



**DRAFT
CESSNOCK LGA
TRAFFIC AND TRANSPORT
STRATEGY
2016**

TECHNICAL REPORT

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Appendix B:	Road Hierarchy Map	Appendix E:	Roadwork Implementation
Appendix C:	Consultation Summary		Reference Maps

Document Control Sheet

Revision Dates

Version	Date	Document	Reviewer	Recipient
1	6 May 2016	Cessnock LGA Traffic and Transport Strategy	S. Brooke	M. Nikolaidis - CCC
2	1 November 2016	Cessnock LGA Traffic and Transport Strategy – Technical Report	S. Brooke	M. Nikolaidis - CCC
3	5 January 2017	Cessnock LGA Traffic and Transport Strategy – Technical Report and Summary Report	S. Brooke	M. Nikolaidis - CCC
4	23 February 2017	Cessnock LGA Traffic and Transport Strategy – Technical Report and Summary Report	M. Nikolaidis & A. Hambling	
5	8 May 2017	Cessnock LGA Traffic and Transport Strategy – Technical Report and Summary Report	S. Brooke	M. Nikolaidis - CCC
6	24 May 2017	Cessnock LGA Traffic and Transport Strategy – Technical Report and Summary Report	M. Nikolaidis	

Part A

Setting the scene

Introduction

Background

Cessnock, like many regional NSW local government areas, is a well-connected collection of towns and villages of varying sizes. With the regional city of Newcastle to the east, its strong mining base, and its Hunter Valley wineries, Cessnock has a robust economic base which is leading to growth. This growth is expected to introduce further traffic and parking demands which need to be managed in a way to encourage greater use of sustainable modes and ensure the liveability of local communities is maintained.

With the opening of HEX, travel time from Cessnock to surrounding employment centres including Newcastle and Lake Macquarie have almost halved. This improved access, along with affordable property market and social and lifestyle benefits, has resulted in a trend of people migrating to Cessnock.

Council has identified areas within the Cessnock transport network with capacity issues. Some routes are experiencing heavy traffic movements, and consequential increased delays to the road users.

In response to increasing growth in development, population and associated increase in travel demand, Cessnock City Council initiated the development of a new traffic and transport strategy. The Cessnock Traffic and Transport Strategy 2016 (CTTS) is the first comprehensive, integrated transport master plan for the City that will guide transport decision-making in Cessnock.

Purpose and Contents

The CTTS is the blueprint for the city's transport network over the next 25 years, with a particular focus on expected accelerated growth in the region. It provides a plan to keep Cessnock moving in the event this accelerated growth is achieved.

The CTTS aims to improve and future proof the City's transport network, and provide Council and its residents with a vision for transport, both public and private, that improves access to housing, jobs and services. It will guide transport policy and investment decisions, ensuring transport funding is allocated in ways that deliver maximum benefits for the people of Cessnock and those who visit the city.

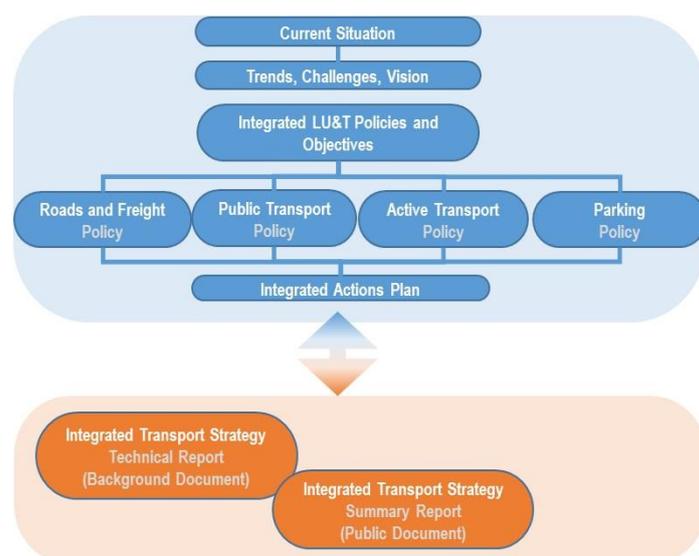
It also highlights requirements for new or improved road infrastructure and provides guidance on provision for new or improved public transport and active transport (e.g. bicycle and pedestrian) facilities.

Scope

The development of the CTTS included four key components, as follows:

- *Trends and Challenges;*
- *Vision and Policies;*
- *Strategies and Actions; and*
- *Implementation Plan.*

This report provides the policy framework for traffic and transport planning and operational decisions within Cessnock LGA between 2016 and 2041. Its purpose is also as a foundation plan for generating further more detailed investigations. This report and its implementation plan is intended to be a “live” document that is regularly monitored and reviewed.



Traffic Model

A traffic model of the study area was developed using the AIMSUN simulation package. This software was used to develop a LGA-wide traffic model to review the LGA’s road network capacity to accommodate future growth in traffic demand and to assist in determining road capacity upgrade needs, evaluate options for new road connections and to test the impacts of new developments. It has been developed to model the existing inter-regional and intra-regional traffic network across the LGA, as well as any future strategies developed as part of the study.

The model coverage is shown in Figure 1. The network outside the town centres was modelled as strategic, whilst mesoscopic simulation was modelled within the town centre with the capability of microsimulation modelling in the future, if needed. A base year model (2015) was developed, calibrated and validated (to RMS modelling guidelines) using traffic counts at 101 intersections and using origin-destination surveys from 13 stations. The model was used to undertake a range of technical analysis for existing and future horizon years including strategic and local network testing and was also used as an analytical tool in developing the road network hierarchy, road widening policy, and the overall transport strategy.

Future year AM and PM peak hour models (2021, 2031 and 2041) were developed to determine timing requirements for transport infrastructure upgrades.

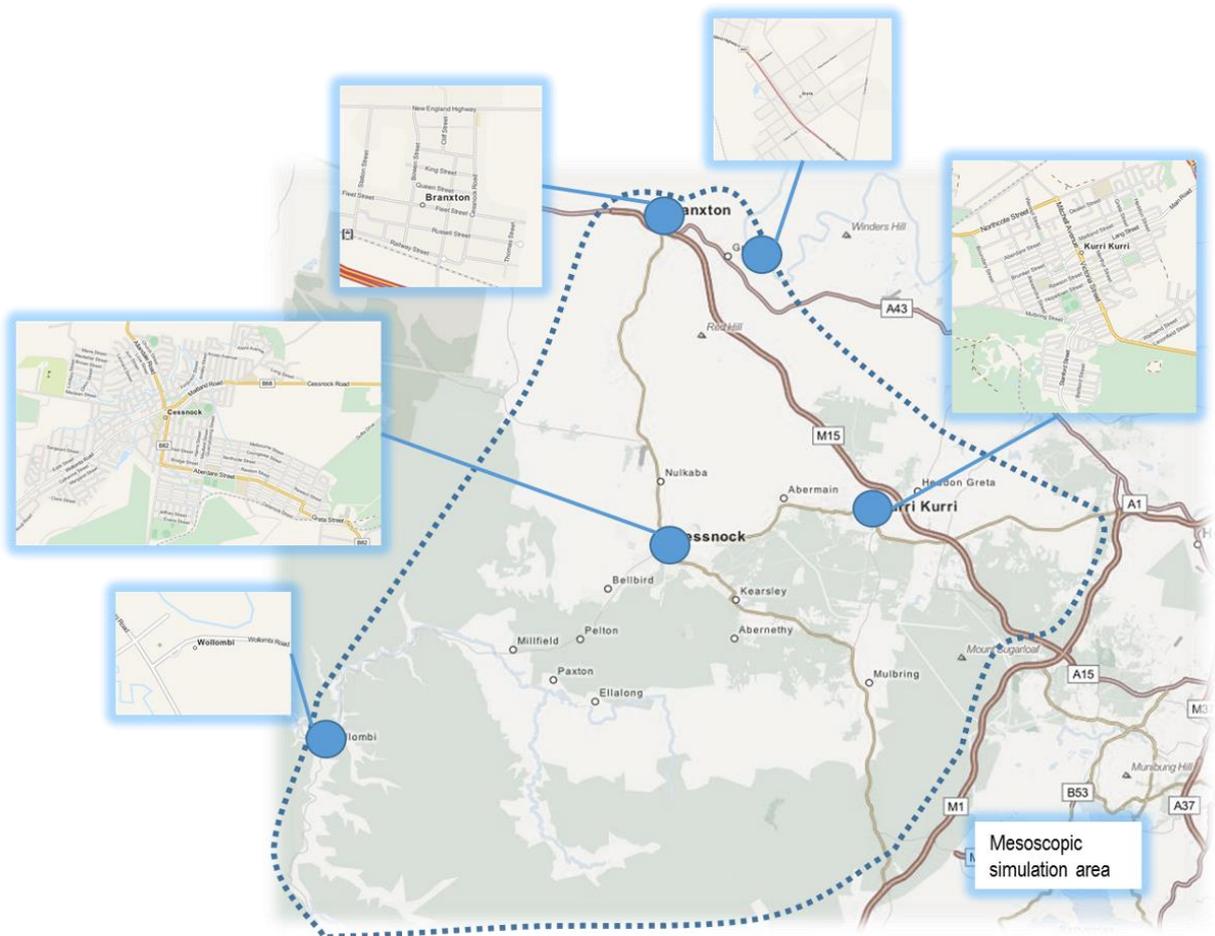


Figure 1: Model Coverage

The Traffic Modelling Report (see Appendix A) provides more detail on the model development, calibration and validation. It details the analysis of future traffic demands and the results of the options tested.

Planning Context

Regional Planning Studies

Community Strategic Plan 2023

Council's Community Strategic Plan 2023, 'Our People, Our Place, Our Future' outlines the aspirations and objectives of Council and its residents and guides both the operations and strategic planning for Council over the coming years. Operations and decisions are guided by five community desired outcomes:

A connected, safe and creative community	A sustainable and prosperous economy	A sustainable and healthy environment	Accessible infrastructure, services and facilities	Civic leadership and effective governance
-------------------------------------------------	---------------------------------------------	----------------------------------------------	-----------------------------------------------------------	--------------------------------------------------

It is through these community desired outcomes that Council can plan for and maximise the quality of life for its residents. The relevant objectives of these desired outcomes as determined through community engagement are:

A connected, safe and creative community.

Objective 1.3 – Promoting safe communities.

A sustainable and prosperous economy.

Objective 2.3 – Increasing tourism opportunities and visitation in the area.

Accessible infrastructure, services and facilities.

Objective 4.1 – Better transport links: and

Objective 4.2 – Improving the road network,

Lower Hunter Regional Strategy (2006)

The Lower Hunter Regional Strategy (LHRS) was prepared by the NSW Department of Planning, which aims to provide adequate and appropriately placed land able to accommodate the projected population growth in the Region to 2031. The LHRS also aims to provide sufficient employment lands to meet the expected growth. The LHRS primarily focuses on development and growth in the regional city of Newcastle, but also includes the revitalisation of other regional centres of Maitland, Singleton, Lake Macquarie, Port Stephens, and Cessnock in order to support Newcastle as the regional city.

The key findings of the LHRS, specifically relating to the Cessnock LGA, are summarised as follows:

- *expected 115,000 new dwellings across the Region, with 60% of new dwellings to be built in new release areas, including Bellbird North (approximately 3500 new dwellings) and Branxton-Huntlee (up to 7500 new dwellings);*
- *expected 66,000 new jobs across the Region, with the Cessnock CBD, identified as 1 of 6 major regional centres for employment, to provide 2300 new jobs; and*
- *the planned extension of the F3 Freeway (now M1) to New England Highway west of Branxton (complete and in operation as of March 2014 as HEX).*

An update of the LHRS was issued in 2009, which identified the population growth of Cessnock LGA as 1.62% per annum; the second highest growth rate out of the five LGAs in the Lower Hunter Region. The update also identified the towns of Greta, Kitchener, Nulkaba, and Cliftleigh as new housing release areas within the Cessnock LGA.

Hunter Regional Plan 2036

The Hunter Regional Plan was released in October 2016 by NSW Planning and Environment, and is the State Government's 20-year blueprint for the Hunter. The plan's vision is to create a leading regional economy in Australia with a vibrant metropolitan city at its heart. The plan proposes delivery of the vision through the following goals:

- *A leading regional economy in Australia;*
- *A biodiversity-rich natural environment;*
- *Thriving communities; and*
- *Greater land choice and jobs.*

Under these goals, the plan develops 27 directions and associated actions. The most relevant to Cessnock LGA and this Traffic and Transport Strategy are:

Direction 4 - Enhance inter-regional linkages to support economic growth:

- *Updating the Regional Transport Plan to ensure there are improved connections to jobs, study and centres for Hunter residents;*
- *Prepare a strategy for land along HEX that considers its region- shaping potential;*
- *Enhance inter-regional transport connections to support economic growth; and*
- *Enable development that relies on access to HEX interchanges, provided it encourages efficiencies to the inter-regional transport network.*

Direction 9 – Grow tourism in the region

- *Enable investment in infrastructure to expand the tourism industry, including connections to tourism gateways and attractions;*

Direction 11 - Manage the ongoing use of natural resources

- *Work with relevant stakeholders, including councils, communities and industry, to prepare land use plans that respond to the lifecycle of resource activity for active and emerging mining areas;*

Direction 18 - Enhance access to recreational facilities and connect open spaces

- *Facilitate more recreational walking and cycling paths including planning for the Richmond Vale Rail Trail and expanded inter-regional and intra-regional walking and cycling links.*

Direction 20 - Revitalise existing communities

- *Accelerate urban revitalisation by directing social infrastructure where there is growth;*
- *Undertake planning and place-making for main streets and centres; and*
- *Enhance the amenity and attractiveness of existing places.*

Cessnock City Wide Settlement Strategy (2010)

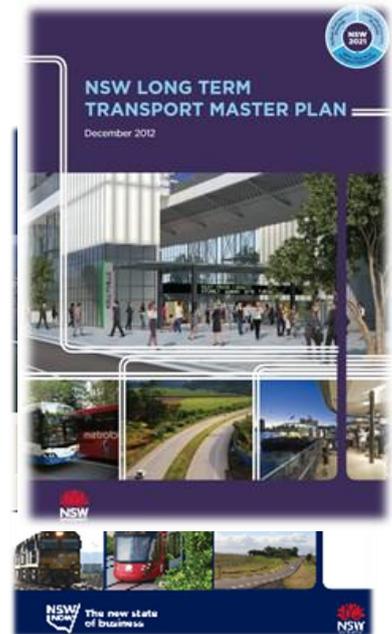
The Cessnock City Wide Settlement Strategy (CWSS) was developed to provide strategic direction for incorporating the relevant outcomes and actions of the LHRS into Cessnock's Local Environment Plan (LEP), which was later adopted in 2011. Key strategies identified in the CWSS included:

- *the possibility for development beyond what was identified for growth in the LHRS;*
- *the need to contain the urban footprint of the Cessnock LGA;*
- *limiting the commercial expansion in Cessnock to land at "Cessnock Civic", located south of Aberdare Road;*
- *elevating the village status of Heddon Greta, Greta, Kearsley, and Neath into the residential hierarchy to allow for potential future development;*
- *retaining the Hunter Economic Zone (HEZ) site as a general industrial zone, where there is significant opportunity for future development, with over 800 hectares of vacant land; and*
- *the need for an integrated land use and transport study to identify appropriate transport infrastructure and services as a result of the projected population growth outlined in the LHRS.*

Regional Transport Strategies

NSW Long Term Transport Masterplan – December 2012

The NSW Long Term Transport Masterplan guides the NSW government's transport infrastructure investments for the next 20 years. It is a planned and coordinated framework designed to assist in guiding transport plans and policy decisions, prioritising key routes and transport network structures across NSW.



Hunter Regional Transport Plan (2014)

The Hunter Regional Transport Plan 2014 was developed to support the New south Wales Long Term Transport Master Plan.

A number of actions (some completed) influence transport in Cessnock LGA. These include:

- *the Hunter Expressway (HEX);*
- *Cessnock Public Transport Improvements Program and upgrade and improve seating, shelters, signage and disability access at 25 locations;*
- *safety works including clearing trees and hazards within road clear zone, road widening, strengthening of the existing pavement and sealing along the Old Maitland Road in Cessnock;*
- *improve safety by upgrading Wine Country Drive and associated local roads in Pokolbin;*
- *traffic safety works on Wollombi Road in Pelton;*
- *improve opportunities for walking and cycling;*
- *improved Public Transport Services - review the public transport network to understand current service provision and requirements going forward. Opportunities for community transport and flexible transport improvements will be investigated to identify ways we can extend the reach of the public transport system and make it more flexible for customers; and*
- *manage road capacity and safety. Upon the completion of the Hunter Expressway, we will continue to work with Council to monitor road capacity and network safety in the Cessnock LGA.*

Sustainable Transport in the Lower Hunter Region (2003)

This issues paper identifies the transport infrastructure and operations issues across the Lower Hunter Region, and promotes various approaches for regional councils to consider creating a sustainable transport system to accommodate the expected growth of the region. The study focuses primarily on the need for short term actions to be implemented, with a “do nothing” approach not considered acceptable if the urban quality and liveability is to be retained or enhanced. Most of the actions raised have been accomplished with the completion of HEX.

Previous Local Transport Studies

Kurri Kurri CBD Parking & Traffic Study (2007)

The Kurri Kurri CBD Parking and Traffic Study was undertaken by Gennaoui Consulting, which provided a detailed assessment of the existing and future parking and traffic conditions within the Kurri Kurri CBD, as well as recommended measures to mitigate the impacts associated with future growth, and optimise both on-street and off-street parking. The study’s key findings have been summarised as follows:

- *all existing intersections operate at a level of service B or better;*
- *63% of existing parking is on-street, with 44% short-stay, but a parking surplus of 625 spaces exists;*
- *limited off-street parking, which is mostly long-stay;*
- *potential residential growth in the surrounding region is likely to generate 1330 trips in the afternoon peak;*
- *traffic associated with development of the HEZ site would likely reduce the level of service of Lang Street to ‘D’;*
- *a recommendation to replace the roundabout at Lang Street / Mitchell Avenue / Victoria Street with a signalised intersection; and*
- *a recommendation to provide a two-lane circulating roundabout at:*
 - *the Lang Street / Merthyr Street intersection; and*
 - *the Mitchell Ave / Maitland Street intersection.*

It is understood that the above-mentioned recommendations have not yet been implemented.

Cessnock CBD Parking and Traffic Study (2006)

The Cessnock CBD Parking and Traffic Study was undertaken by Gennaoui Consulting. This study provided an assessment of the existing and future parking and traffic conditions in the Cessnock CBD, as well as recommended measures to mitigate some of the impacts associated with future growth. The study’s key findings have been summarised as follows:

- *all existing intersections operate at a level of service B or better;*
- *a high parking demand at the Cessnock Market Place, with 40% of all visitors parking in Woolworths and Coles car parks, but a surplus in parking spaces across the whole CBD;*
- *potential future growth exists in the Cessnock Civic precinct (south of Aberdare Street), with over 180% increase in commercial/retail GFA over the next 10 years (to 2016);*
- *a recommendation for a proposed new four-way signalised intersection at Darwin Street / South Avenue, with heavy vehicle access to and from the Cessnock Civic precinct to be restricted to this intersection (and not via Vincent Street);*

- the future growth of the Cessnock Civic precinct would have marginal impact to the traffic network, with a level of service D observed at just one intersection—the proposed new intersection at South Avenue and Darwin Street;
- a recommendation for a ring road, with directional signage, around the CBD along Cumberland Road – Maitland Road – Wollombi Road – Darwin Street – Snape Street – Aberdare Street to allow traffic to bypass the CBD; a recommendation for a signalised intersection at Wollombi Road and Cessnock Market Place car park access to reduce the delays observed during the evening peak; and
- a recommendation for a signalised intersection at Cumberland Street and Aberdare Road, in conjunction with the ring road recommendation.

Figure 2 illustrates the proposed recommendations from the study. It is understood that these recommendations have not yet been implemented.

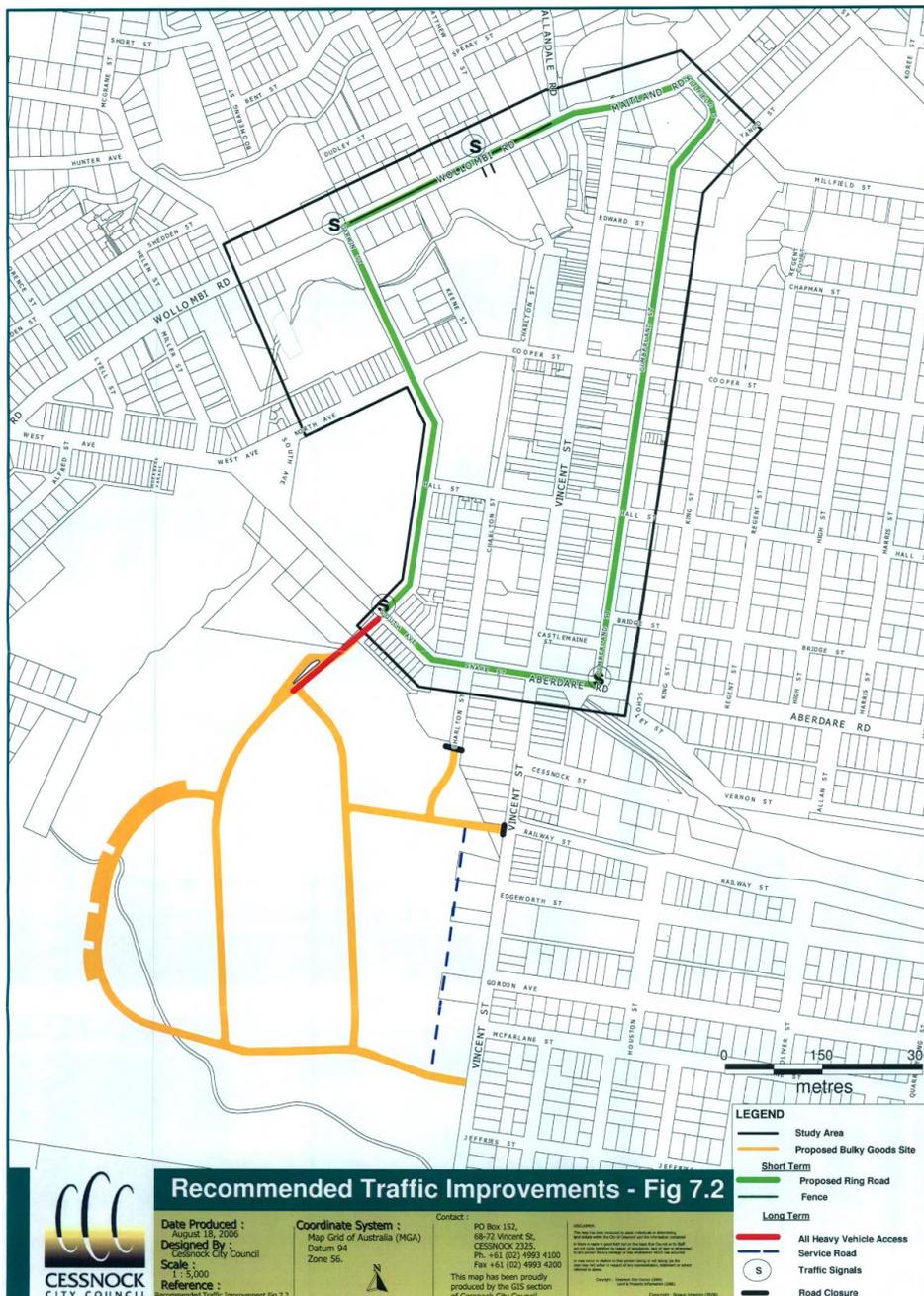


Image Source: Cessnock CBD Traffic & Parking Study (Cessnock City Council 2006)

Figure 2: Recommended Traffic Improvements from 2006 Cessnock CBD Study

Active Transport Plans and Strategies

Council recently adopted the Cessnock LGA Pedestrian Access and Mobility Plan and the Cessnock Cycling Strategy.

Cessnock Cycling Strategy

The Cycling Strategy builds on the Cessnock City Council Bicycle Plan 1995, which proposed a number of actions designed to encourage and support cycling in the Cessnock area. The vision for cycling in Cessnock is to *“Create a safe, attractive and accessible cycleway network that improves the community’s connections with key destinations and each other and encourages residents of all ages to use their bicycle for recreation and everyday transport.”* The vision is supported by four strategic objectives:

- *provide a cycling environment that is safe, secure and encourages residents to cycle without fear of accident or injury;*
- *provide a cohesive and integrated bicycle network that is easy for cyclists to use;*
- *integrate cycling into Council’s planning processes; and*
- *promote awareness of cycling amongst the community and road and path user groups.*

To achieve the objectives of the Cessnock Cycling Strategy, seven strategic directions have been identified. They are:

1. Enhance the safety and continuity of cycling in Cessnock;
2. Provide appropriate support infrastructure;
3. Provide a convenient and attractive cycling environment;
4. Provide measures for cycling in new development;
5. Provide leadership and direction in encouraging cycling through planning and policy;
6. Promote cycling, cycleway routes and cycling events through various sources; and
7. Monitor the implementation of cycling actions and progress towards targets.

The Strategy proposes a number of key actions, including:

- *supporting the Transport for NSW’s Cycling Safety Action Plan 2014;*
- *implementing Council’s Road Safety Strategy through developing road safety programs to improve road safety outcomes for bicyclists, participate in Bike Week activities/ events to further promote road safety solutions, bicycle safety campaign materials to promote the increased use of helmets and work with local school communities;*
- *assessing provisions for cyclists and determine capacity for upgrading of facilities (such as reallocation of space, line marking, physical separation of cyclists and motorists) in future road upgrade and maintenance programs;*
- *enhanced provision of bicycle parking and end of trip facilities at key destinations and in new developments;*
- *educational and promotional campaigns to encourage more cycling activity for work, education and recreational trips; and*



- *implement the projects identified in the Works Program.*

The Cycling Strategy Works Program prioritised projects into three timeframes, as presented in Table 1 below.

Table 1: Cessnock Cycling Strategy Works Program Summary

Priority	Timeframe	Length (Km)	Cost (\$)
High	As soon as resources allow	63	\$8,827,300
Medium	the next 5 – 10 years	112	\$21,327,295
Low	More than 10 years	79	\$10,682,500

Cessnock LGA Pedestrian Access and Mobility Study (PAMP)

Cessnock City Council is committed to providing long term planning for pedestrian access and mobility, to promote cycling and walking for short trips and to link public transport services and community facilities.

Council formerly adopted the Cessnock LGA Pedestrian Access and Mobility Study, PAMP in July 2016. The PAMP was developed in accordance with the Department of Roads and Maritime Services guidelines. The PAMP included an audit of existing pedestrian facilities, identification of key pedestrian generators and priority routes. A key objective of the PAMP is to improve connectivity to and within the LGA's towns and villages, to facilitate a healthy, active, engaged, cohesive community that maintains its unique local identity and friendliness into the future through improved pedestrian facilities.

The PAMP routes were prioritised for importance and future funding. Higher priority was given to routes within major town centres and key pedestrian links to stations, bus stops, schools, and aged care facilities. The route prioritisation system is shown in Table 2.

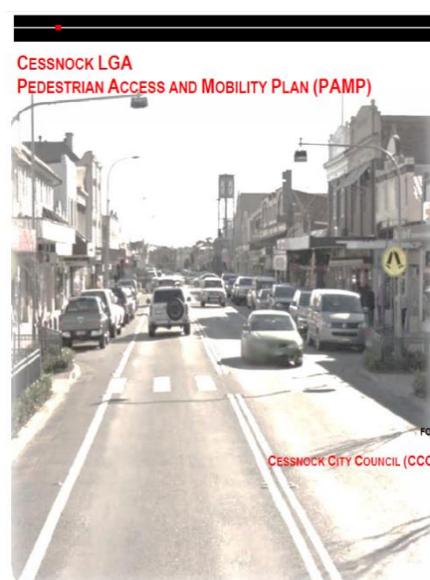


Table 2: Route Prioritisation System Criteria

Criteria	Major Town Centre	Minor Town Centre	Local Residential Area
Primary link to pedestrian attractors/generators	High	Medium	Low
Secondary link to pedestrian attractors/generators	Medium	Low	Low
Location of pedestrian crashes	High	High to Medium	Low
Connections between existing footpaths or towns/villages	High to Medium	Medium	Medium to Low
Concerns from community feedback	Medium	Low to Medium	Low
Relation to road hierarchy	Medium	Low	Low

The PAMP program prioritised works into two streams:

- *priority routes which comprise mostly new routes; and*
- *audits, which comprise maintenance works and road crossing facilities.*

The works program for all recommended treatments (across priority works and priority routes) is shown in Table 3 and Table 4. These cost estimates do not include costs associated with RMS State Roads, as they are not included as part of Council's funding or responsibility.

Table 3: Cost Estimates Summary for Priority Routes

		Route Priority			
		High	Medium	Low	Sub Total
Location	Cessnock	\$1,281,100	\$1,522,300	\$2,469,700	\$5,273,100
	Kurri Kurri	\$22,500	\$1,745,000	\$1,969,500	\$3,737,000
	Weston		\$414,500	\$156,000	\$570,500
	Branxton		\$434,300	\$1,159,500	\$1,593,800
	Greta		\$357,500	\$1,230,200	\$1,587,700
	Sub Total	\$1,303,600	\$4,473,600	\$6,984,900	\$12,762,100

Table 4: Cost Estimates Summary for Audit

		Audit			
		High	Medium	Low	Sub Total
Location	Cessnock	\$77,576	\$144,038	\$38,665	\$260,280
	Kurri Kurri	\$13,000	\$20,000	\$80,429	\$113,429
	Weston	\$123,500	\$2,400	\$9,175	\$135,075
	Sub Total	\$214,076	\$166,438	\$128,269	\$508,784

Previous Consultation Activities

Community Consultation

The community was engaged in the development of this strategy through community workshops, on-line information through Council's website and an on-line questionnaire. A total of 65 Cessnock LGA residents responded.

What people talked to us about

Consultation revealed that poor road pavement condition (24%), congestion (18%) and public transport (20%) are the community's biggest transport concerns (see Figure 3). Road safety and lack of alternate route options to HEX also rated highly as community concerns. Some of the key comments were:

- road congestion and traffic flows need to be reviewed. Access from HEX to Cessnock and surrounding suburbs needs to be looked at;
- a direct link to the new HEX bypassing Weston and Kurri Kurri is needed;
- the times the buses run wouldn't get me to work on time or way too early;
- University services do not extend throughout the day - attending evening classes by bus is impossible; and
- potholes, potholes, potholes. They are the top three.

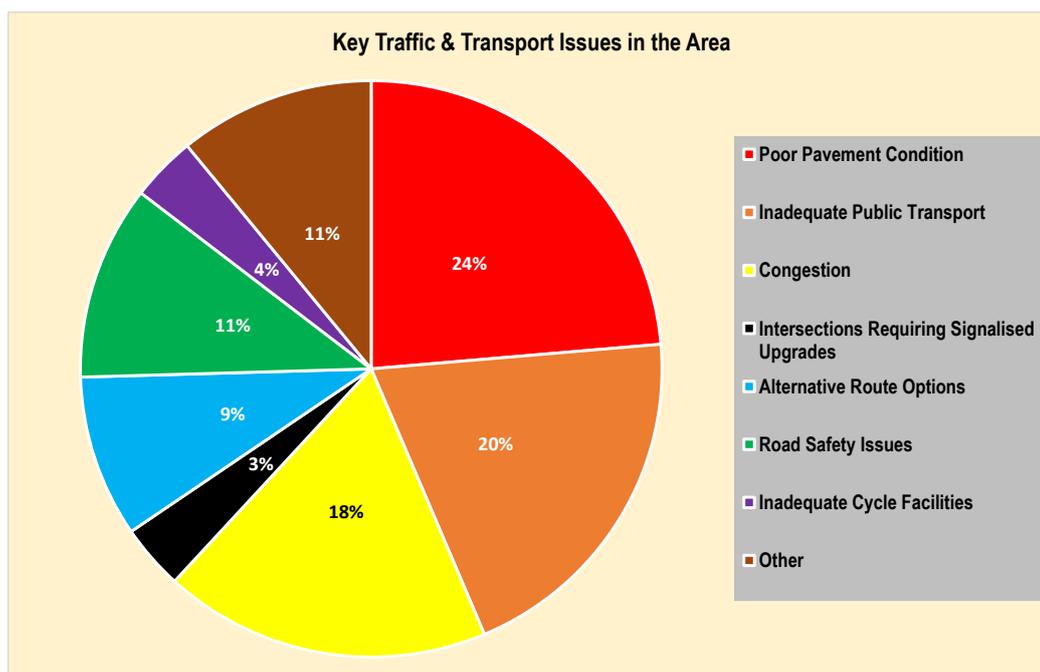


Figure 3: Key Traffic and Transport Issues from Community Consultation

Key Stakeholder Consultation

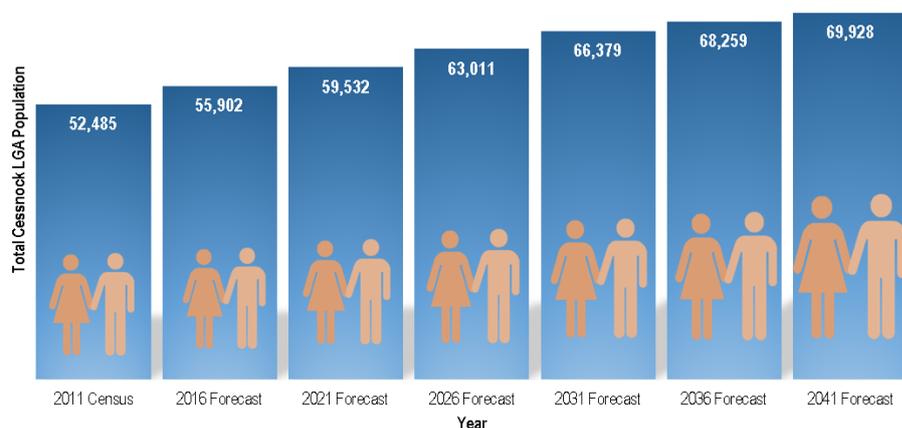
A number of workshops were held with Council officers representing Works and Infrastructure, Planning and Environment and Corporate and Community Services. The workshops took a collaborative and interactive approach to exploring transport solutions for the LGA, which helped to determine realistic transport initiatives that can be implemented by Council and the State Government.

Key Statistics and Trends

Demographics

Population

Population forecasts profiled by the NSW BTS and based on ABS census data from 2011 is shown in Figure 4. The data indicates an increase in Cessnock LGA residents of over 33% out to the year 2041.



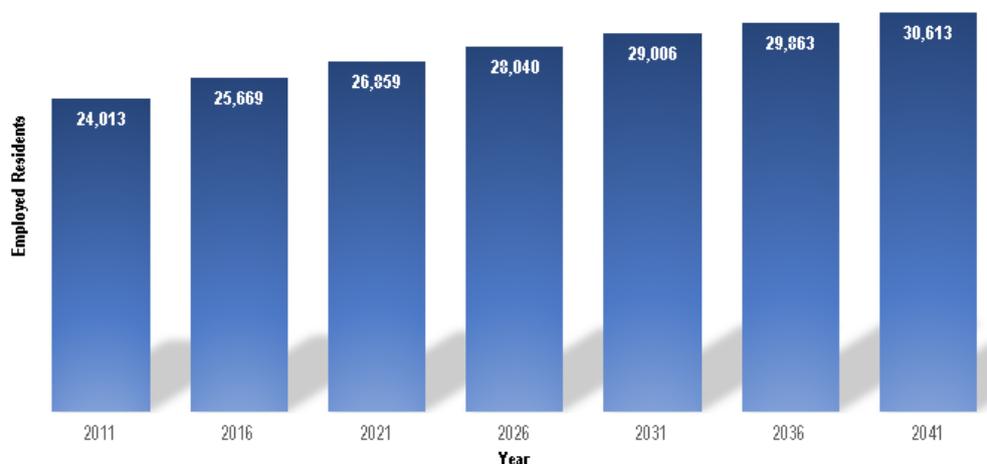
Source: NSW BTS Data

Figure 4: Forecast Population Growth

The forecast suggests a growth rate of 1.1% per annum over the next 30 years which is a slowing trend compared to an average 1.8% p.a. growth since 2007 and may not factor in recent development planning activities post opening of HEX.

