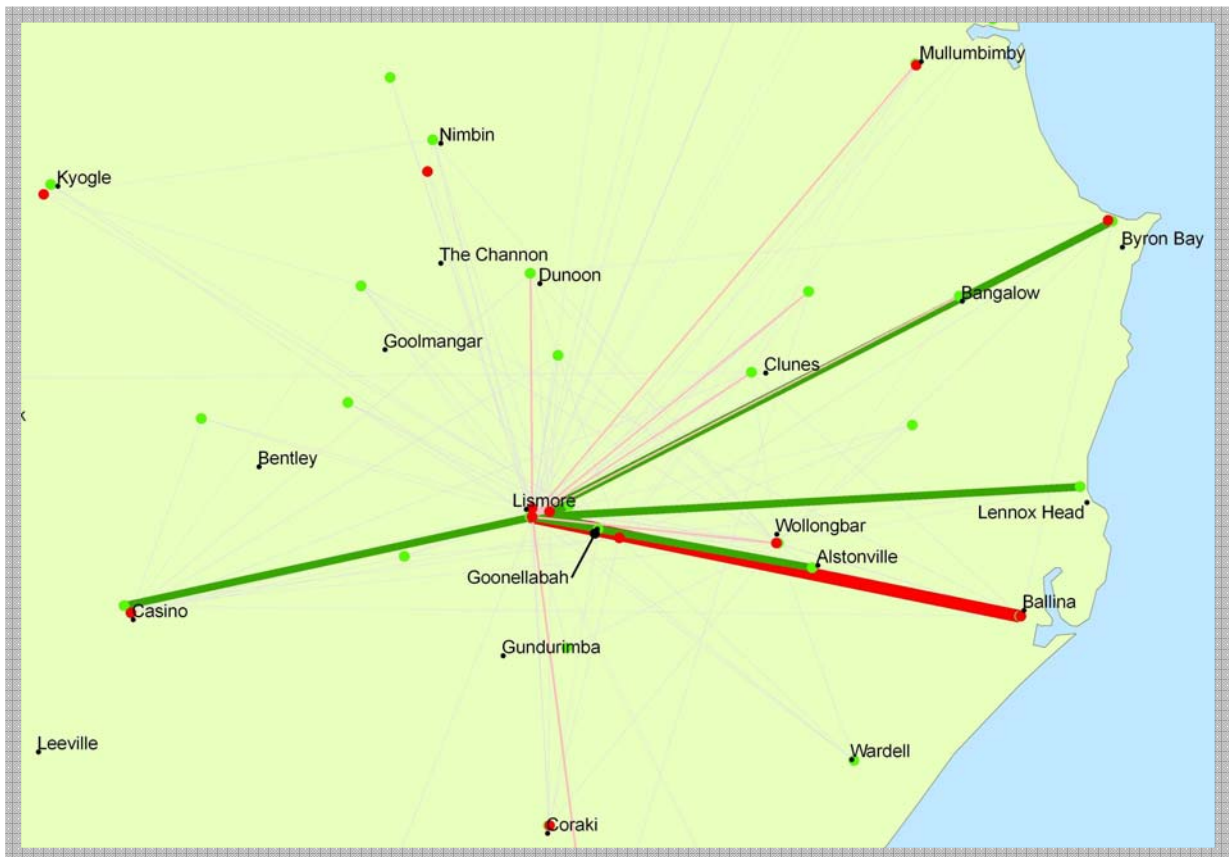




Lismore Commuter Hub Report

a *Sustain Northern Rivers* project
to increase transport options



NSW Health Department

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Sixteen regional organisations participated in the online survey that provided the data set for the North Coast Commuter Mapping project. In addition to North Coast Area Health Service these are North Coast TAFE; Southern Cross University; Northern Rivers Social Development Council; Lismore City Council; Clarence Valley Council; Richmond Valley Council; and Tweed, Byron, Ballina, and Kyogle Shire Councils. In the Mid North Coast, Coffs Harbour, Bellingen, Kempsey, Nambucca and Port Macquarie-Hastings Council participated in the survey.

Uta Dietrich and Jillian Adams in North Coast Health Promotion have provided ongoing support of collaborative work to address the complex issues of transport disadvantage. Maxine Molyneux, Health Promotion Officer, contributed to data management and analysis of the NCAHS survey, part of which has been incorporated into this survey.

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EXECUTIVE SUMMARY

The *Lismore Commuter Hub Report* is one of multiple reports that came from the *North Coast Commuter Mapping* project initiated by *Sustain Northern Rivers*, in which sixteen participating organisations joined an online commuter survey for staff and/or students. *Sustain Northern Rivers* (SNR) is a Collaboration of peak regional organisations to address climate change and to improve the transport, food and energy sustainability of the Northern Rivers. Its transport goals are to reduce transport emissions, increase transport options, and to increase physical activity, social capital and resilience.

The *Lismore Commuter Hub Report* uses a novel approach to map major commuter flows to key destinations in Lismore by aggregating data from Southern Cross University (SCU), North Coast TAFE, North Coast Area Health Service (NCAHS), Lismore City Council, and the Northern Rivers Social Development Council (NRSDC). It shows where commuter flows to participating organisations originate; preferred times of travel; location of key destinations; as well as the incentives respondents would consider helpful to shift from solo car-journey travel. There were 1083 responses from commuters travelling to and from Lismore to work and study destinations (a subset of the 3661 respondents in the SNR Commuter Mapping survey which spanned sixteen organisations on the North Coast).

Lismore is a regional city surrounded by rural and coastal towns and villages in a region with limited public transport. By aggregating data from large institutions that attract commuting, the results in this report are indicative of commuting flows. The data could provide the basis for collaboration between organisations, transport providers, and government agencies to develop ways to increase transport options for people commuting to Lismore.

Key findings

- 29.3% of respondents lived within 5km of their work/study site. This is within walking range for most people, yet only 10.9% of respondents walked.
- 38.4% of respondents lived within 10km of their site. This is within cycling distance for many people, yet only 4.2% of respondents cycled.
- 45.4% of respondents lived more than 21 km from their work/study site. The data showed a relationship between distance and the alternative travel modes they would consider. The greater the distance from home to work, the higher the percentage of respondents nominating car-pooling as an alternative travel mode. The closer they lived to their destination, the more likely they were to nominate walking and cycling as alternative modes.

- Commuters to Lismore are very car-dependent. 67.8% of all trips to Lismore in the week prior to the survey were solo car journeys.
- Students in TAFE and SCU reported less solo car trips (54.9% and 68.2% of students and staff trips respectively). TAFE and SCU staff were as likely to commute via solo car trips as staff in other organisations.
- Active travelling is more prevalent among students (students 22.3%, staff 8.3%).
- The busiest commuting routes to and from Lismore were Ballina-Lismore, followed by Bangalow-Lismore (including respondents from Byron Bay, Mullumbimby, Tweed, Bangalow, Clunes and Bexhill). The third busiest route was Casino-Lismore.
- The data shows the times of peak commuting. This could potentially be used to review public transport routes, and to generate new ways of providing transport options, particularly for students of TAFE and SCU.
- The largest number of respondents worked or studied in the East Lismore SCU campus, followed by the Lismore town area (including CBD and health precinct).

NORTH COAST COMMUTER MAPPING

North Coast Commuter Mapping is a novel method to map commuter flows via collaboration of 16 large organisations with multiple work sites. The project addresses a lack of transport data in a region of high transport disadvantage. It created a data set that can be used to increase transport options by leveraging the co-operation of regional organisations in the *Sustain Northern Rivers* Collaboration.

Sustain Northern Rivers (SNR) is a Collaboration of eighteen peak regional organisations to address climate change and improve the transport, food and energy sustainability of the Northern Rivers. The transport goals of *SNR* are to reduce transport emissions, increase transport options, and to increase physical activity, social capital and resilience.

A large body of evidence reveals the extent of the threat posed by human-induced climate change¹⁻³. Climate disruption is a risk to our communities; to international security; built environments; species diversity and ecosystems. This threat is of such magnitude that all institutions, sectors and organisations must play their part in turning around current uncontrolled growth in greenhouse gas emissions. To achieve this we need to reduce greenhouse emissions from transport.

In 2009, the *Sustain Northern Rivers* (SNR) transport working group decided to conduct a collaborative commuter survey, adapting a survey instrument developed by North Coast Area Health Service (NCAHS) to determine the commuting modes, times and preferences of staff. Using an online platform, the survey was repeated in NCAHS, and conducted for North Coast TAFE, Southern Cross University (SCU), Northern Rivers Social Development Council (NRSDC) and twelve local councils. A large data set was created for 3,661 respondents. Because participating organisations included large institutions such as NCAHS, TAFE, and Southern Cross University, the collaborative approach yielded data for multiple work and study destinations across the North Coast.

The SNR Commuter Mapping project has several phases

1. Adapting the instrument and engaging participant organisations
2. Conducting the online survey
3. Cleaning and analysing data
4. Reports to each of the 16 participating organisations that showed how their students or staff commuted, their distance from work or study, and incentives that would encourage respondents to use public transport, walk or cycle, or car-pool.

Organisations wanting to quantify their commuting carbon footprint for internal carbon accounting are able to access these data. Recommendations, resources and information were also provided on the benefits of increasing active transport including reducing greenhouse emissions, and increasing staff health and productivity.

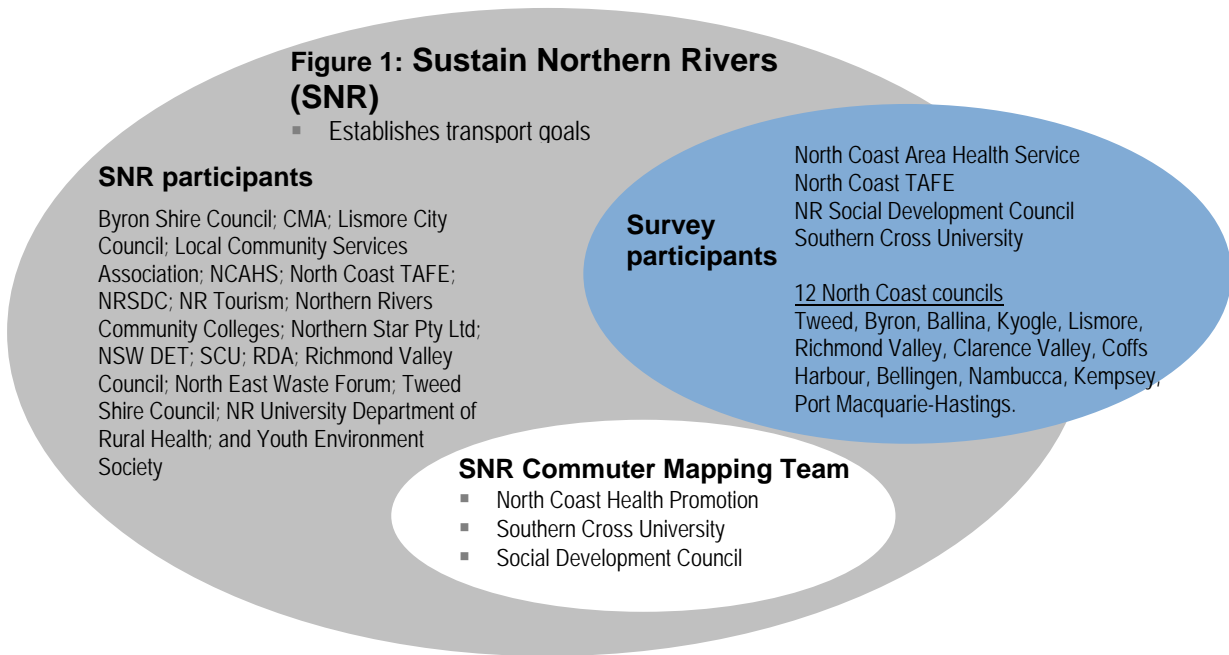
5. Development of a method of aggregating data for a Hub report, including times of travel. The Lismore Commuter Hub report is the pilot for this approach, now repeated for Coffs Harbour and Tweed Heads. In each instance a method was developed to group commuters in transport catchments and corridors unique to each destination.
6. The next phase will be to conduct forums for transport stakeholders at Lismore, Coffs Harbour and Tweed Heads, in order to use the data in the hub reports to generate collaborative solutions to commuter needs.

The SNR North Coast Commuter Mapping project team consists of North Coast Health Promotion (the lead agency), Southern Cross University, and the Northern Rivers Social Development Council. Health Promotion takes the lead role in this partnership because access to transport is a key determinant of health. Lack of transport options contributes to social marginalisation by impeding access to jobs, health services and social activities by socially disadvantaged people. By increasing transport options, we will increase social inclusion. Active transport, defined as any travel using *body fuel instead of fossil fuel* (such as walking to bus stops), will help turn around rising levels of diabetes and other chronic diseases. Currently, only 56% of the North Coast population achieves the minimum exercise required for good health⁴, and active travel is a convenient way to get incidental exercise.

During the last several decades, changes to built environments in developed countries have contributed to dramatic changes as we shifted to fossil fuels instead of *body fuel*. Behaviours that are healthy for people and the environment have become more difficult. Foremost amongst these trends have been changes to roads and thoroughfares that favour the use of private motorized transport. Roundabouts and highways ease the flow of cars but are difficult for people on foot or bicycles. Increasing speed of motorised vehicles in these spaces accentuates the trend. Cars have become more affordable. These factors form the context for the high levels of car dependence evident from the North Coast Commuter Survey, with 77% of respondents travelling solo in a car on 3 or more days per week. Car dependence is concerning from the point of view of greenhouse emissions. This transport pattern is also obesogenic: evidence shows that for every 30 minutes spent in a car each day, the likelihood of obesity is increased by 3%⁵.

In taking the lead role in this project, North Coast Health Promotion has been informed by complex adaptive systems theory, a framework used to generate self-organised solutions via engagement of diverse 'agents'. The project demonstrates the value of co-operation

across organisational boundaries; the benefits of pooling resources; and the capacity to generate unexpected outcomes through creative collaboration. The various partnerships involved in *Sustain Northern Rivers* and its project North Coast Commuter Mapping are shown in Figure 1.



Lismore workplace context

Lismore is a regional city of 44,255 people serving as an administrative hub for the far north coast of NSW, and a centre of employment and post-secondary education⁶. Lismore City Council covers the area of some 1267 sq. kilometres extending from North Woodburn in the south to Nimbin in the north and from Clunes in the east to just west of Goolmangar⁷. Commuters to Lismore also come from Ballina, Byron, Richmond Valley and Kyogle Shires, with some coming from further afield. The State capital Sydney is 730 kilometres south by road. Brisbane is 200 kilometres to the north. There is very limited public transport in this region compared with metropolitan areas.



There are limited non-school passenger services for commuting to Lismore work destinations. The state-subsidized school buses are not oriented to adult commuting needs. These buses feed from villages to towns: leaving in the morning and returning between 3-4pm each weekday, with no service during school holidays. Most towns have limited infrastructure in terms of cycle and foot paths. The train line from Casino to Murwillumbah has been discontinued. From an economic and social perspective, the region is vulnerable in terms of its dependence on private cars for transport. This dependence is problematic with respect to peak oil and to the carbon price necessary to mitigate global warming.

METHODS

The North Coast Commuter Survey was administered via the SurveyMonkey website⁸ and the NCAHS intranet to workers and students of NCAHS, Southern Cross University, North Coast TAFE, Northern Rivers Social Development Council and 12 North Coast Councils. The use of online surveys allowed rapid data collection in a limited time frame. Amongst participating organisations, there are varying degrees of computer access (for example, most NCAHS nurses and council outdoors workers do not have computer log-on). For this reason, the online survey is not as comprehensive as one conducted via hard-copies attached to payslips. However staff / students requesting the hard copy version were promptly provided with one.

The survey was launched via a global email in each organisation and conducted over four weeks in August/September 2009 for some organisation and October/November in NCAHS. Those who filled in the survey could opt to go into a draw for a \$100 voucher for sporting footwear/goods, with additional prizes being offered in some of the participated organisations.

The data used to map commuter flows to Lismore is a subset of the North Coast data set (N= 3661). It consists of 1083 responses of people commuting to and from Lismore. Only a small number of respondents (N=31) commuted out of Lismore to other work/study locations.

