole movement system supports a balanced approach.

Active Transport Principles

Measure 6: Local Access Street Design

A holistic approach is recommended to be taken to balance all users of local streets and will include sufficient space to provide a high level of pedestrian amenity. This will include appropriate traffic calming, signage and speed limits as well as built-form controls on adjacent parcels to create a cohesive and robust environment.

Measure 7: Pedestrian and Cycle Hierarchy

Established a pedestrian and cycle network for Eurobodalla Shire that links key amenities including open spaces, schools and the facilities in the Batemans Bay and village centres. A hierarchy of paths will be used to create enhanced corridors providing a greater level of amenity for both pedestrians and cyclists. The path or on-street bike lane network will make extensive use of the open space areas, linkage corridors (including the linear riparian corridors), collector and arterial roads, and pedestrian priority streets.

Measure 8: Wayfinding Signage

The way-finding strategy will be designed and installed to indicate access routes for amenities and local facilities. The signage system needs to be clear and co-ordinated and present information on distances, times and accessibility where relevant.

Measure 9: Parking Strategies

Parking in Bateman's Bay and Town and Village Centres will be co-ordinated and where possible shared across uses. This, along with possible time restrictions and extensive on-street parking, will create more walkable centres. The establishment of a shared parking district could also be considered in the Batemans Bay CBD to further reduce the parking requirements and to encourage a park once attitude when undertaking multiple activities in the Batemans Bay CBD.

Measure 10: Safety Elements for Network

Crime Prevention through Environmental Design (CPTED) principals will be applied where possible to all trails and paths in the pedestrian and cycle network. A sub network of lit paths will be provided to encourage after-dark pedestrian and cycle access. Other amenities will be considered as part of the network including water supply, seats, bike racks, and shade structures where appropriate.

Measure 11: Bicycle Parking

To facilitate cycle usage throughout the project, bicycle parking will be provided in close proximity to the schools and sports ovals, in Batemans Bay and Village Centres and will be encouraged as part of new development of employment and other commercial uses. Other areas of key Open Spaces will also have bicycle parking.

Public Transport Principles

Measure 12: Bus Network Provision

A hierarchy of bus routes should be developed and implemented as part of a future study in the area.

Measure 13: Service levels that meet and exceed NSWTI's *Outer Metropolitan Service Planning Guidelines*

The future improved public transport network should be operated with acceptable target service levels which meet and exceed NSWTI's guidelines.

Measure 14: Branding and Publicity

A clear map identifying bus route hierarchy and indicative stop locations should be made available to potential users. Eurobodalla Shire Council should make representations to NSWTI and Premier Illawarra to urge the development of a branding strategy based on public transport LoS.

Measure 15: Bus Stop Infrastructure

A hierarchy of bus stops should be developed and implemented, as appropriate.