Employment

The number of persons employed in the Cessnock LGA is proposed to increase by approximately 5,000 jobs between 2016 and 2041 (or 27.5%), as shown in Figure 5.

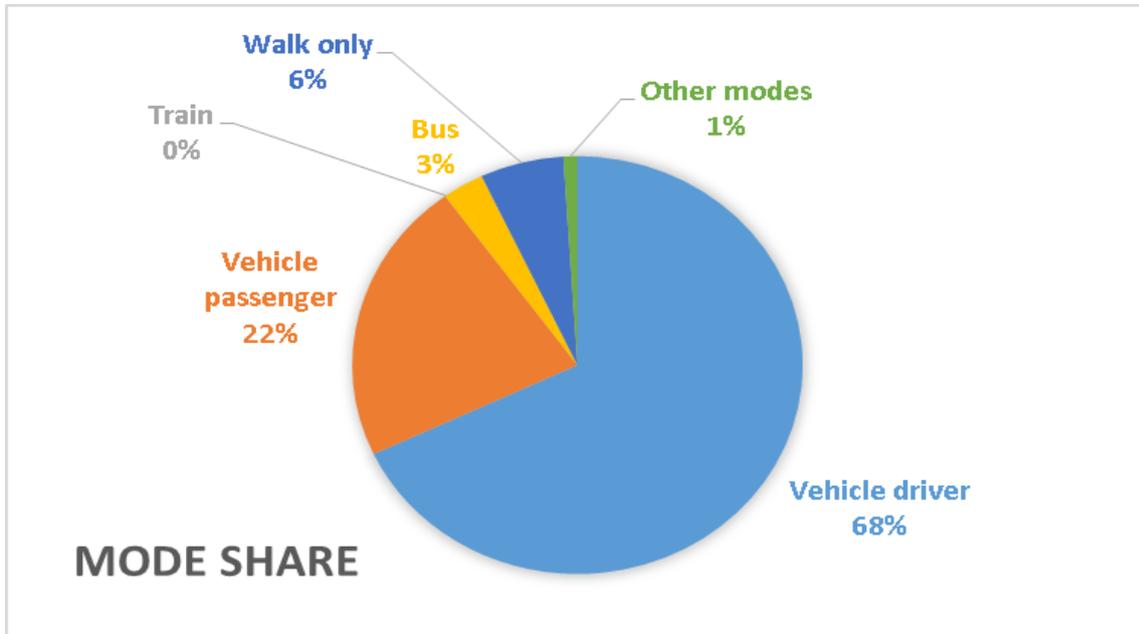


Source: NSW BTS Data

Figure 5: Employed Residents Growth

Mode Share

In 2013, around 181,000 trips per day were made within the Cessnock LGA. Ninety percent of these trips were made by private vehicle, of which 124,000 (68%) were in single occupant vehicles. Figure 6 shows the breakdown of trips by mode of travel. Public transport makes up 3% and walking 6%.



Source: 2013 Household Travel Surveys

Figure 6: Mode of Travel - Cessnock LGA

While the total number of trips remained relatively the same between 2007 and 2013, private vehicle trips have increase from 143,000 trips per day to 163,000 trips per day; an increase of 15%. In the same period, public transport trips decreased from 14,000 to 6,000 trips per day, or -57%, as see in Figure 7.

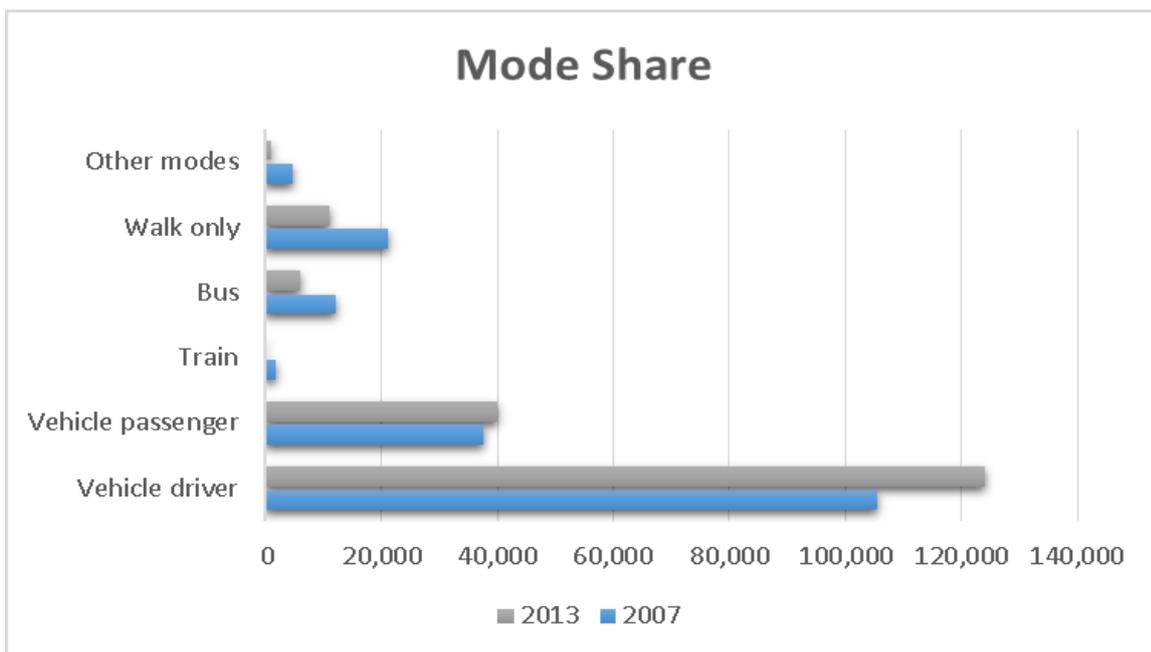


Figure 7: Change in Mode of Travel (2007-2013)

Travel Patterns

All Trips

Work trips including business trips make up 37% of all trips in the Cessnock LGA. This is followed by social recreation and shopping trips (19% and 16% respectively) as shown in Figure 8. Although work trips make up slightly over a third of all trips (37%), they account for nearly half of all kilometres travelled (45%). This is slightly higher than the comparable proportion of 42% for the lower hunter sub-region.

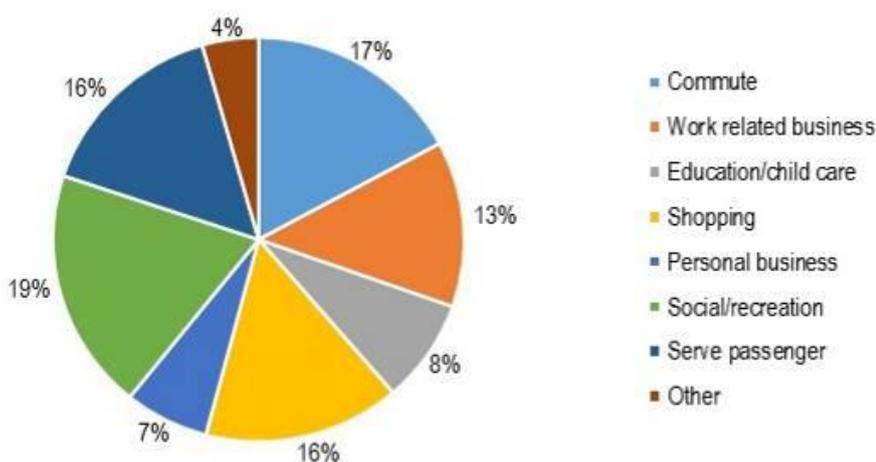


Figure 8: Purpose of Travel - Cessnock LGA

Journey to Work

Australian Bureau of Statistics (ABS) Journey to Work (JTW) data was analysed to understand the distribution of work trips to and from the Cessnock LGA. Of the total work trips, 45% (10,078 trips) are contained within the study area.

The destination of outbound work trips from the LGA is shown in Table 5 and in Figure 9. 23% of the outbound work trips travelled to Maitland followed by 22% to Newcastle. About 14% trips travelled to Broke and 11% to Lake Macquarie.

The destination of inbound work trips to the LGA are shown in Table 5 and in Figure 10. 32% of the inbound work trips travelled from Maitland. Almost 23% travelled from Lake Macquarie and 21% from Newcastle.

Table 5: Daily Car Trips from Cessnock LGA (Outbound)

Geographic Area	Number of Trips from Cessnock LGA	%
Wyong / Gosford	276	3%
Port Stephens	402	5%
Singleton	530	7%
Glendon Brook	612	8%
Lake Macquarie	892	11%
Broke	1,096	14%
Newcastle	1,756	22%
Maitland	1,840	23%
Others	582	7%

Total	4,296	100%
Within Cessnock LGA	10,078	-

Table 6: Daily Car Trips to Cessnock LGA (Inbound)

Geographic Area	Number of Trips to Cessnock LGA	%
Wyong / Gosford	265	6%
Port Stephens	254	6%
Newcastle	893	21%
Lake Macquarie	991	23%
Maitland	1,385	32%
Others	300	12%
Total	4,296	100%
Within Cessnock LGA	10,078	-

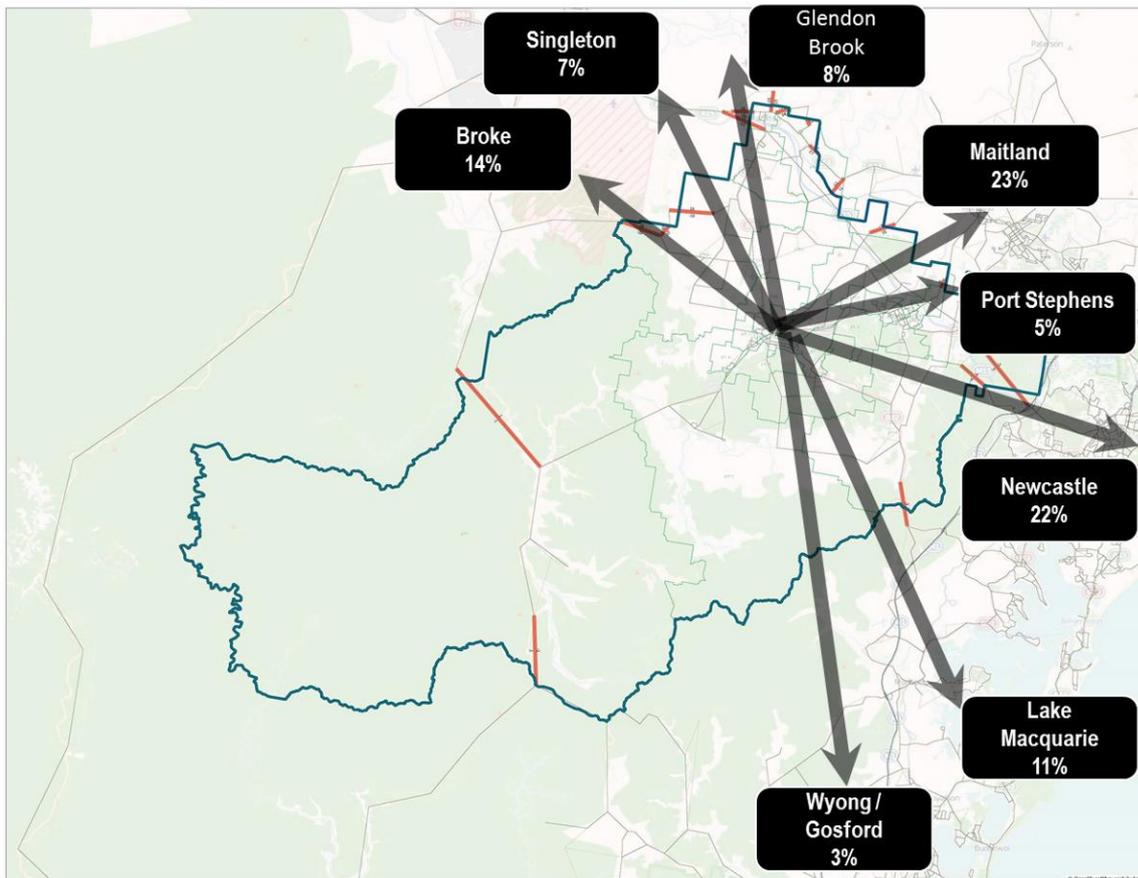


Figure 9: Daily Journey to Work Trips

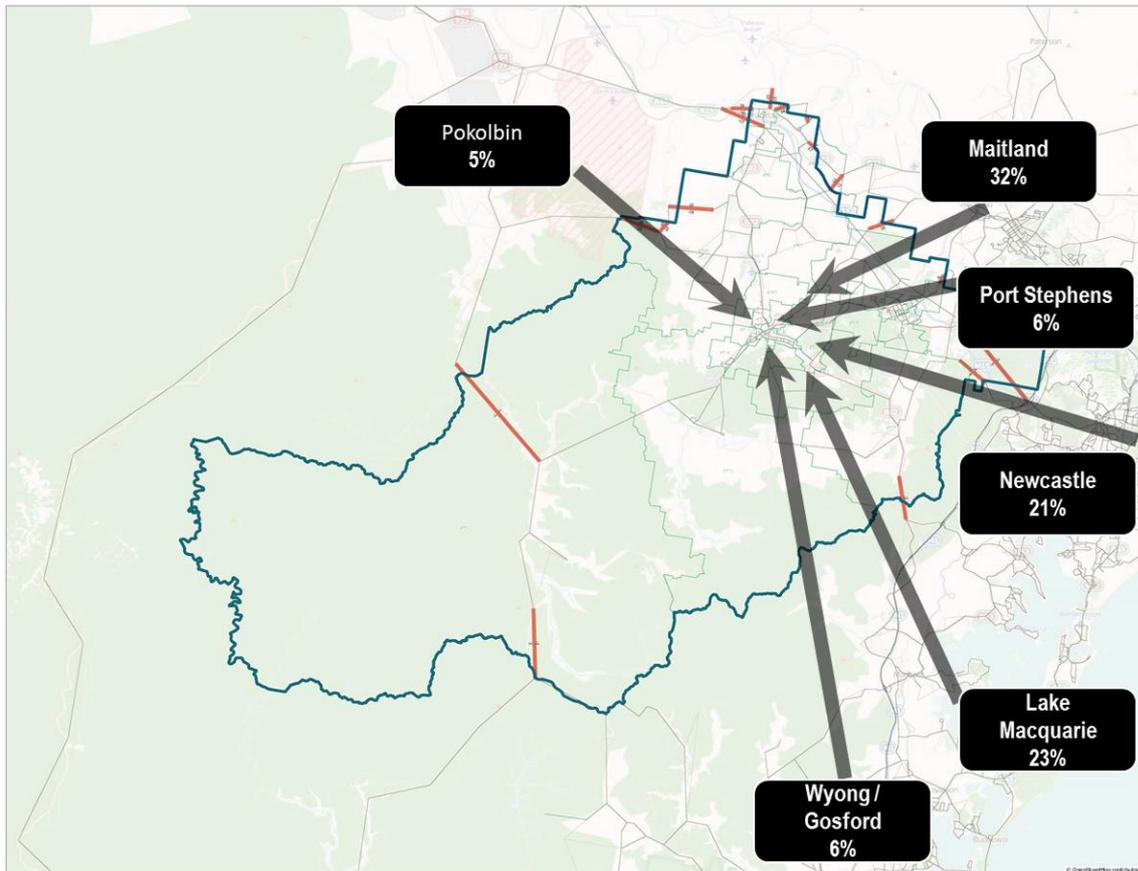


Figure 10: Daily Journey to Work Trips to the Cessnock LGA (Inbound)

Car Ownership

On average, between 2009 and 2013 car ownership within the LGA has increased by 2.5% per annum. This is higher than the recent population growth of 1.8% per annum. The low-density areas within the LGA are likely to continue to remain highly car-dependent. Figure 11 shows car ownership from 2009 - 2013.

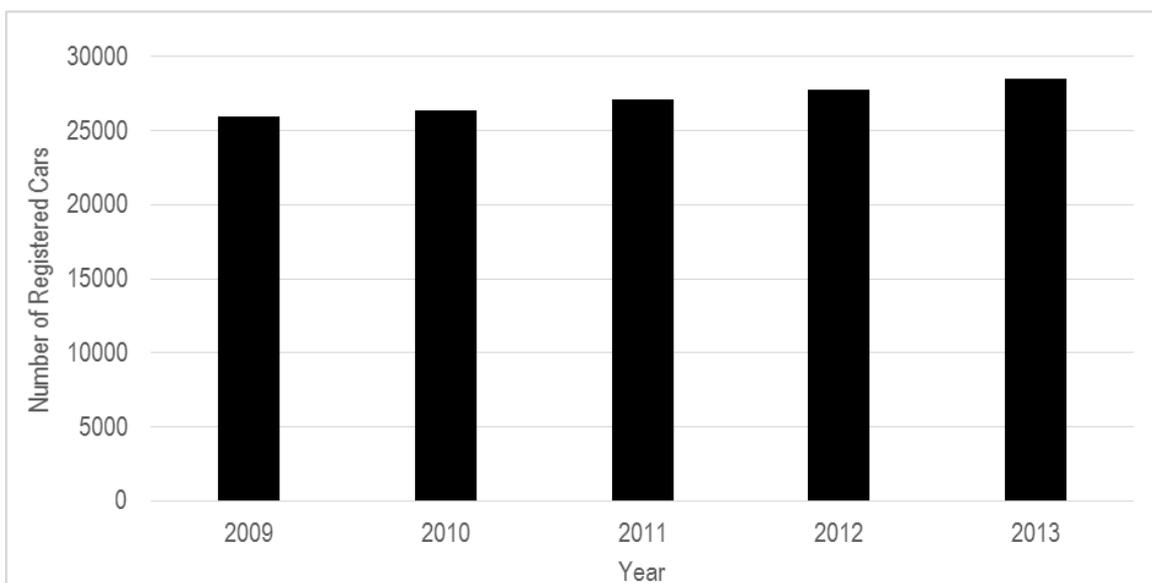


Figure 11: Car Ownership in Cessnock LGA (2009 - 2013)

Weekend Travel

Cessnock LGA experiences unique weekend travel characteristics when compared to similarly sized LGAs. The wineries, villages, shops, dining, sporting activities and special events (such as music festivals) attract a large number of discretionary trips from residents and overnight tourists. In addition to the high demand put on the network by residents, the city attracts considerable numbers of day trippers on weekends from neighbouring areas such as Sydney and Newcastle. As a result a number of key roads can experience traffic levels on weekends matching or exceeding the weekday commuter peak.

Transport and Health Outcomes

Transport choice can have an impact on the health outcomes of the community. In a number of health indicators, Hunter region residents fare worse than the metropolitan average. For example:

- *63% of adults are classified as overweight or obese, compared with the New South Wales average of 52.1%;*
- *circulatory disease hospitalization in Cessnock LGA are significantly higher than the State average;*
- *11.9% Hunter residents have diabetes or high blood glucose, compared with the New South Wales average of 9.4 per cent; and*
- *although these differences cannot be directly linked to transport choices, they match the high levels of car use and low levels of walking and cycling found in the Cessnock LGA.*

Transport Challenges

Growth and New Release Areas

General

The majority of the residential development growth is expected around Huntlee, Bellbird North and Loxford (Hydro Kurri Kurri), as shown in Figure 12. These developments pose significant challenges to the existing road network. Huntlee and Loxford have good access to HEX and are therefore attractive for commuter trips to Newcastle, however development in these locations have relatively long travel distances and add to already congestion traffic routes for accessing local services including health, administration and recreation facilities. Affected roads include Cessnock/Maitland Road and Wine Country Drive/Allandale Road.

Bellbird North is located closer to the Cessnock CBD, which increases the potential for more active travel and public transport use. However, most trips from the area must go via Wollombi Road which experiences periods of congestion during morning and evening peaks, especially east of Mount View Road.

The Cessnock Correctional Facility is expected to become the largest facility in NSW with an additional 1000 beds to be constructed, in addition to the existing 800 beds. Traffic information was not available at the time the traffic and transport strategy was modelled. Given the high volume of vehicles using the existing network, the increase in vehicle movements will impact the network, and further analysis of these potential impacts should be undertaken as part of the planning works for the expansion of the Correctional Facility.

Residential Growth

There are four key residential growth areas identified in the City Wide Settlement Strategy (CWSS) 2010:

- *new urban release areas (as per the LHRS identifies individual 'release areas' generally with an area of greater than 50 hectares);*
- *infill housing (increased residential densities in and around commercial areas);*
- *small area rezoning (augmenting dwelling capacities for 'infill' housing within the established urban footprint); and*
- *existing zones (already zoned for residential development but yet to be developed).*

In addition to the above, there are village growth areas and rural residential lands.

For all four key categories above, Council provided a list of estimated lot yields for all key developments within the LGA. In addition, traffic impact assessment reports of various smaller developments were interrogated to reveal development yields. As per the current proposals, a total of 25,870 dwellings are estimated to be built by 2041. A breakdown of these development yields is provided in the Traffic Report in Appendix A.

The estimated growth of 25,870 dwellings over 25 years (2016 to 2041) equates to an annual growth rate of 3.2% per annum. Development staging and hence the rate of development are very difficult inputs to predict as they depend on a number of key factors including future economic environment, demand growth, infrastructure constraints and the political environment.

Council Officers were involved in setting out an expected growth rate for the LGA. Council's estimated growth rate was between 1.2% and 1.8% per annum which is substantially lower than the 3.2% p.a.

originally estimated. In discussion with Council it was agreed that the estimated 25,870 dwellings will be achieved at a much slower rate and by 2061 (i.e. in 45 years as opposed to 25 years as originally estimated).

Historical data on dwelling growth within the LGA between 1996 and 2011 (15-year period) was analysed and plotted in Figure 12. A regression model was developed with actual number of dwellings (black dotted line in the figure). The historical data indicates that the number of dwellings in the Cessnock LGA has grown by 2.0% per annum.

The average forecast dwelling growth is predicted to be 2.4% between 2016 and 2061. The projected growth is expected to be high in the initial years and would gradually slow down substantially by 2061 as shown by an orange line in Figure 12.

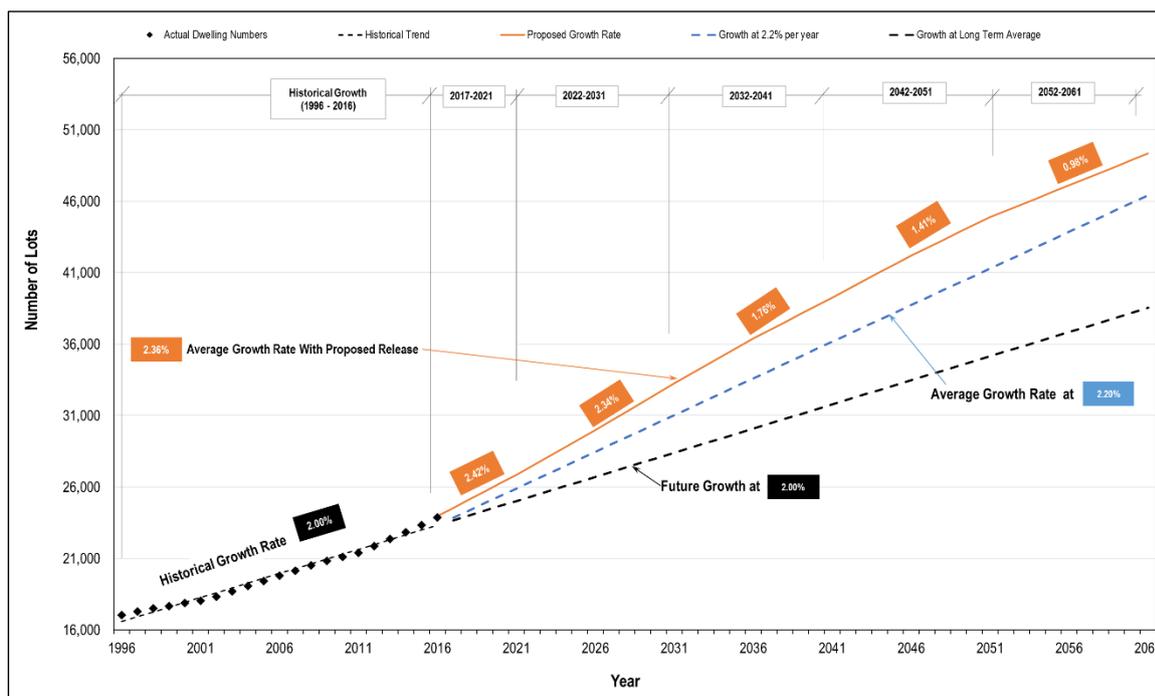


Figure 12: Forecast Dwelling Growth in Cessnock LGA

The future dwelling numbers in the Cessnock LGA are shown in Table 7. By 2041 the number of dwellings in Cessnock is predicted to be 39,225. This represents an overall growth of 65% between 2016 and 2041.

This growth translates to approximately 50,000 to 60,000 additional vehicle trips per day on the Cessnock LGA road network and nearly 6,000 additional peak hour vehicle trips.

Table 7: Forecast Dwelling Growth in Cessnock LGA

Year	Actual		Forecast				
	1996	2016	2021	2031	2041	2051	2061
Dwelling Number	17,040	23,860	26,850	33,260	39,255	44,890	49,340
Growth (%)	n/a	2.0%	2.42%	2.34%	1.76%	1.41%	0.98%

As the demand for transport is dependent on population, age structure and rates of participation in employment, education and community the provision and timely delivery of appropriate infrastructure is a significant challenge for Council.

Utilising Council's Community Profile, population growth in Cessnock for 2011 – 2016 show an average increase in population of 1.7%, far short of the 3.2% growth anticipated by the Department of Planning through the Lower Hunter Regional Strategy and more in line with the projected population growth of 1.2% to 1.8% growth scenarios proposed in Council's City Wide Settlement Strategy and the recently released Hunter Regional Plan, which projects 1.3% growth.

This growth pattern is expected to continue in the short term (2021). However, as land supply reduces in surrounding local government areas, and the influence of major infrastructure projects such as HEX, and Huntlee New Town at Branxton, take up from existing and proposed urban release areas, particularly within the Kurri Kurri Growth Corridor and affordable housing initiatives take effect, demand for land within the Cessnock LGA is projected to increase to 2.4%, as identified in the Traffic and Transport Strategy.

The Traffic and Transport Strategy seeks to accommodate this anticipated growth to ensure that the community is provided with an appropriate level of service and support.

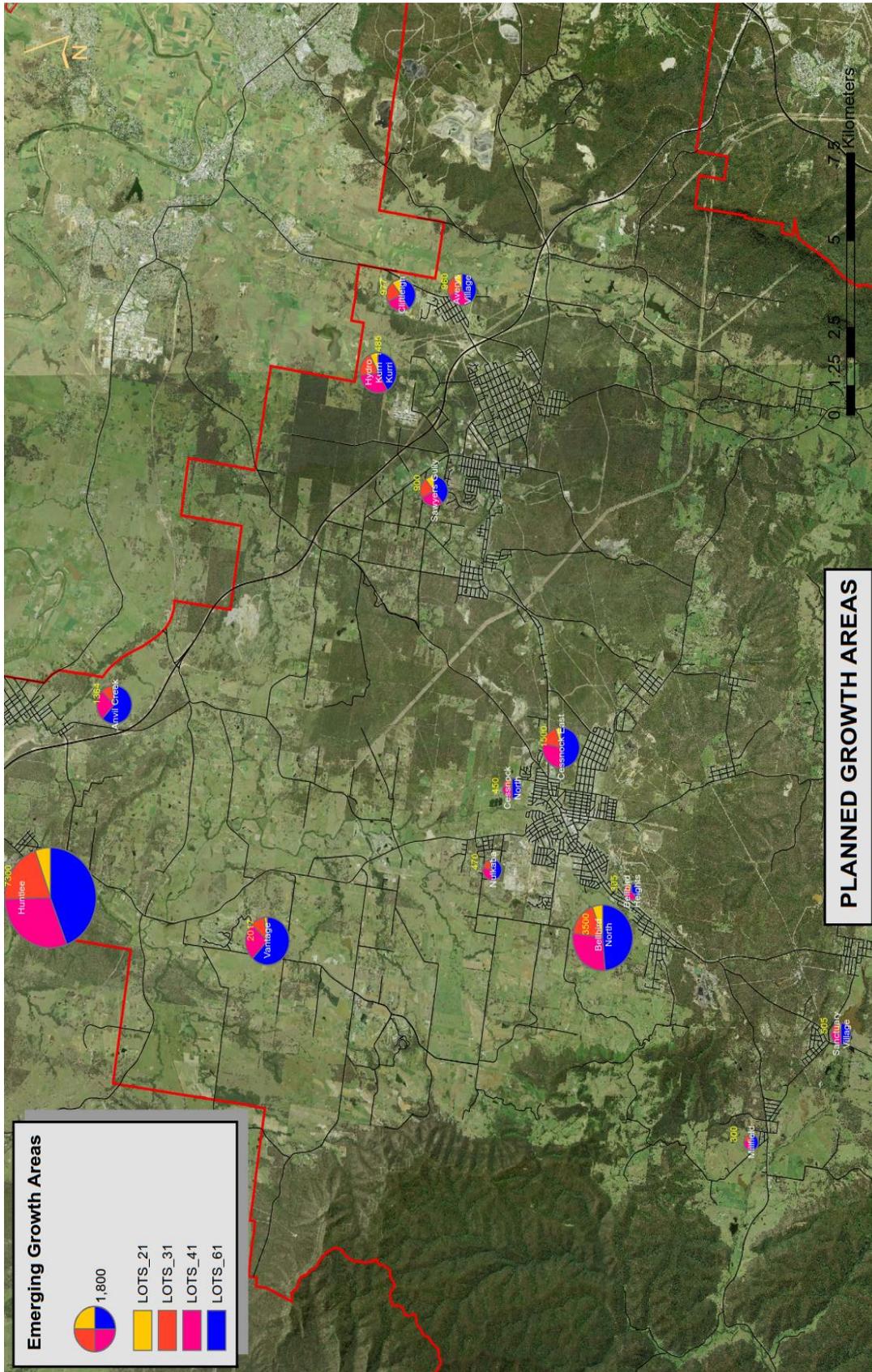
Tourism Growth

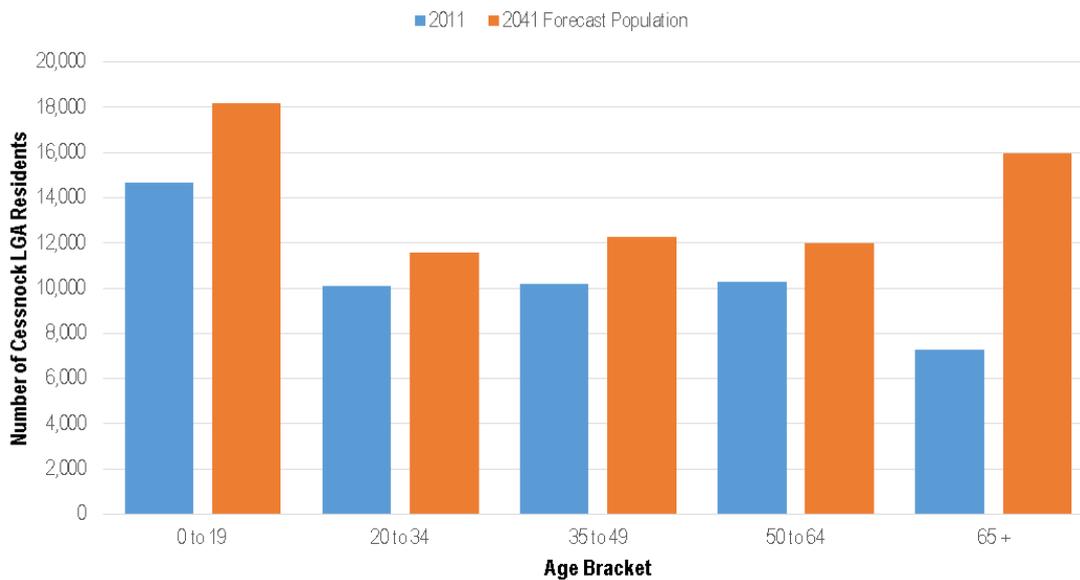
The Hunter is one of the most important markets for tourism in NSW, and rated as the most popular tourist destination outside of Sydney. In turn, the Lower Hunter Vineyards represent the single most important tourist attraction within the Hunter Region.

Ageing Population

Forecast population data (see Figure 13) shows an expected increase in the percentage of Cessnock LGA residents that will be under the age of 20 and over the age of 65 out to the year 2041, consistent with the State average. These age groups typically have a greater reliance on public transport (and community transport for the 65+ age group). Given this, the availability of dwellings in highly accessible locations increases in importance over the next 15 years.

Figure 13: Planned Growth Areas





Source: NSW BTS Data

Figure 14: Age Profile Changes to 2041

Car Dependence

Car travel has been the main focus of the regions transport system for the past 75 years, resulting in a sprawling development pattern, a low public transport use. Passenger rail services that used to stop at Aberdare Junction, Bee Siding, North Kurri Kurri, Weston, Abermain, Neath, Caledonia and Cessnock were ceased circa 1970; arguably because of the lack of passenger demand, as car travel was more convenient and quicker than rail.

While car ownership has increased at a rate faster than population growth, the use of public transport has declined.

Also, while Cessnock LGA is expected to continue to be a car-dependent city, a balanced investment in public and active transport infrastructure is required to provide greater choice of travel modes. Land use planning has a significant role to play so that new land releases are ideally located close to employment, education and services, thereby reducing trip distances and making walking and cycling more attractive options to access them.

Energy, Oil and Climate Change

Cessnock LGAs location, growth, development and demand for services increased its exposure to the effects of climate change. In Australia, cars produce an average 0.3 kilograms of greenhouse gas per kilometre travelled and in NSW transport activity accounts for approximately 19% of carbon emissions. Transport emissions are currently the second largest component of NSW greenhouse gas emissions. The major source of transport emissions is road transport which accounts for 86% of all NSW transport emissions. This reflects the importance of motor vehicles for both passenger and freight transport within the State.

Energy from all sources will become more expensive in the future and car-dependant lifestyles will expose residents to major economic risks into the future.

As well as increased carbon emissions and escalating fuel/energy costs and expensive supply of fuel, the region's infrastructure will be affected by other long-term climate change effects, such as extreme weather events.

Traffic Congestion

Overview

Traffic congestion is fast becoming a major challenge for Cessnock LGA as the city develops and grows. The completion of HEX has reduced travel times to Newcastle and the surrounding coastal area. It has also increased travel demand on a number of roads, and in particular Cessnock-Maitland Road. If not addressed, congestion will impact productivity, impact the safety and the amenity of towns and villages undermining the lifestyle enjoyed by the city's residents and visitors.

A number of key roads within the Cessnock LGA experience high levels of traffic congestion issues during the morning and evening peak hours. Traffic counts undertaken for the study, in 2015 were used to assess the existing road conditions and provided input into the development of the traffic model to determine future traffic demands. The section below details the assessment of road capacity and level of service.

Road Capacity

Road capacity is described as the maximum number of vehicles that pass a given section of a lane or roadway in one direction (or in both directions for two-lane or multi-lane highway) during a given time under prevailing roadway and traffic conditions. It is the maximum rate of flow that is expected to occur. Comparing traffic flows to road capacity establishes a level of service for road operation.

A suitable level of service should be maintained relative to the economic value of each road and its rank in the functional road hierarchy. Austroads uses the following regime for Level of Service (LoS):

- A. Excellent; free flow.
- B. Good; stable flow, free to select desired speed and manoeuvres.
- C. Satisfactory; stable flow, some restrictions to select desired speed and manoeuvres.
- D. Tolerable; all drivers restricted.
- E. Unstable; minor disturbance will cause flow breakdown.
- F. Flow breakdown; forced flow with queue and delays.