Table 1: Number of respondents commuting to various organisations in Lismore	
Southern Cross University	722
North Coast Area Health service	121
Lismore City Council	104
North Coast TAFE (includes Lismore and Wollongbar campuses)	94
Northern Rivers Social Development Council	11

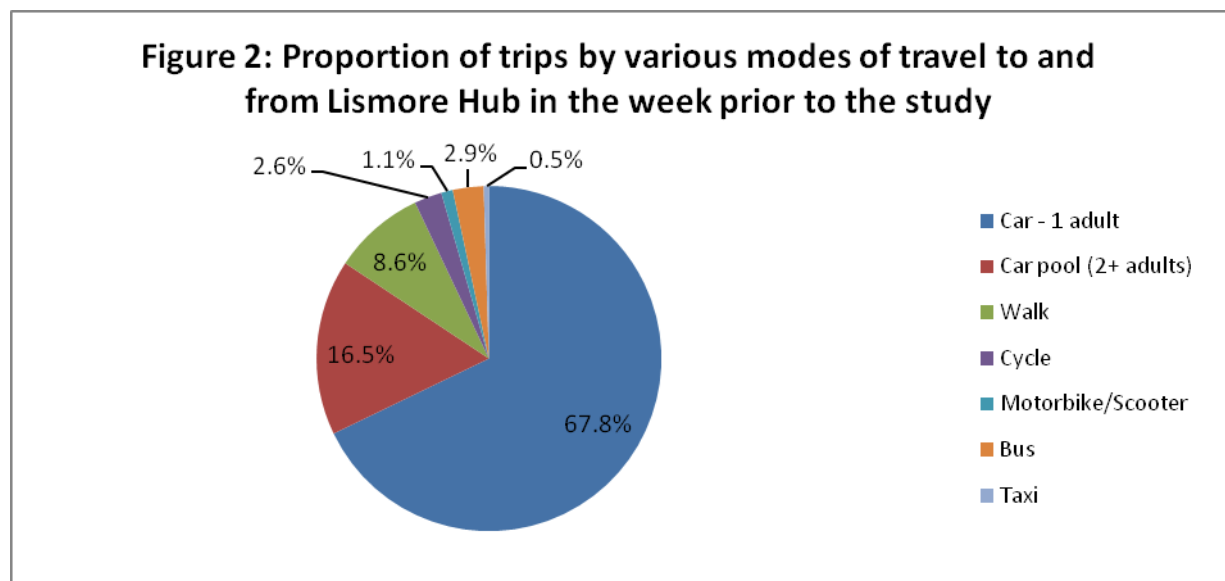
Different corridors and their catchments were created via a process of amalgamation, based on their locations and number of responses per locality. Analysis was done using MS Excel and SAS

SURVEY RESULTS

Car dependence

The following table and figure show the number and percentage of all trips taken to work/study in the Lismore Hub, by mode of travel, during the week before the survey. It shows a high degree of car dependence. Of all commuting trips, 67.8% were solo car journeys and 16.5% were made by car with one or more passengers. Despite a significant percent of respondents living within the active travel mode range for walking, cycling or public transport, very few trips were made in these ways.

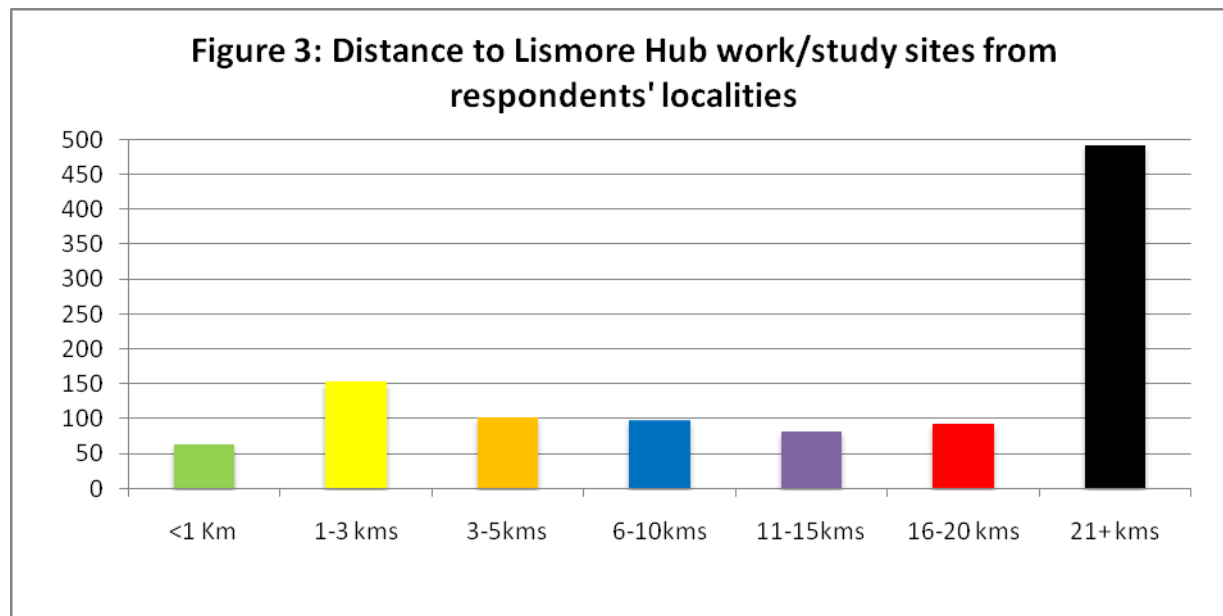
Table 2: Modes of travel to and from work/study.	
Number of trips during the week before the survey (N = 5063)	
Car – solo	3435
Car – 2+	834
Walk	437
Bus	131
Cycle	55
Motorbike	146
Taxi	25



Distance to work/study

The survey asked respondents to nominate distance to their work/study sites. Almost a third (29.3%) of respondents lived within 5km, 38.4% lived within 10km, with approximately half of the respondents travelling 21km or more to their work/study.

<1 km	1-3 km	3-5 km	6-10 km	11-15km	16-20 km	21+ km	Total
64	153	101	98	82	93	491	1082
5.9%	14.1%	9.3%	9.1%	7.6%	8.6%	45.4%	100%



Peak arrival and finishing times at work/study

Respondents were asked to nominate their commuting times during the week prior to the survey. The options were at 30 minutes intervals over 24 hours. Tables 4&5 and figures 4&5 below show the peak traffic flows of respondents to and from their work/study sites. Approximately 80% of respondents arrived at their work/study destination between 8.00am to 9.00am. Approximately 70% of the respondents finished at their work/study site between 4.00pm to 5.00pm.

Arrival times at Work/Study sites	7.00am	7.30am	8.00am	8.30am	9.00am	9.30am	10.00am
Lismore CBD(LBH, Council sites, TAFE, Community Health)	12	17	35	42	26	8	0
Southern Cross University-Lismore Campus	8	12	93	121	287	46	90
Lismore City Council	1	3	31	13	4	0	0
Wollongbar TAFE	1	8	8	14	9	3	1

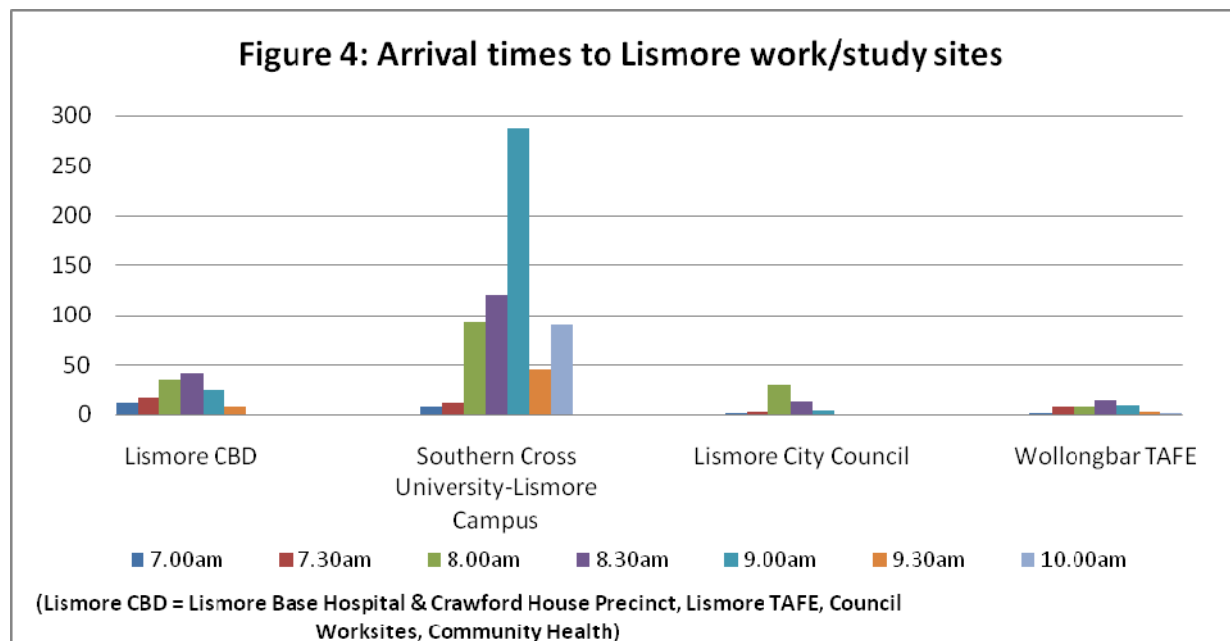
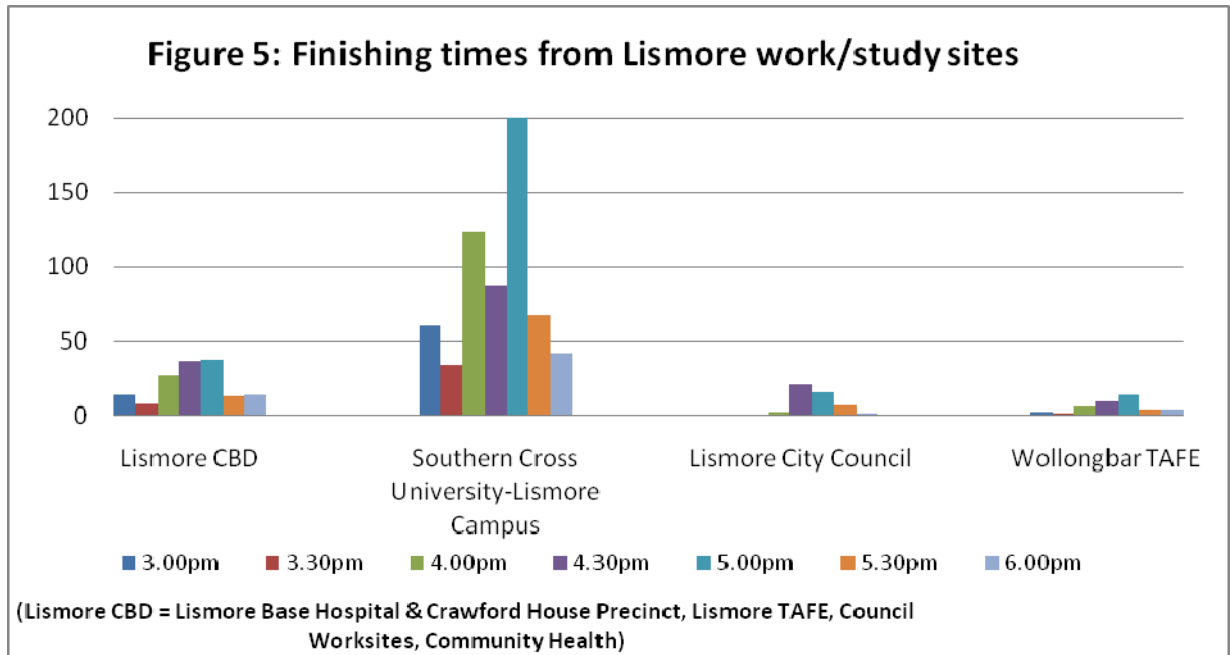


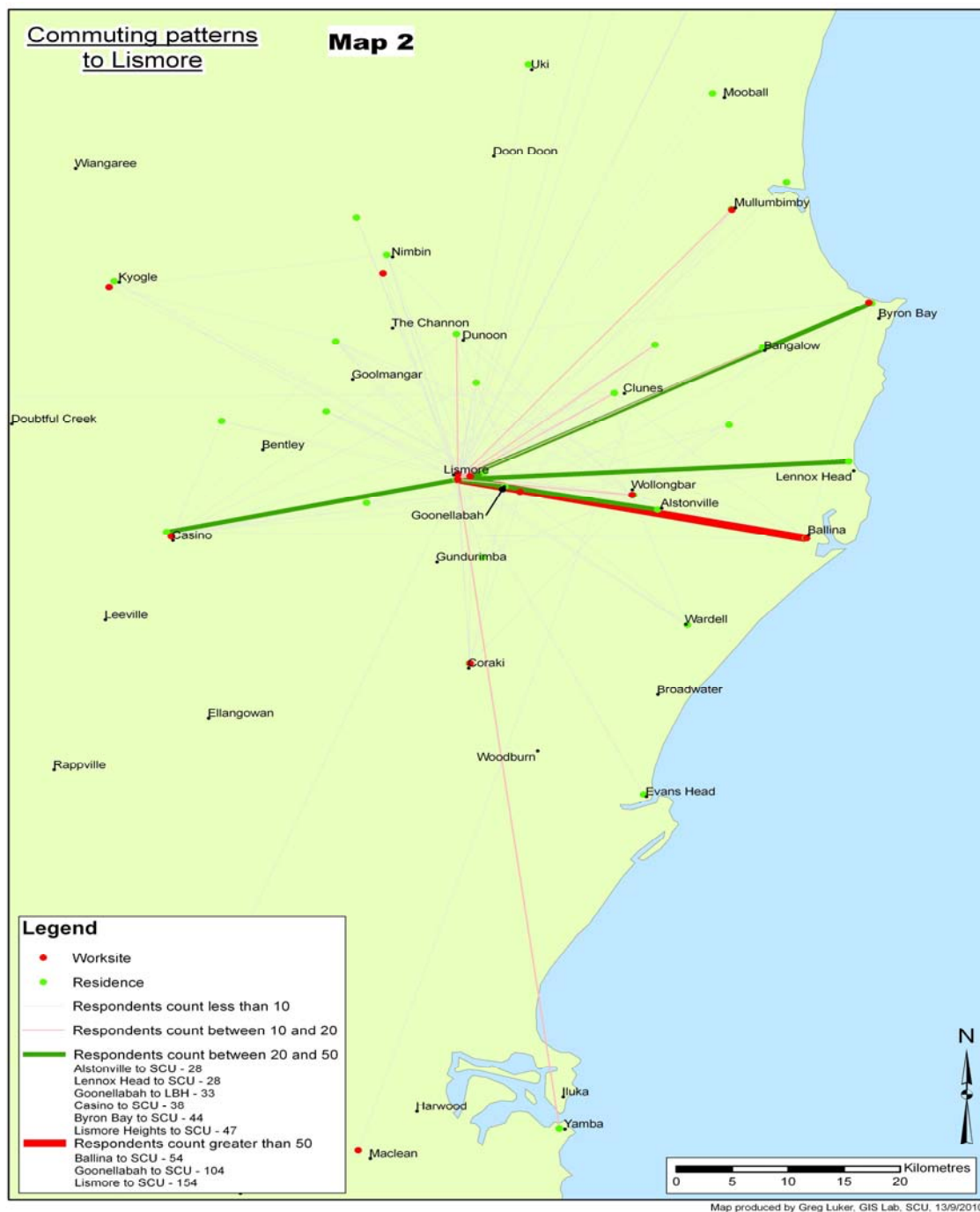
Table 5: Number of respondents travelling by finishing time and site

Finishing times of work/study sites	3.00pm	3.30pm	4.00pm	4.30pm	5.00pm	5.30pm	6.00pm
Lismore CBD (LBH, Council sites, TAFE, Community Health)	14	8	27	37	38	13	14
Southern Cross University-Lismore Campus	61	34	124	88	200	68	42
Lismore City Council	0	0	3	21	16	7	2
Wollongbar TAFE	3	2	6	10	14	4	4

Figure 5: Finishing times from Lismore work/study sites



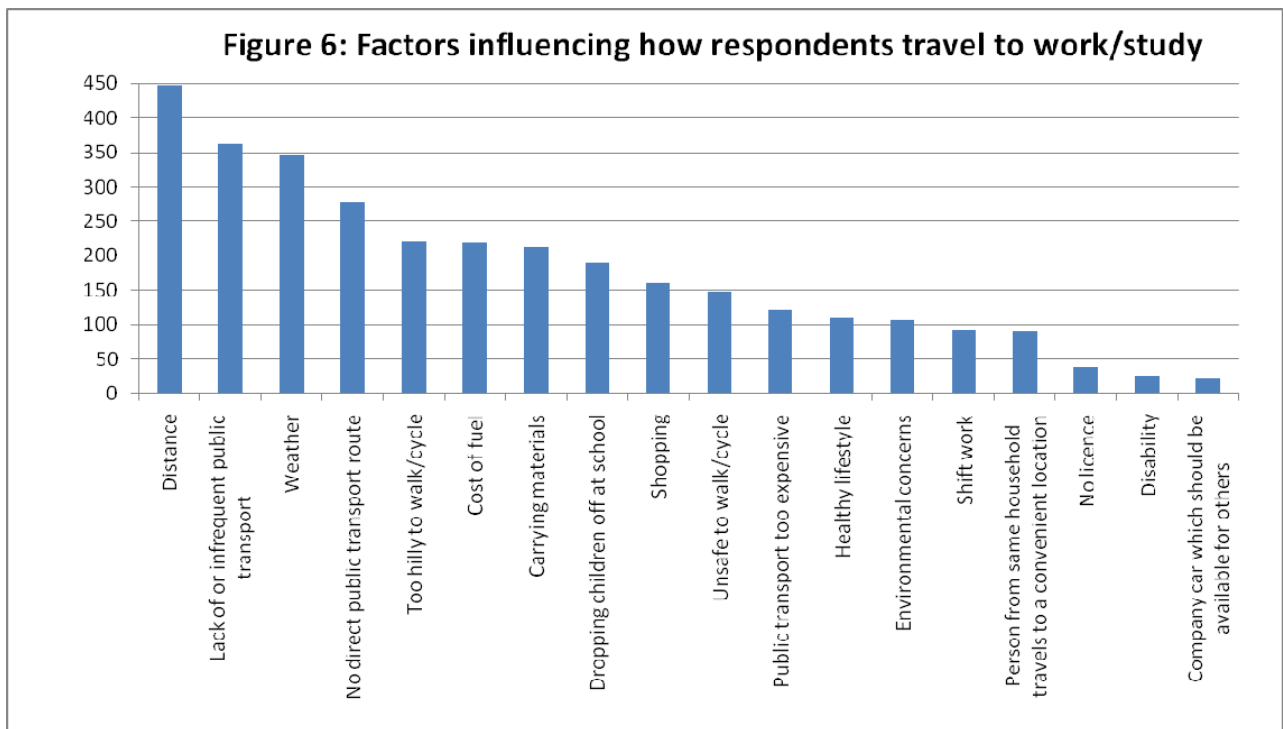
Main commuter flows to Lismore



The map above shows that the major commuter flows are between Ballina and Lismore. This route covers the catchments of Ballina, Alstonville, Wollongbar and Goonellabah. Next follows the Byron, Casino and Lennox routes.

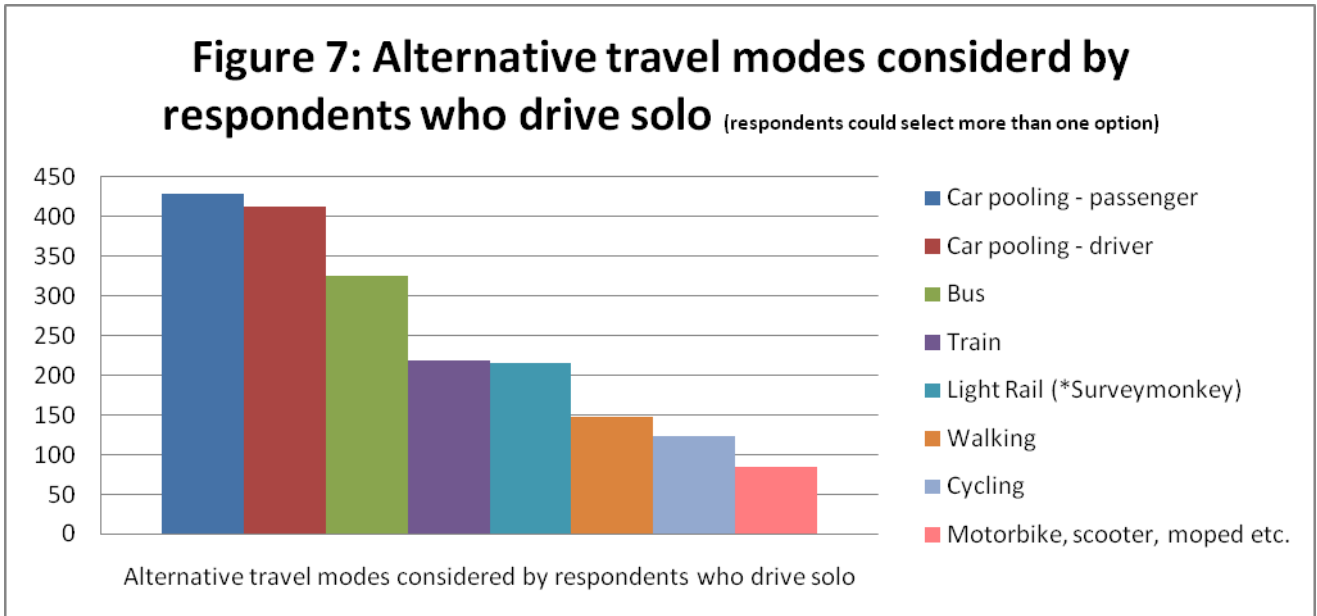
Factors influencing mode of travel

When asked “Do any of the following influence the way you get to work/study?” 42.3% of the respondents said that *distance* is the main influencing factor; 33.4% nominated *lack of, or infrequent public transport*; 31.9 % said *weather*; 25.7% said *no direct public transport*. *Too hilly to walk*, *cost of fuel* and *carrying materials* rated highly among the other influencing factors.



Interest in alternative ways to travel

The survey revealed considerable interest in alternative modes of travel by respondents who usually drive solo.



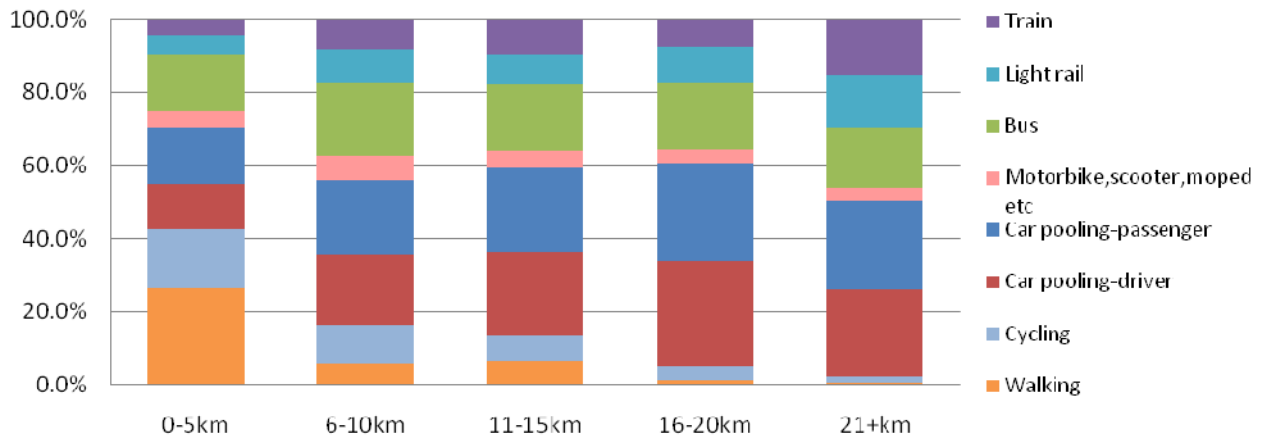
Alternative modes considered by respondents who usually drive solo by distance

The following table and chart shows preferences for alternative modes of travel, for those who normally drive solo, for different proximities to work/study sites. This provides useful information when planning strategies to encourage active transport. 26.6% of those who live within 5km show interest in walking. Even amongst those who live 6-10km from their work/study destination, 5.7% would consider walking to work/study. The cycling data shows less sensitivity to distance than walking. Of those who live 0-15km of their work/study site, 33.2% would consider cycling. As distance increases, an increasing percentage of respondents show interest in carpooling.

Table 6: Alternative modes of travel considered by those who usually drive solo

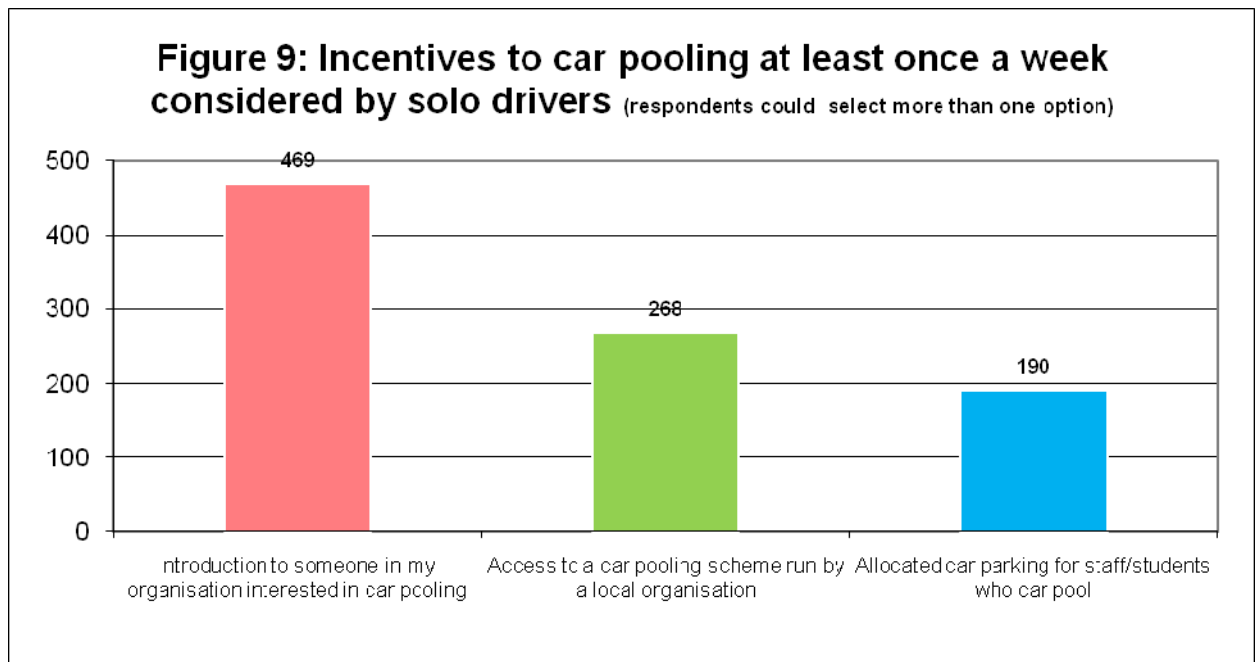
Distance	Walking	Cycling	Car pooling-driver	Car pooling-passenger	Motorbike, scooter, moped etc	Bus	Light Rail Not asked in NCAHS	Train
0-5km	26.6%	15.8%	12.7%	15.3%	4.5%	15.6%	5.0%	4.5%
6-10km	5.7%	10.8%	19.0%	20.3%	7.0%	19.6%	9.5%	8.2%
11-15km	6.6%	6.6%	23.0%	23.0%	4.9%	18.0%	8.2%	9.8%
16-20km	1.3%	3.8%	28.7%	26.8%	3.8%	18.5%	9.6%	7.6%
21+km	0.5%	1.8%	23.7%	24.3%	3.8%	16.3%	14.4%	15.3%

Figure 8: Alternative travel modes considered by respondents who usually drive solo (by distance from work)



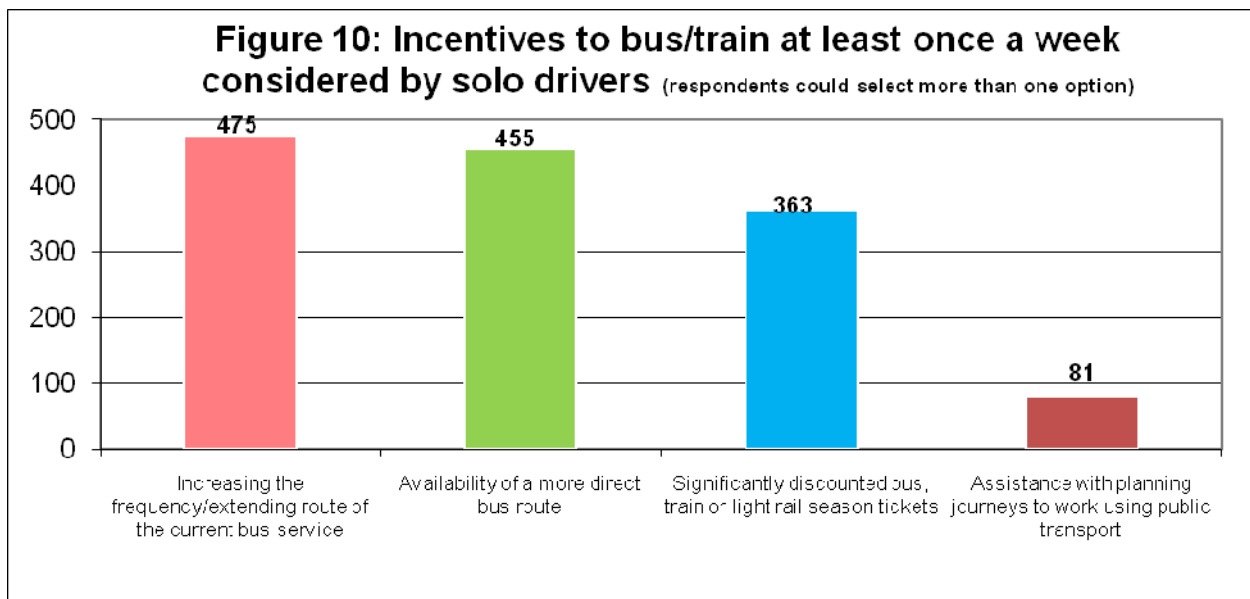
Incentives favoured for car-pooling

When asked “what incentives would you need to take up carpooling at least once a week?” 43.3%(469) of the respondents who usually drive solo showed preference for being introduced to a peer. 24.8%(268) showed interest in using a carpooling scheme, and 17.6%(190) were interested in access to allocated parking for those who carpool.



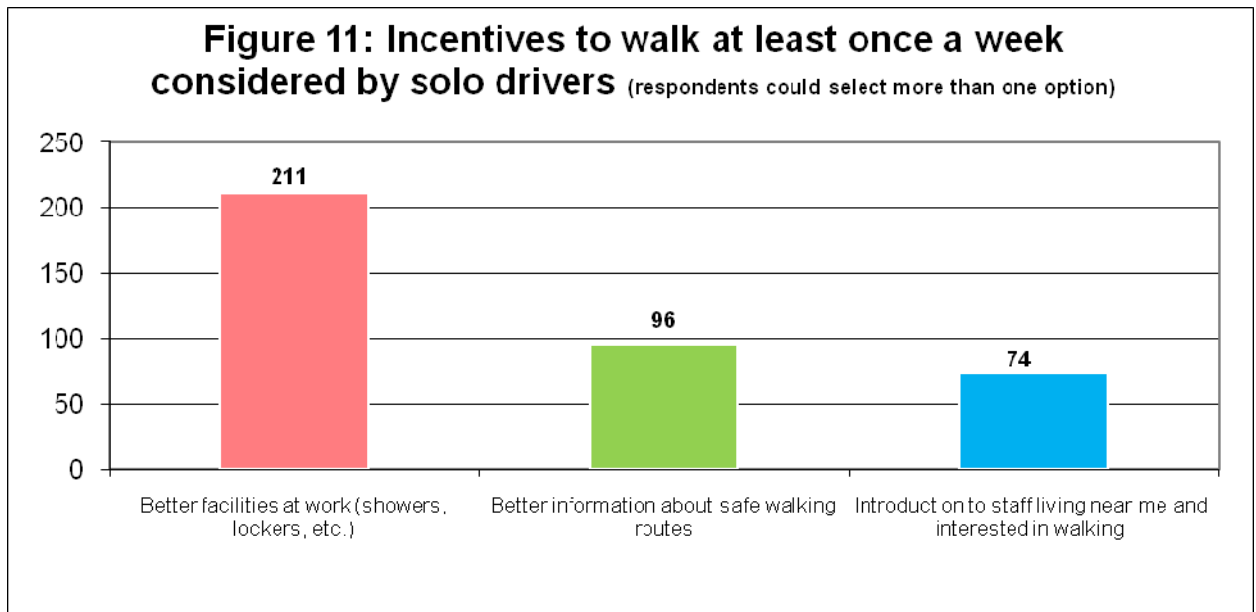
Incentives favoured for bus/train

When asked “what incentives would you need to use a bus/train at least once a week?”, 43.9%(475) of respondents nominated increasing the frequency and/or extending the routes of the current bus services; 42.1%(455) nominated availability of more direct bus routes; 33.5%(363) nominated significantly discounted bus/train season tickets; and 7.5% (81) of respondents wanted assistance with planning journeys to work using public transport.



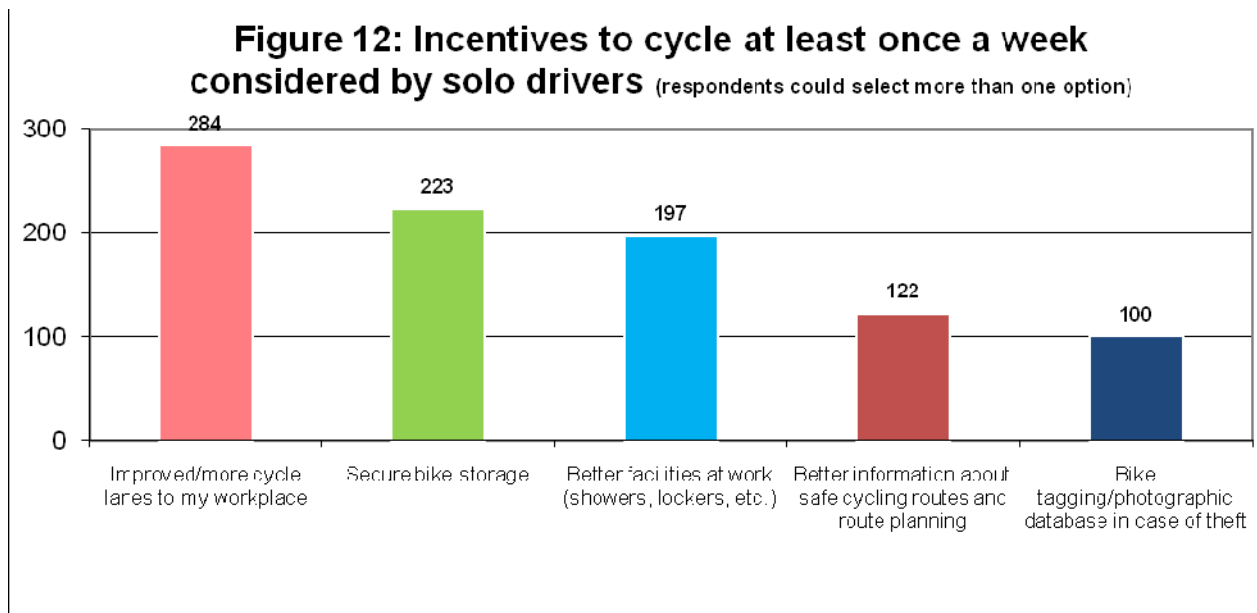
Incentives favoured for walking

When asked “what incentives would you need to walk to work (part or whole of trip) at least once a week?” 19.5% (211) of the respondents nominated better facilities at work (showers, lockers, etc.); 8.9% (96) nominated safe walking route information; and 6.8% (74) nominated introduction to a peer for walking.