One-way hourly volumes during peak hours for urban and rural roads and recommended LoS are shown in Table 8 and Table 9, respectively.

Table 8: Urban Road Peak Hour Flows by LoS (per Direction)

Level of Service	One Lane (veh/hour)	Two Lane (veh/hour)
A	200	900
B	380	1,400

C	600	1,800
D	900	2,200
E	1,400	2,800

Source: Austroads

It is generally considered impractical and uneconomical to provide (LoS) A in urban areas and on the major traffic carrying roads, and typically LoS C-D is adopted as the desirable lower-limit threshold for urban road networks.

Table 9: Typical Mid-block Capacities for Urban Roads with Interrupted Flow

Type of Road	One-way Midblock Lane Capacity (cars/hour)	
Median or inner lane:	Divided road	1,000
	Undivided road	900
Outer or kerb lane:	With adjacent parking lane	900
	Clearway conditions	900
	Occasional parked cars	600
4 lane undivided:	Occasional parked cars	1,500
	Clearway conditions	1,800
4 lane divided:	Clearway conditions	1,900

Source: Austroads

Another way to specify the level of service is Volume/Capacity or V/C; the ratio between the traffic volume and the theoretical capacity. The two schemes are not entirely congruent, but the following approximate comparison can be made:

- AUSTROADS LoS A – C V/C less than 0.7;
- AUSTROADS LoS D – E V/C 0.7 to less than 1; and
- AUSTROADS LoS F V/C 1 or greater.

Table 10 provides a summary of the 2015 AM and PM peak hour traffic volumes and level of service for key urban roads in the Cessnock LGA. This summary demonstrates that a number of roads are nearing or exceeding LoS values below desirable minima.

Table 10: 2015 Road Network Volume and LOS Summary - Key Routes/Locations

Town	Road	Location	Direction	AIMSUN ID	No. of Lanes	2015 AM		2015PM	
						Pk Hr Vol	LOS	Pk Hr Vol	LOS
Bellbird	Wollombi Road	east of Abbotsford Street	e/b	119696	1	583	C	380	C
			w/b	131633	2	288	A	587	A
Cessnock	Wollombi Road	west of West Avenue	e/b	119665	1	884	D	707	D
			w/b	133483	1	480	C	908	E
		east of West Avenue	e/b	134705	1	559	C	394	C
			w/b	119618	1	283	B	517	C
		west of Sergeant Street	e/b	125814	1	722	D	399	C
			w/b	131749	1	262	B	602	D
	west of Allandale Road	e/b	119598	1	733	D	751	D	
		w/b	119597	1	761	D	923	E	
	Maitland Road	east of Millfield Street	e/b	131258	1	518	C	684	D
			w/b	131274	1	828	D	672	D
		west of Old Maitland Road	e/b	119642	1	566	C	620	D
			w/b	132928	1	707	D	667	D
	Cessnock Road	east of Duffie Drive	e/b	134992	1	584	C	792	D
			w/b	119669	1	685	D	625	D
	Duffie Drive	south of Cessnock Road	n/b	119668	1	130	A	273	B
			s/b	131414	1	156	A	127	A
	Darwin Street	south of Wollombi Road	n/b	119611	1	262	B	607	D
			s/b	133505	1	393	C	413	C
	West Avenue	east of Wollombi Road	e/b	134666	1	401	C	391	C
			w/b	119619	1	277	B	468	C
	Vincent Street	south of Wollombi Road	n/b	119592	1	154	A	238	B
			s/b	134005	1	268	B	228	B
	Allandale Road	north of Wollombi Road	n/b	125998	1	456	C	463	C
			s/b	119594	1	503	C	649	D
	Aberdare Road	east of Vincent Street	e/b	119653	1	275	B	298	B
			w/b	119648	1	375	B	273	B
	South Avenue	east of Darwin Street	e/b	134524	1	325	B	438	C
			w/b	129884	1	294	B	335	B
	Mt View Road	north of Wollombi Road	n/b	119616	1	204	B	351	B
			s/b	119615	1	381	C	354	B
Old Maitland Road	towards Sawyers Gully	e/b	134980	1	68	A	61	A	
		w/b	127595	1	68	A	121	A	
Neath	Cessnock Road	west of Church Street	e/b	135873	1	729	D	796	D
			w/b	119730	1	746	D	738	D
Weston	Cessnock Road	west of Station St	e/b	119666	1	760	D	767	D
			w/b	131935	1	706	D	804	D
	Northcote	east of	e/b	119752	1	655	D	571	C

Town	Road	Location	Direction	AIMSUN ID	No. of Lanes	2015 AM		2015PM	
						Pk Hr Vol	LOS	Pk Hr Vol	LOS
	Road	Government Road	w/b	119758	1	604	D	773	D
	Gingers Lane	west of Government Road	e/b	127662	1	16	A	21	A
			w/b	127678	1	291	B	332	B
	Frame Drive	south of Gingers Lane	n/b	2428441	Road Closed				
s/b			2428478	Road Closed					
Loxford	Hart Road	east of Loxford IC	e/b	120802	1	292	B	331	B
			w/b	120797	1	253	B	337	B
	Government Road	south of Hart Rd	n/b	127659	1	301	B	415	C
			s/b	127664	2	309	A	366	A
		south of Mitchell Av	n/b	127658	1	255	B	302	B
			s/b	127672	1	241	B	337	B
Kurri Kurri	Lang Street	east of Heddon Street	e/b	120322	1	540	C	677	D
			w/b	120319	1	818	D	710	D
	Mitchell Avenue	north of Lang Street	n/b	2425933	2	537	A	491	A
			s/b	119765	2	594	A	538	A
	Tarro Street	south of Railway Street	n/b	120073	2	396	A	558	A
			s/b	132718	2	339	A	377	A
Greta	NEH	north of Nelson Street	n/b	120620	1	357	B	435	C
			s/b	120621	1	389	C	605	D
Branxton	NEH	east of Cessnock Road	e/b	120510	1	155	A	362	B
			w/b	120507	1	306	B	152	A
Huntlee	Wine Country Drive	south of Bridge Street	n/b	121117	1	291	B	288	B
			s/b	133173	1	258	B	347	B
Heddon Greta	Main Street	west of Heddon	e/b	132953	1	539	C	770	D
			w/b	132952	1	651	D	782	D
Wollombi	Wollombi Road	west of Paynes Crossing Rd	e/b	121260	1	80	A	47	A
			w/b	121261	1	36	A	61	A

Table 10 and Figure 15 roads that are currently exceeding or approaching the preferred lower limit of LoS include:

- *Wollombi Road – east of Ivan Street;*
- *Maitland Road - between Allandale Road and Duffie Drive;*
- *Cessnock Road – between Duffie Drive and Government Road;*
- *Northcote Street –between Government Road and Mitchell Avenue;*
- *Lang Street – between Mitchell Avenue and HEX;*
- *Main Street – between HEX and Maitland LGA boundary; and*
- *Allandale Road – North of Wollombi Road.*

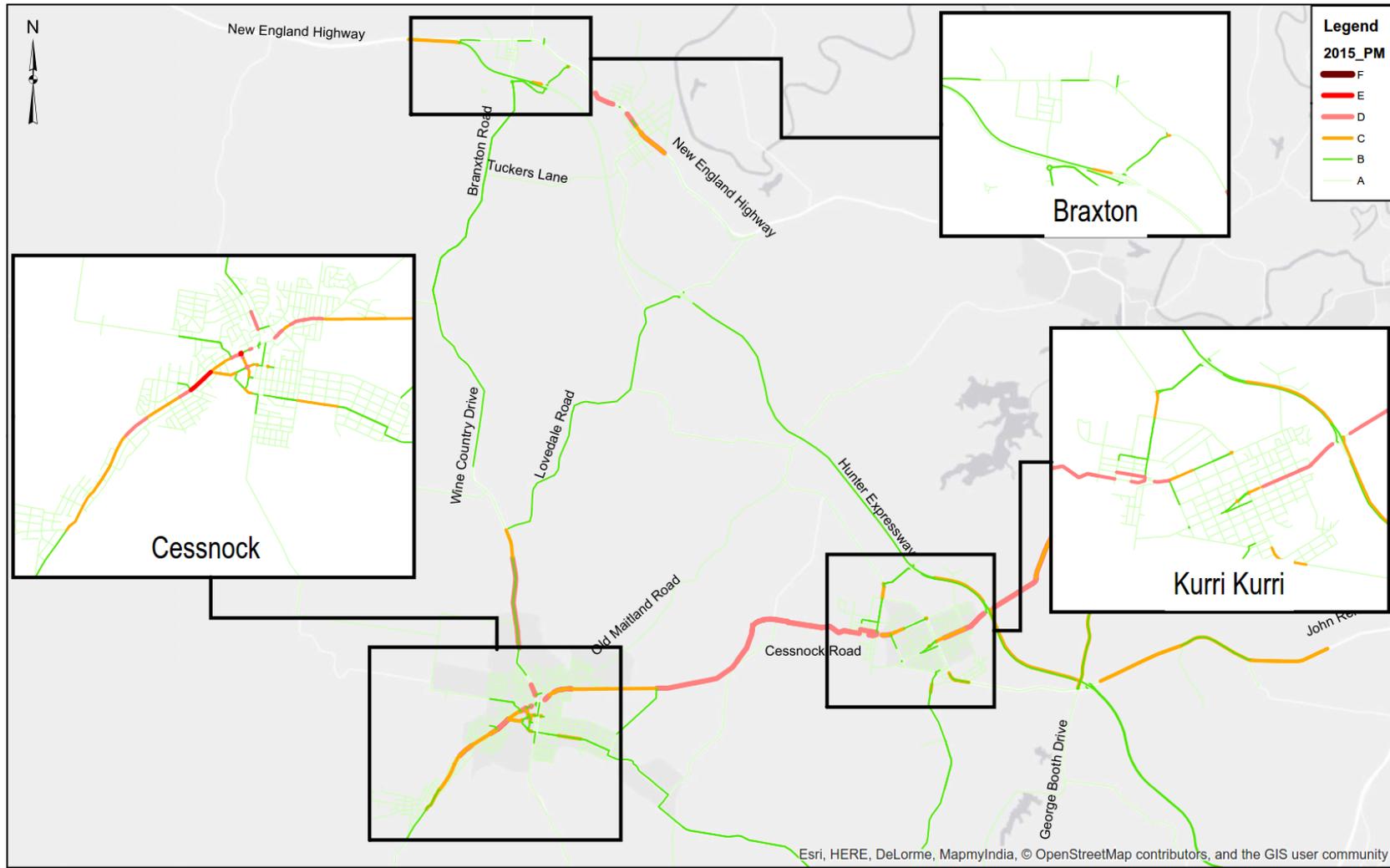


Figure 15: Roads Approaching LoS Thresholds (2015)

Future Traffic Demands and Impacts

Table 11 provides a summary of the future (2041) peak hour traffic flow volumes and level of service for key urban roads in the Cessnock LGA. This summary demonstrates that a number of roads are below the desired minimum LoS. The modelled 2041 network has included road upgrades from Council's Section 94 program of works as these upgrades are considered to be part of the "Do-Minimum" network.

Table 11: 2041 "Do-Minimum" Road Network Volume and LOS Summary - Key Routes/Locations

Town	Road	Location	Direction	AIMSUN ID	No. of Lanes	2041 AM		2041 PM		
						Pk Hr Vol	LOS	Pk Hr Vol	LOS	
Bellbird	Wollombi Road	east of Abbotsford Street	e/b	119696	2*	1145	B	749	A	
			w/b	131633	2	545	A	1042	B	
Cessnock	Wollombi Road	west of West Avenue	e/b	119665	2*	1790	C	1260	B	
			w/b	133483	2*	828	A	1682	C	
		east of West Avenue	e/b	134705	2*	859	A	669	A	
			w/b	119618	2*	502	A	987	B	
		west of Sergeant Street	e/b	125814	2*	1335	B	1009	B	
			w/b	131749	2*	608	A	1319	B	
		west of Allandale Road	e/b	119598	2*	1070	B	900	B	
			w/b	119597	2*	1177	B	1437	C	
		Maitland Road	east of Millfield Street	e/b	131258	1	792	D	814	D
				w/b	131274	1	954	E	1025	E
			west of Old Maitland Road	e/b	119642	1	825	D	749	D
				w/b	132928	1	881	D	1113	E
	Cessnock Road	east of Duffie Drive	e/b	134992	1	1050	E	983	E	
			w/b	119669	1	1100	E	1215	E	
	Duffie Drive	south of Cessnock Road	n/b	119668	1	366	B	425	C	
			s/b	131414	1	390	C	305	B	
	Darwin Street	south of Wollombi Road	n/b	119611	1	441	C	673	D	
			s/b	133505	1	424	C	467	C	
	West Avenue	east of Wollombi Road	e/b	134666	1	972	E	643	D	
			w/b	119619	1	372	B	746	D	
	Vincent Street	south of Wollombi Road	n/b	119592	1	246	B	450	C	
			s/b	134005	1	325	B	349	B	
	Allandale Road	north of Wollombi Road	n/b	125998	1	507	C	534	C	
			s/b	119594	1	770	D	886	D	
	Aberdare Road	east of Vincent Street	e/b	119653	1	399	C	487	C	
			w/b	119648	1	397	C	485	C	
	South Avenue	east of Darwin Street	e/b	134524	1	459	C	484	C	
			w/b	129884	1	372	B	393	C	
Mt View Road	north of Wollombi Road	n/b	119616	1	385	C	552	C		
		s/b	119615	1	312	B	381	C		
Old Maitland	towards Sawyers Gully	e/b	134980	1	162	A	230	B		
		w/b	127595	1	112	A	213	B		

Town	Road	Location	Direction	AIMSUN ID	No. of Lanes	2041 AM		2041 PM	
						Pk Hr Vol	LOS	Pk Hr Vol	LOS
	Road								
Neath	Cessnock Road	west of Church Street	e/b	135873	1	1045	E	1178	E
			w/b	119730	1	1210	E	1111	E
Weston	Cessnock Road	west of Station St	e/b	119666	1	1115	E	1165	E
			w/b	131935	1	1149	E	1111	E
	Northcote Road	east of Government Road	e/b	119752	1	862	D	941	E
			w/b	119758	1	639	D	886	D
	Gingers Lane	west of Government Road	e/b	127662	1	224	B	375	B
			w/b	127678	1	698	D	641	D
Frame Drive	south of Gingers Lane	n/b	2428441	1*	320	B	267	B	
		s/b	2428478	1*	488	C	544	C	
Loxford	Hart Road	east of Loxford IC	e/b	120802	1	700	D	643	D
			w/b	120797	1	920	E	995	E
	Government Road	south of Hart Rd	n/b	127659	1	593	C	710	D
			s/b	127664	1	773	D	677	D
		south of Mitchell Av	n/b	127658	1	447	C	485	C
s/b	127672	1	663	D	593	C			
Kurri Kurri	Lang Street	east of Heddon Street	e/b	120322	1	925	E	1155	E
			w/b	120319	1	1055	E	872	D
	Mitchell Avenue	north of Lang Street	n/b	2425933	2	519	A	525	A
			s/b	119765	2	696	A	858	A
Tarro Street	south of Railway Street	n/b	120073	2	421	A	694	A	
		s/b	132718	2	388	A	459	A	
Greta	NEH	north of Nelson Street	n/b	120620	1	454	C	599	C
			s/b	120621	1	531	C	772	D
Branxton	NEH	east of Cessnock Road	e/b	120510	1	273	B	414	C
			w/b	120507	2	356	A	200	A
Huntlee	Wine Country Drive	south of Bridge Street	n/b	121117	2	1405	C	1119	B
			s/b	133173	2	940	B	1547	C
Heddon Greta	Main Street	west of Heddon	e/b	132953	1	1199	E	1732	F
			w/b	132952	1	1609	F	1466	F
Wollombi	Wollombi Road	west of Paynes Crossing Rd	e/b	121260	1	113	A	77	A
			w/b	121261	1	42	A	72	A

*Section 94 upgrades have been applied with additional lanes. This is noted as the "Do-Minimum" for the network.

By 2041 a number of key traffic routes are expected to reach or begin to approach undesirable LoS conditions (i.e. LoS E) where flow breakdown may occur. Under these conditions access from side streets and properties onto the main roads will be difficult as fewer gaps in the traffic stream are present and delays will increase impacting on travel times and road safety. With the planned growth, Main Street through Heddon-Greta is likely to experience flow breakdown in the morning and evening peak periods without capacity upgrades.

By 2041, peak hour traffic flows on Cessnock Road through Neath and Abermain will increase by 50% and would be approaching unstable flow conditions. Figure 16 shows the predicted LoS for the key routes

in 2041, without additional capacity upgrades to the network (except for the already committed Section 94 work).

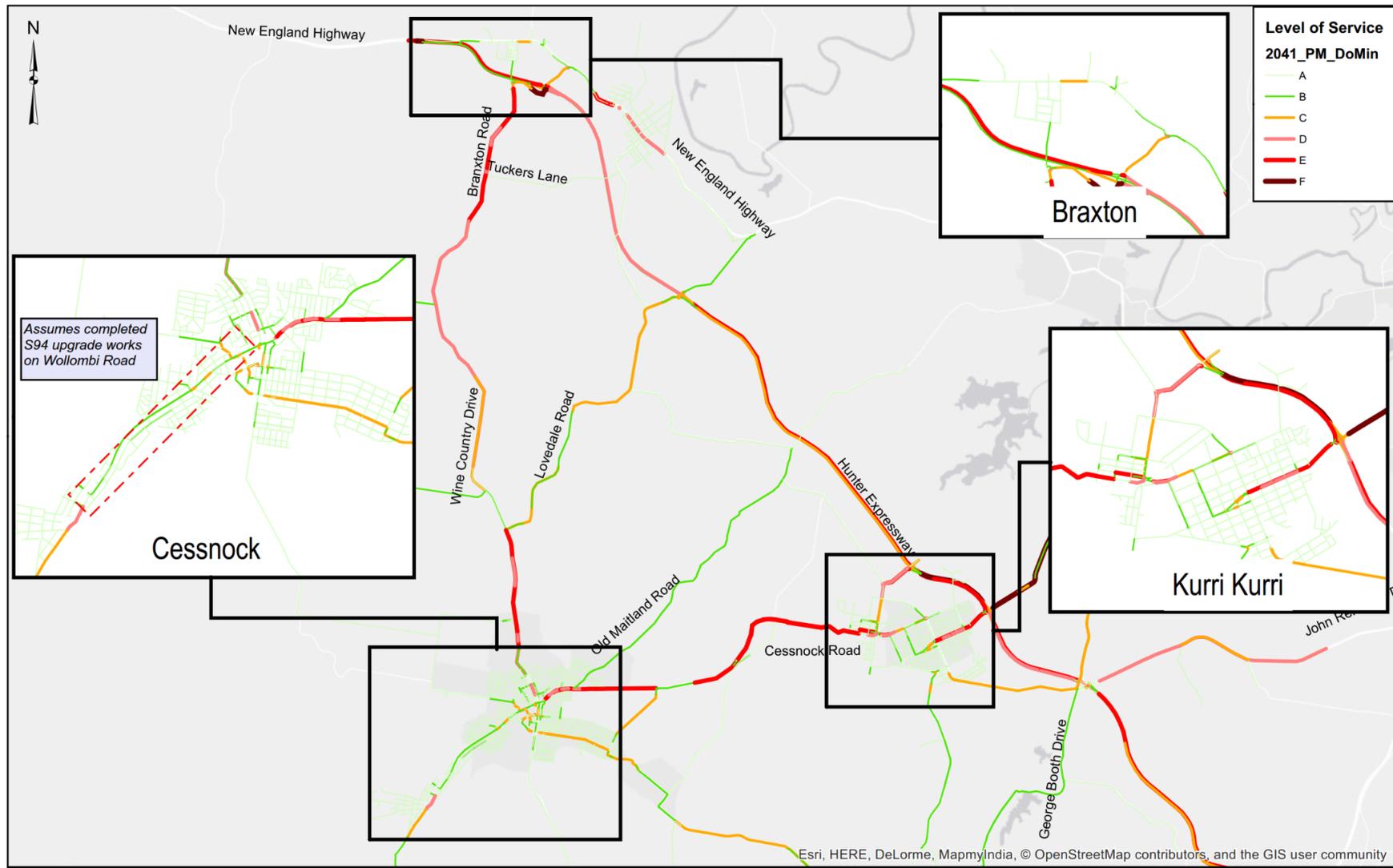


Figure 16: Roads at Level of Service Thresholds (2041)

Options for Meeting the Challenges

Overview

A number of network improvement options have been developed to address future predicted traffic issues within the LGA. To test these options a strategic traffic model was developed in the AIMSUN modelling software. This model was used to analyse the proposed options and informed the development of a preferred option. Options suggested during meetings with Council were also tested using the AIMSUN model.

The modelling was based on 2015 “current” traffic volumes and future year traffic volumes for years 2021, 2031 and 2041. The section below describes the development of each option and its subsequent testing in the AIMSUN model and how these modelling results were used to develop a preferred network.

Options Development

During the option development process the following documents were consulted. This was done to ensure that the proposed upgrades support the strategies set out in those documents. The reference documents were:

- Cessnock City Wide Transport Strategy;
- Lower Hunter Regional Strategy;
- NSW Long Term Transport Masterplan; and
- Hunter Regional Transport Plan.

Some of the other key considerations were:

- *the ability of the proposed option to reduce local as well as wider area traffic issues; and*
- *the ability of the proposed option to encourage growths within the corridor.*

A simple five-stage process was adopted to identify, assess and finalise options for improving traffic performance. The process is illustrated in Figure 17.

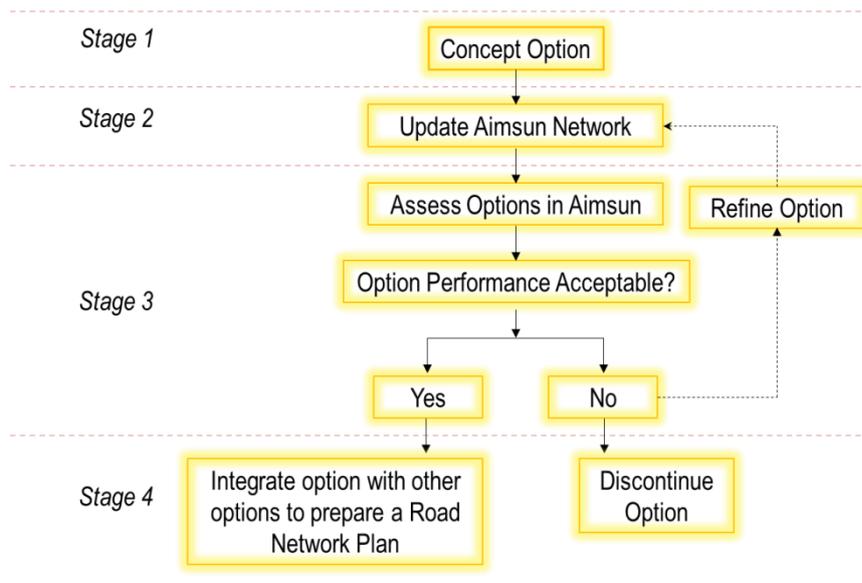


Figure 17: Option Development Flowchart

Options Evaluation Process and Outcomes

Process and Criteria

To define the “ultimate” Road Network Plan, network upgrade options were developed for 2041 traffic conditions.

A total of 15 options were considered during the development of a preferred road network plan. Of these 15 options, seven were defined as “primary” options. These primary options were assessed as standalone projects. The remaining nine options were hybrid options created by combining two or more primary options.

For each option, separate assessment summary tables were prepared to present the AM and PM peak traffic performance results and are available in the Traffic Modelling Report in Appendix A. The following key criteria were used in assessing each option:

- **Traffic Volumes:** changes in traffic volumes at key locations within the LGA including Wollombi Road, Maitland Road, Wine Country Drive, Interchange and Cessnock Road corridor;
- **Travel Time:** Bi-directional travel times along key transport corridors particularly those would be impacted by the option; and
- **Level of Service:** Capacity of urban roads is generally determined by the capacity of intersections. However, Table 4.3 and Table 4.4 of Roads and Maritime’s Guide to Traffic Generating Developments provide some guidance on mid-block capacities for urban roads and the likely Level of Service and these capacities have been used to assess “link” LoS.

Key Routes

The strategic approach to development of the preferred road network seeks to:

- support greater utilisation of the network by a range of users;
- plan for growth and development opportunities; and
- address known deficiencies or inadequacies within the network.

Prior to creating the seven “primary” and nine “hybrid” network options potential key route upgrades were identified, as follows:

- **Cessnock Road / Maitland Road upgrade:** This includes Cessnock Road / Maitland Road widened to four lanes (two lanes in each direction between Allandale Road and Weston). This also includes a grade separated intersection at Weston;
- **Lang Street / Main Road upgrade:** This includes Lang Street / Main Road upgraded to 4 lanes (two-lanes in each direction) between Mitchell Avenue, Kurri Kurri and the end of Cessnock LGA;
- **Weston Bypass:** A new link connecting Gingers Lane with Old Maitland Road. This also includes upgrade of a portion of Old Maitland Road;
- **Inner CBD Bypass:** This includes West Avenue– South Avenue– Snape Street – Aberdare Road upgrade to 4 lanes (2 lanes each way). The Inner CBD bypass also includes Colliery Street – Duffie Drive upgrade to 4 lanes (2 lanes each way);
- **Hydro Link:** A new road linking Main Road with Loxford Interchange through the proposed Hydro site;
- **HEZ Links:** Construction of a new connection between Cessnock and Kurri Kurri / John Renshaw Drive through the existing HEZ site bisecting Leggetts Drive;

-
- **Northern Outer CBD Bypass:** Northern Outer CBD bypass that includes Mount View Road, Oakey Creek Road and O'Connors Road to two lanes each way. The Northern Outer CBD bypass also includes a new link road connecting Wine Country Drive with Old Maitland Road;
 - **Southern Outer CBD Bypass:** Including a new link between Wollombi Road in Bellbird and Aberdare Road in Aberdare; and
 - **Old Maitland Road Upgrade:** Upgrade the section of Old Maitland Road between the Western Bypass and end of LGA boundary. This also includes a full interchange at HEX.

The primary options are shown graphically in Figure 18.

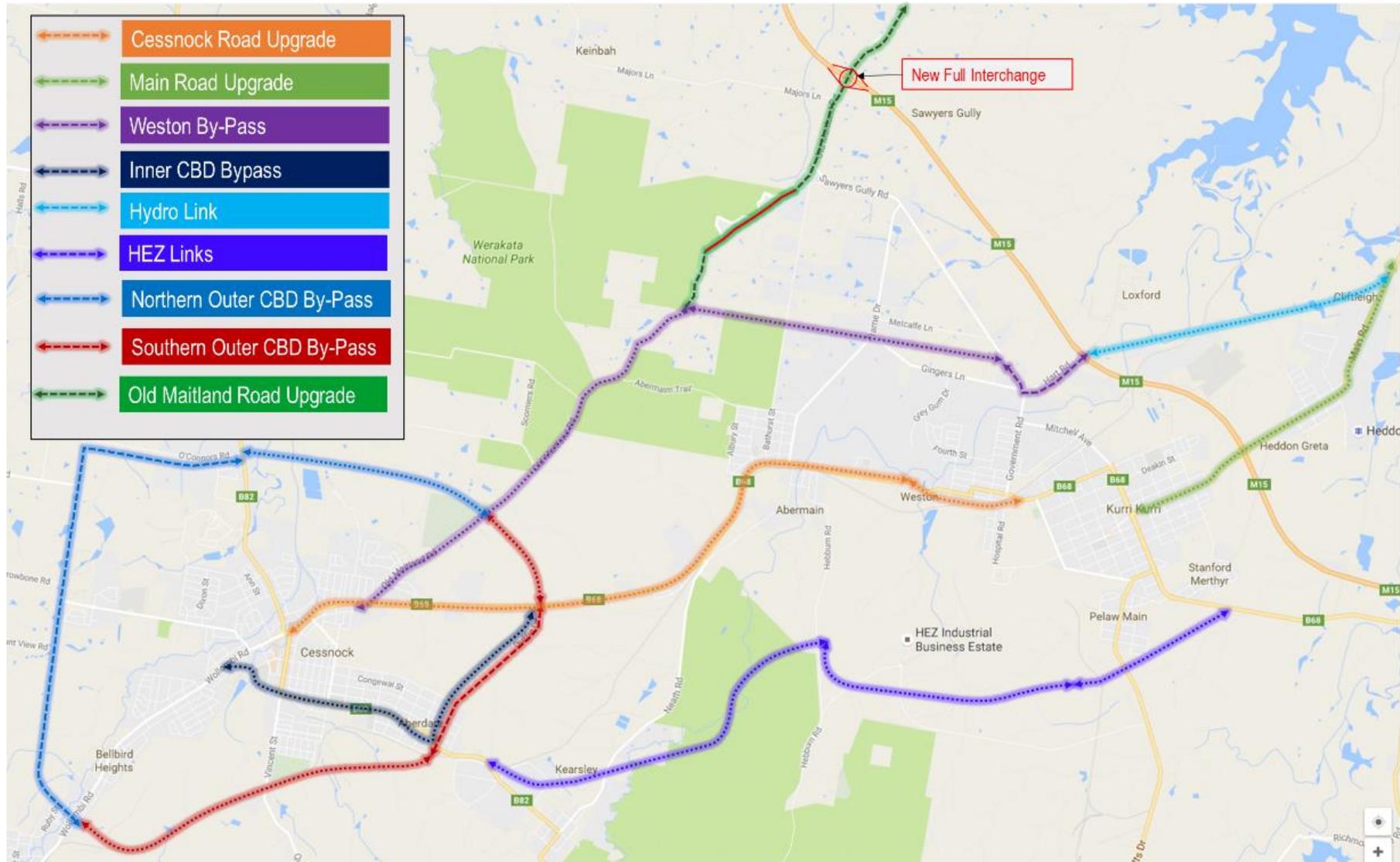


Figure 18: Key Routes considered for Option Development

Option Assessment

The key routes were considered and combined to create the seven primary network options and then combined to create the nine hybrid network options, as summarised in Table 12.

Table 12: Summary of Options Assessed

Options	Description	Primary Option?
Option 1	Cessnock Road / Maitland Road upgraded to four lanes (two lanes in each direction between Allandale Road and Weston) plus grade separated intersection at Weston.	Y
Option 2	Lang Street / Main Road upgraded to 4 lanes (two-lanes in each direction) between Mitchell Avenue, Kurri Kurri and the end of Cessnock LGA.	Y
Option 3	Weston Bypass including a new Link connecting Gingers Lane with Old Maitland Road.	Y
Option 4	A combination of Option 1 and Option 2.	Y
Option 5	A combination of Option 2 and Option 3.	Y
Option 6	Inner CBD bypass includes West Avenue– South Avenue– Snape Street – Aberdare Road upgrade to 4 lanes (2 lanes each way). The Inner CBD bypass also includes Colliery Street – Duffie Drive upgrade to 4 lanes (2 lanes each way).	Y
Option 11	Hydro Bypass includes a link between Main Road and Loxford Interchange through the proposed Hydro site.	Y
Option 7	A combination of Option 1 (partial, Cessnock Road upgrade between Duffie Drive and Weston) and Option 6 (Inner CBD Bypass).	
Option 8	A combination of Maitland Road upgrade (between Allandale Road and Old Maitland Road) and Weston Bypass. Weston Bypass includes a new link between Gingers Lane with Old Maitland Road and upgrade Old Maitland Road.	
Option 9	Northern Outer CBD bypass that includes Mount View Road, Oakey Creek Road and O'Connors Road to two lanes each way. The Northern Outer CBD bypass also includes a new link road connecting Wine Country Drive with Old Maitland Road. This option also includes Weston Bypass.	
Option 10	HEZ Link includes a new connection between Cessnock and Kurri Kurri / John Renshaw Drive through the existing HEZ site bisecting Leggetts Drive.	Y
Option 12	This is a combination of Inner CBD bypass and Weston Bypass. This option also includes a link between Cessnock Road and Old Maitland Road.	
Option 13	This option includes Weston Bypass, Maitland Road upgrade between Allandale Road and Old Maitland Road and Old Maitland Road upgrade between Weston Bypass and end of LGA boundary	
Option 13b	This option includes Old Maitland Road upgrade between Cessnock Road end of LGA boundary and Maitland Road upgrade between Allandale Road and Old Maitland Road.	
Option 14	This is a combination of Northern Outer CBD Bypass, Weston Bypass and Hydro Link.	
Option 15	This option includes the Southern Outer CBD Bypass, a new link between Cessnock Road and Old Maitland Road and, upgrade and realignment of Old Maitland Road up	

Options	Description	Primary Option?
	to LGA boundary.	

Detailed analysis in changes in traffic volumes at key locations, travel time and link level of service were undertaken for each option.

A qualitative assessment was also undertaken by assigning a score for each of the key criteria under five primary objectives of economy, environmental sustainability, accessibility, safety and integration.

The best performing option was adopted to create the preferred Network Improvement option. Detailed results for each of the combination and primary options can be found in the Traffic Modelling Report in Appendix A.

A qualitative assessment of the nine hybrid options included assessment across each of the following aspects:

- **Economic Benefit:** Includes the cost and benefit components of the proposed option. The cost component mainly considers road widening, intersection improvements, land resumption and property acquisition. The key benefits relate to travel time improvements along key routes including Cessnock - Kurri Kurri and Maitland - Kurri Kurri.
- **Environmental Sustainability:** Considers impacts on natural environment including deforestation and uncertainty in flood mitigation etc.
- **Accessibility:** Consider changes in traffic volumes through town/city centres and main road corridors, community severance, parking and access to the strategic road network (i.e. HEX).
- **Safety:** A high level qualitative assessment on road safety relating traffic volumes to crashes.
- **Integration:** Assesses how options support new growth areas

Table 13 provides a summary scoresheet of the seven primary network options considered whilst detailed score sheets for all nine hybrid options are available in the Traffic Modelling Report in Appendix A.

The assessment scored both positive and negative impacts of 28 criteria using a sliding scale from -5 (greatest impact) to +5 (greatest benefit) using both quantitative (e.g. modelling outputs) and qualitative (constraints assessment and workshops with Council officers) to define each score.

Table 13: Summary Scoresheet

The key observations from the Options Assessment are:

Qualitative Assessment of Modelling Options



Criteria	Option 7	Option 8	Option 9	Option 10	Option 12	Option 13	Option 13b	Option 14	Option 15
Economic Benefits									
Requires road widening	-3	-3	-2	-2	-2	-2	-3	-2	-2
Requires major intersection upgrade	-2	-2	-2	-2	-2	-3	-3	-2	-3
Requires other major infrastructure upgrade (e.g. new link, bridge upgrade)	-3	-2	-3	-2	-2	-2	-3	-4	-2
Ability to reduce travel times between Cessnock and Kurri Kurri	1	3	1	1	0	3	3	2	2
Ability to reduce travel times between Maitland and Kurri Kurri	0	0	0	0	0	0	0	2	0
Requires land resumption	-2	-2	-2	-2	-2	-5	-4	-3	-4
Requires property acquisition	-2	-1	-1	-1	0	-1	-1	-1	-1
Environmental sustainability									
In line with Lower Hunter Regional Strategy	0	1	1	1	1	1	1	1	1
Requires deforestation	-1	-2	-2	-3	-1	-4	-4	-3	-4
Uncertainty in mitigating environmental impacts (e.g. floodrisk)	0	0	0	0	0	0	0	-5	0
Accessibility									
Ability to reduce traffic volumes on Main Road	0	0	0	0	0	2	2	2	2
Ability to reduce traffic volumes on Cessnock Road corridor	-2	3	3	2	3	4	3	4	3
Ability to reduce traffic volumes through Kurri Kurri town centre	2	2	3	2	2	3	3	3	3
Improves road capacity Level of Service	2	2	1	1	2	3	3	2	2
Provides access to HEZ site	0	0	0	2	0	0	0	0	0
Provides by-pass of local towns	-2	3	2	1	3	3	3	3	3
Provides alternative access to Hunter Expressway	0	0	0	0	0	4	2	0	2
Reduces rat-running through Cessnock local roads	2	2	0	2	2	2	2	1	2
Reduces traffic taking long detours	3	3	1	3	3	3	3	2	3
Severance of communities on both sides of Cessnock Road corridor	-2	1	3	1	1	3	3	3	3
Severance of communities on both sides of Main Road	0	0	0	0	0	1	1	2	0
Impacts on street parking (residential and commercial)	-2	-1	0	0	0	-1	-1	0	0
Safety									
Increases likelihood of crashes on Cessnock Road	-2	1	2	1	1	2	2	2	2
Increases likelihood of crashes on Main Road	0	0	0	0	0	1	1	2	0
Impacts on pedestrian safety due to road widening	-2	1	2	1	1	1	1	2	1
Increases weaving on Hunter Expressway due to short local trips	-2	-3	-3	2	-3	-1	2	1	1
Integration									
Supports new development areas	0	2	2	1	2	2	0	2	1
Supports public and active transport	-1	2	2	1	2	2	2	2	2
Total	-18	10	8	10	11	21	18	18	17

- Option 7, 8, 9, 10 and 12 perform poorly with overall score between negative 10 and positive 10;
- Although Option 14 performs well, the key component of this option (the Hydro Link) is not expected to be feasible as the alignment is likely to go through the existing flood plain area;
- Option 13, 13b and 15 perform well and provide similar levels of network performance; and
- Option 13 performs best of all the “well performing” options.

Further details of the options that performed well are provided below:

Option 13

Option 13 provides the best performance. It provides two alternative access points to HEX. It will reduce traffic volumes from the Cessnock Road corridor which would contribute in improving local accessibility to the villages of Neath and Abermain.

Approximately 200-300 veh/hr in the 2041 "Do-Minimum" model which use Wine Country Drive to access Cessnock, would be diverted to Old Maitland Road via the proposed HEX interchange under this option.

Option 13 will also support residential development growth in the Gingers Lane corridor by providing easy access to Cessnock, Kurri Kurri and HEX.

Option 13 scores negative in the land resumption and de-forestation criterion. It would result in loss of on-street parking in the section of Maitland Road between Allandale Road and Victoria Street which is a key commercial area within Cessnock. Option 13 would not reduce traffic volumes or improve traffic performance on the Main Road corridor.

Option 13b

Option 13b will provide benefits similar to Option 13.

The absence of the Weston Bypass in this option would contribute to increased traffic volumes in Weston. In order to reduce traffic volumes through Weston, Option 13b would require the proposed HEX interchange at Sawyers Gully to be constructed within the next 5-10 years. This timing is not expected to be feasible given current funding and planning commitments.

Option 15

The Southern Outer Cessnock CBD bypass will support growth in the corridor and will also contribute in reducing traffic volumes through Cessnock City Centre.

As in Option 13b, Option 15 would require the proposed HEX interchange at Sawyers Gully to be constructed within the next 5-10 years, which is extremely unlikely.

Preferred Option

Modifications

As Option 13 provides the best performance it was chosen as the preferred option but including a number of modifications to address its dis-benefits. The following components were introduced:

- **Main Road Upgrade:** It is proposed to upgrade Main Road / Land Street from one to two traffic lanes each way between Mitchell Street in Kurri Kurri and the LGA boundary.
- **Northern and Southern Outer CBD Bypass:** The proposed Maitland Road widening from one to two traffic lanes each way between Millfield Street and Old Maitland Road as in Option 13, would result in loss of valuable on-street parking from the key Cessnock commercial precinct. To be able to maintain City Centre on-street parking, it is proposed to introduce the Northern and Southern Outer CBD Bypass roads. These bypass roads would divert traffic from Cessnock CBD and most importantly from Maitland Road removing the need for any proposed Maitland Road widening. The proposed bypass roads would also support growth along the corridor by providing improved and alternative access. The final 2041 Preferred Road Network is shown in Figure 19.

Assessment of Preferred Road Network with 2041 Traffic

The Preferred Road Network was assessed for the 2041 AM and PM peak traffic conditions including the following key improvements:

- **Northern Outer CBD Bypass:** Northern Outer CBD bypass that includes Mount View Road, Oakey Creek Road and O'Connors Road upgraded to two lanes each way. The Northern Outer CBD bypass also includes a new link road connecting Wine Country Drive with Old Maitland Road;
- **Southern Outer CBD Bypass:** This includes a new link from Abbottsford Street, Bellbird to Colliery Street, Aberdare to create a Southern Outer CBD by-pass of Cessnock Town Centre. This also includes upgrades of Colliery Street and Duffie Drive to four lanes (two lanes each way). As part of the Southern Outer CBD Bypass, it is proposed to construct a new link connecting Cessnock Road at Duffie Drive and Old Maitland Road;
- **Old Maitland Road Upgrade:** This includes the upgrade and realignment of the northern half of Old Maitland Road which is currently not paved. It is proposed to introduce a new full interchange at HEX at Old Maitland Road;
- **Weston Bypass:** It is proposed to introduce a new link between Old Maitland Road and Sawyers Gully Road. It is proposed to introduce a signalised intersection at the Maitland Road and Old Maitland Road intersection; and
- **Main Road Upgrade:** Includes Lang Street / Main Road upgraded to four lanes (two-lanes in each direction) between Mitchell Avenue, Kurri Kurri and the end of Cessnock LGA.

The AM and PM peak assessment results summarised in the Traffic Modelling Report in Appendix A show that the Preferred Road Network provides the following key benefits:

- traffic volumes predicted to reduce substantially on the Cessnock Road - Maitland Road corridor between Cessnock and Kurri Kurri;
- traffic volumes predicted to reduce substantially on Wine Country Drive and Allandale Road corridor (26%-38%);
- travel time between HEX and Cessnock is expected to improve substantially as compared to the "Do-Minimum" scenario;
- Level of Service on key corridors are predicted to improve significantly;
- potential reduction of through traffic along the villages (Neath and Abermain) will result in improved local accessibility and amenity;
- reduces traffic volumes using long detours and environmentally sensitive routes;
- reduces traffic volumes through Cessnock City Centre (25%-60%);
- provides an alternative by-pass for traffic travelling between Cessnock and Maitland;
- provides an alternative route for traffic travelling between Cessnock and the Branxton;
- supports the wider community / land use strategy;
- supports new developments north of Gingers Lane (along Weston Bypass corridor);
- supports new developments along the proposed Northern and Southern Outer CBD bypass;
- limited loss of on-street parking;
- limited property acquisition; and

Opportunity for possible staging (e.g. introduction of Weston Bypass followed by the new HEX interchange at Sawyers Gully).

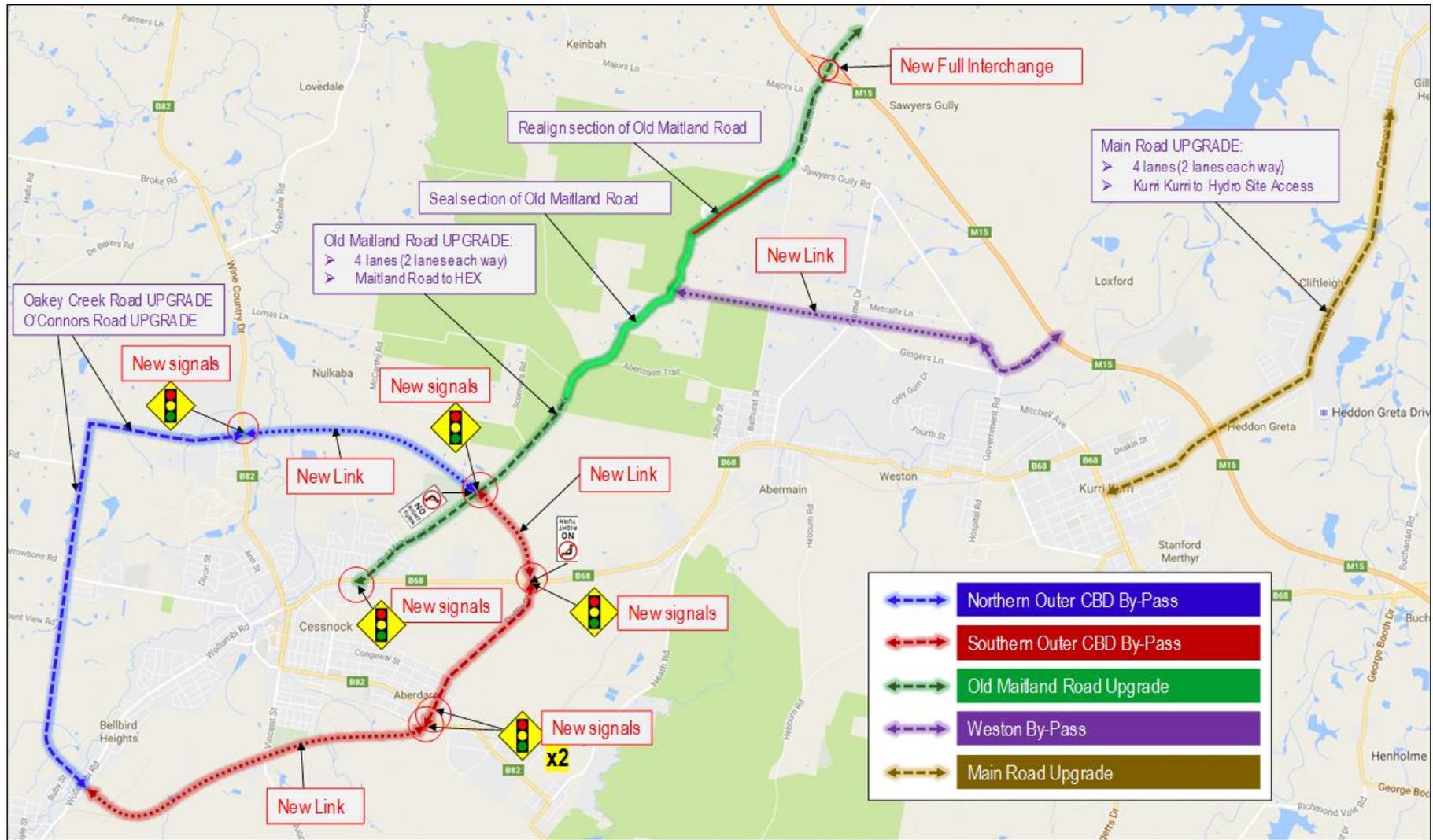


Figure 19: Preferred Road Network 2041

Transport Vision, Policies and Objectives

Transport Strategy Vision

The vision for the Cessnock's traffic and transport system (2016-2041) is defined as:

The traffic and transport system supports economic growth and local amenity by stimulating land development, influencing the use of sustainable transport whilst promoting safety and equity. Cessnock's towns and villages are well connected locally and with the rest of the Hunter Region.

Key Policy Positions

Key integrated transport policies that stem from the transport vision for Cessnock are:

KP1. Land use intensification is focused in the most accessible centres, defined as those centres most accessible by active transport then by public transport then by traffic and parking. Land use mix is designed and influenced to minimise trip making and to achieve economies of scale for active transport and public transport facilities provision.

KP2. Parking is planned and managed to maximise local accessibility for on-street and off-street short stay, high value parking purposes and to influence the use of alternative modes for on-street and off-street long stay, low value parking purposes.

KP3. Active transport (walking and cycling) is encouraged for access to education, commuting purposes, recreational purposes (linked to open space plan), and by connecting facilities which target the specific needs of each user group. Pedestrian and cyclist safety is paramount.

KP4. Public transport efficiently moves residents to key destinations within and outside the Council area using logical, accessible and connected services, maximising the use of infrastructure that gives a travel time advantage over cars. Service coverage ensures social equity.

KP5. Roads and freight are managed to maximise traffic efficiency and safety and local freight movement efficiency considering all road users. Streets are designed and managed to maximise accessibility whilst prioritising safety and local amenity.

The Vision

The traffic and transport system supports economic growth and local amenity by stimulating land development, influencing the use of sustainable transport whilst promoting safety and equity. Cessnock's towns and villages are well connected locally and with the rest of the Hunter Region.

Integrated Land Use Intensification (LU)

LU1 – Residential development is encouraged in the most accessible locations within existing centres, near recreational opportunities and near major public transport hubs whilst residential intensification is discouraged away from centres that do not have regional public transport connections

LU2 – The scale, orientation, structure and permeability of development in centres is designed with the aim of maximising walking and cycling and improving access to public transport

LU3 – Public and active transport investment is prioritised into centres where a critical mass of employment or mixed use development exists or would benefit from enhanced accessibility

Parking (PK)

Objectives within each policy provide a clear understanding of how The Vision will be achieved

PK1 – A parking area classification scheme and hierarchy is maintained and identifies the objectives of parking supply management in each type of centre

PK2 – Sufficient off street parking capacity is provided for long stay purposes in “car-orientated” centres

PK3 – Short stay parking accessibility is facilitated in areas which rely on drop-in trade by ensuring sufficient turnover through time regulation, enforcement and pricing if needed

PK4 – Commuter parking is facilitated in areas to encourage car pooling and park and ride

PK5 – Special parking such as loading zones, bus stops, taxi ranks, car share schemes, for people with disabilities etc., is provided where required

Active Transport (AT)

AT1 – A connected and accessible “layered” network of cycle facilities balances the needs of specific user groups with providing a common, legible network.

AT2 – In defined centres, local traffic management and parking decisions acknowledge movement priority for pedestrians over other modes of transport

AT3 – New residential, retail and commercial developments include appropriate and sufficient end of trip facilities

AT4 – Safe cycling routes are provided within 1km of all public schools

AT5 – Walking and cycling programs are used to encourage higher levels of active transport usage

Public Transport (PT)

PT1 – Bus service times and frequency support access to jobs, education and important services

PT2 - Increase rail service times and frequency to support emerging growth areas.

PT3 - Integrate bus routes to improve coverage and reduce travel times

Road and Freight (RF)

RF1 – Through traffic movement on the arterial road network is efficient but recognises local accessibility needs.

RF2 – Residential amenity in streets is preserved by limiting the volume and speed of through traffic using local area traffic management schemes

RF3 – Heavy vehicle movements in local residential streets are prohibited.

RF4 – Roads and streets are maintained to provide safe and efficient access for all road users.

Integrated Land Use Transport Strategy

Context

A number of the major roads in Cessnock LGA are already congested, for longer periods throughout the day. Through traffic is increasing as vehicles pass through Cessnock CBD, Kurri Kurri and other villages to/from commercial and residential areas to the east and west and connecting to HEX. Research in other regions show that “renewal” and intensification areas are those with the lowest car ownership levels, and the greater propensity to walk, cycle and use public transport.

Given these characteristics and the minimal spare capacity on the current major road system, it is extremely important that the balance of trip making shifts towards locations that are most accessible by public transport, walking and cycling. These locations are typically near public transport hubs, near bus priority corridors and where compact mixed-use development is feasible.



Such an approach not only requires increasing density potential at identified “accessible” centres, it requires a concerted effort to limit intensification in less accessible areas.

This can be achieved directly through development controls or indirectly through transport investment intervention decisions that invest in public and active transport accessibility in defined centres, prioritising this investment away from less accessible areas. Such an approach however relies on complimentary parking and traffic access policies being implemented in order to maximise this return on public transport and active transport investment.

LU1 - The right density in the right place

Encourage residential development in areas that can be best supported by the transport system

The efficiency of the transport system is related to the location and mix of land use relative to highly accessible transport infrastructure and services. Increasing residential densities along existing transport spines will minimise access times to employment, education, shopping, recreation and services. The benefits of this are:

- *shorter trips providing more opportunities for walking and cycling usage to be feasible for the trip;*
- *shorter vehicle trips using less of the road network and reducing congestion and road infrastructure costs; and*
- *more trips consolidated closer to major public transport stations/stops means less car trips and in particular fewer longer-distance, commuter trips.*

Residential and commercial densification as close as possible to the Cessnock, Kurri Kurri and Branxton offers enormous opportunities for reducing trips lengths for a large number of trips; providing walking and

cycling opportunities for local employment, recreation, education and shopping trips which are all in close proximity.

LU1.1 Through planning controls, discourage residential densification in areas without adequate transport infrastructure to service the travel demands.

LU1.2 Encourage new development in close proximity to the key business centres/villages or close to employment to reduce trip lengths and encourage more sustainable transport options.

LU2 – Accessibility by Design

Walking and cycling is maximised and access to public transport improved in centres.

Insufficient permeability in town centres reduces the attractiveness of walking and cycling by increasing trip distances. Successful town centres ensure that all design components aim to provide walking and cycling routes that are as direct as possible, as attractive as possible and promote as many active transport trips as possible.

Some town centres within the Cessnock LGA have layouts that introduce difficulties for pedestrians and cyclists moving into or through the area or to/from public transport stops and parking spaces. Future redevelopment of centres should ensure that block sizes are reduced or that public pedestrian and cyclist access is provided through development sites as directly as possible and are better utilised.

LU2.1 Ensure DCP's in centres aim to reduce block sizes in high activity areas.

LU 2.2 Development controls are put in place in centres to ensure pedestrian and cyclist permeability is achieved, with permeability especially sought near railway stations and major bus stops.

LU3: Investing in integration

Public and active transport investment is prioritised into centres where a critical mass of employment or mixed use development exists or would benefit from enhanced accessibility.

Across Cessnock LGA, careful prioritisation and additional funding of footpath (and cycleway) infrastructure is needed.

Locations where increasing the share of trips by cycling and walking, most likely due to trip origin location being close to large numbers of trip destinations, are logical candidates for conversion to walking and cycling. Also, prioritising public transport investment where the most contestable trips are located maximises the return on this investment. These locations are typically in the larger mixed use commercial centres where more of the long stay trips can be readily captured on public transport. Centres such as Cessnock CBD, Kurri Kurri and Huntlee (when completed) are expected to return the greatest benefits for focussing active transport and public transport investment.

Many Cessnock LGA residents travel out of the LGA for work, education, business and other needs. Providing long-term commuter parking at interchange nodes along the HEX and near bus interchanges and train stations can encourage high car occupancies, through car-pooling, and public transport.

LU3.1 Implement the high priorities from the Cessnock PAMP and Cessnock Cycle Strategy.

- LU3.2** Investigate development incentives/controls to encourage facilitation of improved active transport access and connectivity and end of trip facilities.

Integrated Land Use – Transport Actions

No.	Action	Lead Area	When
LU1.1	Through planning controls, discourage residential densification in areas without adequate transport infrastructure to service the travel demands.	CCC	Short Term
LU1.2	Encourage new development in close proximity to the key business centres/villages or close to employment to reduce trip lengths and encourage more sustainable transport options.	CCC	On-going
LU2.1	Ensure DCP's in centres aim to reduce block sizes in high activity areas.	CCC	Short Term
LU2.2	Development controls are put in place in centres to ensure pedestrian and cyclist permeability is achieved, with permeability especially sought near railway stations and major bus stops.	CCC	Short Term
LU3.1	Implement the high priorities from the Cessnock PAMP and Cycle Strategy.	CCC	On-going
LU3.2	Investigate development incentives/controls to encourage facilitation of improved active transport access and connectivity and end of trip facilities.	CCC	Medium Term

Parking Strategy

Context

Parking is unquestionably an integral part of the land use – transport system of urban centres. In fact it is estimated that motorised vehicles tend to be parked for approximately 22 to 23 hours in a day (more than 90% of the day).

The parking function is related to the land uses it intends to service. “Parking is not a cause but rather an effect, where demand is generated by land use type and intensity, spatial distribution and availability of supply and choice” (*Austrroads Guide to Traffic Management Part 11: Parking*).

When reviewing how parking is managed, Council takes the following key principles into consideration:

- *support the economic viability and sustainability of commercial centres, in particular Cessnock CBD and Kurri Kurri, Wollombi, Branxton and Greta;*
- *recognise the total economic, environmental and social cost of travel;*
- *economically important parking spaces in the central areas of commercial area will only be for short-term parking;*
- *commuter and long-term parking will be accommodated in peripheral areas, including locations adjacent to major road corridors (e.g. HEX) to encourage carpooling;*
- *management of time limits will be used to maximise the use of each car park;*
- *parking time limits (where applicable) will be graduated, so that time limits priority is given to customers and these will mobility difficulties close to the centre and longer time limits (including all-day) located at the periphery of the centre;*
- *road safety, pedestrian, cycling, public transport and loading facilities will take precedence over parking;*
- *excessive commuter parking will not be permitted in residential area, but should be encourage in designed at interchange nodes on HEX and near public transport interchanges (bus interchange and train stations);*
- *appropriate and proportionate levels of enforcement will apply in all areas;*
- *parking will be provided through a balance of public investment and private provision;*
- *seasonal parking will be considered where appropriate; and*
- *parking policies will continue to encourage accessibility for all.*



These principles provide the framework for which potential changes to how parking is managed are tested against.

The type of parking supply needs to be well planned and provided in a way that meets the parking needs of business centres, towns and villages. There are few different categories of parking which cater for different uses and services different land use types.

PK1 – PK3: Parking Hierarchy

PK 1: Classification scheme and hierarchy

A parking area classification scheme and hierarchy is maintained and identifies the objectives of parking supply management in each type of centre.

Parking is used for a range of purposes. These include all day parking for employees of an area, medium duration parking (typically 2-4) hours for business activities or longer shopping/personal business trips (e.g. multiple shops) and short duration parking for business meetings, personal business appointments and “drop in” parking for quick, convenience purchases.

It is important to understand the mix of parking demand types in each centre and the supporting transport system available in order to achieve the relevant transport objectives in each area.

For example, plentiful, free, long stay parking on-street should be actively discouraged in centres where road space is too valuable for this type of parking and where occupying parking spaces fronting “drop-in” businesses significantly impacts their prosperity.

The parking strategy must also consider all parking needs, which can be significantly different in various parts of the city. Areas that require higher parking turnover generally have some form of regulation applied (time restriction, parking fees or both) to ensure that the average duration of stay is kept to the intended period.

Table 14 shows an indicative kerb side user priority based on the street use, this can provide a guide as to how to best apply parking throughout the LGA.

Table 14: Street Types and Kerb Side Use Priorities

Priority	Mixed Street	Residential Street	Work Street	Shopping / Food Street	Recreational Street	Entertainment Street
	Pedestrian and Cycle Movement					
	Vehicle Safety					
	Active Transport					
	Public and Alternative Transport	Taxi Service				
	Business and Servicing	Residential Parking	Business and Servicing	Business and Servicing	People with Disabilities	Public and Alternative Transport
	People with Disabilities	Short Stay Parking	People with Disabilities	People with Disabilities	Taxi Service	Business and Servicing
	Taxi Service	Medium Stay Parking	Taxi Service	Taxi Service	Business and Servicing	People with Disabilities
	Vehicle Movement/Clearways	Long Stay Parking	Short Stay Parking	Short Stay Parking	Short Stay Parking	Short Stay Parking
	Short Stay Parking	People with Disabilities	Medium Stay Parking	Medium Stay Parking	Medium Stay Parking	Medium Stay Parking
	Medium Stay Parking		Long Stay Parking		Long Stay Parking	
Low			Vehicle Movement/Clearways		Residential Parking	

Source: Austroads

PK2 - Off-Street Parking Capacity

Sufficient off-street parking capacity is provided for long-stay purposes in centres.

Long-stay parkers should be encouraged to park off-street with longer walking distances compared to short-stay parkers who should have accessible, proximate parking.

PK 3 - Short-stay Parking Accessibility

Short stay parking accessibility is facilitated in areas which rely on drop-in trade by ensuring sufficient turnover through time regulation and enforcement.

The parking strategy recognises that the highest value parking is lowest to the centre which in turn should be used by those who would bring the most value to the business in the centre. Accordingly, a parking hierarchy promotes high turnover customer parking nearest to the centres or business with longer stay parking (typically staff – parking) located further away. Regulations and pricing are often needed to enforce this hierarchy. These hierarchy considerations also account for trip length. A five-minute walk trip

from a car park in the context of an eight hour work day is different to the needs of a 15 minute “drop in” trip where parking in close proximity to the destination is of greater value, as represented in Figure 20.

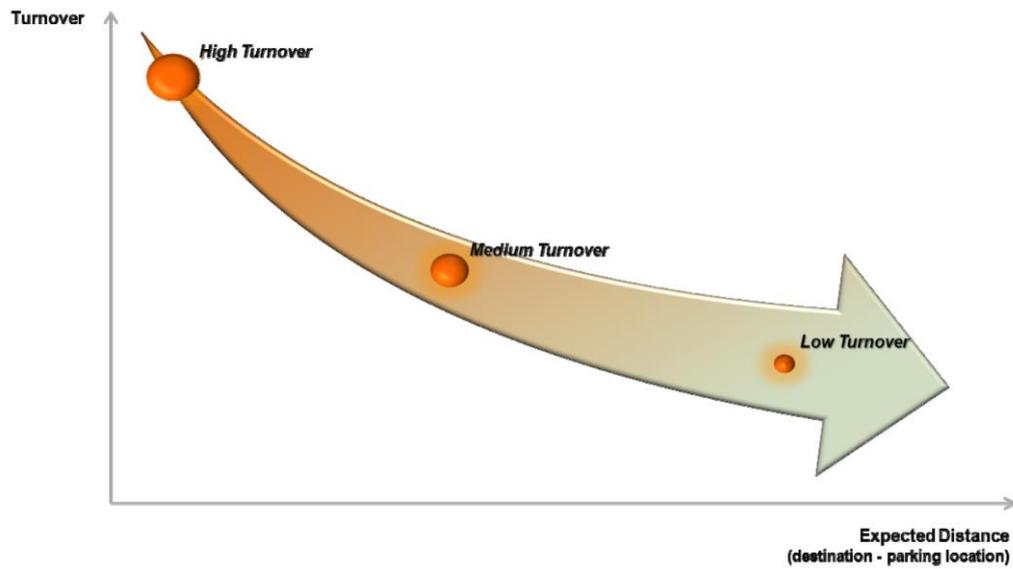


Figure 20: Parking Turnover vs Walking Distance

Cessnock LGA is a very popular stopping place and/or destination for visitor coming by recreational vehicles (RVs), towing caravans or by coach. Often these travellers find it difficult to access parking in the town centres and villages. Opportunities for RV, caravan and coach parking should be investigated to improve access town centres and villages. Ideally, these locations should be on the fringe of the commercial areas, and away from residential properties. Directional signage on the main traffic routes into towns should guide travels to these parking areas.

PK 4 - Commuter Parking Opportunities

Commuter parking is facilitated in areas that encourage carpooling and park and ride.

Commuter parking, in low density areas, along major traffic routes and near public transport interchanges encourages park and ride and carpooling opportunities. By bringing people to consolidated public transport nodes, sufficient demand is generated to warrant higher frequency services. It also reduces travel times, as express, limited stop service can be provided from the transport interchange. Informal parking around the HEX interchanges is evidence of Cessnock LGA residents using these locations to carpool. By having more people using one vehicle, carpooling reduces travel costs and frees up capacity on the major roads. Carpooling is also a more environmentally friendly and sustainable way to travel. Opportunities should be investigated, with the State Government, to formalise commuter parking at the HEX interchange nodes and at public transport nodes (e.g. bus interchanges and train stations)

Parking Actions

No.	Action	Lead Area	When
PK2.1	Sufficient off-street parking capacity is provided for long-stay purposes in centres.	CCC	On-going
PK2.2	Work with land owners to consolidate off-street parking west of Vincent Street to support “park once” principals and reduce traffic movements for short parking trips	CCC and stakeholders	Medium Term
PK3.1	Audit kerbside allocation in key centres and apply the allocation hierarchy principles to each centre to define a kerbside allocation program	CCC	Short Term
PK3.2	Monitor short-stay parking occupancy levels in Cessnock CBD, Kurri Kurri, Branxton and Greta, and expand time-limited parking area when occupancy levels exceed 85% capacity at peak times	CCC	On-going
PK3.3	Investigate RV, coach and caravan/trailer parking in town centres	CCC	Short Term
PK4.1	Investigate commuter parking at public transport nodes and along HEX interchange nodes	CCC & State	Short-term

Active Transport Strategy

Context

Active Transport (walking and cycling) is encouraged for access to education, commuting purposes, recreational purposes (linked to the open space plan), and by connecting facilities which target the specific needs of each user group. Pedestrian and cyclist safety is paramount.

Walking and cycling are safe, inexpensive and healthy travel modes. They have the least impact on the environment and can contribute to attractive and connected communities. Recently there has been a strong shift in planning priorities, where walking and cycling are now considered the preferred modes of travel to promote shorter trips in and around activity centres.

Apart from the transport benefits of improving walking and cycling conditions, there are numerous other benefits such as health benefits, improved connections to/from public transport and economic flow-on benefits associated with more street-level activity in town centres.

As such, Council is focusing on improving pedestrian and bicycle infrastructure and facilities. In 2016, Council adopted its Cycling Strategy and Pedestrian Access and Mobility Plan (PAMP).



Whilst there has been plenty of work undertaken by Council in understanding what active transport infrastructure needs to be constructed, sufficient funding to escalate the implementation of these improvements is an ongoing issue. The funding issues include:

- a need for more funding to be allocated towards traffic and transport infrastructure generally;
- a need for more of the traffic and transport budget to be allocated towards active transport infrastructure; and
- a need for greater attention to “value for money” active transport infrastructure to essentially achieve more length of paths/cycle facilities etc. per dollar spent.

New roads and upgrades should include provisions for appropriate cycling infrastructure. Council will work closely with the RMS to ensure proper consideration is given to cyclists needs, both current and future.

The future growth of Cessnock presents a significant opportunity for ensuring that cycling infrastructure and facilities are included in developer contributions for all new development - residential and commercial. Commercial development, including office and retail, should include the provision of appropriate bicycle parking, changing and storage facilities

AT1 - A Layered Network of Facilities

A connected and accessible network of cycle facilities balances the needs of specific user groups with providing a common, legible network.

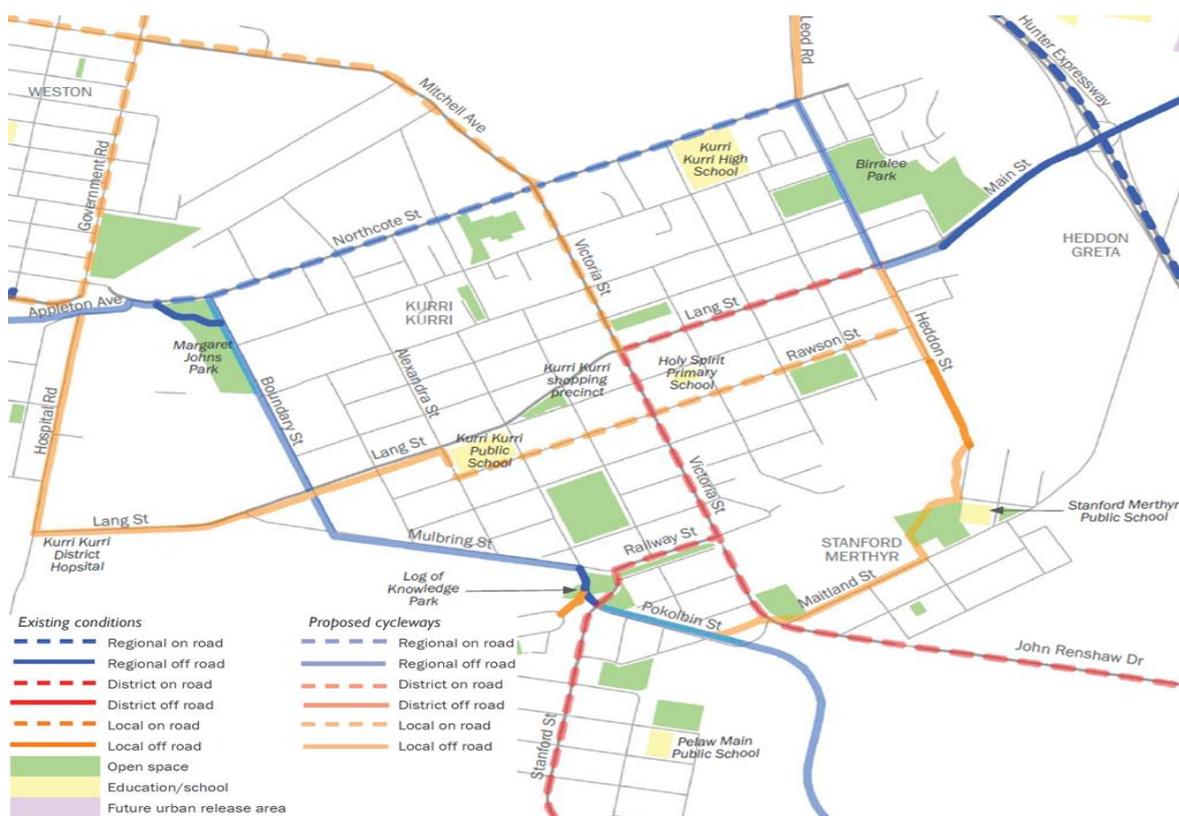


Different cycling user groups require different types of cycling facilities. Commuter cyclists require fast, direct connections, ideally without too many adverse grades. Recreational cyclists prefer aesthetically pleasing routes that are typically off road whereas sports cyclists seek direct on road facilities. Factors that may contribute to on-street cycle usage include age, terrain and riders level of experience. School cyclists and other vulnerable users need highly visible cycle facilities that are safe and separated from traffic as much as possible. Similarly, different pedestrian types and trip purposes also have different needs.

Cycle-way facilities connecting to key destinations such as employment centres, TAFE, shopping centres, schools, parks etc. are typically constructed for their specific purpose emanating radially from these key uses. Connecting these facilities through completion of “missing links” significantly adds value to purpose-specific route facilities to create a network of cycle facilities and footpaths across areas in the Cessnock LGA. Cycle facilities can be defined as three (3) distinct types, “cycle-way” off-road cyclists only path, “shared user path” cycle-way shared with pedestrians and “bike lanes” usually on-street lanes for cyclists only.

The value of this network can be enhanced by improving its legibility through wayfinding signage and branding. There is currently limited wayfinding signage or branding of key cycle corridors with many facilities only shown on maps with no associated street signage or pavement markings to denote them as key cycling routes.

The Cycling Strategy shows the cycling environment and missing links proposed for further investigation and construction, in the key centres of Cessnock, Pokolbin, Greta-Branxton, Kurri Kurri, Weston-Abermain-Neath and Kitchener-Kearsley, respectively. Figure 21 outlines the proposed links throughout Kurri Kurri proposed within the Cycling Strategy. In general, the links proposed connect between existing cycle facilities and between existing cycle facilities and locations where cycling would be a feasible modal alternative.



Source: Cessnock Cycling Strategy

Figure 21: Proposed Cycle Connections through Kurri Kurri

In addition, a pedestrian and cyclist wayfinding and facility branding strategy will provide benefits in improving network legibility and the highlight the presence of cycling and walking as alternative options to private vehicle travel.

AT2 – Priority in Centres

In defined centres, local traffic management and parking decisions acknowledge movement priority for pedestrians over other modes of transport.

In centres, the ease and safety of movements for pedestrians should be paramount. In key locations, pedestrian priority should be clearly defined through pavement treatments, lane narrowing, and speed reductions. In the few locations within the LGA where there are often more pedestrians than vehicles, street configurations remain with the majority of the street space provided for vehicles and parking with pedestrian movements funnelled into narrow paths and relatively few crossing points.

The PAMP propose a number of key pedestrian access links that will benefit people travelling through and within the LGA, such as providing safer accessibility through high density pedestrian centres and to key pedestrian generators, improving linkages between villages and to important services such as health care. Funding from all levels of government and developer contributions will assist the Council in the development of these key major pedestrian infrastructure improvements.

The Cycle Strategy propose improvements throughout the city centres with many of the existing cycle ways being linked together through both on and off road paths give cyclists improved safety through these heavily trafficked areas. Well-connected, direct and legible pedestrian networks will facilitate improved pedestrian safety, increase activity and health benefits, and reduce the volume of traffic in town centres.

AT3 – End of Trip Facilities

New residential, retail and commercial developments include appropriate and sufficient end of trip facilities

End of trip facilities typically include storage for bicycles and shower and change room areas. The quantity and quality of facilities provided can vary considerable from secure, undercover bike sheds to bicycle racks and from fully stocked and staffed shower/bathroom complexes to individual showers for each suite/office.