Incentives favoured for cycling

When asked “what incentives would you need to cycle to work (part or whole of trip) at least once a week?”, 26.2%(284) of respondents said that they would need better or more cycle lanes; 20.6%(223) nominated secure bike storage; 18.2%(197) nominated end-of-journey facilities such as showers, lockers etc.; 11.3%(122) nominated safe cycling routes and route planning and 9.2%(100) nominated anti-theft bike identity tagging.



DISCUSSION AND RECOMMENDATIONS

The Sustain Northern Rivers commuter mapping survey shows that employees and students of participating organisations across the North Coast are interested in exploring different ways of travelling to work and study. This desire to commute via alternative modes is also evident in the sub-set data for those who commute to destinations in Lismore.

There are few examples of travel surveys in rural or regional Australia. Research has focussed on metropolitan areas that have more extensive public transport networks and infrastructure^{9, 10}. The SNR Commuter Survey maps work and study travel patterns around all large and many small settlements in the region. For this reason, the survey suggests that one way to fill the gap in transport mapping in regional areas is via travel surveys conducted by large institutions with significant geographical footprints such as health services, educational institutions and council worksites.

The results of this survey are consistent with those of the online survey conducted for the Northern Territory TravelSmart Workplaces Project in Darwin¹¹. This survey found similar levels of car-dependence and interest in carpooling as an option, and in incentives such as showers, changing facilities, secure bike storage; access to better bus services¹¹.

A 2007 Transport Usage Survey conducted for Coffs Harbour City Council reveals high levels of car dependence and car ownership¹². This is consistent with the findings of the Lismore Hub commuter data. The Coffs Harbour survey also found that 44% of respondents said they were interested in using bus services more often, which is significantly higher than the 30.1% interested in bus transport in the Lismore hub results. The difference in interest in bus travel may be due to the fact that Coffs Harbour may have better bus services than other regional cities, and that higher visibility of bus services increases expectations¹². Alternatively, the variation may be due to the fact that the Coffs Harbour survey targeted the general community, while the Lismore hub survey sample was comprised primarily of workers and students at Health Service, Council, University and TAFE sites, and its main goal was to ascertain issues related to commuting. The Coffs Harbour survey therefore shows the value of conducting transport surveys in specific regional centres: while on the whole public transport options are poor in the region, there is some local variability.

In view of the fact that the aggregated data shows the peak times and routes of major commuter flows, the Lismore Commuter Hub Mapping results suggest a number of strategies that could be considered to improve sustainable transport options for people commuting to Lismore:

1. **A Lismore Commuter Stakeholder Forum** could be conducted, with invitations to the key participant organisations, transport providers, the NSW Ministry of Transport, Regional Development Australia, and other members of the Lismore Sustainable Transport and Sustainable Environment Policy Advisory Groups. The data could be presented to participants prior to the forum, so that they can work together to generate innovative ways to increase options for commuters. The Forum could address:
 - Opportunities to improve the integration and targeting of transport services, using the data showing peak times and routes;
 - Opportunities to collaborate to ‘think outside the square’ to meet the needs of students;
 - Opportunities to make cycling and walking easier in Lismore, such as use of Shared Space principles in existing suburbs and secondary routes;
2. Institutions that attract significant numbers of commuters to Lismore could ensure ongoing promotion of the Northern Rivers Car Pool website for their staff and students, and consider other means of introducing potential car-poolers (for example, car pool morning teas);
3. Organisations that attract commuters to Lismore could promote active transport by:
 - Integrating cycling and walking infrastructure into all new capital works and building renovation;
 - Improving end-of-journey facilities to encourage cycling and walking. Where showers and lockers already exist, they could raise awareness of these facilities;
 - Providing secure bicycle storage;
 - Providing cycle or walking route information to staff and students.

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APPENDICES

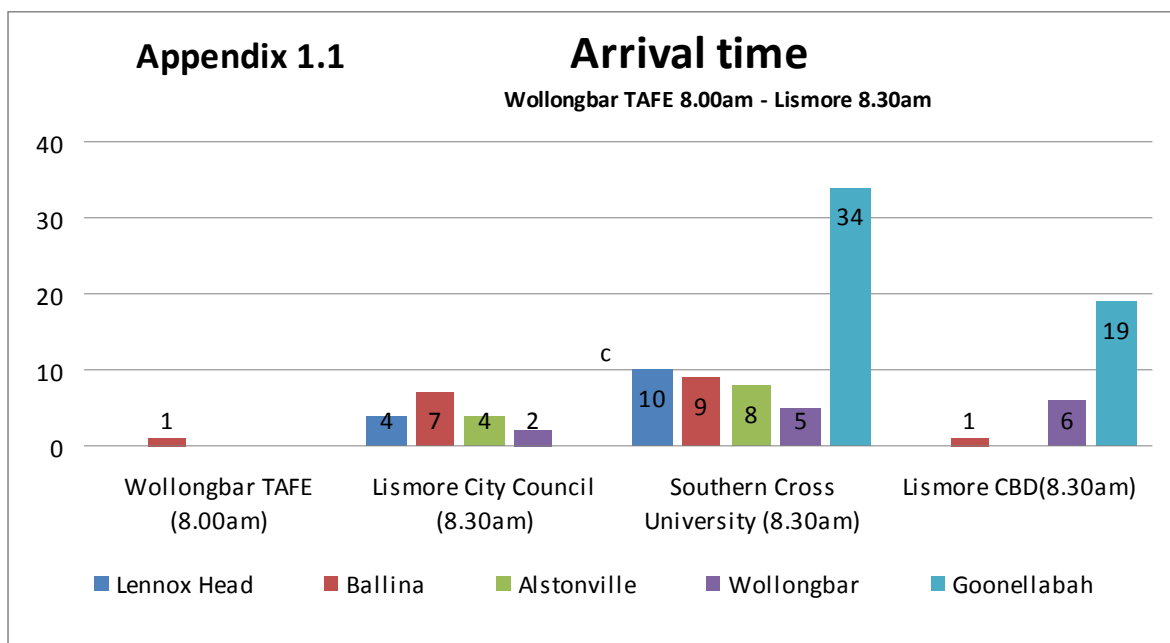
Appendix 1 - Arrival and finishing times

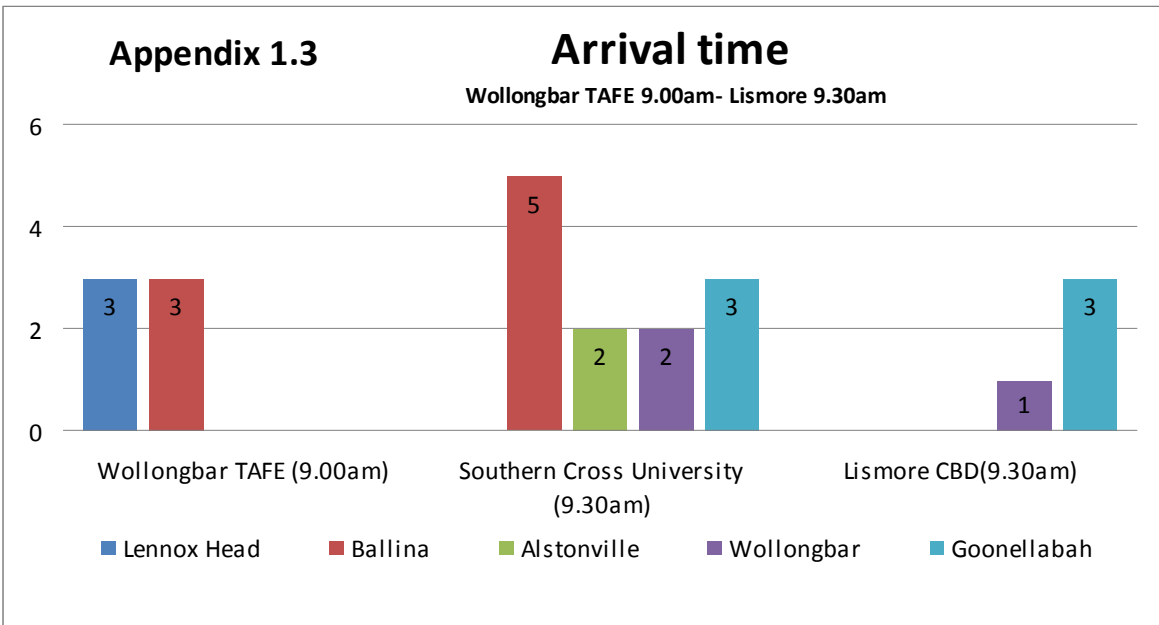
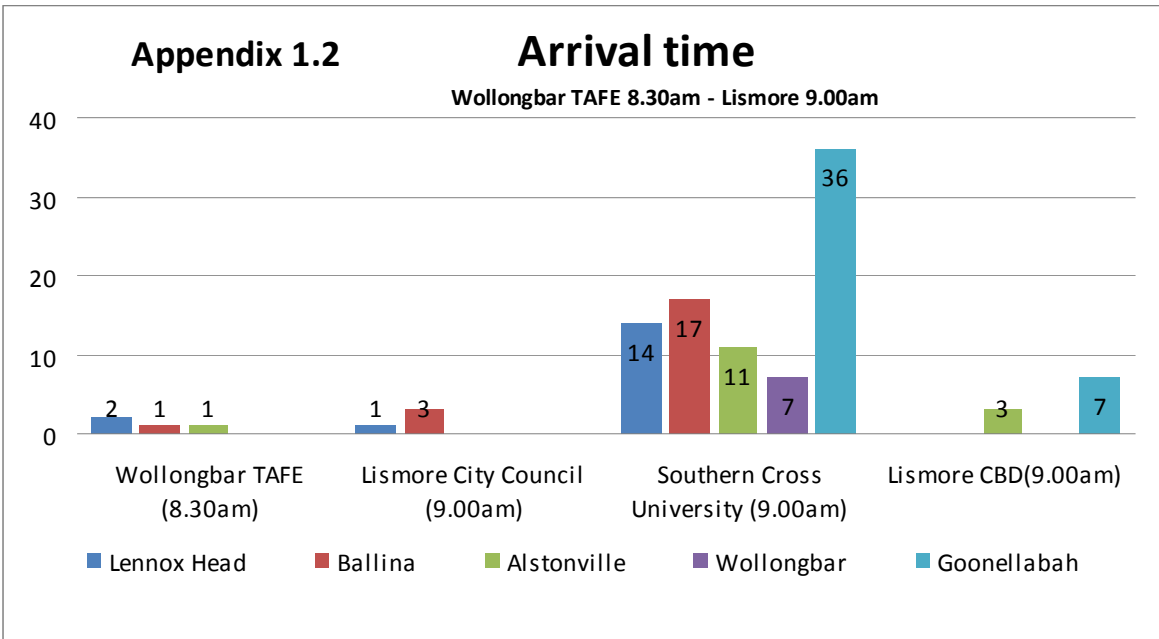
Destinations. These include a number of work-study sites in Lismore, as well as Wollongbar TAFE. For the purposes of this analysis, *Lismore CBD* is broadly defined to include Lismore TAFE; council worksites such as the Art Gallery; Community Health; and also the Uralba Street Lismore Base Hospital precinct.

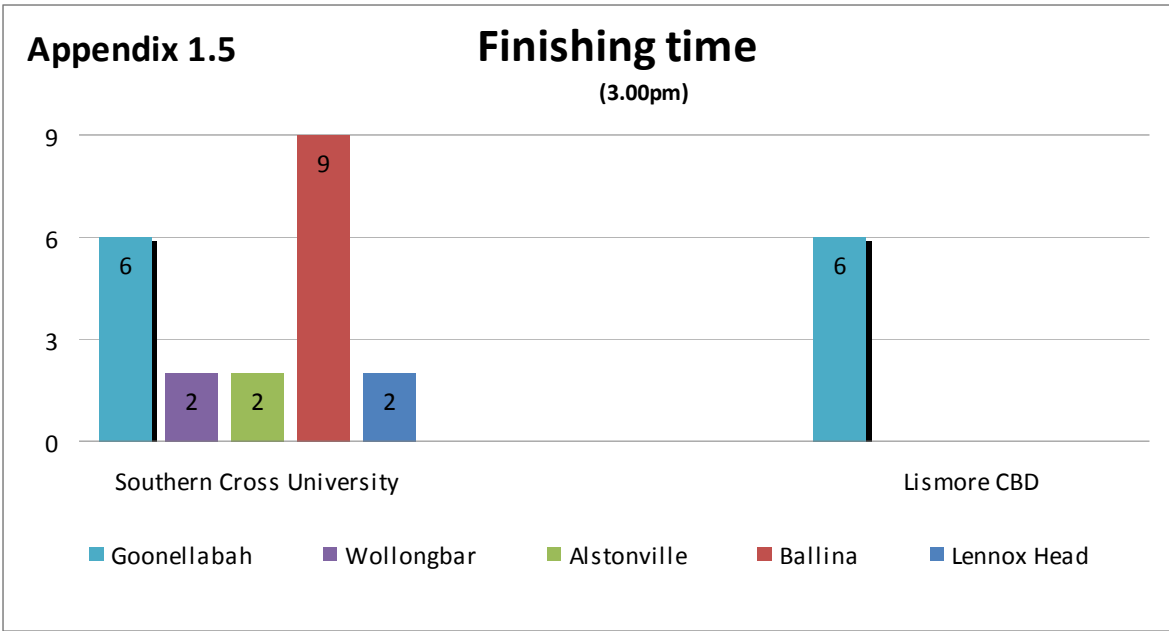
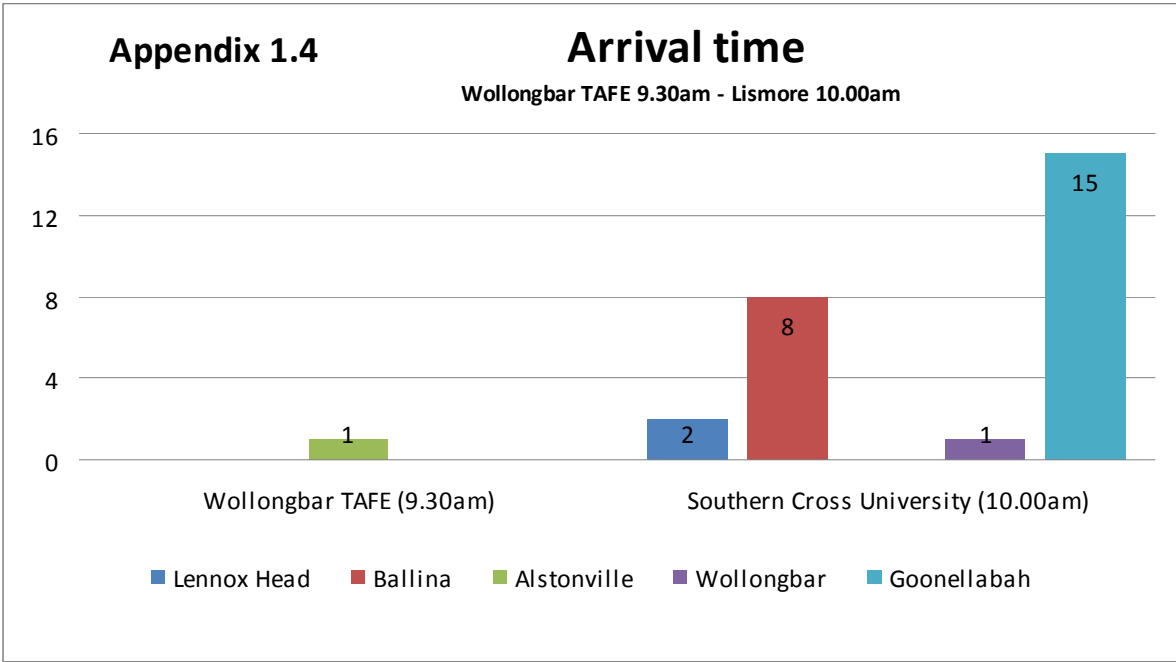
Source Catchments. Respondents travelling to Lismore were grouped in *catchments* of near locations. For example, the Ballina *catchment* consists of residents in East Ballina, Ballina, and West Ballina. Because some trips to work destinations in Lismore also originate in the town of Lismore, a *catchment* was created for the city of Lismore. Some graphs show trips that begin within the Lismore catchment that go to Lismore destinations, for example, commuters who live in Goonellabah and travel to Southern Cross University.

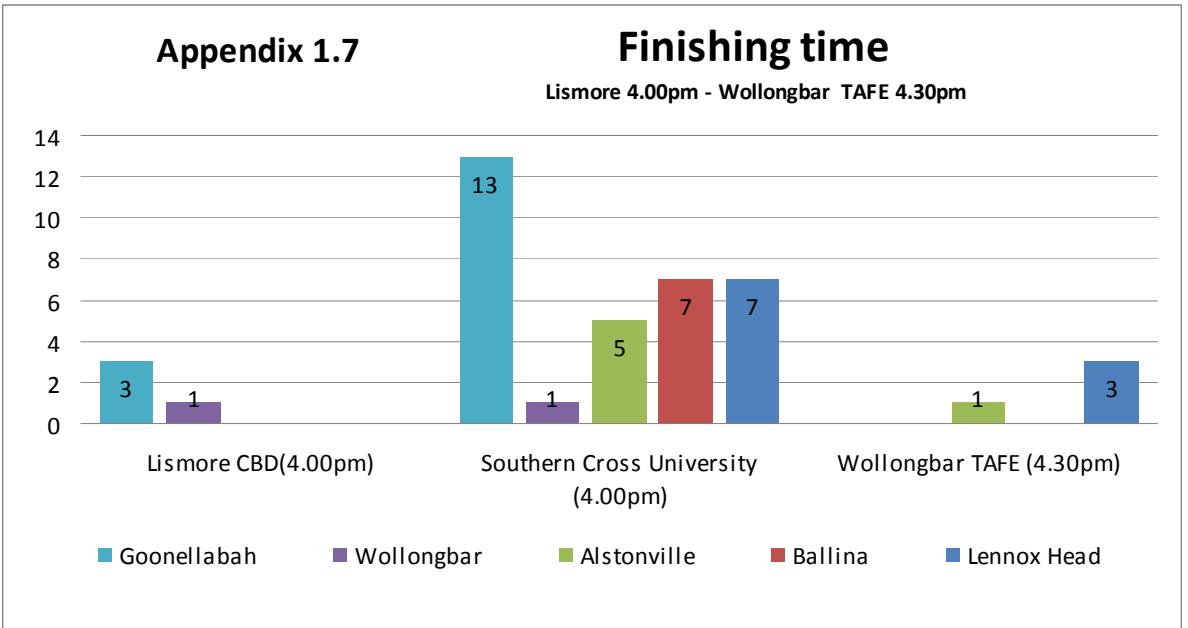
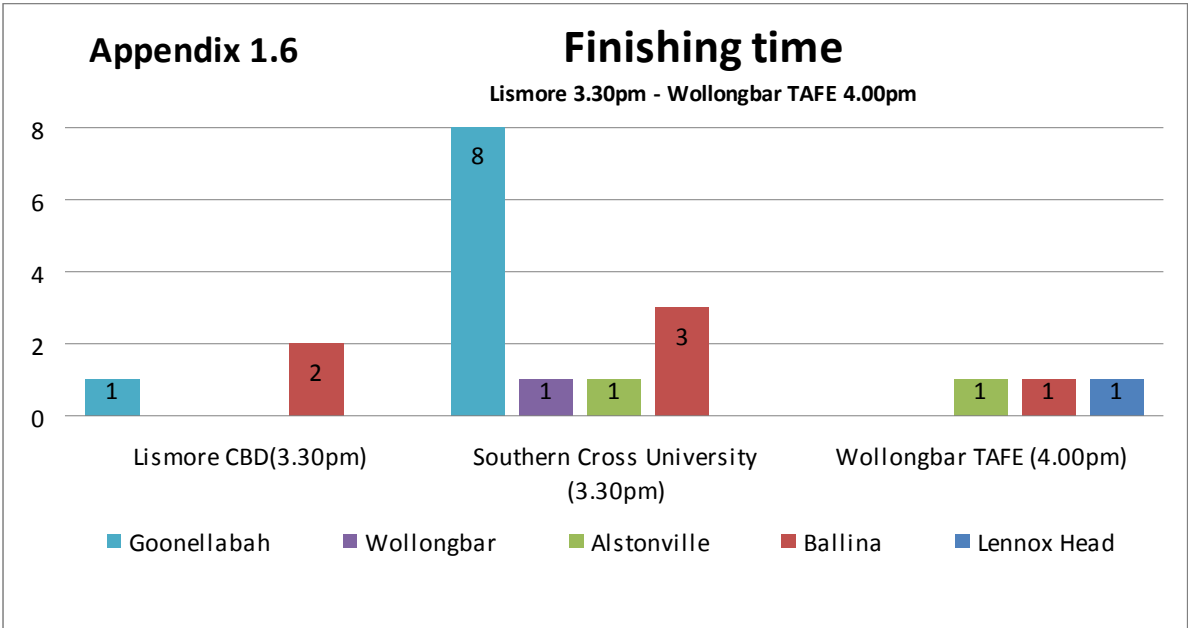
Routes. The graphs in Appendix 1 relate to two major *routes* into Lismore. These are 1) Lennox Head - Ballina – Wollongbar – Lismore; and 2) Mullumbimby and Byron to Bangalow and Lismore.

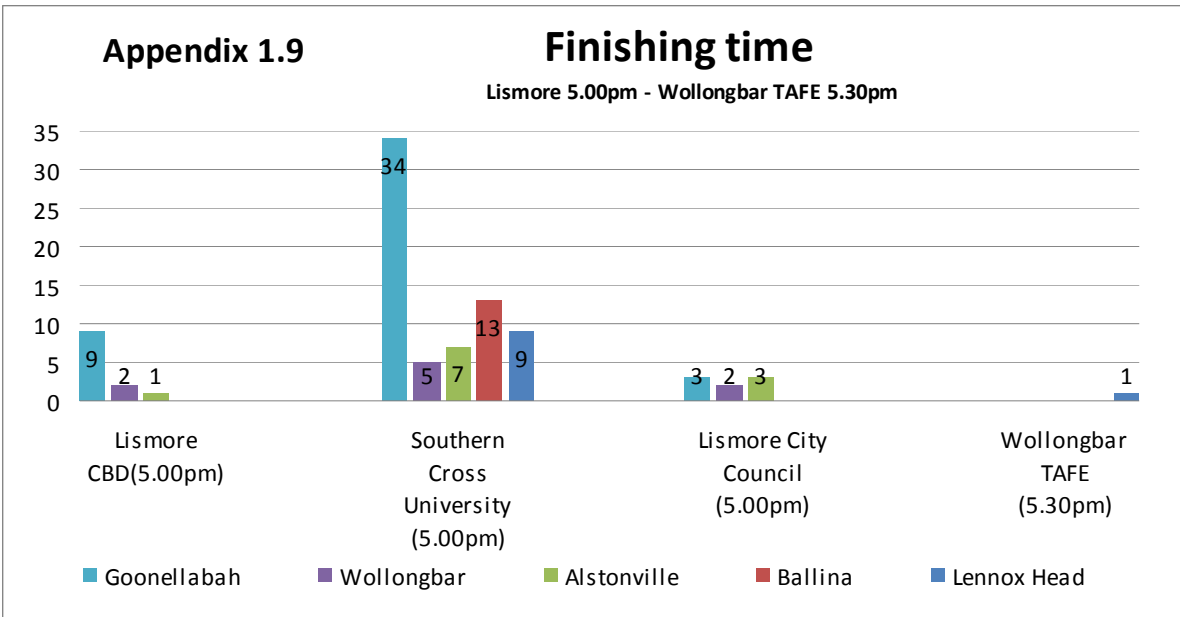
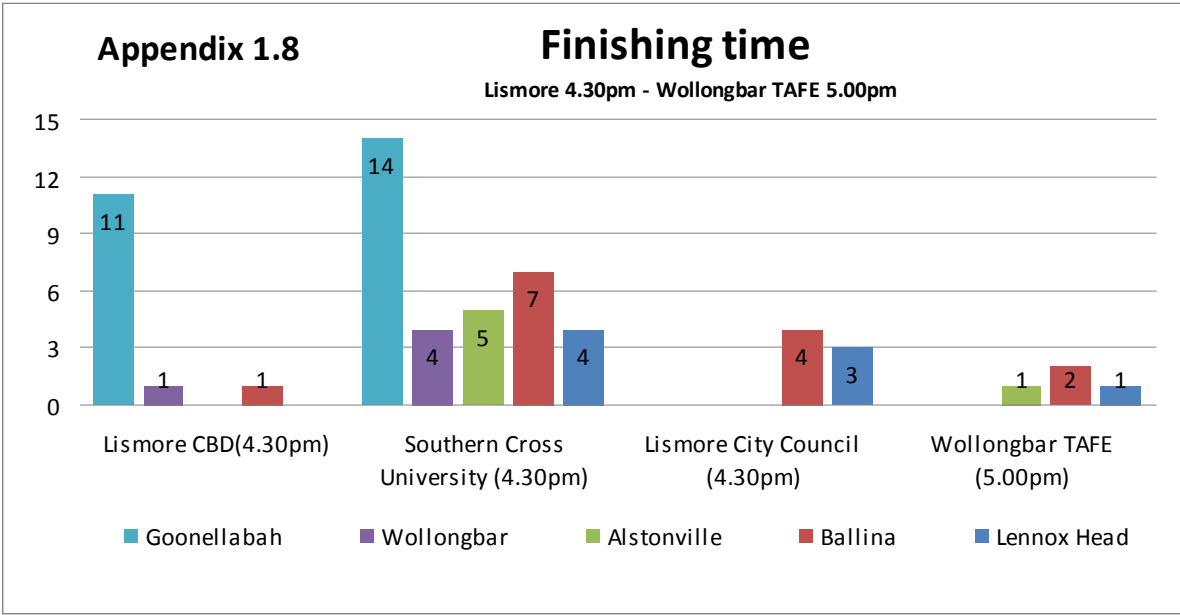
Arrival and finishing times (Lennox Head-Ballina-Wollongbar-Lismore)







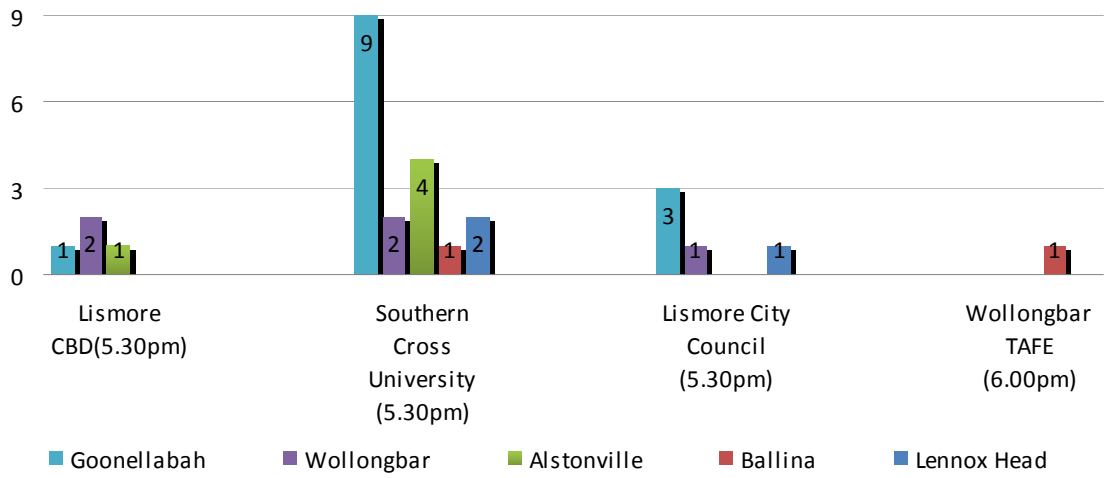




Appendix 1.10

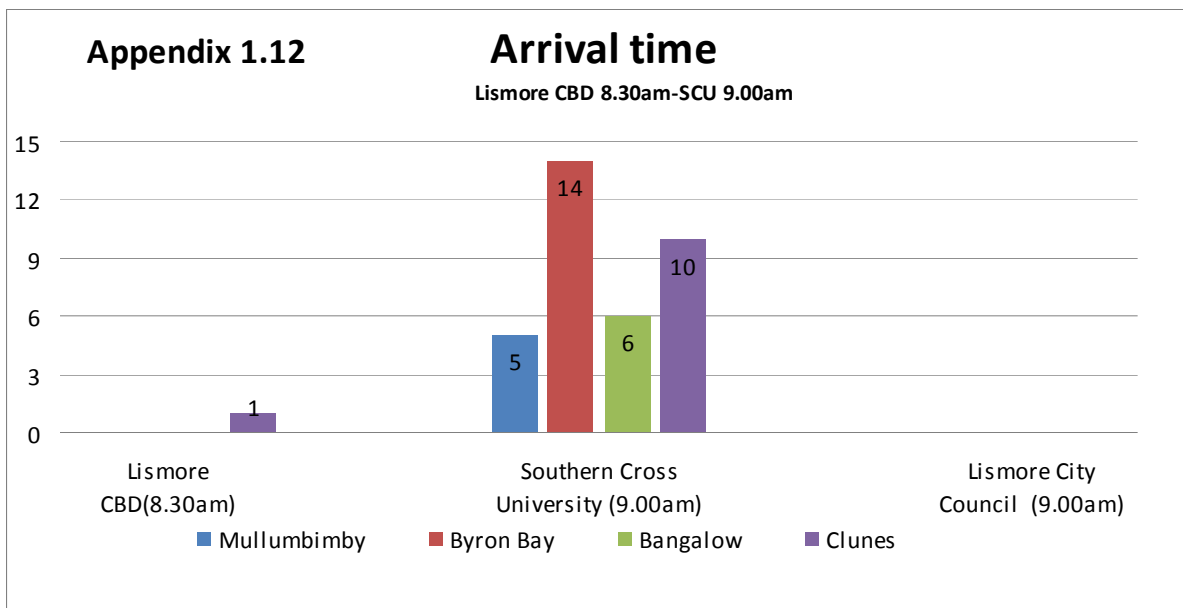
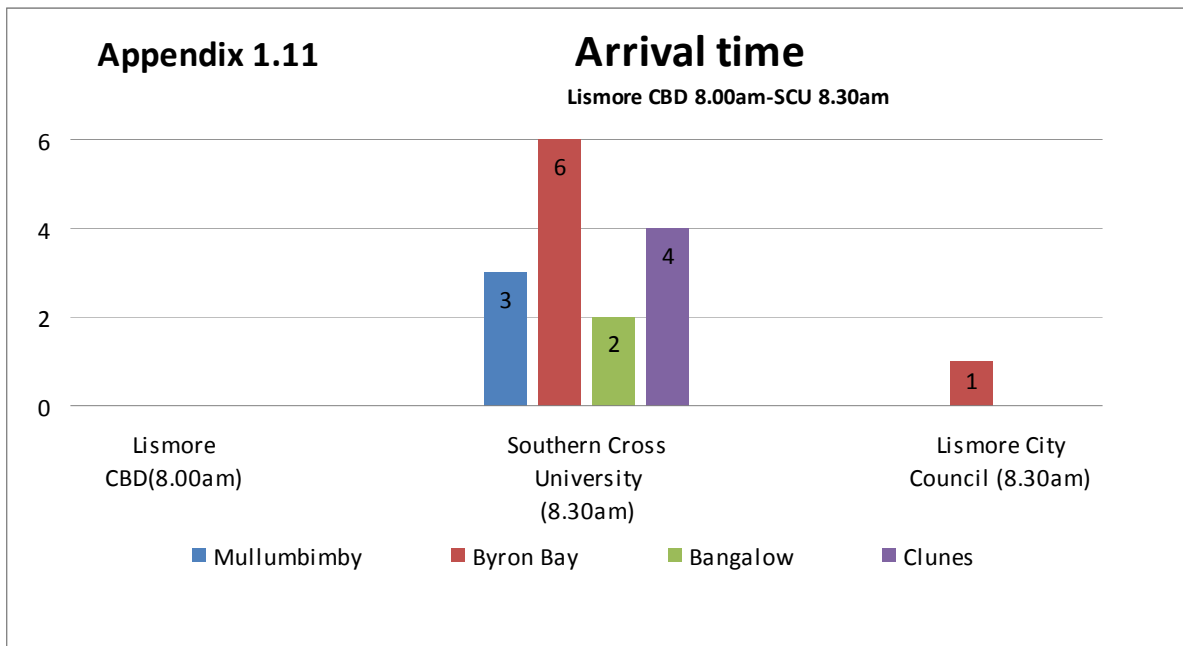
Finishing time