The level of facilities warranted to be requested to be provided as part of development conditions should be commensurate with the potential for cycling to be used to access these areas. That is, it is unreasonable to require significant facilities to be provided in areas where cycling is unlikely to be used to access the site, even with the best of end of trip facilities. Conversely, where significant potential exists to attract more cyclists to this mode and away from private vehicles, it is reasonable to require development to provide these facilities as part of reducing its potential traffic impact.



Developments of certain types and in certain locations should be required to provide end of trip facilities.

The Cycling Strategy outlines the key issues and outlines that the Cessnock Development Control Plan should be reviewed as to include requirements for end-of-trip facilities in new developments as a high priority item.

AT4 – Safe Cycling Routes are promoted

Safe cycling routes are provided within 1km of all public schools.

Cycling to school introduces a range of benefits to the transport system as well as to general health and wellbeing of students. For vulnerable and inexperienced cyclists, usually associated with Primary School-aged children, the separation of facilities from traffic is paramount and particular attention is needed at street crossing points to ensure treatments recognise the varied behaviours of children.



The greatest value for money for safe cycling route investment is close to each school where the largest number of cyclists would be located. Safe cycling routes should be determined outwards from each school location and into its 1km catchment. Where deficiencies exist, investment should be prioritised from the location of the school outwards on the basis of providing as many students as possible the opportunity to ride to school. The development of these cycle routes should be undertaken in conjunction with Action AT1.1.

AT5 – Community Programs

Walking and cycling programs are used to encourage increased levels of active transport usage.

Context

A major barrier for many travellers commencing cycling or considering walking for many of their trips is a lack of information. This information gap can include not understanding the routes/facilities available for use, not understanding the physical benefits and not understanding the broader economic and community benefits of less cars on local roads.

Providing residents and visitors with a web sites clear links to “walking” and “cycling” pages. These web pages offer detailed information on a range of aspects of walking and cycling in both existing council areas.

places of interest to cycle to in Ryde

Natural areas:

- Lane Cove National Park at Browns Waterhole
- Lane Cove National Park, De Bungs Bridge to Fullers Bridge.
- Torrays Creek (walking only)
- Field of Mars Reserve (walking only) Pittwater Rd Gladsville Ref P13
- Smith Farm Park (walking only) Lawson St Eastwood Ref B9
- Wallumatta Nature Reserve (walking only)

Recreational Parks

- Abuklea Rd Tennis Centre (tennis)
- Christie Park (soccer)
- Eastwood Park (soccer and cricket)
- ES Hall Park (fitness circuit, soccer, rugby league, Australian Rules)

accident and first aid

In the event of an accident call 000 for help!

St John DRABCD Action Plan

D check for **DANGER**

- to you to others, to casualty

R check for **RESPONSE**

- is casualty conscious? (if conscious/ manage injuries)
- is casualty unconscious? (if unconscious, place on side)

A **AIRWAY**

- is airway clear of objects? (lock in mouth)
- is airway open? (tilt head back)

secure bicycle parking

Level 1 - Fully enclosed bike lockers/bike cages

- Meadowbank wharf v4 (Ref F15)
- Meadowbank Station v4 (Ref F14)
- Kingsford Wharf v4 (Ref H17)
- Macquarie University Station v8 (Ref L5)
- Macquarie Park Station v8 (Ref N7)
- North Ryde Station v4 (Ref Q9)
- Eastwood Railway Station way west - bike cage (Ref D1)

Level 3 - Bicycle parking rails

- Blenheim Rd Shops (Ref N10)
- Bonoma Park Shops (Ref P15)
- Eastwood Library (Ref D8)
- Eastwood Plaza, both ends (Ref D9)
- Eastwood Shopping Village (Ref D9)
- Eastwood Railway Station east and west (Ref D8)
- Five Ways Shops, North/Balclutha (Ref G7)
- Gladsville Shops (Ref N18)
- Macquarie University Railway Station (Ref K5)

CHECK BEFORE YOU STEP

Don't get distracted

What's your distraction...

- talking? • music? • daydreaming?
- text? • phone?

WATCH OUT CARS ABOUT

An outcome of councils recently adopted Cycling Strategy outlines that one of the key actions to be undertaken is provide cycling routes, safety messaging, skills and confidence training course to the community through a dedicated website.

Active Transport Actions

No.	Action	Lead Area	When
AT1.1	Development controls be updated to reflect the types of bicycle paths required in each area within the Cessnock LGA.	CCC	Short Term
AT1.2	Implement Cycling Strategy.	CCC	On-going
AT1.3	Continue to increase annual funding for cycling infrastructure.	State & CCC	Short Term
AT2.1	Investigate key linkages and undertake negotiations with land owners for right of way corridors through sites.	CCC	Medium Term
AT3.1	Development controls be updated to reflect the level of cycling end of trip facilities required in each area. Development controls are to include a component of visitor cycle facilities.	CCC	Short Term
AT4.1	Assess the available and quality of safe cycle routes to/from each primary school and develop a program of improvements/upgrades, prioritised on the basis of proximity to each school and in consideration of Action AT1.1. (only for areas not considered by PAMPS).	CCC	Long Term
AT5.1	Develop a series of cycling and walking guide maps of Cessnock LGA including safe cycling and walk routes to key destination (e.g. Wineries, Arts and Community Centre, Libraries)	CCC	Short Term

Public Transport Strategy

Context

Bus services provide the majority of public transport services for travel within the Hunter region. These regional bus services provide connections to, and between, the region's major centres, towns and villages.

The Hunter Regional Transport Plan (2014) currently is working on improving the public transport network by strengthening bus operations through network and timetable reviews in the context of the current Outer Metropolitan Bus Service Planning Guidelines. This is being done through investigating employment and tourist destinations within the Hunter valley region.

Currently there is one (1) route that travels between the Cessnock LGA and Newcastle (Route 160). There is one (1) route that travels between the Cessnock LGA and Morisset (Route 163). The route to Newcastle is serviced by 4 services in each direction Monday to Friday and 2 services each direction on Saturdays. The route to Morisset is serviced by 2 services in each direction Monday to Friday and 2 services each direction on Saturdays, Sundays and Public Holidays.

PT1 – Improve Bus Service Times, Frequency and Coverage

Bus service times and frequency support access to jobs, education and important services, and coverage expands to service new growth area.

Community input into the Transport Strategy's development shows a strong desire for improved service times, frequency of service and hour of operation. Current operating provisions do not support people living outside (e.g. Newcastle) but working in Cessnock or vice versa.

Part of the Hunter Regional Transport Plan includes increasing public transport coverage as new residential areas and associated demand develop. Providing these public transport services to new developments will be vital for the development in the area and in turn will provide improved and more frequent services throughout the region.



Table 15 lists the bus routes that currently operate within Cessnock LGA.

Maitland (Route 164) is the most regularly serviced destination with a time frequency of 60 minutes and a total of 8 services both in the morning period (5am to 11:59am) and afternoon period (12pm to 9pm), compared to Newcastle as a destination with a total of 2 services both in the morning and afternoon periods.

Table 15: Existing Bus Routes in Cessnock City LGA

Bus Route	Origin	Destination	Description	Time Frequency (Minutes)	Service Frequency (5am to 12pm)	Service Frequency (12pm to 9pm)
160	Cessnock CBD	Newcastle	via Kurri Kurri, M15 Hunter Expressway, Newcastle University and Mayfield	60	2	2
162	Kearsley	Cessnock CBD	Kearsley (Abernethy) to Cessnock	120	2	3
162	Cessnock CBD	Kearsley	Cessnock to Kearsley (Abernethy)	130	2	3
163	Cessnock CBD	Morisset	via Kurri Kurri and M1 Pacific Motorway	600	1	1
164	Cessnock CBD	Maitland	via Kurri Kurri	60	8	8
165	Cessnock CBD	West Cessnock	Loop	120	4	4
166	Kurri Kurri	Maitland	Kurri to Maitland and Maitland to Kurri Kurri	120	3	3
167	Cessnock CBD	Nulkaba	Loop	75	2	1
168	Cessnock CBD	Millfield	Loop via Bellbird, Ellalong and Paxton	120	3	4
171	Weston	Kurri Kurri	Weston to Kurri Kurri and Kurri Kurri to Weston	120	2	2
179	North Rothbury	Stockland Green Hills (East Maitland)	via Maitland	60	5	0
180	Singleton Heights	Stockland Green Hills (East Maitland)	via Maitland	180	2	2

Source: NSW Transport

Figure 22 shows the existing bus routes coverage in Cessnock LGA. Establishing services in new growth areas from an early stage facilitates greater take up of service. Expanded coverage of bus services into new growth areas should be further investigated. While public transport is a State Government responsibility, Council and developers can ensure that new estates are planned and design for future bus service, with staging and connectivity provided to existing areas, as shown in Figure 23.

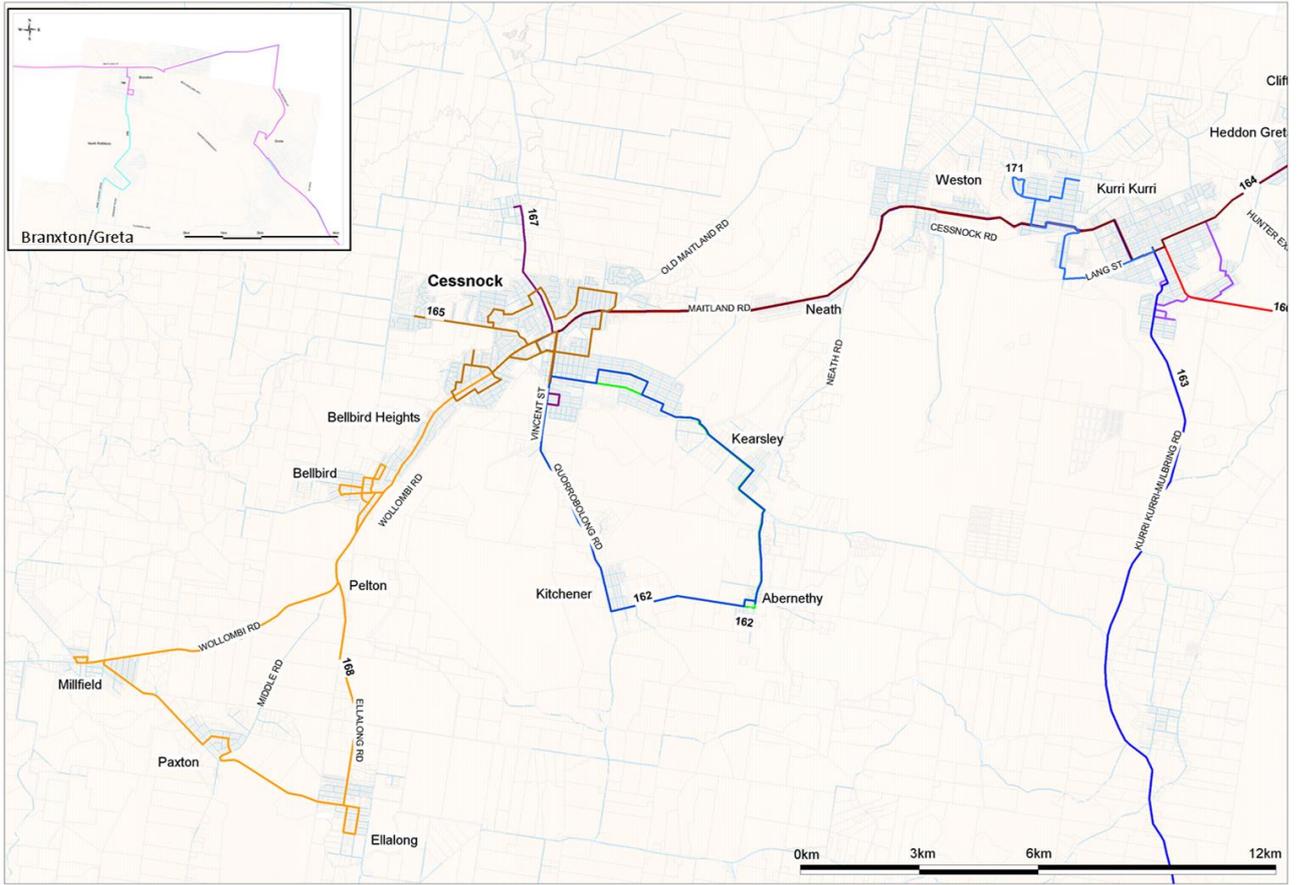


Figure 22: Cessnock LGA Bus Route Coverage

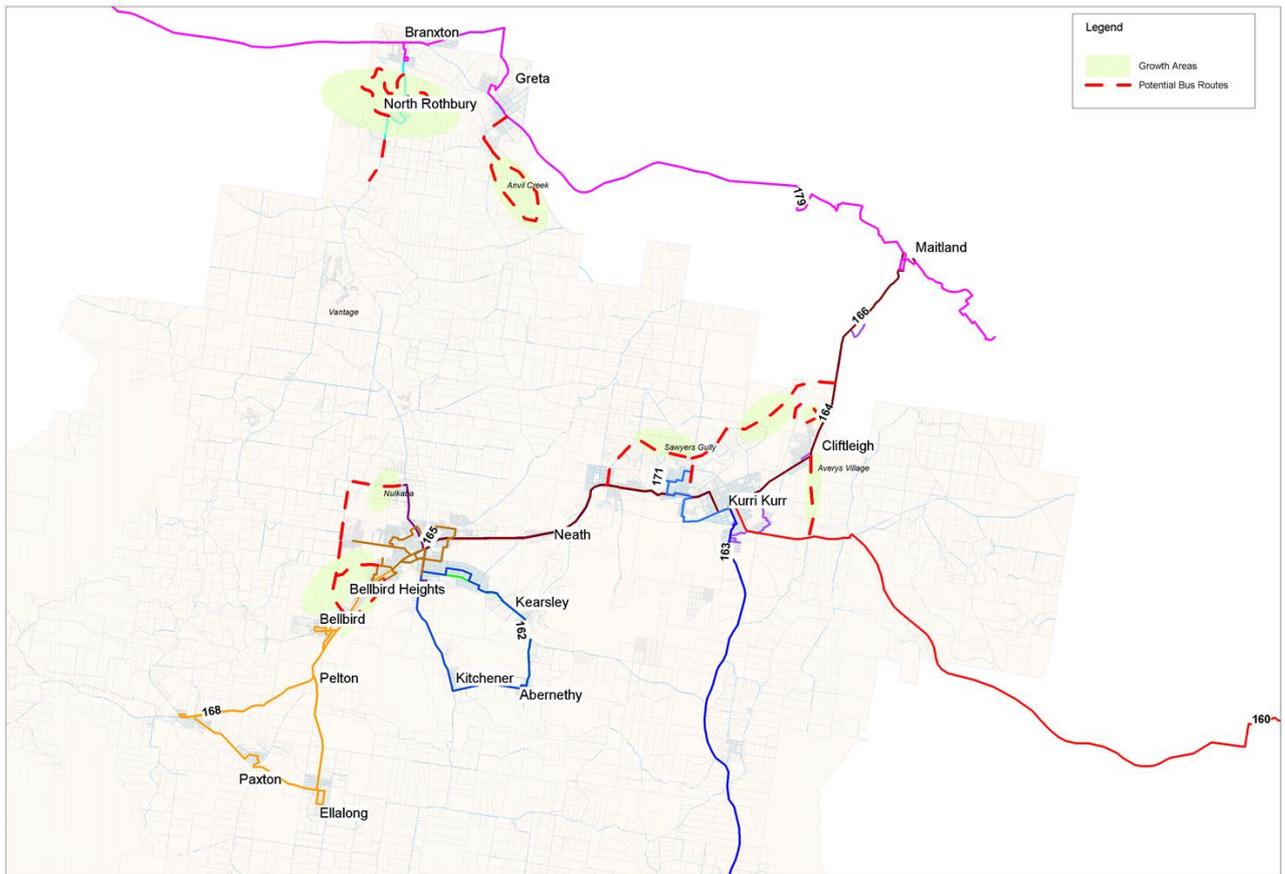


Figure 23: Expand Bus Route Coverage to New Growth Area

- PT1.1** Work with the State Government to review the public transport network to understand current service provision
- PT1.2** Lobby State Government for increased hour of operation and frequency of services between Newcastle and Cessnock LGA

PT2 – Increase Rail Service Times and Frequency

Increase rail service times and frequency to support emerging growth areas.

With the continued development in the Branxton/Greta area there is an increasing opportunity to increase the frequency of the rail service which travels through the north of the Cessnock LGA with coinciding bus trips from throughout the LGA. Currently there are 4 rail services which pass the station (2 morning and 2 evening services).

- PT2.1** – Lobby State Government to reintroduce and increase the frequency of rail services.



PT3 –Expand Intra-Regional Bus Services

Integrate bus routes to improve coverage and reduce travel times

Currently there two (2) routes that travel between Cessnock and Maitland (Route 164, 166) and two (2) routes that travel between Branxton/Greta to Maitland (Route 179, 180).

The Cessnock to Maitland route is serviced by 24 services in each direction Monday to Friday, 14 services on Saturdays and 8 Services on Sundays and Public Holidays. The Branxton/Greta to Maitland route is serviced by 11 services in each direction Monday to Friday, 5 services on Saturdays.

With the developments in the Branxton/Greta area there are opportunities to integrate new bus routes into the existing routes. A reoccurring route could be established passing through Branxton, Greta, Maitland, Kurri Kurri and Cessnock. This would provide connectivity throughout the Cessnock LGA and to Maitland. The route could also be split into two routes divided by HEX reducing the trip time and allowing passengers to transfer at North Rothbury. Figure 24 outlines the potential Bus routes.



Source: Google Maps

Figure 24: *Potential Bus Routes*

Within the Hunter Regional transport Plan it is outlined that Maitland City Council has proposed re-opening the South Maitland Rail Line to passengers. This would provide connectivity from Maitland to Cessnock and Kurri Kurri and then onto Newcastle. The draw back to this is the inherent cost of using this rail line as it is privately owned and operated, this opportunity has not been completely dismissed and is currently being revived by Transport for NSW.

- PT3.1** Work with the State and bus operators to integrate and expand service coverage of bus services.

Public Transport Actions

No.	Action	Lead Area	When
PT1.1	Work with the State Government to review the public transport network to understand current service provision	State & CCC	Short Term
PT1.2	Lobby State Government for increased hour of operation and frequency of services between Newcastle and Cessnock LGA	State & CCC	Medium Term
PT2.1	Lobby State Government to reintroduce and increase the frequency of rail services	State & CCC	Long Term
PT3.1	Work with the State and bus operators to integrate and expand service coverage of bus services	State & CCC	Medium Term

Roads and Freight Strategy

Context

Roads in the Cessnock LGA should be managed to maximise traffic efficiency and safety and freight movement efficiency considering all road users. Streets should be designed and managed to maximise accessibility whilst prioritising safety and local amenity.

RF1 – Maximise Traffic Efficiency

Through traffic movement on the arterial road network is efficient but recognises local accessibility needs.

Traffic movement efficiency provides economic benefits to local and regional communities through productivity gains due to travel time savings as well as through reducing risks with greater travel time reliability. Traditionally this through movement efficiency on arterial roads has been achieved by progressively restricting local access to these roads whether it is through cutting off local streets, barring right turn movements or simply reducing the amount of signal green time available for local street approaches to major intersections. As networks evolve and arterials become congested for much of the day, a balance needs to be struck between trying to preserve through movement efficiency and allowing local movements that don't need to be held up in this congestion, to cross the area.

Within the Cessnock LGA, un-restricted local accessibility is present near the major through movements on most arterial roads. Roads like Cessnock Road, Wollombi Road, Allandale Road and Aberdare Road perform important through movement functions but have direct property accesses and no formal policy for control of through movements versus control of side street movements. What is needed is a revised functional road hierarchy and access management strategy which identifies the preferred road function for each local government road and its associated access management plan that can be worked to over time.

Consolidating property access and intersection turn movements is necessary to reduce friction, on capacity and speed, to maximise the efficiency and safety of these important transport spines.

Key actions arising from RF 1 – Maximise Traffic Efficiency are:

- RF1.1** Establish a functional road hierarchy and access management plan for local government roads within the Cessnock LGA to support the arterial road system and improve local accessibility.
- RF1.2** Develop bypass routes of centres and villages (e.g. Cessnock CBD Neath and Weston) for longer distance trips and heavy vehicles.
- RF1.3** Manage/introduce access control on the arterial network to reduce delays to through traffic movements.

RF2 – Protecting Local Amenity and Safety

Residential amenity in streets is preserved by limiting the volume and speed of through traffic by implementing local area traffic management schemes.

Roads provide a wide range of functions ranging from arterial moving large volumes of mixed traffic (including freight and bus) over longer distances to local streets and laneway providing access and social interaction. It is crucial that roads and streets are planned and used accordingly to ensure money is invested in the right place and the safety and amenity of residents is maintained.

Residential amenity in local streets can be improved by encouraging traffic travelling through the area to either avoid these streets or to do so at a reduced speed. With a well-established functional road hierarchy, traffic would be encouraged to use arterial, distributor and collector routes rather than local streets.

Where this clear segregation of functional purposes and traffic trip lengths is not possible, Local Area Traffic Management (LATM) schemes can be implemented to manage competing needs. These schemes can also be used more broadly as street scaping measures to beautify local streets for residents.

Currently the Cessnock LGA has a relatively poor definition of street function due to the way the street network has evolved over time. In some locations, this has led to excessive traffic volumes or excessive speeds in local streets. The opening of HEX and interchange locations has impacted on the local road network with some local roads being used to access HEX from Cessnock CBD, avoiding congestion on the arterial roads.

The development of a LATM policy is critical to defining what type of street conditions warrant what types of measures to be considered, if any. Attributes such as street width, presence of buses, availability of alternative routes, street length and traffic volume and speed would all be key inputs.

A LATM implementation policy should be established for Cessnock's LGA, with local streets audited against the policy to determine the highest priority needs for programming more detailed traffic management scheme investigations. The most successful schemes have significant community involvement and a community involvement process would be expected to be a key element of the policy.



Key actions arising from RF2 – Protecting Local Amenity and Safety are:

- RF2.1** Develop a Local Area Traffic Management (LATM) scheme warrants and implementation policy.

RF3 – Manage Heavy Vehicle Movements

Heavy vehicle movements in local residential streets are prohibited.

Efficient freight movement is important for the regional economy and the local economy. Whilst it is in the interests of freight generating activities to be near major roads with good traffic access, the evolution of land use sometimes mean that freight-generating activities can be embedded in residential areas that develop around them. In these cases, there are freight traffic and residential traffic interface issues that need to be carefully managed so as not to overburden industry whilst preserving residential amenity as best as possible.

Key actions arising from RF4 - Manage Heavy Vehicle Movements are:

- RF3.1** Assess the Cessnock LGA industrial areas and truck routes for impacts on residential areas and develop appropriate management measures.



RF4 – Road Maintenance

Roads and streets are maintained to provide safe and efficient access for all and users.

The main concern with damaged roads that develop into pot holes is the danger it presents to motorists and other users of Council roads. There is a need for Council to be pro-active to repairs particularly in busy streets where traffic and other use is high.

In general terms, roads that are in poor condition, subject to continual traffic and not included in the program will require more attention than those roads that are in satisfactory condition and not subjected to continual traffic. These roads should be inspected regularly whereas roads considered in good condition and with low traffic volumes should be monitored infrequently.

Roads and Freight Actions

No.	Action	Lead Area	When
RF1.1	Establish a functional road hierarchy and access management plan for local roads within the Cessnock LGA to support the arterial road system and improve local accessibility	CCC	Short Term
RF1.2	Develop bypass routes centres and villages (e.g. Cessnock CBD Neath and Weston) for longer distance trips	State & CCC	Medium Term
RF1.3	Manage/introduce access control on the arterial network to reduce delays to through traffic movements	State & CCC	Short Term
RF2.1	Develop a Local Area Traffic Management (LATM) scheme warrants and implementation policy	CCC	Medium Term
RF3.1	Assess the Cessnock LGA industrial areas and truck routes for impacts on residential areas and develop appropriate management measures	CCC	Medium Term

Future Road Network and Hierarchy

Staging Considerations

The preferred future (ultimate) road network plan, as described in Chapter 5 is shown in Figure 25. Further assessment was undertaken to identify potential staging of road network improvements over the next 25+ years. Modelling was undertaken for the interim years of 2021 and 2031 to assess the performance of the network, to identify network deficiencies and to prioritise future road upgrades. It is acknowledged that it may not be feasible to construct all the proposed staged upgrades within the recommended timeframes (e.g. 2021, 2031 and 2041), however the staging schedule provides a prioritised “needs based” plan to progressively upgrade the road network to support the planned growth in Cessnock LGA.

In order to develop a robust staging methodology, the 2021 and 2031 “Do-Minimum” modelling results were thoroughly analysed to identify the year that specific network deficiencies are likely to occur.

2021 Road Network Development

Traffic performance of the 2021 “Do-Minimum” network was assessed against 2021 forecast traffic volumes. The assessment identified network deficiencies and a set of improvement measures were developed to address the deficiencies and to improve traffic performance.

2021 Deficiencies

The key network deficiencies identified in 2021 were:

- *traffic volumes on Cessnock Road (one lane each way) in Weston through the Villages of Neath and Abermain are expected to reach 900 veh/ hr (each way). Cessnock Road would operate at LoS D. Heavy traffic movements will result in loss of village amenity and increase the risk of collisions with pedestrians and cyclists;*
- *traffic volumes are expected to increase through Cessnock Town Centre, including Wollombi Road (1,090veh/hr), West Avenue (575veh/hr) and Darwin Street (760veh/hr). The increase is preliminary attributed to new developments including the Bellbird North development; and*
- *during the peak hours, traffic volumes on Main Road (east of HEX) are projected to grow up to 1,090 veh/hr. Main Road would operate at LoS E/F.*

2021 Network Improvements

In order to improve traffic performance and to address the above issues, the following improvements are needed between now and 2021:

- **Wollombi Road Upgrade:** This includes upgrading Wollombi Road to a four lane configuration between Abbotsford Road and Allandale Road and upgrading a number of intersections along this section, including new signalised intersections;
- **Old Maitland Road Upgrade:** This includes upgrade and realign the northern half of Old Maitland Road which is currently not paved; and
- **Weston Bypass:** It is proposed to introduce a new link between Old Maitland Road and Sawyers Gully Road. It is proposed to introduce a signalised intersection at the Maitland Road and Old Maitland Road intersection;

The proposed improvements are shown in Figure 26.

2031 Road Network Development

Traffic performance of the 2021 proposed network was assessed with 2031 projected traffic volumes. The assessment identified network deficiencies. A set of improvement measures were developed to address these deficiencies and to improve traffic performance. These improvement measures are consistent with the 2041 Preferred Road Network.

2031 Network Deficiencies

The following key network deficiencies identified in the 2021 preferred network with 2031 traffic:

- traffic volumes on Hart Road (Loxford Interchange) would increase to over 1,000 veh/hour in the westbound direction and 900 veh/hour in the eastbound direction. Hart Road will operate at LoS E;
- traffic volumes on Main Road would be 1,300 veh/hr in the westbound direction and 1,100 veh/hr in the eastbound direction. Travel time in the westbound direction is predicted to increase by more than one and a half minutes as compared to the 2021 scenario;
- Old Maitland Road would provide LoS D as compared to LoS C in 2021 modelling; and
- traffic flows on Wine Country Drive are predicted to increase over 30% in both directions.

Substantial increases in traffic volumes are predicted on Hart Road (Loxford Interchange), Main Road, Old Maitland Road and Wine Country Drive. In order to manage traffic movement efficiently and also to reduce traffic volumes through environmentally sensitive areas, an additional access point on HEX is required for traffic travelling between Cessnock and HEX. It is proposed that between 2021 and 2031 the proposed HEX at Sawyers Gully is introduced along with upgrade and realign northern half of Old Maitland Road.

2031 Network Improvements

In order to improve traffic performance and to address the above issues, it has been proposed that the following improvements are proposed to be implemented before 2031:

- **Main Road Upgrade:** Includes Lang Street / Main Road upgraded to 4 lanes (two-lanes in each direction) between HEX and Clifftleigh Meadows.
- **Northern Outer CBD Bypass:** New link joining Wine Country Drive at Nulkaba with Old Maitland Road, including a signalised intersection at Wine Country Drive and O'Connors Road;

-
- **Old Maitland Road:** Duplicate Old Maitland Road to a four-lane configuration between Maitland Road and the new Weston bypass. Upgrade and realign Old Maitland Road between the new Weston Bypass and HEX;
 - **Maitland Road:** Upgrade Maitland Road/Old Maitland Road intersection to traffic signals;
 - **Lang Street:** Upgrade Main Road to a four lane configuration between Kurri Kurri and HEX; and
 - **Sawyers Gully Interchange:** A new full interchange at Old Maitland Road and HEX.
 - The proposed staged improvements are shown in Figure 27

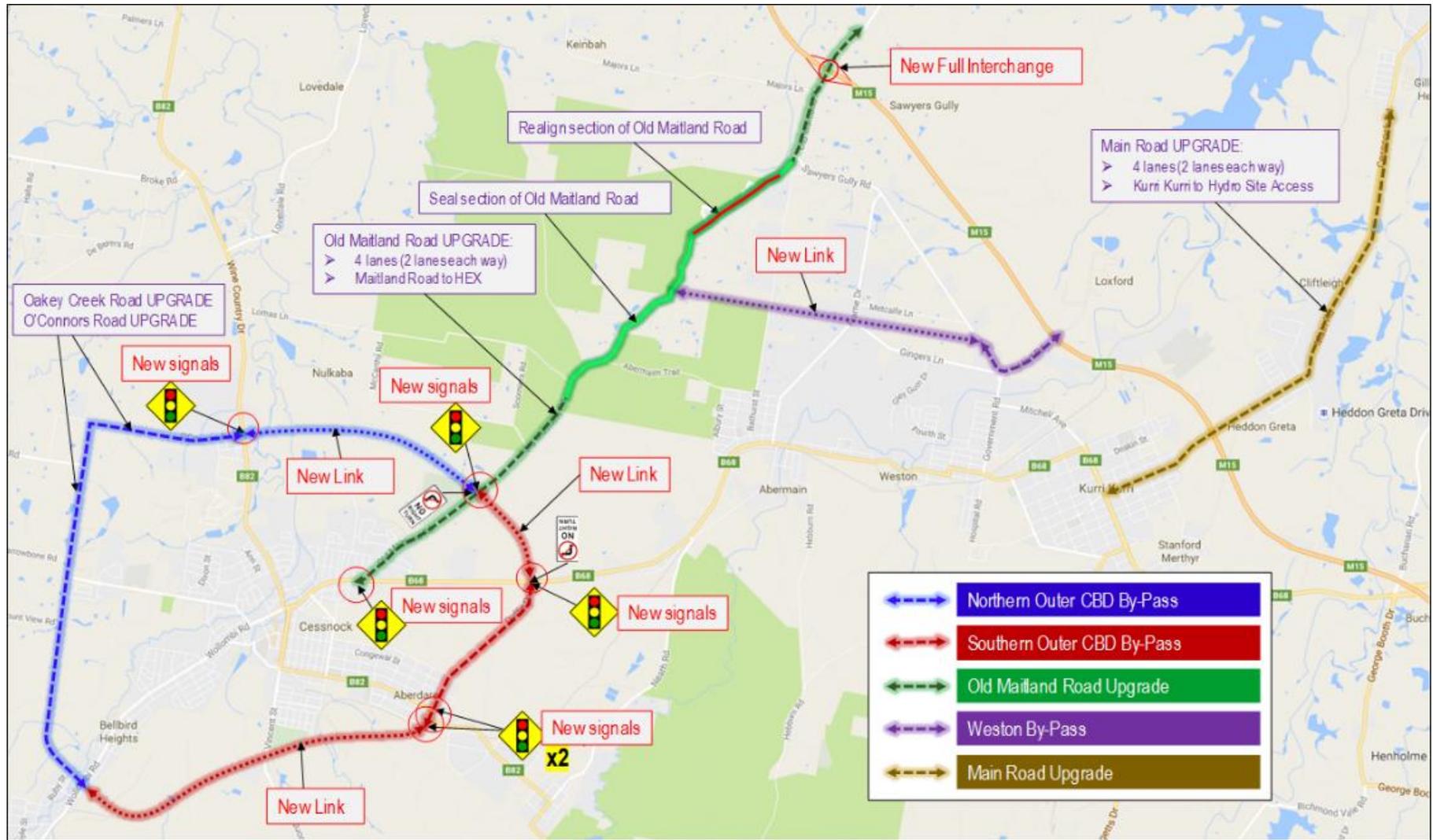


Figure 25: Recommended Road Network 2041

2021 Preferred Network

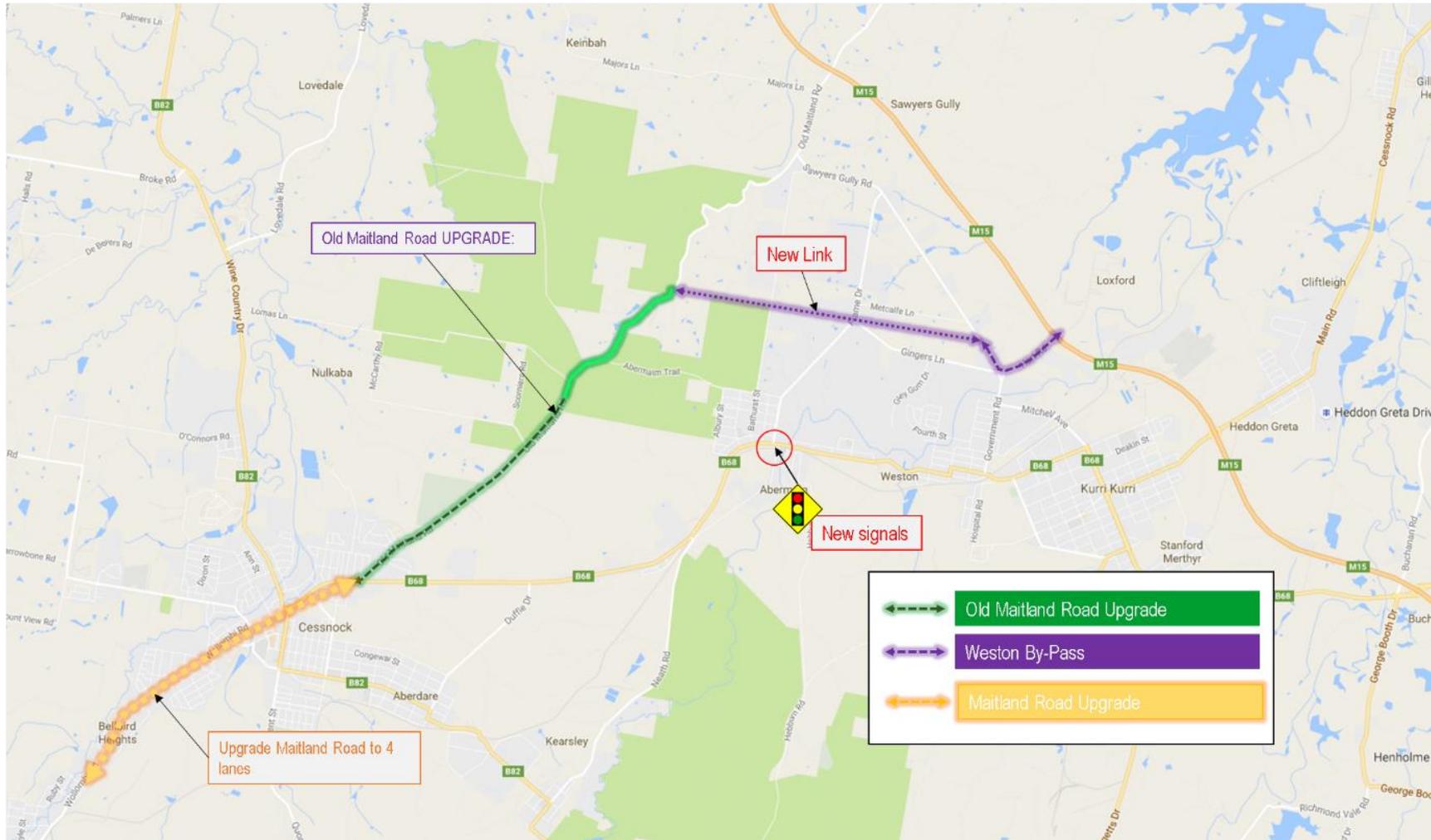


Figure 26: 2021 Road Network Improvements

2031 Preferred Network



Figure 27: 2031 Road Network Improvements

Modal Priorities

Traffic

As a rule of thumb, in urban areas arterial roads comprise about 20% of the total road network but carry 80% of movements. As such, arterial roads have a primary traffic movement function. On these roads, it is important that friction and delays to this traffic movement is properly managed. Lower order roads distribute the traffic around the network and provide access to properties.