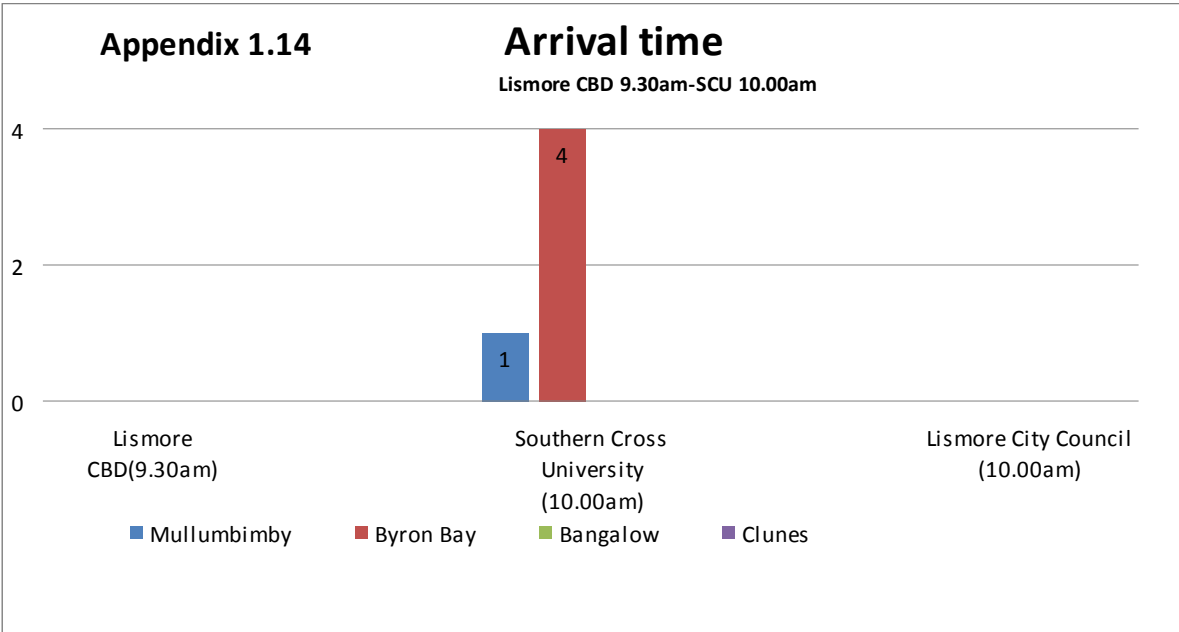
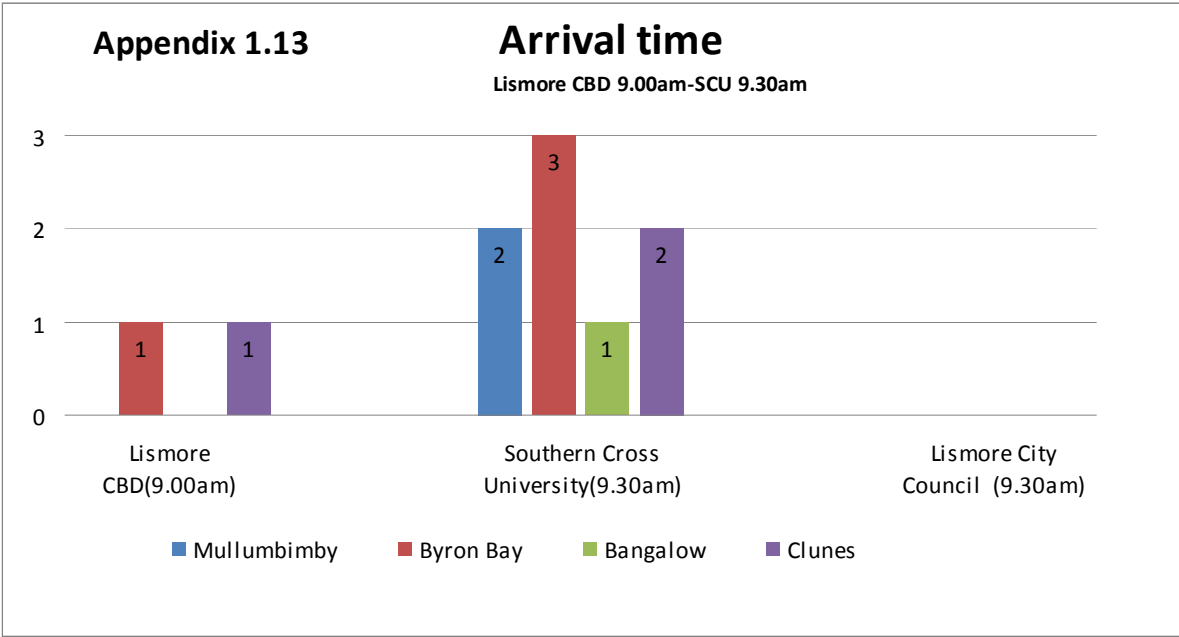
Lismore 5.30pm - Wollongbar TAFE 6.00pm

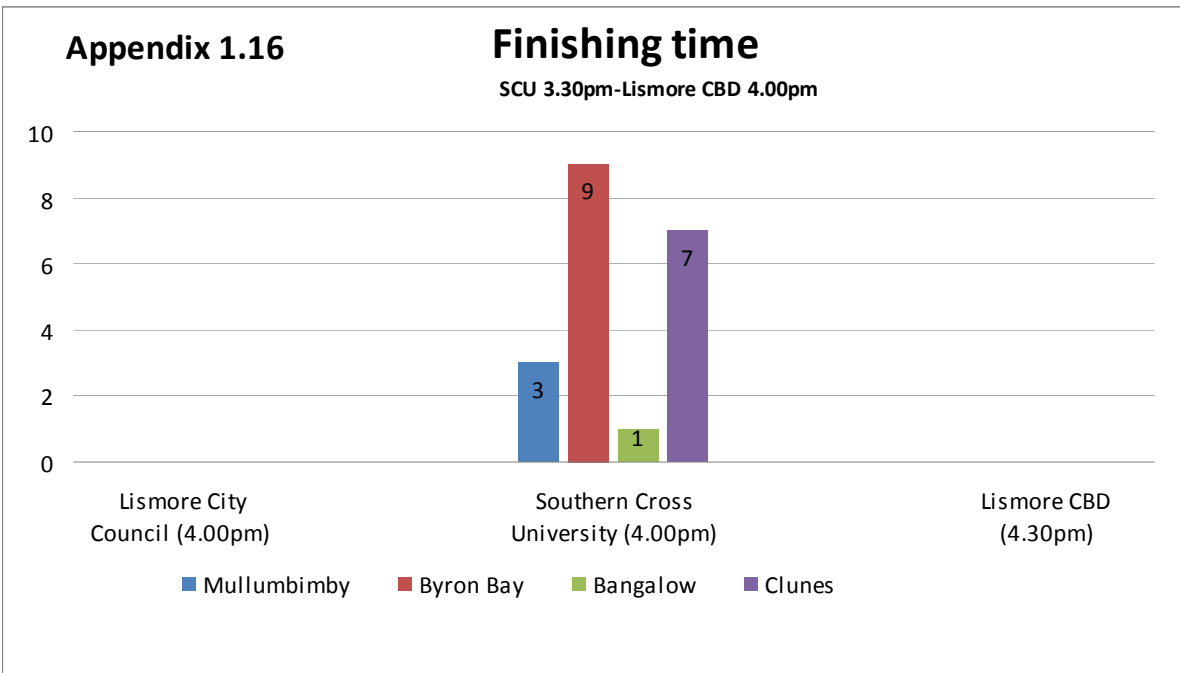
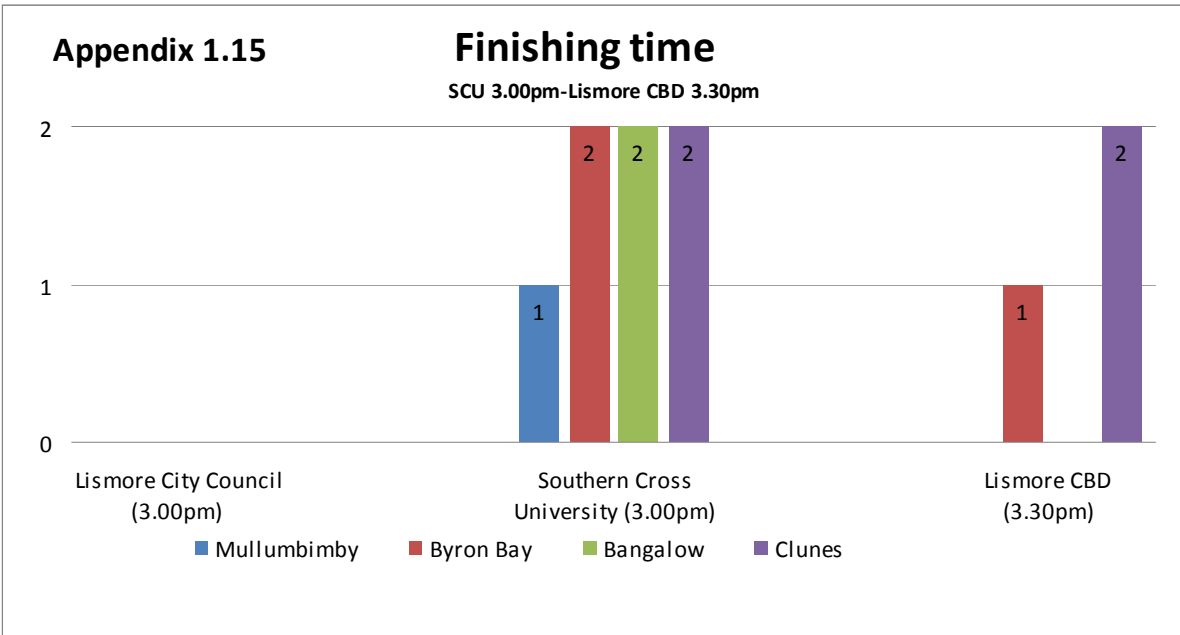


Arrival and finishing times (Mullumbimby-Byron-Clunes-Lismore)

Note that for the purposes of this analysis, *Lismore CBD* is broadly defined to include Lismore TAFE; council worksites such as the Art Gallery; Community Health; and also the Uralba Street Lismore Base Hospital precinct.