Strategically place commuter parking at transport nodes (e.g. near HEX interchanges) can encourage car- pooling, and more efficient use of road space.

Freight

The importance of freight to national, regional and local economies underpins traffic management objectives for truck movements; and the management of freight routes as part of a network must be seen in this light. Transport and storage services represent around 4.5% of the Australian gross domestic product and the movement of freight is critical to the entire agricultural and manufacturing bases (Austroads 2014).

Freight traffic is much more diverse in its characteristics (e.g. vehicle types, vehicle performance, and distribution/delivery patterns) and needs than general road traffic.

Truck movements in urban areas are associated with a range of problems this is because of the significantly larger size of trucks compared to passenger cars, they:

- *require more road space;*
- *require greater overhead and side clearance;*
- *have slower acceleration, requiring more green and gap times at traffic signals;*
- *increase and expedite deterioration of pavements conditions; and*
- *generate more noise and vibration disproportionate to their numbers.*

Road geometry therefore needs to consider increased manoeuvring (wider swept paths), flatter grades and more queuing space for freight vehicles compared to general traffic.

Public Transport

Increasing the use of public transport is a fundamental need of the Cessnock community and to support future growth in the region in a sustainable way. If the public transport network is to achieve this, it will require considerable expansion and improvement, and best practice techniques must be adopted to improve passenger experiences, with emphasis on:

- *developing a public transport network of direct, frequent services on strategic routes linking Cessnock's towns and villages with other regional centres;*
- *supporting the trunk public transport spines with local buses that extend coverage to areas not serviced by high-frequency transport services; and*
- *developing a connected network that services the full range of destinations within the urban area, based around key transfer points.*

Key issues in managing on-road bus services include:

- *traffic interference –buses typically travel slower than general traffic and stop frequently to allow passenger to board and alight. Traffic delays occur mainly at intersections, so public transport priority at signalised intersections is a focus for improvement programs;*

- *reliability of services – inconsistent travel times is a significant deterrent to reliability of public transport services; and*
- *vehicle accessibility – Public transport vehicles are among the larger vehicles on the road. Larger, high capacity vehicles designed mainly around their line-haul function must sometimes also penetrate narrower residential streets.*

Cycling

Active Transport (walking and cycling) is an important element of an overall integrated transport system. The CTS2031 aims to increase cycling mode share from 1.9% in 2011 to 6.0% by 2031.

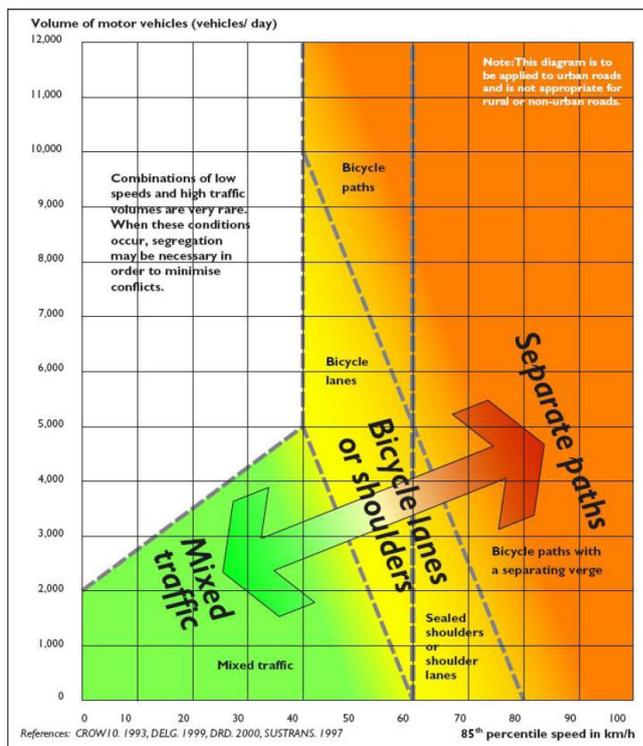
Active Transport (Cycling) covers the most diverse range of users, varying experience and skills, and is the most vulnerable of the transport modes.

Cyclist types using the road network include:

- *School cyclists;*
- *commuters;*
- *recreational cyclists;*
- *sports cyclist; and*
- *tourist cyclists.*

When considering the type of bicycle facility, such as bicycle lanes or shared user paths, the two guiding principles are: separating cyclists from motor vehicles, and providing a high level of priority for cyclists across through intersections.

The following chart (Figure 12.4) provides an example of guidelines for the selection of an appropriate type of bicycle facility. It relates the degree of separation required for cyclists to the speed and volume of general traffic. It should, however, be noted that jurisdictional policy and implementation strategies may also influence selection of particular facilities.



Source: RTA (2005)

Figure 28: RTA Guideline for Selection of Bicycle Facility

Network Planning Principles

Need for a Road Classification System

“Road classification is a means to an end, not an end in itself. Successfully allocating agreed labels to each element in the road system involves so much effort and controversy that it is pointless and best avoided unless the labels are going to have some application”. (Ray Brindle 1989).

A road classification system and network master plan needs to do many things for many parts of Council. It needs to provide the guidance on geometric design (reserve and carriageway widths), parking controls, footpaths and cycleways, access form and intersection spacing. It is also used to prioritise road upgrade program, a traffic management programs and a means of managing competing modal needs in corridors.

“The main purpose of defining a road’s functional class is to provide a basis for establishing the policies which will guide the management of the road, by grouping roads together into categories according to their intended service or qualities”. (Austroads 2009).

A road classification system is essential to:

- *provide for the safe and efficient movement of people and goods;*
- *provide the highest degree of mobility for modal classes;*
- *protect amenity through management of the road network and how the transport system uses it;*
- *aid the planning and design of road systems suitable for the desired traffic composition and volumes;*
- *define assessment management Level of Service (LoS)*
- *define appropriate design standard for new roads; and*
- *ensure that the roads and used for the right purpose.*

The current road classification system is out of date and has evolved from a time when additional road capacity was the primary consideration. Greater emphasis on the classification system is now needed for multimodal road space management, “capacity-balancing” and access management. Any new classification system does however need to be able to be integrated with Council’s design guidelines and therefore needs to consider both redevelopment areas and new development areas.

Road Function

Roads have a number of functions that can be grouped into:

- *movement function (traffic); and*
- *access function (abutting land use).*

The general notion is that arterial roads primarily provide for the movement function and local roads primarily provide for the access function.

The purest functional classification would reflect these two needs (i.e. each road would provide only for movement function or be used for access). All roads, however, (with the possible exceptions of a motorway/freeway and urban cul-de-sac) provide for a mixture of movement and access functions.

Any division of a road network into arterial and local roads therefore requires judgment as to the degree to which movement and access functions predominate in each group. No road class is exclusively used for one function.

Historically most roads have evolved with a mixed access/traffic function and these are reflected in the road classification system with additional categories to reflect the differing access and traffic needs, as illustrated in Figure 29.

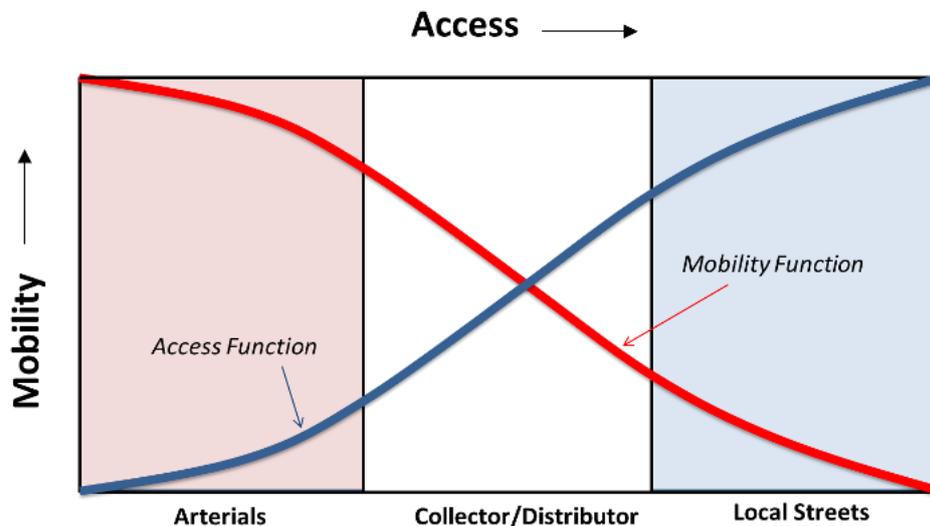


Figure 29: Road Type and Function

Typically arterial roads are carriers of through traffic while local roads mostly carry local traffic. There is, however, great difficulty not only in quantifying these components, but also in the perception as to what constitutes through and local traffic. For example, through traffic to a householder might be all traffic passing their driveway, while through traffic to Local Government might only be the component of traffic that does not originate within their own area.

The majority of roads provide for a mixture of through and local traffic and to a degree which is dependent upon the perceiver's point of view. As for Road Function, any division of a road network into arterial and local roads therefore requires judgment as to the degree to which movement and access functions predominate in each group.

Road classification systems can vary between organisations and within organisations depending on administrative functions, transport management objectives and complexity. Most organisations use a three, four or five level classification scheme. In the simplest form roads would be classified as arterial, collector or local streets. More complex road classification systems, in an endeavour to address varying access/mobility requirements typically include a lower order arterial classification (sub-arterial) and two levels of collector roads, namely distributor roads and collector roads.

While a whole of network functional classification system is desirable, there is also a need to consider the administrative function. Administrative functions are usually determined by levels of government (national, state, and local) as a means of funding and allocating jurisdictional responsibility for the management of certain parts of the road network.

The geographical location, traffic volumes and composition and land use influence road function, and typical classifications are 'urban' or 'rural'. Urban roads are characterised by significantly higher volumes than rural roads. Urban roads also have typically higher concentrations of property access and intersections as well as a greater mix of road users.

Rural roads are typically defined by location that is being outside of the developed urban footprint. Travel on rural roads (particularly higher order roads) typically involves longer distances and higher speeds compared to urban roads. Rural roads rarely operate at capacity but can be more affected by speed differential due competing vehicle classes (e.g. car vs truck) and road geometry.

Road Purpose and Network Operation Plans

Road classification schemes have also been extended to classify roads by the purpose for which they are used (e.g. tourist roads).

Grouping of roads by purpose may have some application in determining the degree of responsibility, standards or priority for improvement, but it is not in itself a fundamental criterion upon which a broad road classification system can be based.

In recent times, multi-layered classification systems have been developed as map layers of varying road use classifications, including, modal priority, freight and access management.

This is particularly important in centres where there are high demands, limited road space and competing needs and priorities. A more recent initiative mostly used for large and smaller centres are Network Operational Plans. A Network Operation Plan (NOP) aims to guide the operation and development of the road/transport network towards contributing an established transport strategy by setting out how these competing priorities are to be managed.

An NOP contains the short-term initiatives and services that guide day-to-day operations. An NOP may also include longer term improvement works that would facilitate or support the day-to-day operation of the network (Austroads Pt 4 – Network Plan).

Austroads adopt a seven phase NOP, beginning with developing network operational objectives, in response to higher level planning objectives. Road user priorities are assigned to each road link and network performance is evaluated against the road use priorities and strategies developed for traffic management, operation and infrastructure solutions.

Notably NOPs usually work on a short-term (i.e. 1-5 years) planning horizon and the initiatives are generally operational in nature and scale. That said a number of the road use priorities can be development or factored into broader city-wide road classification schemes.



Road Hierarchy Definitions

Road Classification Definitions

Motorway

Motorway links are located in major inter-city and regional areas and are usually primary freight routes. The roads are mostly used for longer distance trips at high speeds with minimal 'local' trips as a proportion of all traffic flow. Posted speed limits on motorways are typically 100-110km/h and for that reason that are not a safe environment for pedestrian and cyclists, and should be catered for on alternate roads (e.g. service roads) or segregated facilities.

Arterial Routes

Arterial routes connect major centres (and motorways) and form important links for freight and line haul public transport. These roads cater for relatively high volumes and long distance travel.

These corridors should provide for regional cycle movements, but travel speed, volume and composition is such that cycle movements should desirably be kept separate from general traffic. Active transport will be provided for, with quality footpaths for walking and either on or off-road facilities for cycling.

Urban arterial routes will typically be multi-modal arterial, and may include bus priority. Some arterial route may also provide a bypass function to move traffic around activity centres. In this case traffic flow and travel time efficiency would have priority over other modes.

Sub-Arterial Route

Sub-Arterial routes provide a supportive role to Arterial routes. These roads are of lesser importance than arterial roads but will still carry significant volumes and or long distance travel. These corridors also provide for regional cycle movements, but with lower speeds and volumes and cater for on-road cycle lanes.

Distributor Roads

These roads connect the local road system to the arterial and sub-arterial road system and provide important links in the public transport and local freight network.

Collector Roads

Collector Roads provide access to local access streets and allow for local trip movements within a neighbourhood.

Access Street and Roads

These streets cater for local access to individual dwellings. Access streets also have an open space function that residents use for other community activities.

Road Classification Levels and Objectives

A typical four level framework identifies the functional objectives of each element within each level of the hierarchy. The four levels are arranged in terms of increasing degree of detail with respect to functional objectives and are defined as follows:-

Level 1: Purpose relates to the primary objective of the element, whether to carry through traffic or provide direct property access;

Level 2: Function relates to the relationship between the roadway and the land use it serves (i.e. how the roadway serves the land use), or a rural or urban environment. This can be expanded to include consideration of strategic planning policy such as motorway, multi-modal arterial, bypass roads and community boulevards.

Level 3: Management relates to the emplacement of policies to achieve the envisaged function based upon the attributes of the element and of the adjacent land uses and provides the link to the Land Development Guidelines road typology and design standards; and

Level 4: Design relates to specification of the form of the element in order to achieve its functional objectives.

Consideration of modal priority introduces a fifth level to the framework, as illustrated in Figure 30. Modal priority is a significant factor when considering road typologies, particularly in relation to priority freight, public transport and cycle routes. Often these corridors require additional road space to maintain capacity and efficiency of the transport system and providing adequate separation to vulnerable road users.

Road Hierarchy Level & Objectives

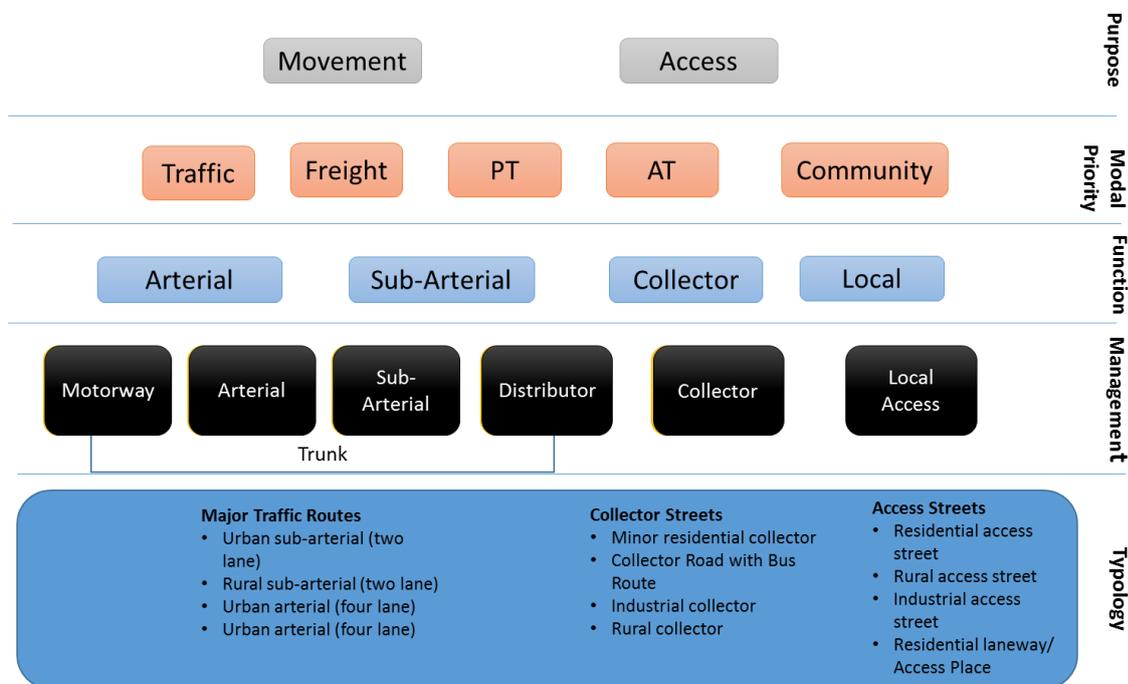
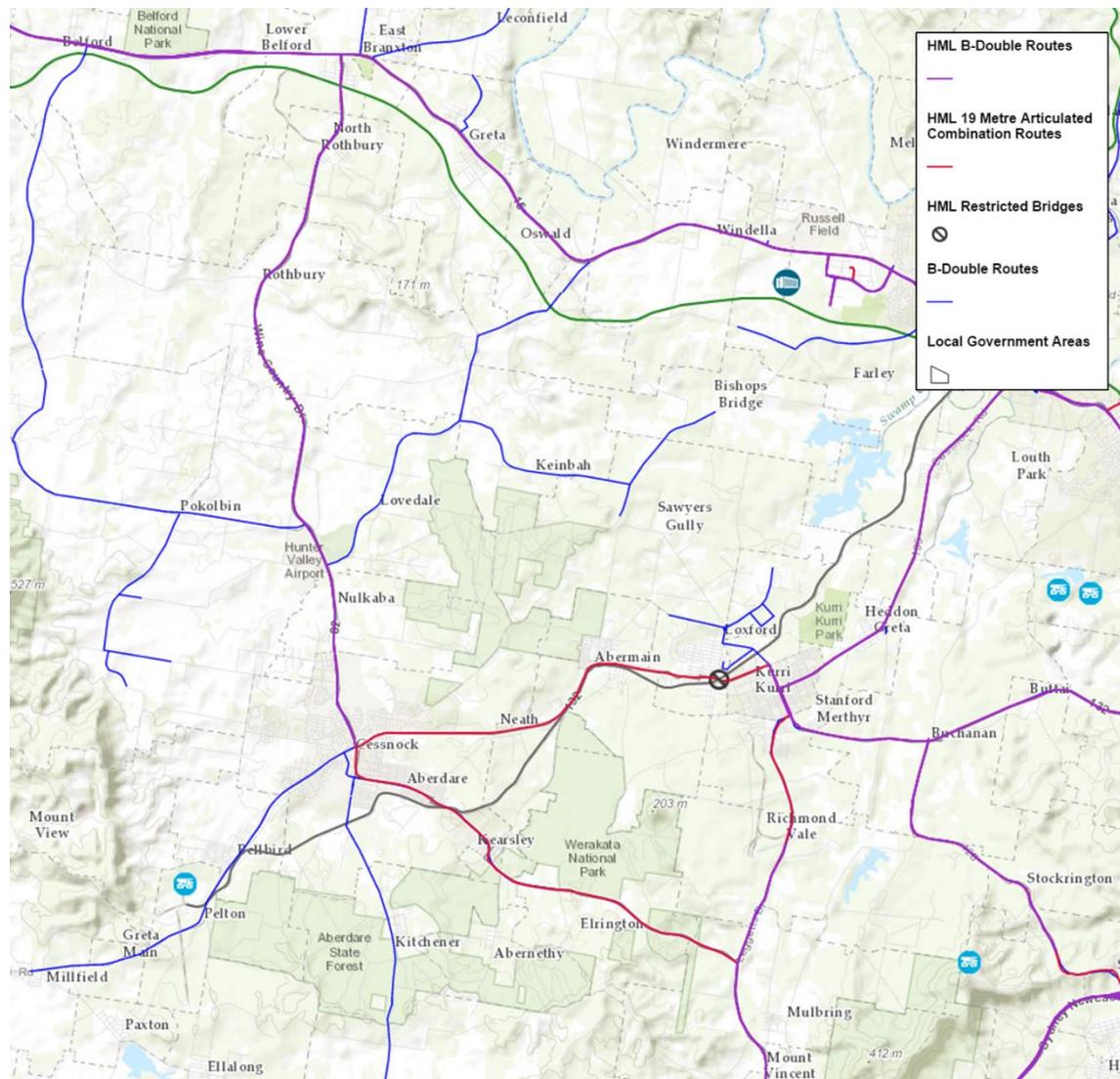


Figure 30: Road Hierarchy Levels and Objectives

Heavy Vehicle Routes

The Transport for NSW existing freight routes as of April 2015 within the Cessnock LGA are shown in Figure 31. Note, all B-double routes also exist as 19m AV routes.



Source: TfNSW - <http://freight.transport.nsw.gov.au/map/index.html>

Figure 31: Existing Heavy Vehicle Network

As shown in Figure 31, heavy vehicle routes currently exist through both Cessnock and Kurri Kurri with a large vehicle route passing through the smaller towns of Neath and Abermain along Cessnock Road, however a bridge restriction at Weston limits use of this route for HML vehicles. There are currently no industrial areas along this section to require the need for heavy vehicle access. It currently exists as a through route, contributing to high traffic levels and reducing the level of service of Cessnock Road and surrounding roads, particularly within the local towns and larger centres where increasing peak traffic would be exacerbated by the presence of heavy vehicles.

A freight rail line also exists past Kurri Kurri and Cessnock and is expected to remain as part of the future transport network.

As part of the preferred future upgrade option for the LGAs traffic network heavy vehicle routes should be altered to avoid town centres, providing less impact in town centres and promoting a more efficient heavy vehicle network. The proposed heavy vehicle routes are shown in Figure 32.

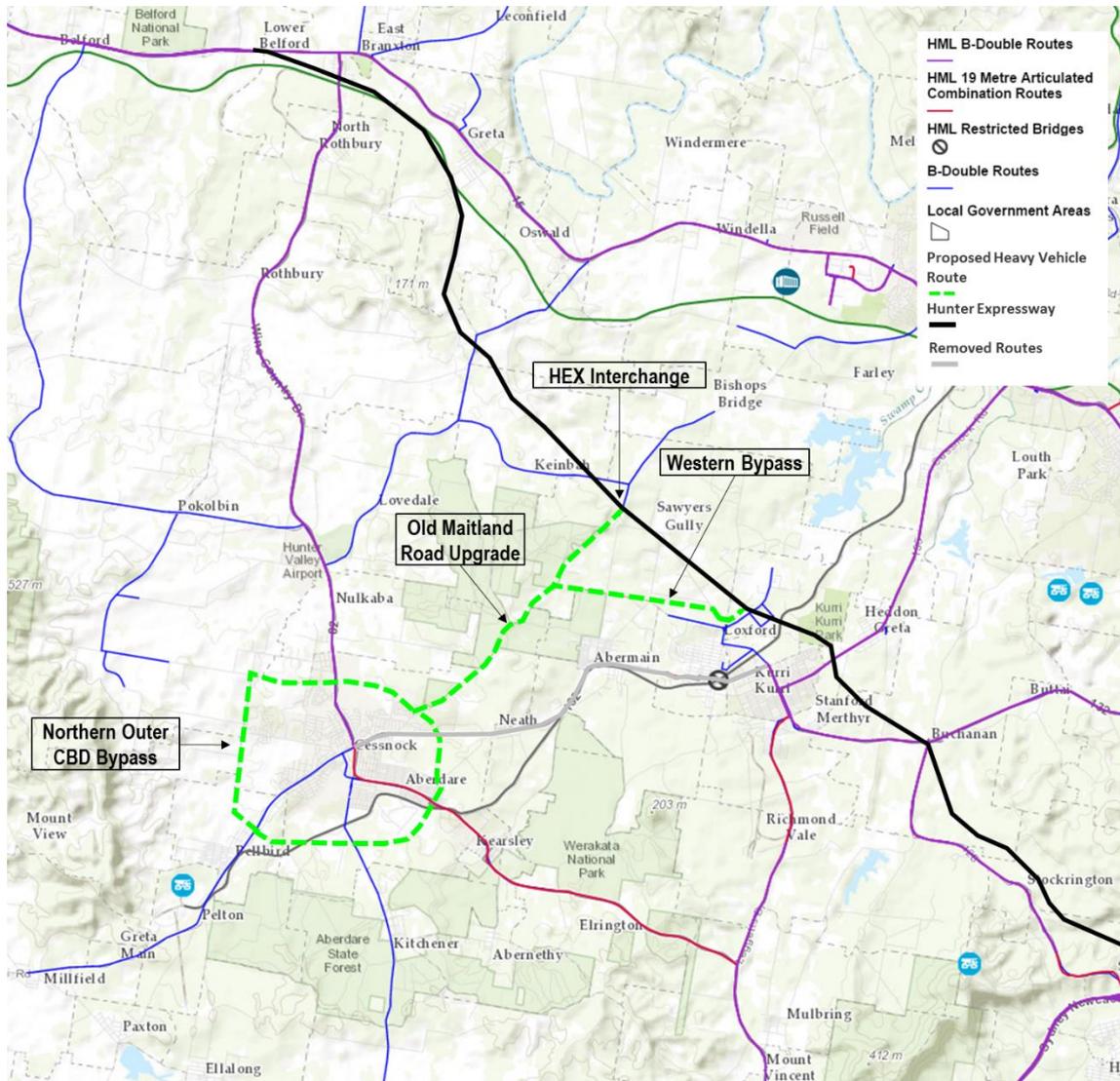


Figure 32: Proposed Heavy Vehicle Routes

Future Strategic Road Network Hierarchy

The proposed road hierarchy for the existing and proposed roads in Cessnock LGA is presented in Figure 33. The proposed road hierarchy has incorporated some of the major roads within Cessnock LGA as distributor roads such as Government Road. New link roads such as the Weston bypass take most of the through traffic (i.e. traffic wanting to access HEX and areas outside the LGA), while the hierarchy of Cessnock Road through Abermain, Neath and Weston will be reduced to provide an access and connection between villages. This measure will maintain the urban character of the area while allowing a slower speed environment with better pedestrian facilities for its users. A lower level road, in terms of hierarchy, would allow more cross road activities for both pedestrians and vehicular movements providing better connectivity for the area.

The strategic road network hierarchy covers the higher-order State and Council Roads. Council is also considering another lower level of local road hierarchy for laneways and cul-de-sacs which service fewer residences.

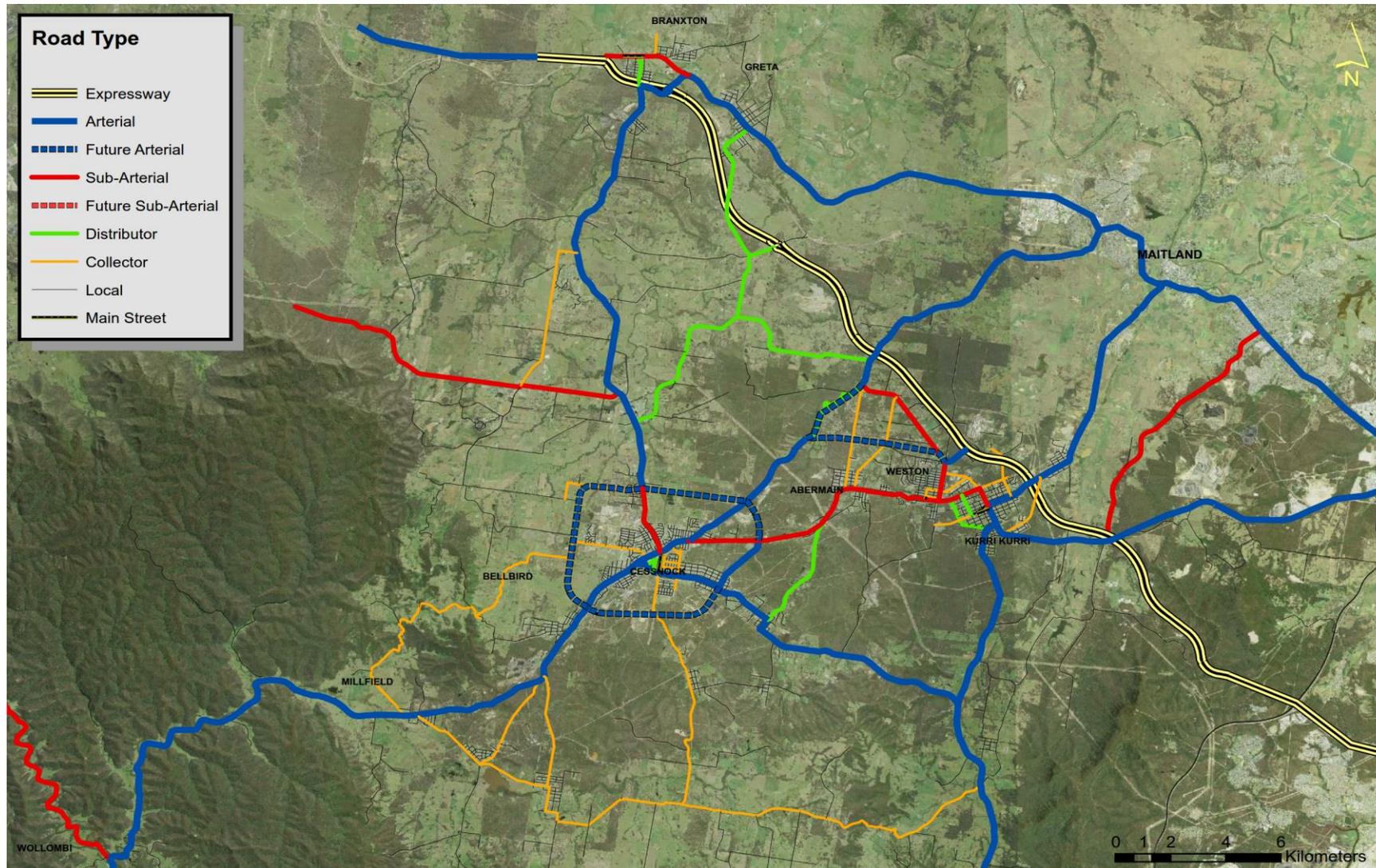


Figure 33: Future Road Hierarchy

In addition to staging the proposed new links and upgrades as part of the future road network defining a road hierarchy is an important aspect. Based on the above definition of road hierarchies, see Section 12.3, existing and proposed future routes have been allocated a hierarchy level as follows:

- **Motorways** - located in major inter-city and regional areas, usually primary freight routes and mostly used for longer distance trips at high speeds. Such roads within the Cessnock LGA would include HEX.
- **Arterial Routes** - Arterial routes connect major centres (and motorways) and form important links for freight and line haul public transport. These roads cater for relatively high volumes and long distance travel. Such roads within the Cessnock LGA would include the proposed Old Maitland Road upgrade, the proposed Western Bypass or Wine Country Drive.
- **Sub-Arterial Route** - Sub-Arterial routes provide a supportive role to Arterial routes and still carry significant volumes and/or cater for long distance travel. Regional cycle movements are sometimes also catered for. Such roads within the Cessnock LGA would include the proposed northern and southern CBD bypass links, Cessnock Road or Wollombi Road.
- **Distributor Roads** - These roads connect the local road system to the arterial and sub-arterial road system and provide important links in the public transport and local freight network. Such roads within the Cessnock LGA would include Neath Road, Lovedale Road or Quorrobolong Road.
- **Collector Roads** - Collector Roads provide access to local access streets and allow for local trip movements within a neighbourhood. Such roads within the Cessnock LGA would include Bimbadeen Road, Mount View Road or Government Road.
- **Access Street and Roads** - These streets cater for local access to individual dwellings. Access streets also have an open space function that residents use for other community activities. Such roads within the Cessnock LGA would include Maitland Street, Wallsend Street, Third Street, Tamworth Street, Ann Street or Cambage Street.

New Roads and Upgrades

Timing

This traffic and transport strategy recommends a number of new roads, road upgrades and intersections to be constructed over the next 25 years, and these projects will require funding from a range of sources, including all levels of government and through development provisions.

Timing for the recommended infrastructure is defined in four periods:

- *Immediate* - 2016 to 2021;
- *Short Term* - 2021 to 2031;
- *Medium Term* - 2031 to 2041; and
- *Long Term* - 2041 - 2061

Cost Estimate

The project costs have been developed as strategic estimates using unit rates defined by the *Independent Pricing and Regulatory Tribunal of New South Wales* (<https://www.ipart.nsw.gov.au/>)

New Roads

Table 16 presents the new strategic roads required to support the future growth and traffic needs of Cessnock LGA.

Table 16: Proposed New Strategic Roads

Road Name	Section	Approx. Length	Indicative Costs	Timing
Weston Bypass	Old Maitland Rd to Hart Rd	4.5km	\$18M	Short term
Northern Outer CBD Bypass – Stage 1	Wollombi Rd to Wine Country Dr	8.5km	\$34M	Medium term
Northern Outer CBD Bypass – Stage 2	Wine Country Dr to Old Maitland Rd	3.5km	\$14M	Medium term
Southern Outer CBD Bypass – Stage 1	Wollombi Rd to Aberdare Rd	5.7km	\$22.8M	Long term
Southern Outer CBD Bypass – Stage 2	Maitland Rd to Old Maitland Rd	1.6km	\$6.4M	Long term

Road Upgrades

Table 17 presents the strategic road upgrades required to support the future growth and traffic needs of Cessnock LGA

Table 17: Proposed Strategic Road Upgrades

Road Name	Section	Approx. Length	Indicative Costs	Timing
Wollombi Road	Abbotsford St to Allandale Rd	3.9km	\$7.8M	Immediate
West Avenue	Maitland Rd to North Ave	0.4km	\$0.95M	Short term
Wine Country Drive	Bridge St to 700m south of Bridge St	0.7km	\$1.71M	Short term
Main Road	HEX to Cliftleigh	2.5km	\$15.61M	Short term
Old Maitland Road – Stage 1	Maitland Road to new Weston Bypass (2 lane arterial)	6.17km	\$18.5M	Short term
Old Maitland Road – Stage 2	New Weston Bypass to HEX	4.0km	\$26M	Medium term
Colliery Street / Duffie Drive	Aberdare Rd to Maitland Rd	2.35km	\$2.8M	Medium term
Old Maitland Road – Stage 3	Maitland Road to new Weston Bypass (4 lane arterial)	6.17km	\$18.5M	Long term
Lang Street	Victoria St to HEX	1.7km	\$1.7M	Long term

Intersection Upgrades

Table 18 presents the key intersection upgrade required to support the future growth and traffic needs of Cessnock LGA.