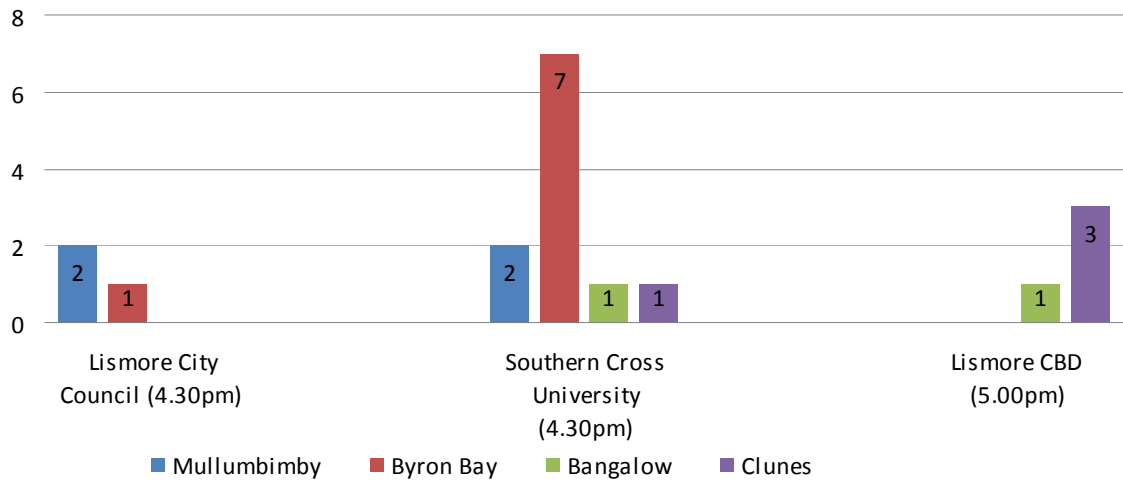




Appendix 1.17

Finishing time

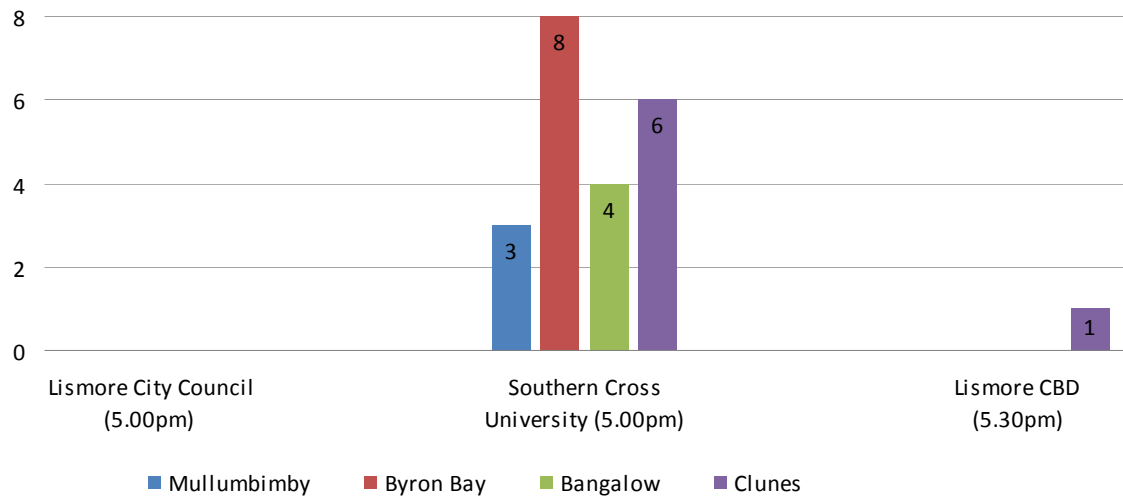
SCU 4.30pm-Lismore CBD 5.00pm



Appendix 1.18

Finishing time

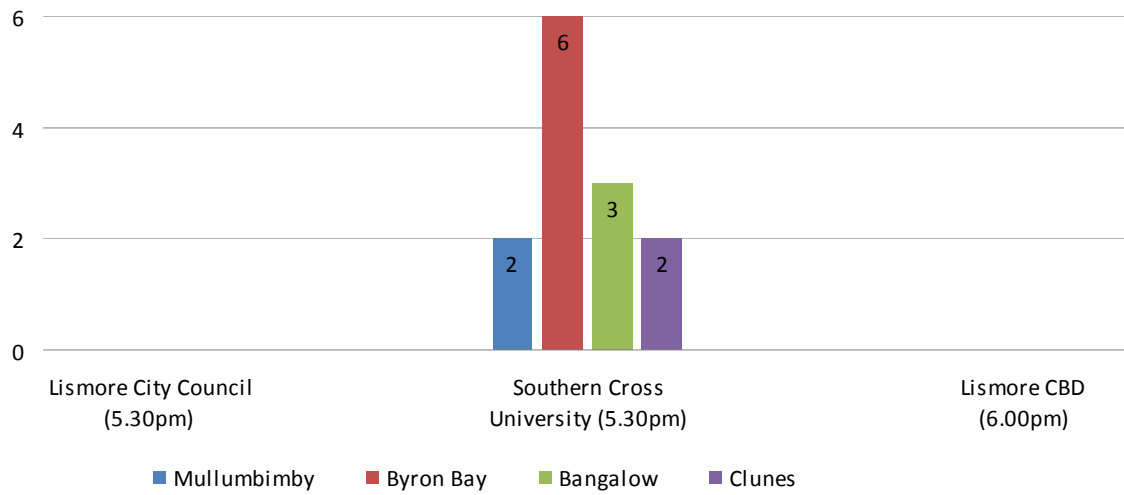
SCU 5.00pm-Lismore CBD 5.30pm



Appendix 1.19

Finishing time

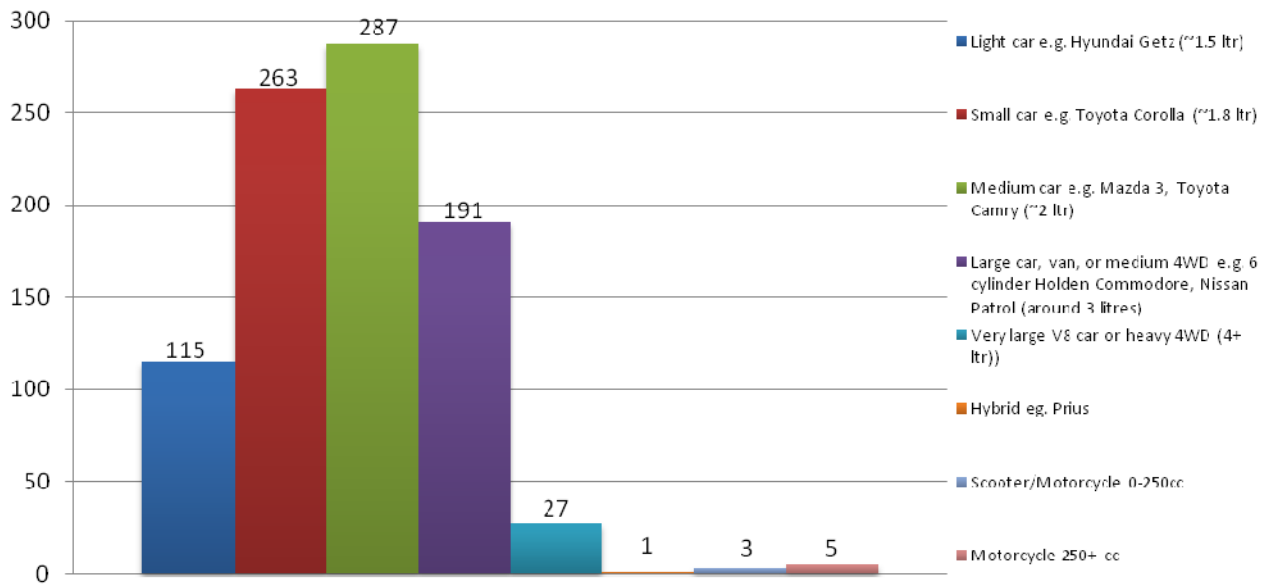
SCU 5.30pm-Lismore CBD 6.00pm



Appendix 2 - Carbon emissions

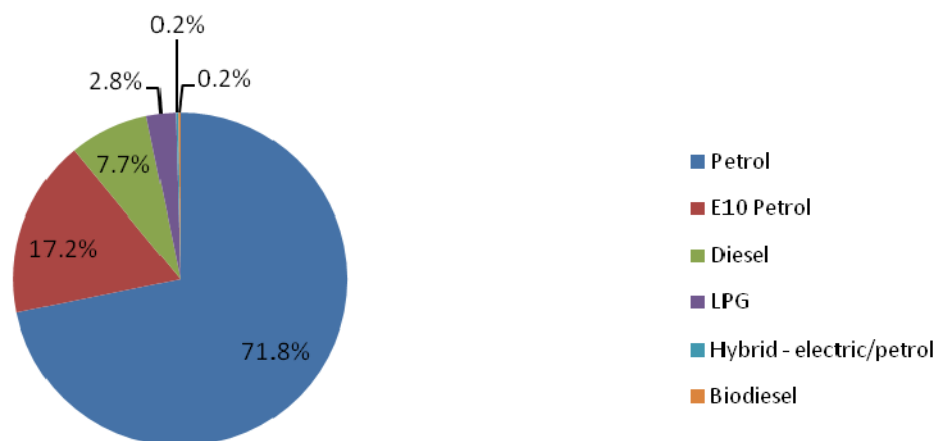
Appendix 2.1

Type of Vehicle

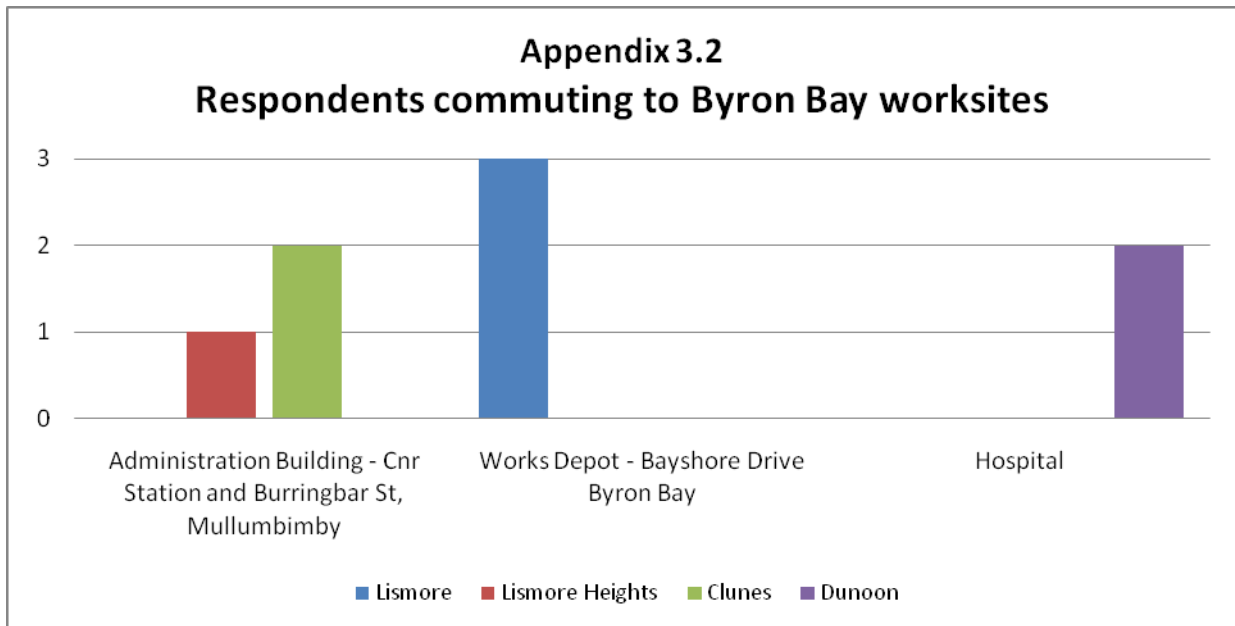
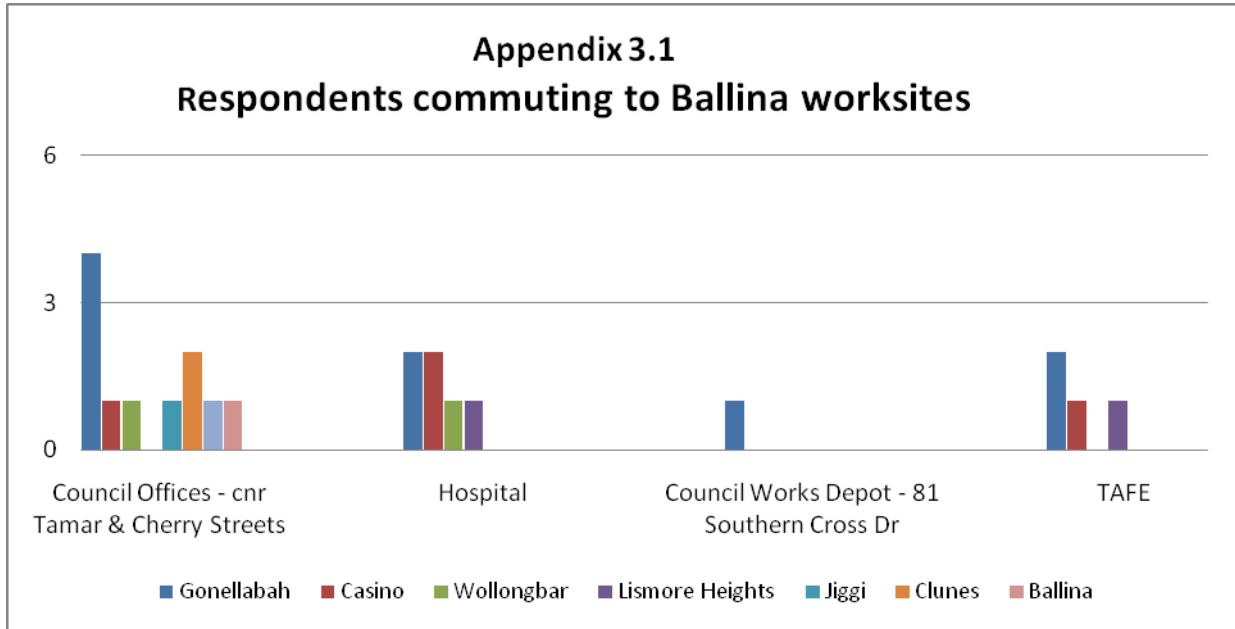


Appendix 2.2

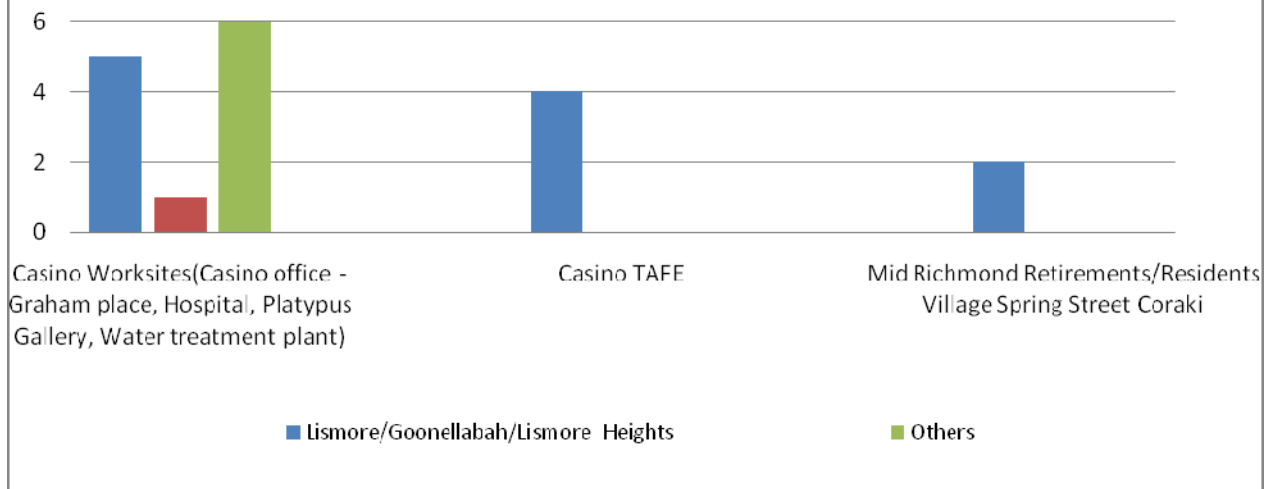
Type of Fuel



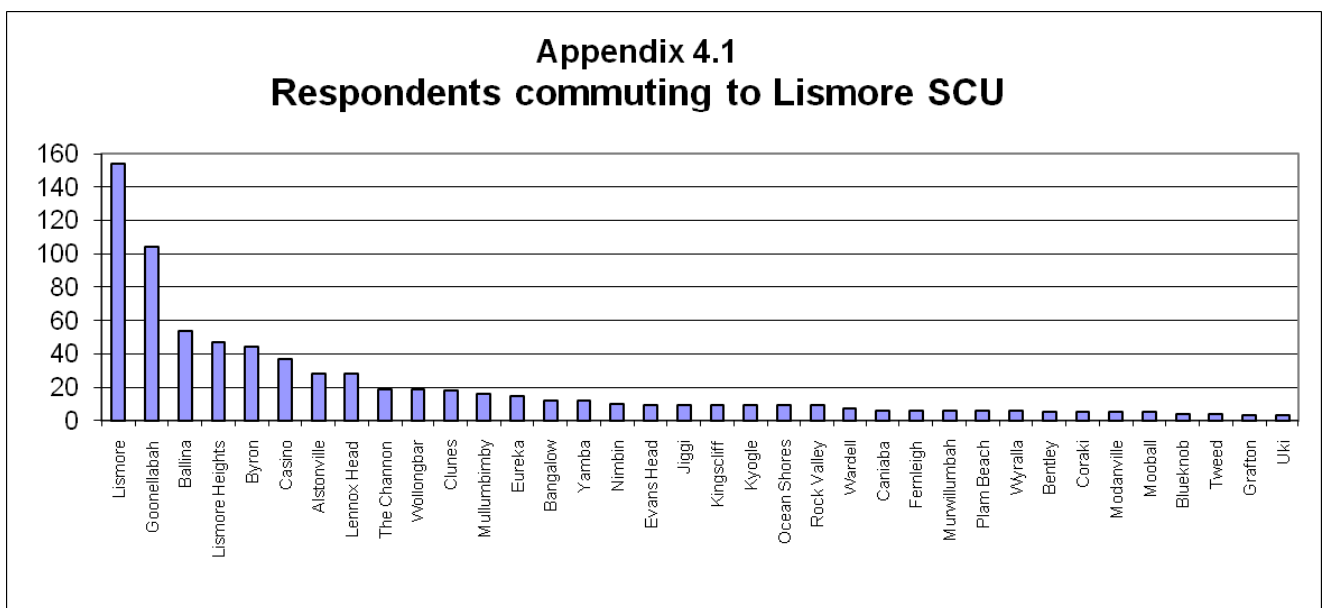
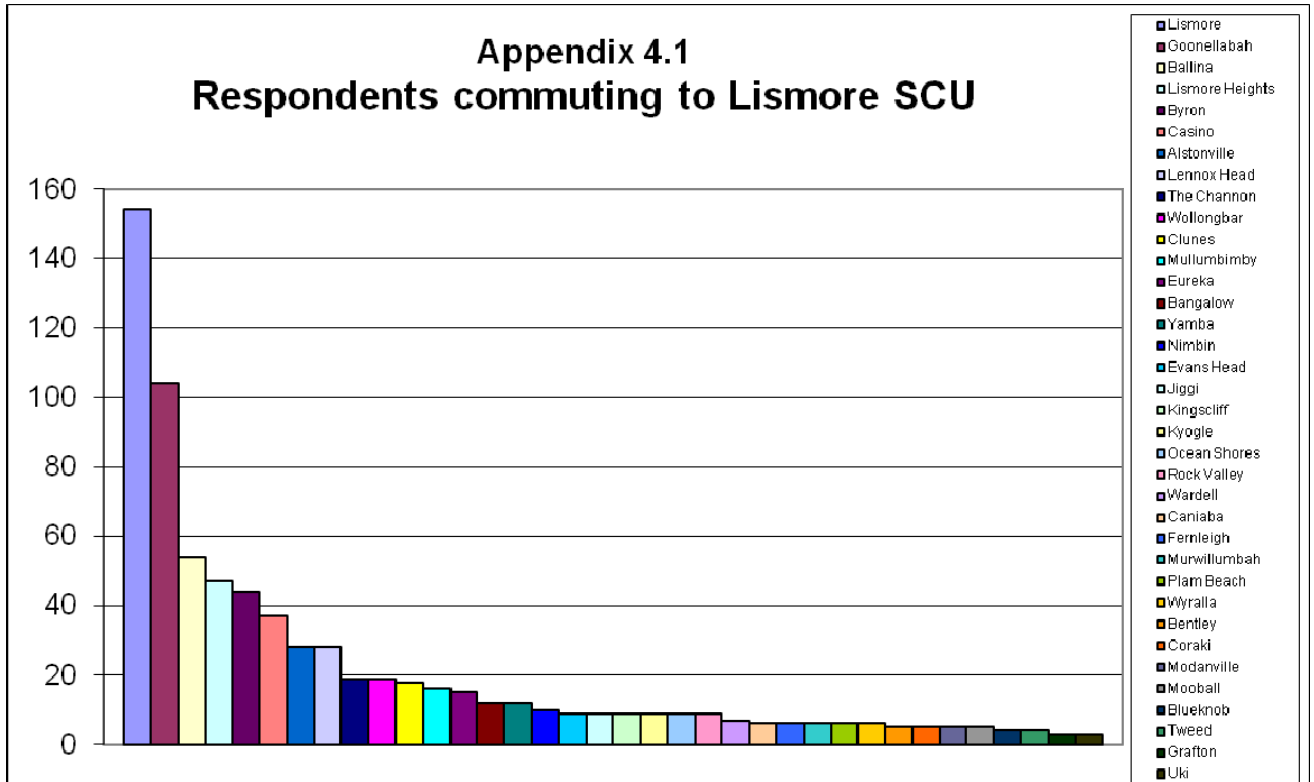
Appendix 3 - Source localities of travel to other councils



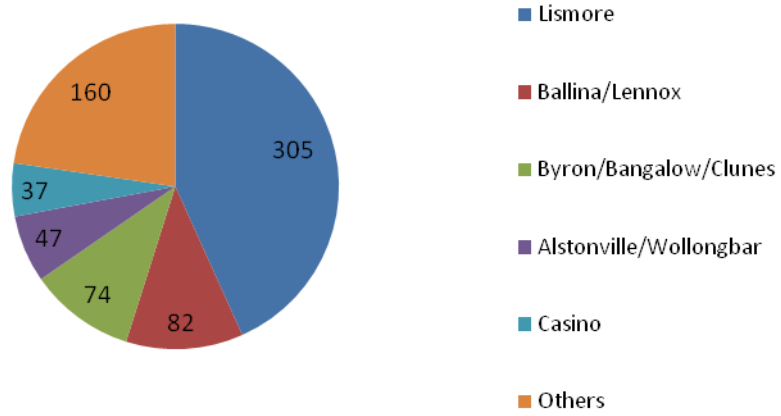
Appendix 3.3 Respondents commuting to Richmond Valley Council



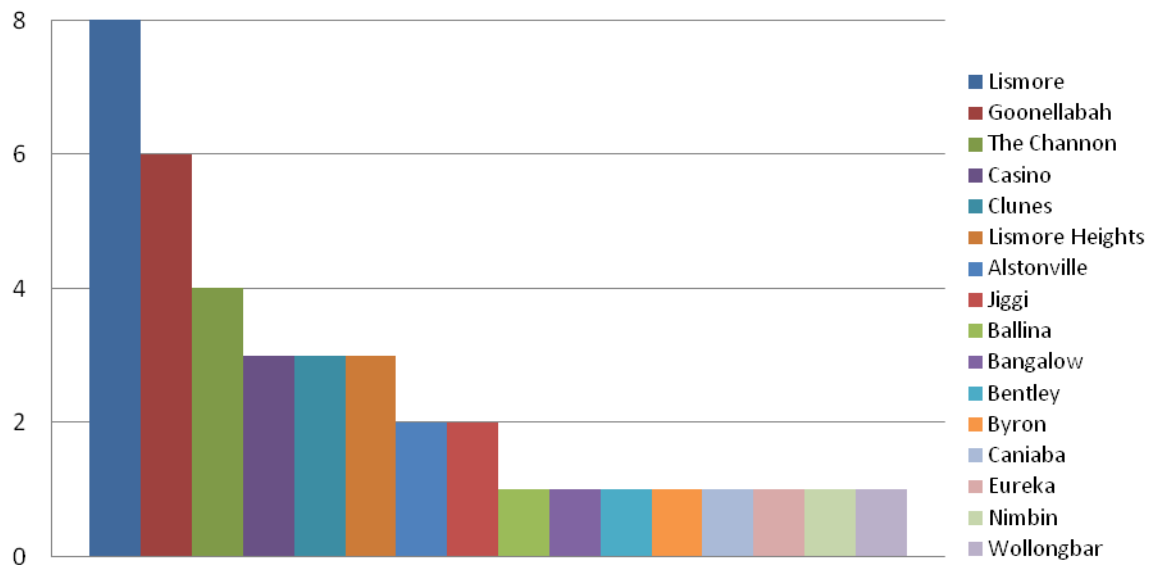
Appendix 4 - Source localities of commuting to specific locations



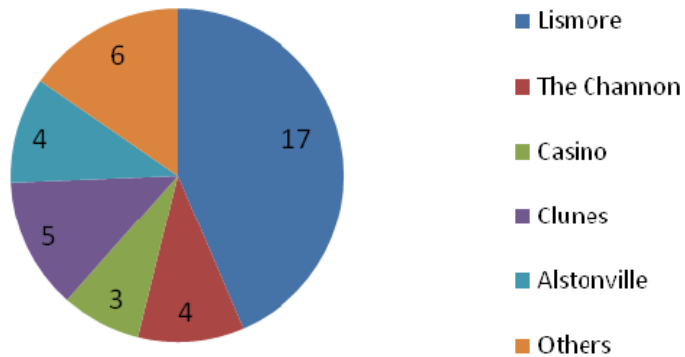
Appendix 4.2 Respondents commuting to Lismore SCU



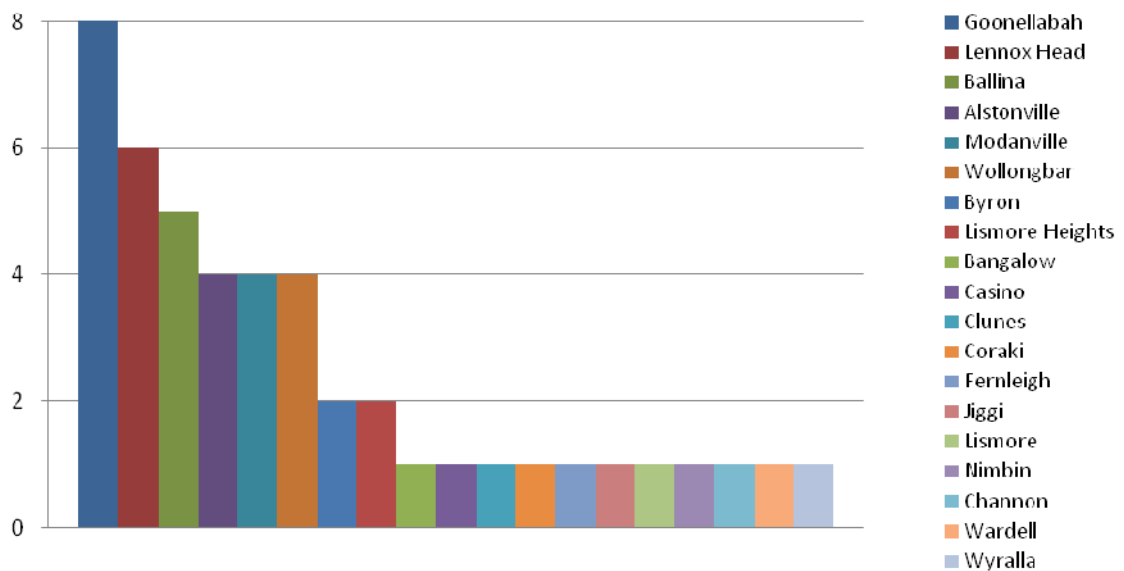
Appendix 4.3 Respondents commuting to Lismore TAFE



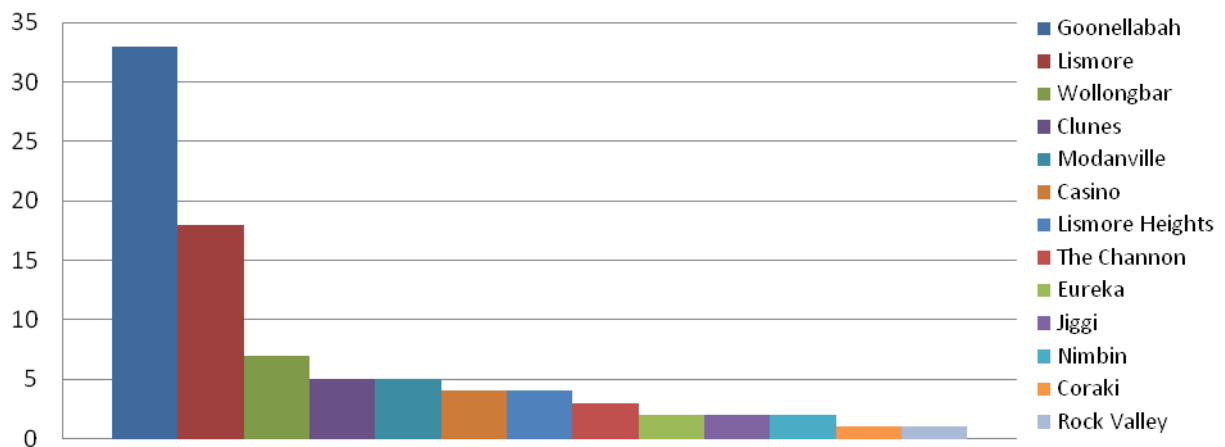
Appendix 4.4 Respondents commuting to Lismore TAFE



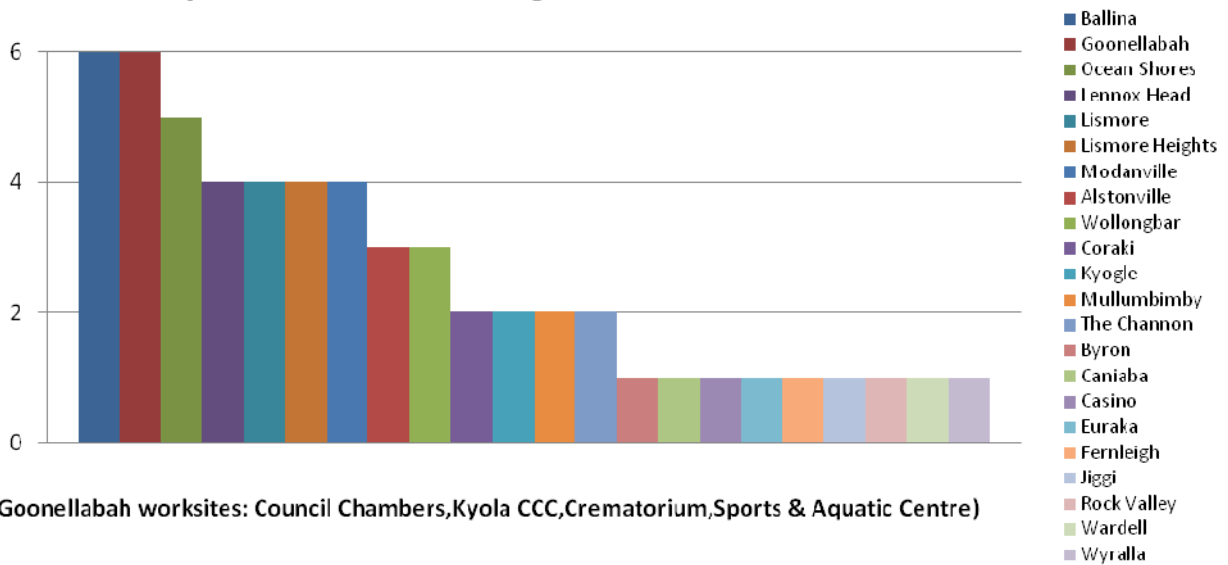
Appendix 4.5 Respondents commuting to Wollongbar TAFE



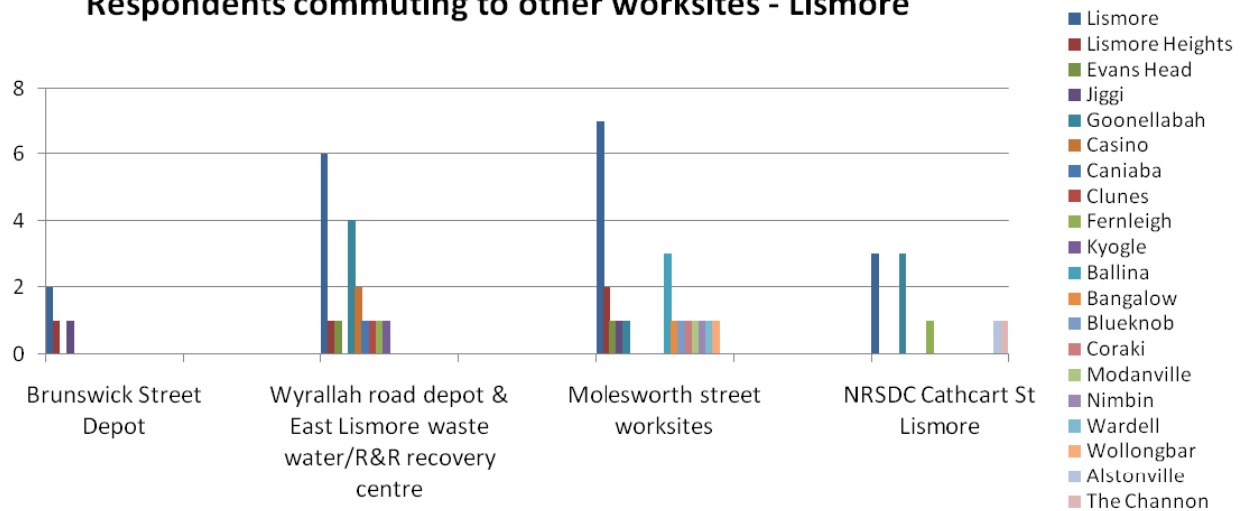
Appendix 4.6 Respondents commuting to Lismore Base and Crawford House Precinct



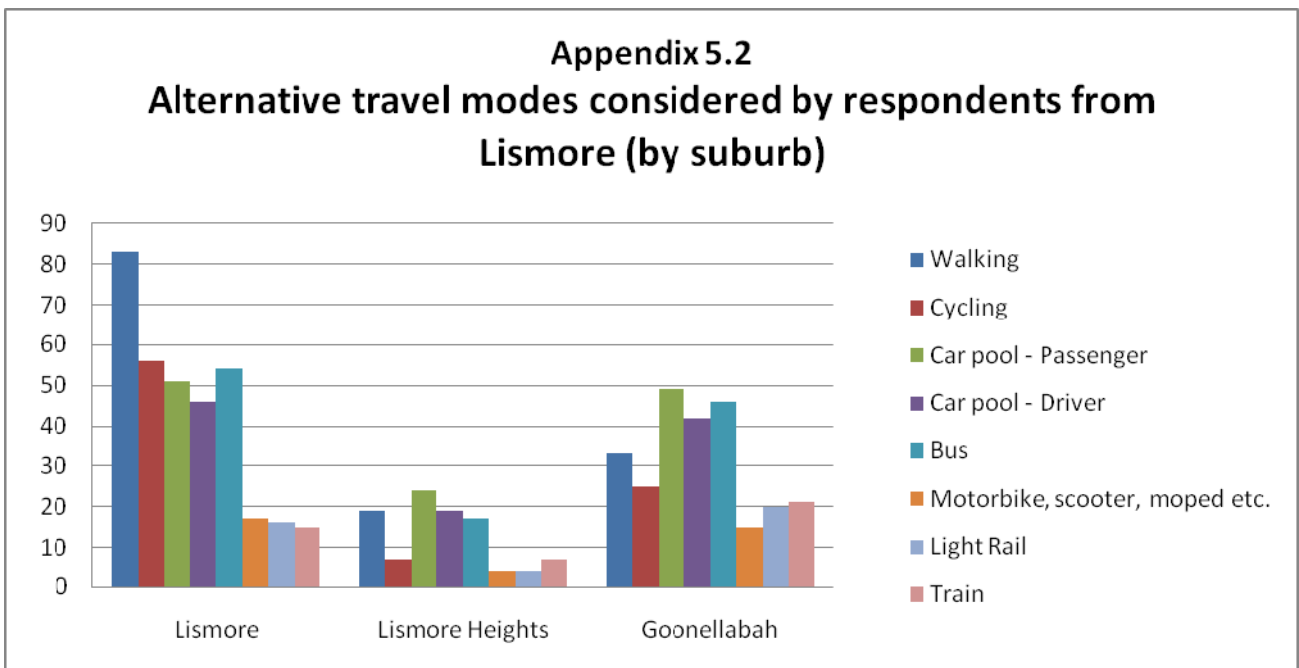
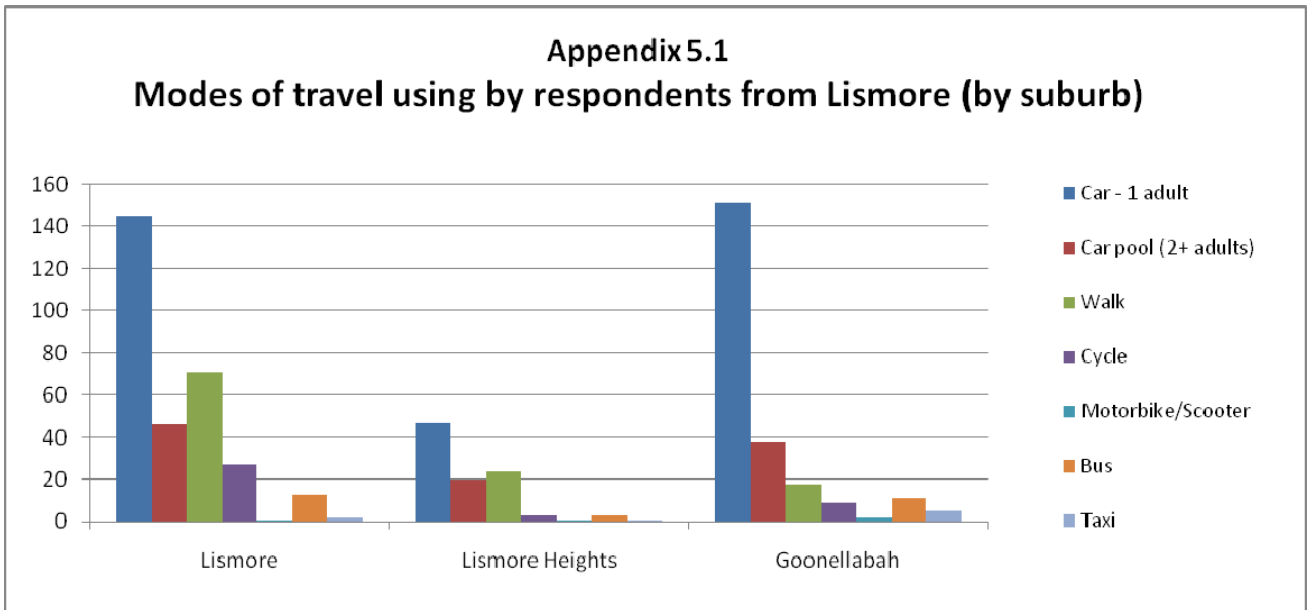
Appendix 4.7 Respondents commuting to Goonellabah Worksites



Appendix 4.8 Respondents commuting to other worksites - Lismore



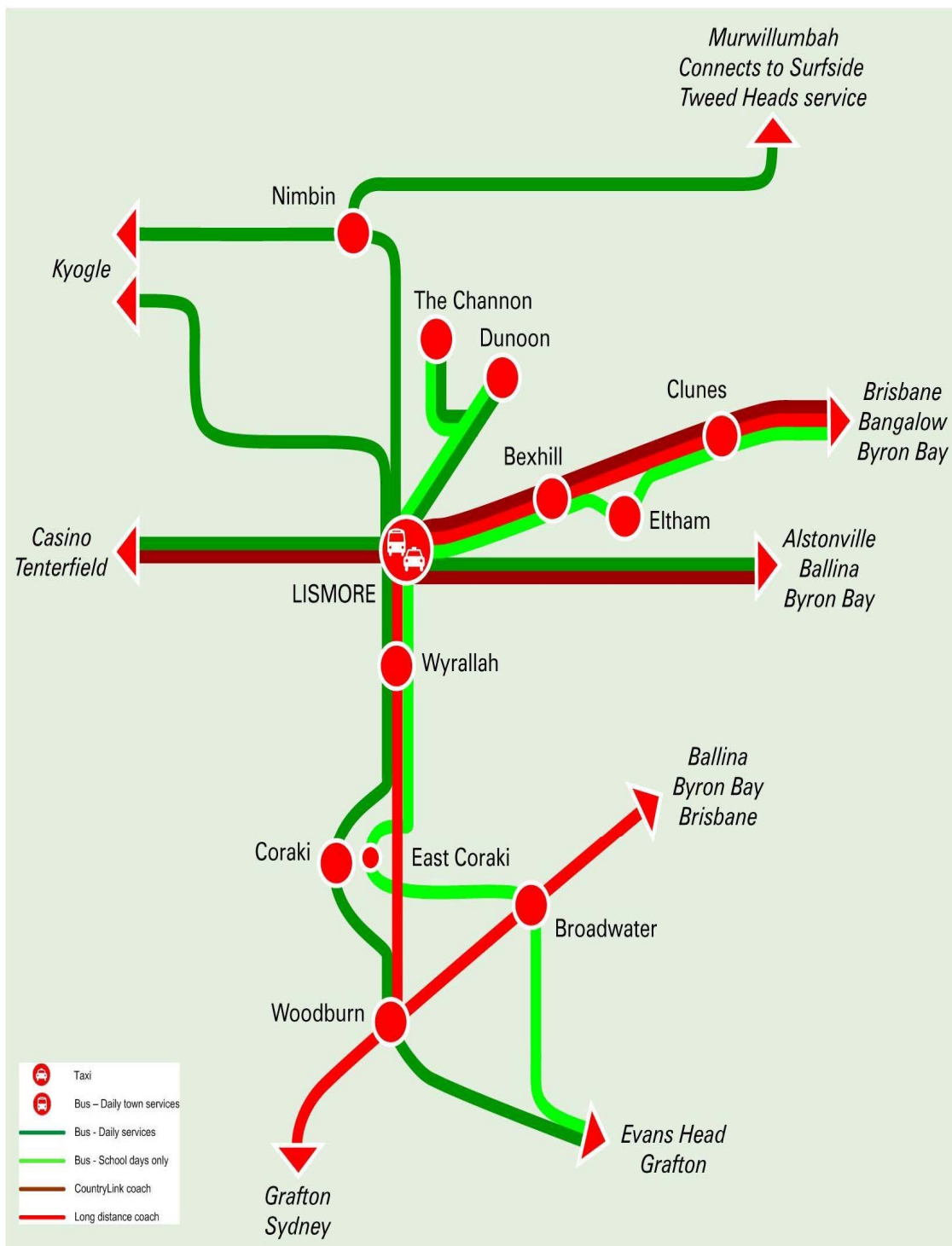
Appendix 5 – Travel mode (Lismore, Lismore Heights, Goonellabah)



Appendix 6 - Lismore transport maps

The following maps were developed by the Northern Rivers Social Development Council and can be viewed on their transport website www.goingplaces.org.au.

Transport feeder routes – Lismore locality



Transport in the Northern Rivers