Table 18: Proposed Intersection Upgrades

Location	Intersection Treatment	Indicative Cost	Timing
Orange Street/Cessnock Road	Traffic Signals	\$0.35M	Immediate
Mt View Rd / Wollombi Rd	Traffic signals	\$0.22M	Immediate
Ivan St/James St / Wollombi Rd	Traffic signals	\$0.22M	Immediate
Campbell St / Wollombi Rd	Traffic signals	\$0.22M	Immediate
Miller Road / Wollombi Rd	Left-in Left-out	\$0.04M	Immediate
Chidgey St / Wollombi Rd	Left-in Left-out	\$0.04M	Immediate
Desmond St / Wollombi Rd	Left-in Left-out	\$0.04M	Immediate
Wangi Ave / Wollombi Rd	Left-in Left-out	\$0.04M	Immediate
O'Neill St / Wollombi Rd	Left-in Left-out	\$0.04M	Immediate
Darwin St / Wollombi Rd	Traffic signals	\$0.25M	Short term
West Av / Wollombi Rd	Traffic signals	\$0.25M	Short term
Sawyers Gully Rd / Hart Rd	Traffic signals or roundabout	\$0.30M	Short term
West Ave / Miller St	Left-in Left-out	\$0.04M	Short term
Barnett St / Mt View Av	Left-in Left-out	\$0.04M	Short term
Darwin St / West Ave	Roundabout	\$0.15M	Short term
Marketplace Entry / Wollombi Rd	Traffic signals	\$0.22M	Medium term
Colliery St / Greta St	Traffic signals or roundabout	\$0.22M	Medium term
Colliery St / Aberdare Rd	Traffic signals or roundabout	\$0.22M	Medium term
Vincent St/ Snape St / Aberdare Rd	Widening for additional capacity	\$0.1M	Medium term
Heddon St / Lang St	Left-in Left-out	\$0.04M	Medium term
Stanford St / Lang St	Left-in Left-out	\$0.04M	Medium term
Victoria St / Lang St / Mitchell St	Upgrade to traffic signals	\$3.00M	Medium term
Old Maitland Rd / Maitland Rd	Traffic signals	\$0.35M	Long term

Local Centre Strategies

Cessnock CBD

Wollombi Road at Allandale Road and Maitland Road at Vincent Street, Cessnock

Three main arterial routes meet in Cessnock CBD at the intersection of Wollombi Road/Allandale Road/Maitland Road/Vincent Street. Vincent Street is also the business centre's 'main street'. The intersection has a staggered configuration of two signalised "T" intersections, approximately 80m apart.

A large open concrete drain crosses under Wollombi Road/Maitland Road between the two intersections. The intersection handle considerable through east-west traffic and high volumes of turn traffic, and experiences considerable queues and delays during the morning and evening peak periods.

Key traffic issues include:

- *substantial queues on the western approach during both the AM and PM peaks at the signalised "dog-leg" intersection of Wollombi Road and Allandale Road joined with Maitland Road and Vincent Street, located in Cessnock Town Centre;*
- *the eastbound approach currently has one (1) lane which widens to three (3) lanes at the stop line. There are two (2) lanes available for through traffic. However, the through traffic predominantly use the second lane, and the kerbside lane is under-utilised. This is likely due to vehicles requiring to merge downstream after Millfield Street, where Maitland Road narrows down from two (2) lanes to (1) lane;*
- *the one lane section of Wollombi Road between Mount View Road and Allandale Road currently operates at 80% to 90% of capacity;*
- *left turning vehicles on the western approach are also delayed due to the congestion on the one lane section; and*
- *future traffic growth along Wollombi Road is expected to grow significantly, and will result in substantial congestion at this section.*



Figure 34: Wollombi Road/Allandale Road/Maitland Road/Vincent Street Intersection Issue

There is little opportunity to realign (or join the intersections) without significant property impacts and costs, nor would it be desirable to encourage increased traffic volumes through Vincent Street. Wollombi Road is currently a two lane configuration and only widens to four lanes at the intersection. The additional eastbound lane is currently underutilised because of the short length of the downstream lane prior to merging.

Eastbound and westbound delays would be reduced by adding an additional peak hour traffic lanes (or clearway) on Wollombi Road between Mount View Road and Allandale Road, and by extending the downstream kerbside lane to Anstey Street.

Wollombi Road/Darwin Street Roundabout

The Wollombi Road/Darwin Street roundabout very heavy conflicting turning movements, particularly during peak time. The roundabout has a very small central island for traffic circulation and in combination with poorly balanced traffic flows results in large queues and delays on all approaches.

Key traffic issues include:

- during the PM peak site visit queues were observed on the roundabout approaches with traffic on all approaches travelling slower than their desired speed;
- the traffic model predicts delays of more than half a minute; and
- with future traffic expected to grow Wollombi Road, congestion and delays would likely worsen.

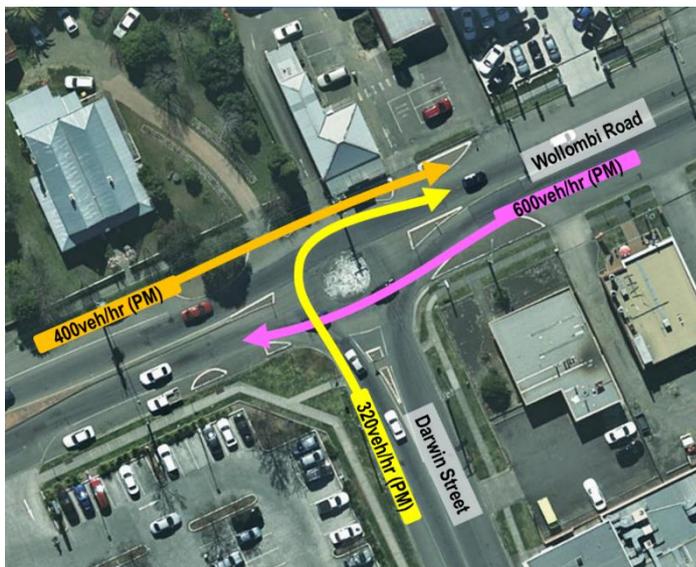


Figure 35: Wollombi Road/Darwin Street Intersection

Upgrading the intersection to traffic signals is required to improve intersection operation and reduce delays, although this would need to be done in conjunction with the four laning of Wollombi Road. Upgrading this intersection would also enhance Darwin Street as the western entry into the central business district and provide direct and improved connection to the shopping precinct.

Wollombi Road/ West Avenue Intersection

West Avenue is used as a bypass of the CBD for trips from the south-west of Cessnock to Aberdare Road or via Duffie Drive to Cessnock Road, towards Kurri Kurri. It also provides a key access to the TAFE and Cessnock High School.

Key traffic issues at this intersection include:

- high volume of right turns (370 veh/h) from Wollombi Road into West Avenue;
- right turn movements and through movements share the same traffic lane, resulting in through movements being stopped behind queued right turning traffic; and

- traffic on Wollombi Road is expected to grow substantially as a result of various developments including the proposed Bellbird North development. With the current intersection configuration, traffic delays are predicted to increase substantially.

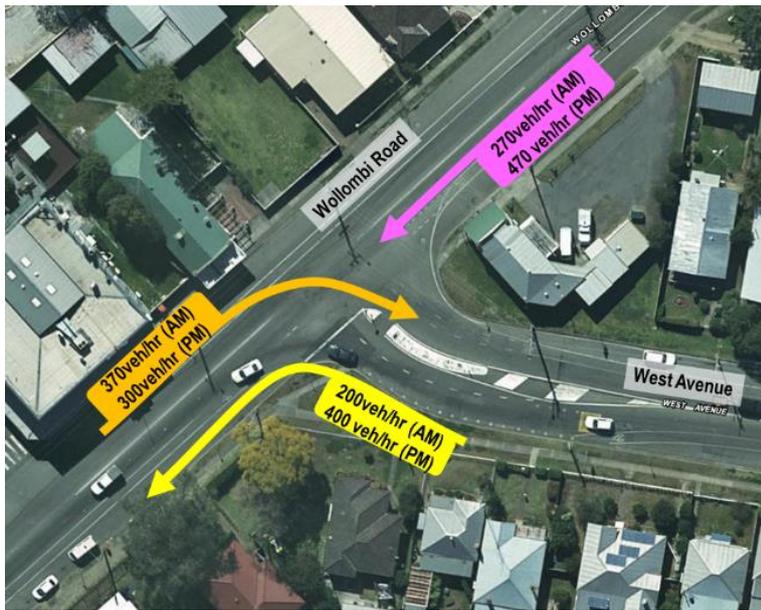


Figure 36: Wollombi Road/West Avenue Intersection

Separation of the turning movements on the western approach is required to reduce delays at this intersection. This would require parking restrictions on the northern side of Wollombi Road from Percy Street to approximately 50m east of West Avenue, and painting a right turn lane on Wollombi Road. New traffic signals will be required to improve intersection operation and to encourage the use of West Street, North Street, South Street as an inner CBD bypass.

Cessnock Inner CBD Bypass

Future traffic growth will further increase congestion levels on Wollombi Road, Cessnock Road and Allandale Road, especially through the town centre. As shown in Figure 37 below, the 2041 V/C ratio on Wollombi Road and Maitland Road is approaching 1.0 or Level of Service E.

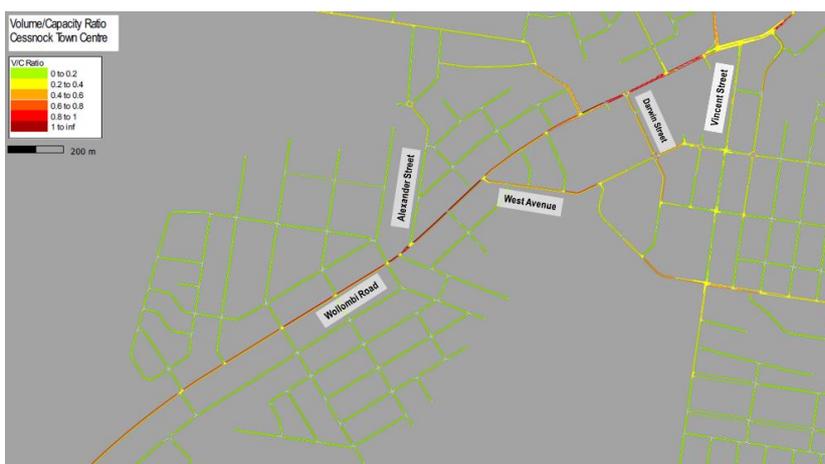


Figure 37: 2041 Volume/Capacity Cessnock Town Centre

In the long term this arterial route will need to be upgraded to four lanes to maintain suitable levels of service.

A bypass of the town centre would remove through traffic and trips that do not have an origin or destination in the town centre from using the road and intersection with the centre. Removing this traffic would also extend the current road network capacity delaying the need for expensive upgrades.

West Avenue and South Avenue provide a connection between Wollombi Road and Aberdare Road. Aberdare Road connects with Duffie Drive and Cessnock Road, forming a ring road around the town centres. Duffie Drive is currently load limited to 25tonne (gross load limit). Further investigations would be required to confirm the suitability of this road as a CBD bypass for heavy vehicles.

Directional signage at the intersections of Wollombi Road/West Avenue and Duffie Drive/Cessnock Road would encourage use of this route for bypassing traffic. Intersection priority controls at Colliery Street/Aberdare Road and South Avenue/West Avenue should be further investigated and change to reflect the most desirable traffic movements.



Figure 38: Town Centre Bypass

Figure 39 summarises the key traffic management treatments in the Cessnock CBD. Council is currently investigating options into the Cessnock Commercial Precinct Project in the Cessnock CBD. Part of this work will include the development of a Masterplan/public domain plan for the commercial area.

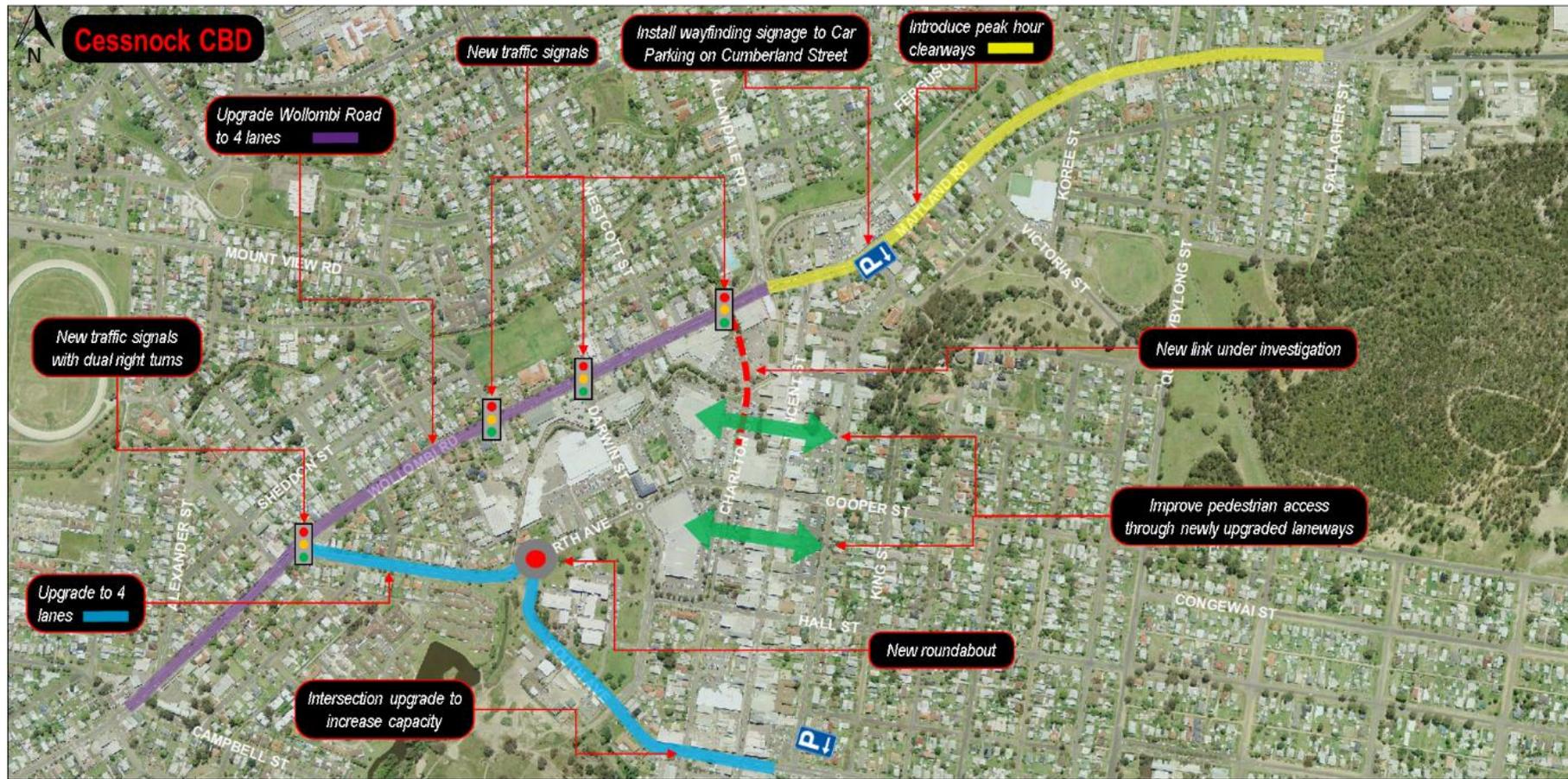


Figure 39: Cessnock CBD Key Traffic Management

Kurri Kurri and Weston

The villages of Weston, Neath and Abermain experience high levels of traffic flow for vehicles connecting HEX and into adjoining areas such as Maitland. The high traffic volume running through the village is not compatible with the land uses, with direct property access and high pedestrian activity. Peak hour traffic delays are already being experienced, especially through Weston, and some motorists are using local streets (e.g. Kline Street, Second and Third Avenue) as rat runs to bypass these traffic delays, and accessing HEX via the Loxford interchange in preference to Heddon Greta.

Widening Cessnock Road (and realigning the rail bridge) to increase capacity may reduce the delays and improve travel times, but it would come at a significant cost. Widening Cessnock Road would require significant property resumptions through Neath, Abermain and Weston. These high traffic volumes would not be compatible with the “village” environment and would increase separation impacts and discourage walking and cycling for local trips.

The replacement and duplication of the Frame Drive bridge is due to be completed in 2017. While this bridge will provide an alternate route to HEX, via Gingers Lane, both Gingers Lane and Frame Drive are local roads and the existing and planned land uses on these roads are not compatible with high through traffic volumes. It will however provide an interim connection, relieving some of the traffic delays on Cessnock Road until the Weston bypass is constructed.

Traffic calming devices will be installed along Second Avenue and Third Avenue to discourage “rat-running” through the back streets of Weston and to reduce traffic speeds.

Extending the left turn lane on the Cessnock Road (westbound) approach to the Station Street traffic lights will also assist in reducing delays at this intersection. This could be done as a peak hour clearway to minimise residential parking loss.

The introduction of time restricted parking (e.g. 2P) on Station Street between Cessnock Road and First Street will improve parking turn-over and free-up this valuable parking for customers rather than all-day staff parking.

Lang Street

Lang Street provides the primary access route or gateway to Cessnock’s urban environment and the start of the “villages”. Traffic modelling confirms that this road will need to be upgraded to provide additional traffic lanes, and as such any future upgrade would provide the opportunity to improve visual appeal on this gateway through landscaping. Central medians and kerb-build-out with landscaping and large trees would soften the road environment, provide a sense of arrival and improve pedestrian accessibility through safe pedestrian refuges.

Lang Street/Victoria Street/Mitchell Avenue Intersection

The roundabout at Lang Street, Victoria Street and Mitchell Avenue experiences peak hour congested, predominantly due to high volumes and unbalanced flows. Roundabouts are not well suited to areas of high pedestrian activity, and particularly difficult for people with reduced mobility. While pedestrian signals are provided on Victoria Street, south of the intersection, there are no facilities to cross Lang Street or Mitchell Avenue. Replacing the roundabout with traffic signals will improve traffic operations (reduce peak hour delays) and provide pedestrian facilities on all approaches, thereby improving connections between the east and west commercial areas, as shown in Figure 40



Figure 40: *Lang Street/Victoria Street/Mitchell Avenue Intersection Improvement*

Other local area traffic management improvements recommended in Kurri Kurri include:

- Kerb build-out in Barton Street and a pedestrian crossing to Rotary Park;
- Work with land owners to establish a pedestrian link or laneway between Barton Street and Land Street, west of Hampden Street.

Figure 41 shows the proposed treatments for Kurri Kurri and Weston, in support of the road network strategy.

Council is currently preparing a Strategy for the Kurri Kurri District which includes the commercial areas of Kurri Kurri and Weston. Part of this work will include the development of a Masterplan/public domain plan for both commercial areas.



Figure 41: Kurri Kurri and Weston Traffic Improvements

Branxton

The opening on HEX significantly reduces traffic volumes on the New England Highway. This provides opportunities to return Branxton to a village environment. The 2015 Branxton Town Masterplan's vision for Branxton is:

Branxton is a vibrant village centre that continues to build upon its strength as an important heritage town in the Hunter Valley. It has developed an attractive and active main street that is encircled and supported by a compact urban form, respecting its unique heritage and rural setting.

It is a local place of commerce, innovation, history and recreation

The masterplan's vision will be achieved through series of actions to:

- Revitalise the main street (Maitland Street);
- Increase connectivity to and within the Town Centre;
- Improve approaches and gateways;
- Strengthen relationships to recreation areas;
- Rationalise parking;
- Respond to unique heritage and rural setting; and
- Enable and encourage future development.

Local traffic measures have been identified to support the Branxton Masterplan. They focus on improved accessibility, rationalised parking and improving connectivity and walkability around the centre. Figure 42 outlines the proposed Local traffic treatments for Branxton.



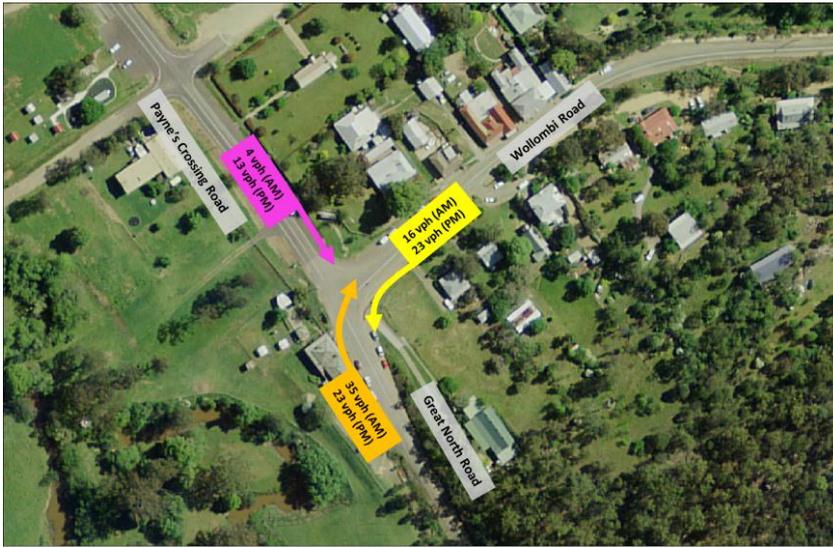
Figure 42: Branxton Local Traffic Improvements

Wollombi

Wollombi small village atmosphere, with pubs, shops, parks and accommodation is an attractive local for locals and visitors to the region, particularly on weekends and holiday periods, where traffic volumes and parking activity can increase significantly.

The village is centred around the intersection of Wollombi Road/Great North Road/Payne's Crossing Road. The primary traffic movement are to and from Wollombi Road and Great North Road, as show in

Figure 43. While the weekday peak hour volumes are relatively low, the village and intersection



experiences significantly more visitations (and traffic) during weekend and holiday periods.

Figure 43: Wollombi Road/Great North Road/Payne's Crossing Road intersection

Changing the intersection priority in favour of the Wollombi Road/Great North Road would better define the major traffic movement, and reduce delays and congestion on Wollombi Road.

High pedestrian movements, especially on weekends, around the village and intersection increases potential pedestrian/vehicle conflicts and safety issues. The warrants for a "high pedestrian activity" zone should be further investigated include pedestrian counts during weeks and peak holiday seasons.

Local traffic improvement measures have been proposed to strengthen connections to parks and recreational areas, improve parking management and walkability around the village and improve legibility of the road environment. The treatments also need to be sympathetic to the historical feel of the village. Figure 44 shows the proposed treatments for Wollombi.



Figure 44: Wollombi Local Traffic Improvements

Local Area Parking

Cessnock

The Cessnock CBD Masterplan outlines opportunities for multi-level carparks, new road corridors, and improvements to pedestrian mobility and details regarding the Business Park towards the south. Figure 45 is taken from the Cessnock CBD Masterplan and outlines some of the details mentioned.



Figure 11. Access and Movement framework diagram

Source: Cessnock CBD Masterplan

Figure 45: Cessnock CBD Masterplan Access and Movement Framework

The parking strategy that is proposed for the CBD includes encouraging a “park-once” principle within the CBD which will be reinforced with the addition of improvements to pedestrian connectivity which is outlined in the *Cessnock LGA Pedestrian Access and Mobility Plan*.

As growth in the centre increases, so does the demand for parking. It is important that customers have priority access to parking close to business within the CBD core area. Over time it will be necessary to extend the boundary of time-limited parking to free-up more space for short-term parking needs.

A 1 - 3 hour parking district is proposed within the CBD with off-street carparks being converted to long term parking to cater for the loss of long term on-street parking. This will need to be coordinated with owners of the privately owned carparks for its success. Figure 46 outlines the proposed parking strategy for Cessnock’s CBD.

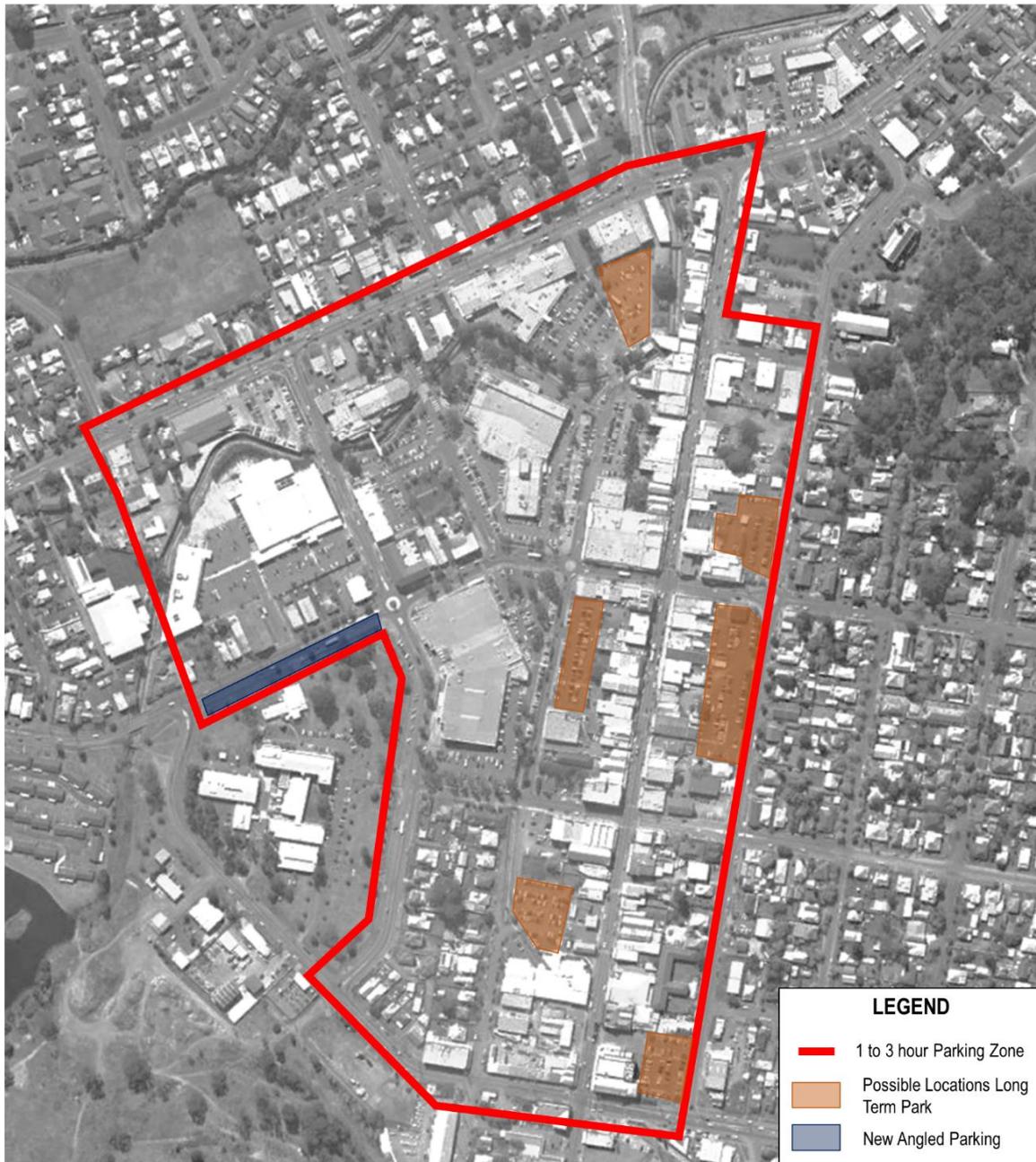


Figure 46: Proposed Parking Strategy - Cessnock CBD

These same principles can also be applied in the future towards the business park which will ensure the success of the parking strategy.

Kurri Kurri

Currently Kurri Kurri's city centre sees the parking along Lang Street is heavily utilised with the parking along Barton Street being underutilised. To better promote utilisation throughout the city centre the parking along Lang Street would have increased restrictions with parking between 15 minutes and 2 hour and the remaining city centre parking converted to 2 hours.

This would negate any increase to long term parking in the business district and result move longer term parking into the fringe areas. Figure 47 outlines the core and fringe areas within Kurri Kurri's town centre as well as the likely parking locations.



Source: NSWglobe

Figure 47: Proposed Parking Strategy - Kurri Kurri

Branxton

Branxton's parking strategy consists of retaining the existing parking restrictions within the core business district to ensure that there is sufficient turnover for business. The existing two hour car park located to the east should also be retained to supply any overflow parking for businesses. These parking restrictions will result in long term parking being pushed into the fringe areas and allowing for higher turnovers in the core area. Figure 48 outlines the Core and Fringe Parking areas within the existing town centre in Branxton.

As larger developments such as the Huntlee Development to the south are established this core area will potentially expand. It will be important that with any expansion of the core area that parking restrictions are applied accordingly as to best provide a high turnover for businesses.



Source: NSWglobe

Figure 48: Proposed Parking Strategy – Branxton

Greta

Greta’s parking strategy consists of retaining the existing parking restrictions within the core of the city centre resulting long term parking being displaced into the fringe area. With the development of Anvil Creek to the south of Greta, there is a likely chance that with the increase to population there will be a resultant growth in the city centre. If this does occur parking restrictions will have to move accordingly with the shift in the core of the city centre. Figure 49 outlines the existing core and fringe areas within Greta’s town centre.



Source: NSWglobe

Figure 49: Proposed Parking Strategy – Greta

Wollombi

Wollombi's parking strategy focuses on better utilisation of the existing parking and the implementation of no stopping restrictions around the main intersection of Wollombi Road and Paynes Crossing Road. The parking restrictions will allow for higher turnovers for the local tavern and business within the core area and push longer term parking away from the intersection resulting in improved road safety at this intersection. In addition to these restrictions the existing informal parking is to be formalised along Paynes Crossing Road and at the nearby tennis courts.

Figure 50 outlines the parking strategy for Wollombi.



Source: NSW globe

Figure 50: Proposed Parking Strategy – Wollombi

Parking Development Controls

The draft changes to parking requirements in new developments are contained in Appendix D.

Local Area Parking Actions

No.	Action	Lead Area	When
PK1	Apply the parking classification system to all the Cessnock LGA to refine the Parking Classification Map.	CCC	Short term
PK2.1	Sufficient off-street parking capacity is provided for long-stay purposes in centres.	CCC	On-going
PK2.2	Work with land owners to consolidate off-street parking west of Vincent Street to support “park once” principals and reduce traffic movements for short parking trips	CCC and stakeholders	Medium term
PK3.1	Audit kerbside allocation in key centres and apply the allocation hierarchy principles to each centre to define a kerbside allocation program	CCC	Medium term
PK4.1	Monitor short-stay parking occupancy levels in Cessnock CBD, Kurri Kurri, Branxton and Greta, and expand time-limited parking area	CCC	On-going

	when occupancy levels exceed 85% capacity at peak times		
PK4.2	Introduce medium term parking (i.e. 3P) on the western side of Cumberland Street to increase parking access for longer-stay customer needs	CCCC	Short-term

Local Pedestrian and Cycling Plans

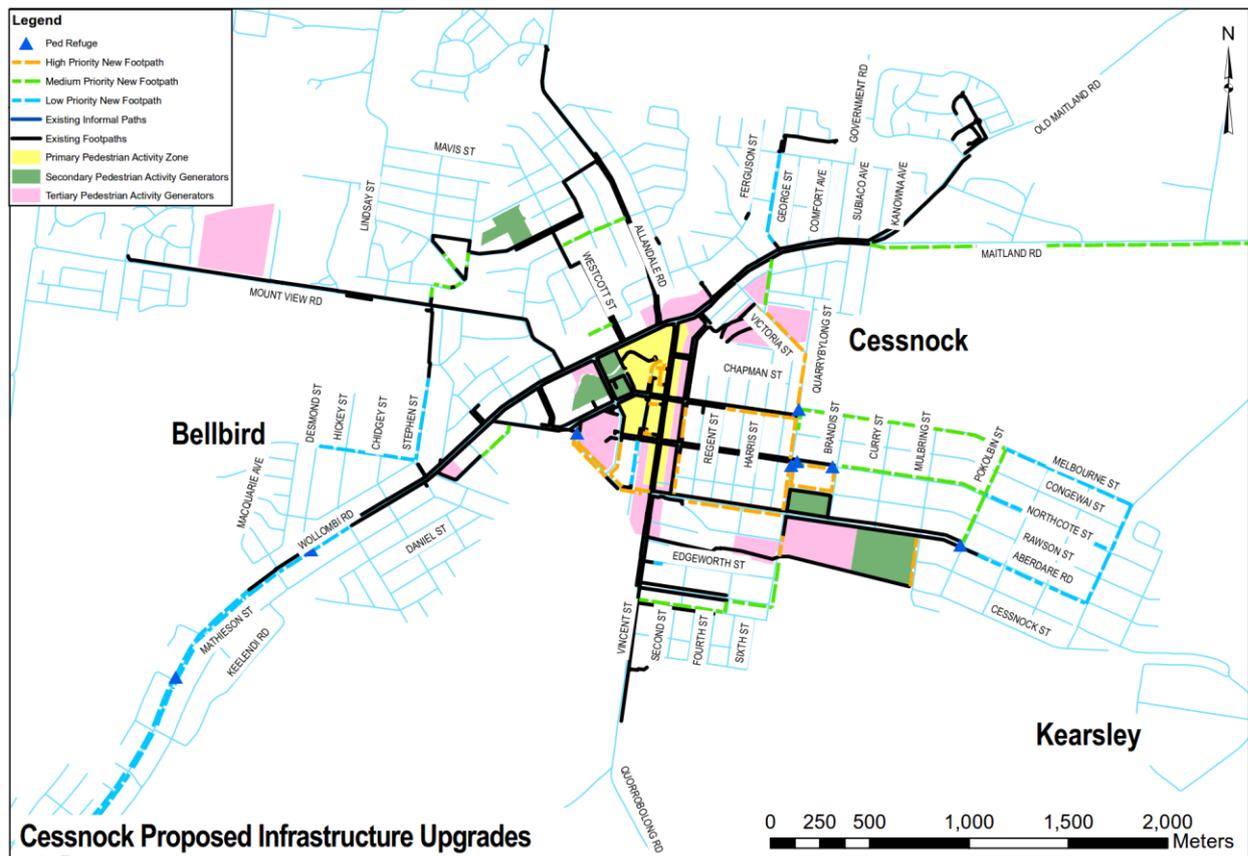
Two key active transport plans were finalised and endorsed by Council in 2016:

- *The Cessnock Cycling Strategy; and*
- *Cessnock LGA Pedestrian Access and Mobility Plan (PAMP)*

As detailed in Section two, both plans show Council's long-term commitment to cycling and walking infrastructure for the LGA.

Cessnock CBD

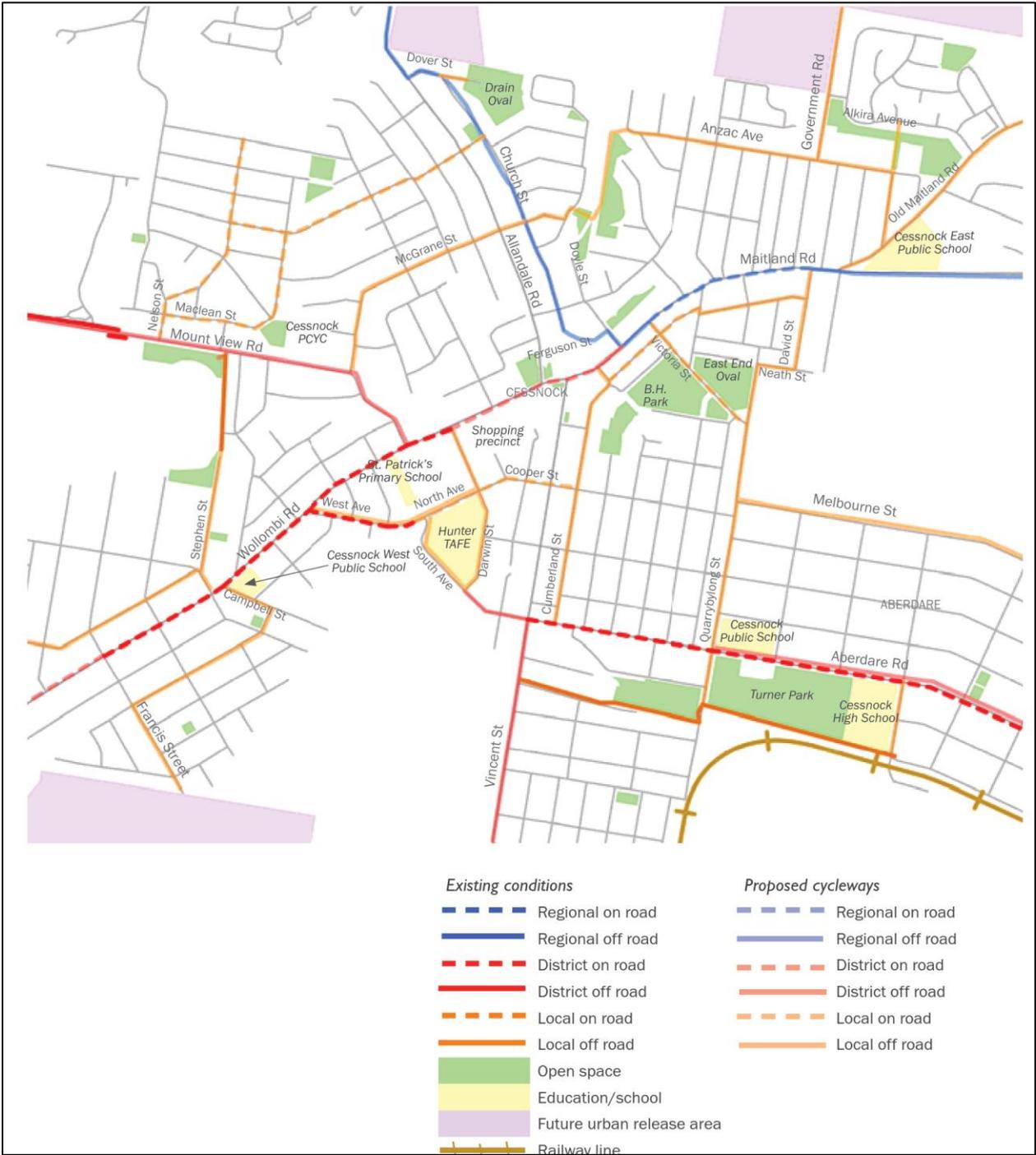
Figure 51 and Figure 52 show the proposed walking and cycling opportunities for Cessnock CBD extracted from the Cessnock LGA PAMP and Cessnock Cycling Strategy, respectively.



Source: Cessnock LGA PAMP (Bitzios Consulting 2016)

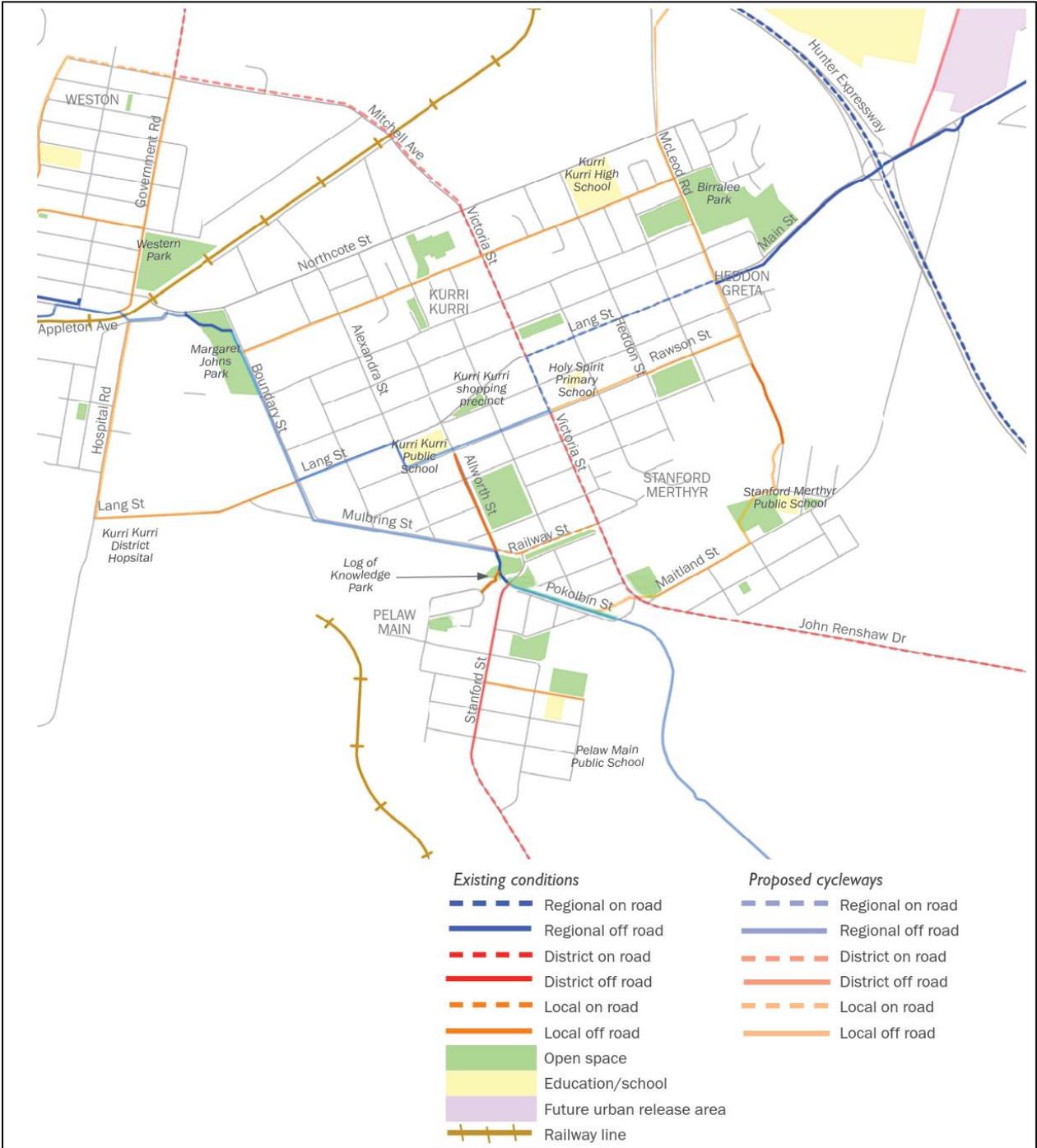
Figure 51: Cessnock CBD Pedestrian Network

No changes to these plans are proposed as part of this strategy.



Source: Cessnock Cycling Strategy (Ross Planning 2016)

Figure 52: Cessnock CBD Cycle Network

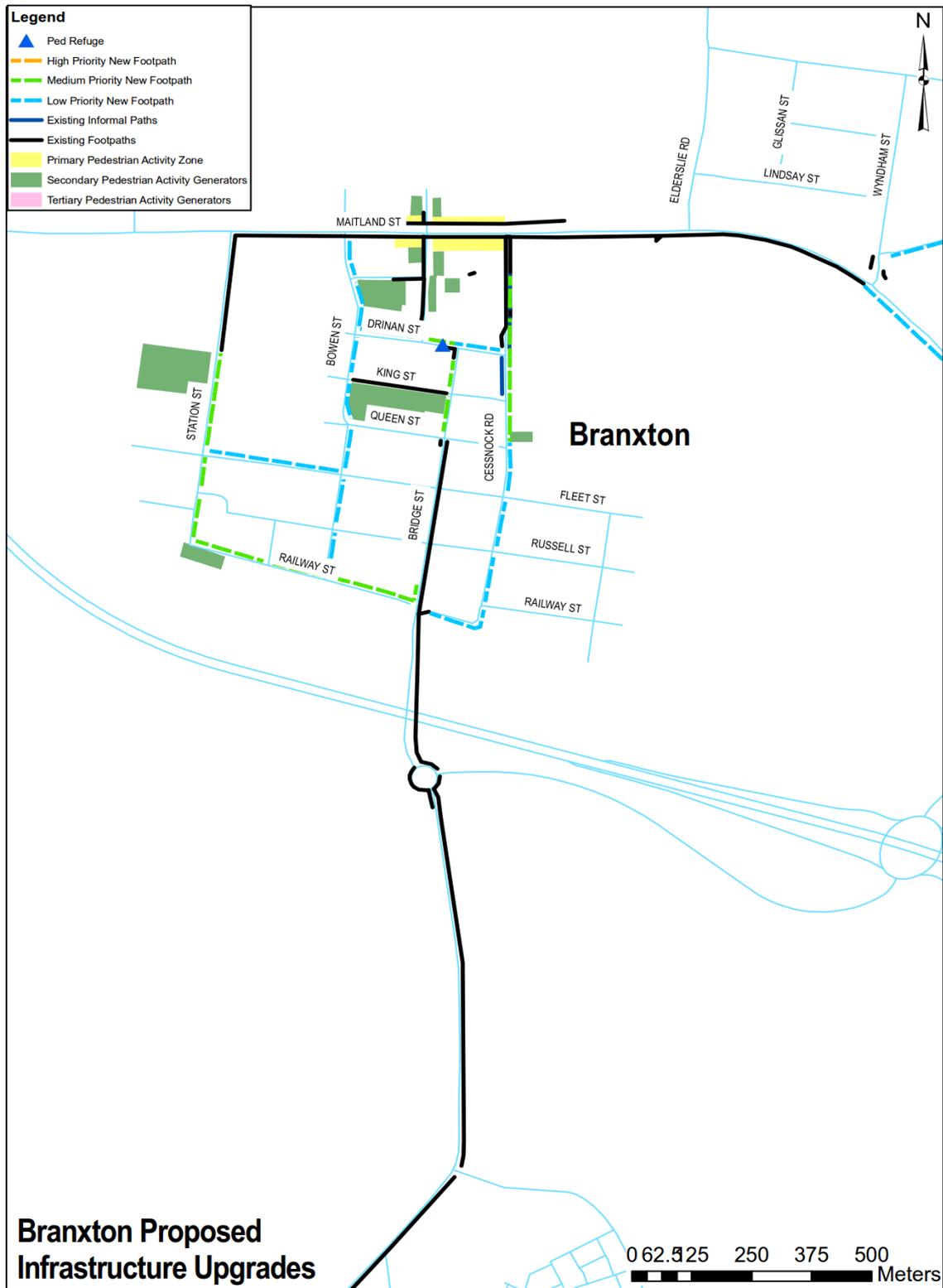


Source: Cessnock Cycling Strategy (Ross Planning 2016)

Figure 54: Kurri Kurri Cycle Network

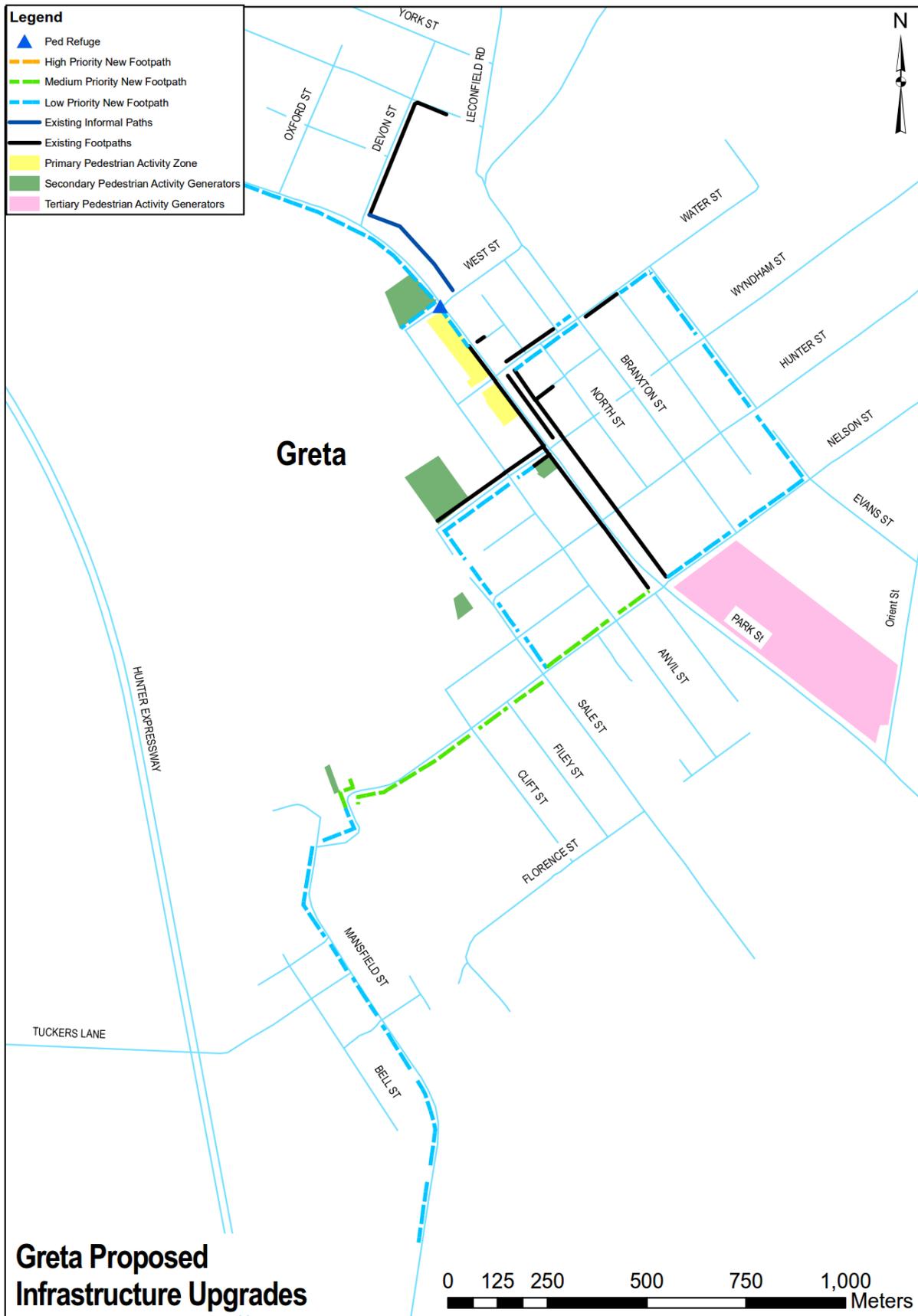
Branxton and Greta

Figure 55 – 56 show the proposed walking and cycling opportunities for Branxton and Greta extracted from the Cessnock LGA PAMP and Cessnock Cycling Strategy, respectively.



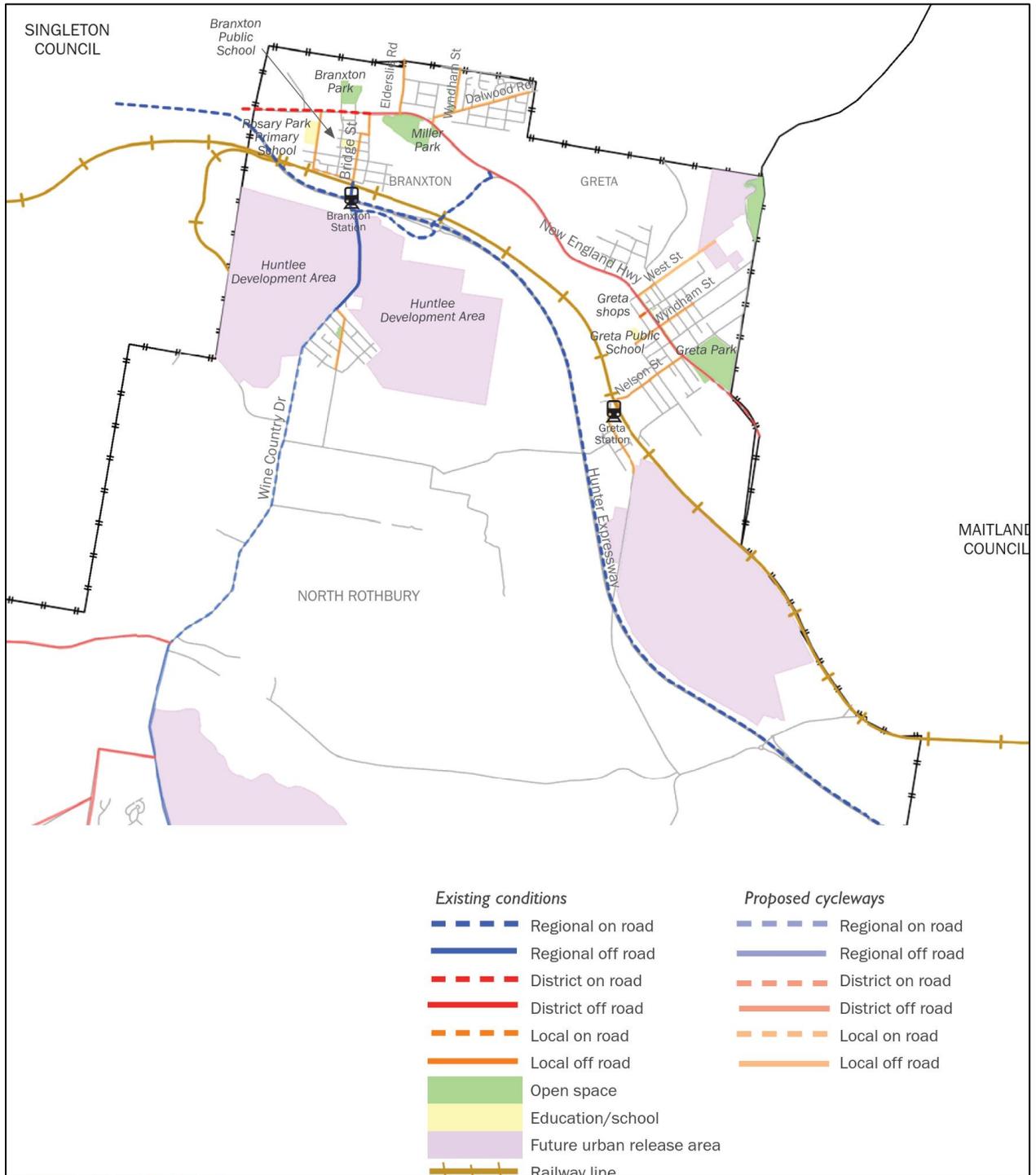
Source: Cessnock LGA PAMP (Bitzios Consulting 2016)

Figure 55: Branxton Pedestrian Network



Source: Cessnock LGA PAMP (Bitzios Consulting 2016)

Figure 56: Greta Pedestrian Network



Source: Cessnock Cycling Strategy (Ross Planning 2016)

Figure 57: Branxton and Greta Cycle Network

Key Conclusions and Recommended Implementation Plan

Key Conclusions

Cessnock LGA is on the move, with over 50% of work related trips (inbound and outbound) travelling to or from the LGA generating high demand on the road network. The opening of HEX has increase accessibility of Cessnock to Newcastle and nearby coastal areas, increasing the attractiveness of Cessnock LGA for new residents. Growth forecasts suggest that an additional 15,000 dwellings could be constructed in the LGA over the next 25-years. This growth translates to approximately 60,000 additional vehicle trips per day on the LGA road network and nearly 6,000 additional peak hour trips.

Cessnock LGA's road network was originally established as a series of connections between its many towns and villages. Residential properties, local shops and businesses front these roads with all requiring driveways, parking and pedestrian access. As population has increased travels demands for private cars, public transport, cycling, walking and freight have also increased, while sharing the same road environment. The conflict between access and through movement is increasing, particular on the LGA's main network linkages and this has a detrimental impact on the villages and towns interspersed along these routes.

Upgrading the main arterial roads (such as Maitland Cessnock Road) may reduce congestion and improve travel times to/from HEX and other areas, however towns and villages like Abermain, Neath and Weston would suffer the environmental, social and safety consequences through increased traffic, noise and air pollution and segregation issues.

This Traffic and Transport Strategy recognises the importance of the villages that make up Cessnock LGA, and proposes a series of new connections and bypass roads to separate longer-distance through traffic from local access and shorter trips with the LGA. Considerable investment is required for transport over the next 25-30 years to ensure that Cessnock LGA continues to grow in a sustainable, prosperous while protecting the unique characteristics of the LGA's towns and villages.

The following sections outline the proposed strategic actions and recommended road capital works program, to be implemented over the next 25-30 years.

Funding

Without adequate planning and funding the Cessnock LGA faces a future of increased levels of traffic congestion, reduced road safety and amenity for its residents and visitors.

Preliminary costings estimate that the implementation of the Cessnock LGA Traffic and Transport Strategy would cost in the order of \$176 million. The projects outlined in this strategy represent an achievable plan for the City's transport future, providing a balance of low cost, short-term actions; and major road infrastructure projects that will require investment from all levels of Government. Table 19 breakdown the estimated costs into immediate, short, medium and long term timeframes.

Table 19: Preliminary Cost Estimate

Timeframe	Period	Estimated Cost
Immediate	2017 - 2021	\$ 8,495,000
Short-term	2021 - 2031	\$ 59,226,000
Medium-term	2031 - 2041	\$ 77,150,000
Long-term	2041 -2061	\$ 31,730,000
Total		\$ 176,601,000

The traffic and transport strategy is not intended to be a fully-funding strategy. It is a vision to guide transport policy and prioritise investment in the transport network. The strategy will be used to assess funding needs and underpin bids for funding from all levels of government.

Responsibility for funding the major transport improvements should generally be based on similar arrangements to those in the past, however the current administrative arrangements for road funding in the LGA should be reviewed. This could include directing potential future State funds for upgrading sections of State roads (e.g. Cessnock Road) to building new road links such as the proposed Weston bypass links.

Other potential funding options include:

- *Grants;*
- *Section 94 Contributions;*
- *Road Reclassification;*
- *State funding; and*
- *Capital Works Programs*

Recommended Action Plan

Table 20: Summary of Strategic Actions

No.	Action	Lead Area	When
LU1.1	Through planning controls, discourage residential densification in areas without adequate transport infrastructure to service the travel demands	CCC	Short term
LU1.2	Encourage new development in close proximity to the key business centres/villages or close to employment to reduce trips lengths and encourage more sustainable transport options	CCC	On-going
LU2.1	Ensure DCP's in centres aim to reduce block sizes in high activity areas	CCC	Short term
LU2.2	Development controls are put in place in centres to ensure pedestrian and cyclist permeability is achieved, with permeability orientated to/from railway stations and major bus stops	CCC	Short term
LU3.1	Implement the high priorities from the Cessnock PAMP and Cessnock Cycle Strategy	CCC	Medium term
LU3.2	Investigate development incentives/controls to encourage facilitation of improved active transport access and connectivity and end of trip facilities	CCC	Medium term
PK2.1	Sufficient off-street parking capacity is provided for long-stay purposes in centres.	CCC	On-going
PK2.2	Work with land owners to consolidate off-street parking west of Vincent Street to support "park once" principals and reduce traffic movements for short parking trips	CCC and stakeholders	Medium term
PK3.1	Audit kerbside allocation in key centres and apply the allocation hierarchy principles to each centre to define a kerbside allocation program	CCC	Medium term
PK3.2	Monitor short-stay parking occupancy levels in Cessnock CBD, Kurri Kurri, Branxton and Greta, and expand time-limited parking area when occupancy levels exceed 85% capacity at peak times	CCC	On-going
PK3.3	Investigate RV, coach and caravan/trailer parking in town centres	CCC	Short Term
PK4.1	Investigate commuter parking opportunities at public transport nodes and along HEX interchange nodes	State and CCC	
PK4.2	Introduce medium term parking (i.e. 3P) on the western side of Cumberland Street to increase parking access for longer-stay customer needs	CCCC	Short-term
AT1.1	Development controls be updated to reflect the types of bicycle paths required in each area within the Cessnock LGA.	CCC	Short term
AT1.2	Implement Cycling Strategy	CCC	On-going
AT1.3	Continue to increase annual funding for cycling infrastructure	State & CCC	Short term
AT2.1	Investigate key linkages and undertake negotiations with land owners for right of way corridors through sites.	CCC	Medium term
AT3.1	Development controls be updated to reflect the level of cycling	CCC	Short term

No.	Action	Lead Area	When
	end of trip facilities required in each area. Development controls are to include a component of visitor cycle facilities.		
AT4.1	Assess the available and quality of safe cycle routes to/from each primary school and develop a program of improvements/upgrades, prioritised on the basis of proximity to each school and in consideration of Action AT1.1. (only for areas not considered by PAMPS).	CCC	Long term
AT5.1	Develop a series of cycling and walking guide maps of Cessnock LGA including safe cycling and walk routes to key destination (e.g. Wineries, Arts and Community Centre, Libraries)	CCC	Medium term
PT1.1	Work with the State Government to review the public transport network to understand current service provision	State & CCC	Short term
PT1.2	Lobby State Government for increased hour of operation and frequency of services between Newcastle and Cessnock LGA	State & CCC	Medium term
PT2.1	Lobby State Government to reintroduce and increase the frequency of rail services	State & CCC	Long term
PT3.1	Work with the State and bus operators to integrate and expand service coverage of bus services	State & CCC	Medium term
RF1.1	Establish a functional road hierarchy and access management plan for local government roads within the Cessnock LGA to support the arterial road system and improve local accessibility	CCC	Short term
RF1.2	Investigate opportunities to bypass centres and villages (e.g. Cessnock CBD Neath and Weston) for longer distance trips	State & CCC	Short term
RF1.3	Manage/introduce access control on the arterial network to reduce delays to through traffic movements	State & CCC	Short term
RF2.1	Develop a Local Area Traffic Management (LATM) scheme warrants and implementation policy	CCC	Medium term
R3.1	Assess the Cessnock LGA industrial areas and truck routes for impacts on residential areas and develop appropriate management measures	CCC	Medium term

Table 21: Road Capital Works Priorities

ID_ Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Lead Agency
57	Orange Street	Cessnock Road	install traffic control signals	TS	\$350,000	improve capacity, pedestrian facilities and road safety	Immediate	State
10	Cessnock Road	between Kline Street and Station Street	Parking restriction to increase intersection capacity	P	\$5,000	local area traffic management	Immediate	CCC
12	Chidgey Street	Wollombi Road	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Immediate	CCC
18	Desmond Street	Wollombi Road	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Immediate	CCC
29	Miller Street	Wollombi Road	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Immediate	CCC
43	Wollombi Road	Abbotsford Street to Allandale Road	Upgrade to provide four lanes	U	\$7,800,000	to improve capacity	Immediate	State
3	Barnett Street	Mt View Road	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Short-term	CCC
4	Barton Street	Kurri Kurri	Pedestrian facility	L	\$20,000	local area traffic management	Short-term	State
5	Bellbird North	Wollombi Road	Install traffic control signals	TS	\$250,000	new access	Short-term	CCC
6	Bridge Street	Wine Country Drive	Upgrade to 2 lane roundabout	U	\$300,000	improved network efficiency	Short-term	CCC
7	Bridge Street/Drinan Street	intersection	install high visibility skid resistant surfacing	L	\$30,000	local area traffic management	Short-term	CCC
8	Campbell Street	Wollombi Road	Install traffic control signals	TS	\$220,000	to improve operation efficiency	Short-term	CCC
9	Cessnock Road	Branxton	expand and landscape car park	P	\$100,000	local area traffic management	Short-term	CCC
11	Charlton Street	between Cooper Street and Maitland Road	upgrade road link through Marketplace	L	\$500,000	local area traffic management	Short-term	CCC
14	Colliery Street	Greta Street	Install traffic signal or roundabout	R	\$220,000	to improve operation efficiency and promote CBD bypass	Short-term	CCC
15	Colliery Street	Aberdare Road	Install traffic signal or roundabout	R	\$220,000	to improve operation efficiency and promote CBD bypass	Short-term	CCC
16	Darwin Street	Wollombi Road	Install traffic control signals & dual right turns	TS	\$250,000	to improve operation efficiency	Short-term	CCC
17	South Street	West Avenue	new roundabout	R	\$150,000	to improve operation efficiency and promote CBD bypass	Short-term	CCC
20	Hart Road	Sawyers Gully Road	intersection upgrade (new signals or roundabout)	R	\$300,000	capacity upgrade and road safety improvement	Short-term	CCC
25	Ivan Street/James Street	Wollombi Road	Install traffic control signals	TS	\$220,000	to improve operation efficiency	Short-term	CCC
26	Main Road	Hunter Expressway to Cliffeigh	Upgrade to provide four lanes	U	\$15,612,500	capacity upgrade and road safety improvement	Short-term	State

ID Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Lead Agency
27	Maitland Road	between Allandale Road and Old Maitland Roads	introduce peak hour clearways	U	\$100,000	local area traffic management	Short-term	State
28	Marketplace Entry	Wollombi Road	Install traffic control signals	TS	\$220,000	improved access	Short-term	CCC
30	Mount View Road	Wollombi Road	Install traffic control signals	TS	\$220,000	to improve operation efficiency and promote CBD bypass	Short-term	CCC
31	New England Highway	Bowen Street to 70m east of Cessnock Road	new landscape central median	L	\$100,000	local area traffic management	Short-term	CCC
32	Old Maitland Road - Stage 1	Maitland Road to new Weston bypass link	upgrade to 2 lane urban arterial standard	U	\$18,510,000	to improve operation efficiency and promote Weston, Neath & Kurri Kurri bypass	Short-term	CCC & State
33	O'Neill Street	Wollombi Road	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Short-term	CCC
34	Second Avenue and Third Avenue	Weston	LATM traffic calming devices	L	\$50,000	local area traffic management	Short-term	CCC
35	Station Street	between Cessnock Road and First Street	Install 2hr parking signage	P	\$5,000	local area traffic management	Short-term	CCC
36	Wangi Avenue	Wollombi Road	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Short-term	CCC
37	West Avenue	Wollombi Road	Install traffic control signals & dual right turns	TS	\$250,000	to improve operation efficiency and promote CBD bypass	Short-term	CCC
38	West Avenue	Miller Street	Left In - Left Out	IT	\$40,000	road safety and network efficiency	Short-term	CCC
39	West Avenue	Wollombi Road to North Avenue	Upgrade to provide four lanes	U	\$950,000	to improve operation efficiency and promote CBD bypass	Short-term	CCC
40	Weston bypass link	Old Maitland Road to Sawyers Gully Road	new 2 lane road	NL	\$18,000,000	to improve operation efficiency and promote Weston, Neath & Kurri Kurri bypass	Short-term	CCC & State
41	Wine Country Drive	Bridge Street to 700m south of Bridge Street	Upgrade to provide four lanes	U	\$1,718,500	improved network efficiency	Short-term	State
42	Wollombi	Wollombi	LATM treatments	L	\$200,000	local traffic management	Short-term	CCC
44	Old Maitland Road	Maitland Road	install traffic control signals	TS	\$350,000	to improve capacity	Short-term	CCC
45	Branxton	between Cliff Street and Cessnock Road	new road link	NL	\$50,000	local area traffic management	Medium-term	CCC
46	Northern Outer CBD Bypass Stage 1	Wollombi Road to Wine Country Drive	new 2 lane road	NL	\$34,000,000	to improve operation efficiency and promote CBD bypass	Medium-term	CCC
47	Northern Outer CBD Bypass Stage 2	Wine Country Drive to Old Maitland Road	new 2 lane road	NL	\$14,000,000	to improve operation efficiency and promote CBD bypass	Medium-term	CCC

ID Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Lead Agency
48	Old Maitland Road - Stage 2	Weston bypass link road to HEX	realign and upgrade to 2 lane urban arterial	U	\$26,000,000	to improve capacity	Medium-term	CCC & State
49	Victoria Street/Lang Street	Mitchell Avenue	replace roundabout with traffic signals and pedestrian facilities	TS	\$3,000,000	improve capacity, pedestrian facilities and road safety	Medium-term	State
50	Vincent/Snape	Aberdare Road	intersection improvements	IT	\$100,000	to improve operation efficiency and promote CBD bypass	Medium-term	CCC
51	CBD Southern Bypass Stage 1	Wollombi Road to Aberdare Road	new 2 lane road	NL	\$22,800,000	to improve operation efficiency and promote CBD bypass	Long-term	CCC
52	CBD Southern Bypass Stage 2	Maitland Road to Old Maitland Road	new 2 lane road	NL	\$6,400,000	to improve operation efficiency and promote Weston, Neath & Kurri Kurri bypass	Long-term	CCC
53	Colliery Street / Duffie Drive	Aberdare Road to Maitland Road	Upgrade to 2 lane urban arterial standard	U	\$2,820,000	to improve operation efficiency and promote CBD bypass	Long-term	CCC & State
54	Lang Street	between Victoria Street and HEX	Upgrade to provide four lanes with landscaped central median	U	\$1,720,000	to improve capacity	Long-term	State
55	Old Maitland Road - Stage 3	Maitland Road to new Weston bypass link	Upgrade to provide four lanes	U	\$18,510,000	to improve capacity	Long-term	CCC & State

Glossary of Terms

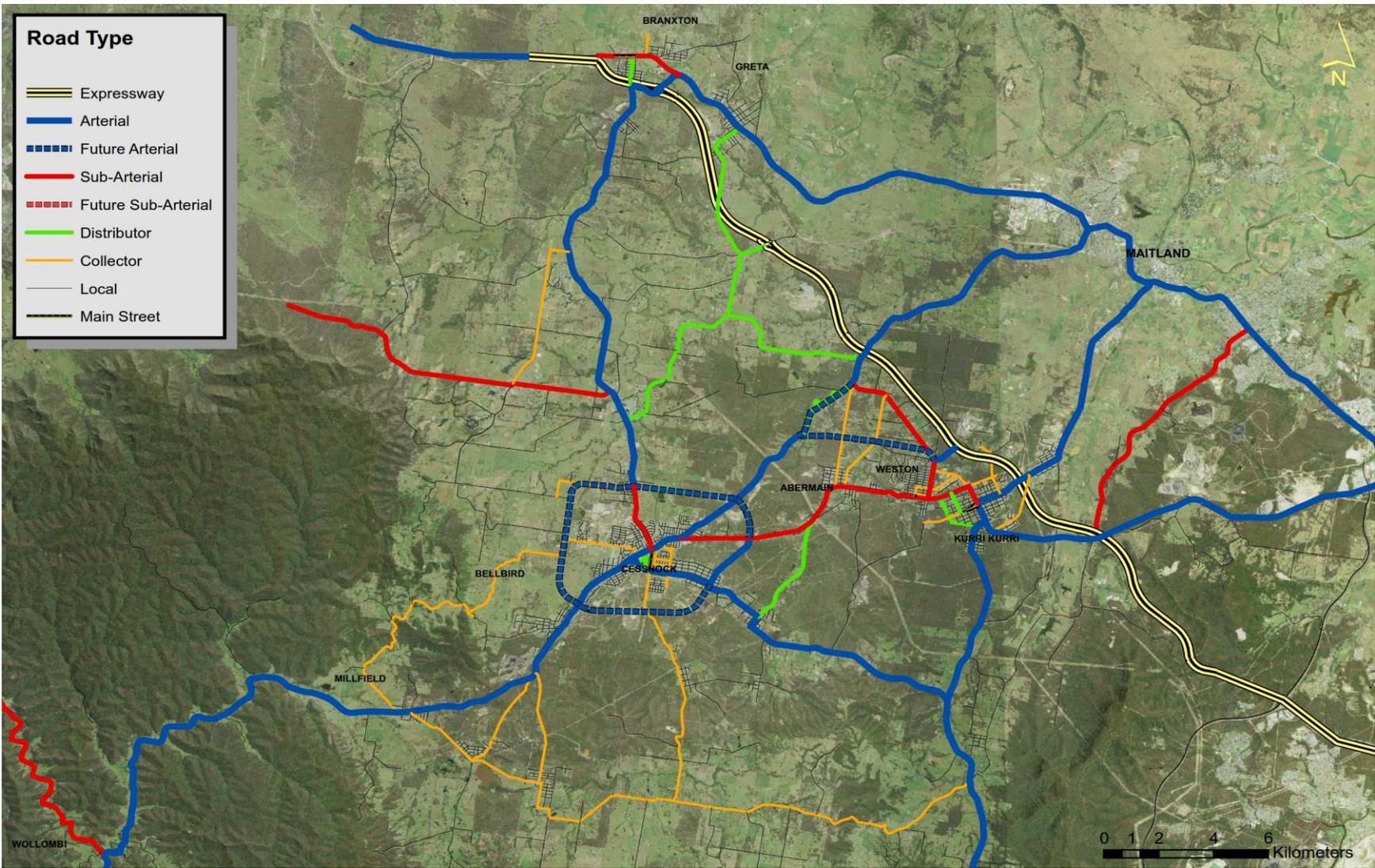
CCC	Cessnock City Council
LGA	Local Government Area
RMS	Roads and Maritime Services
CTTS	Cessnock Traffic and Transport Strategy
PAMP	Pedestrian Access and Mobility Plan
HEX	Hunter Expressway
HEZ	Hunter Economic Zone
LOS	Level of Service
LHRS	Lower Hunter Regional Strategy

Appendix A

Traffic Modelling Report

Appendix B

Road Hierarchy Map



Appendix C

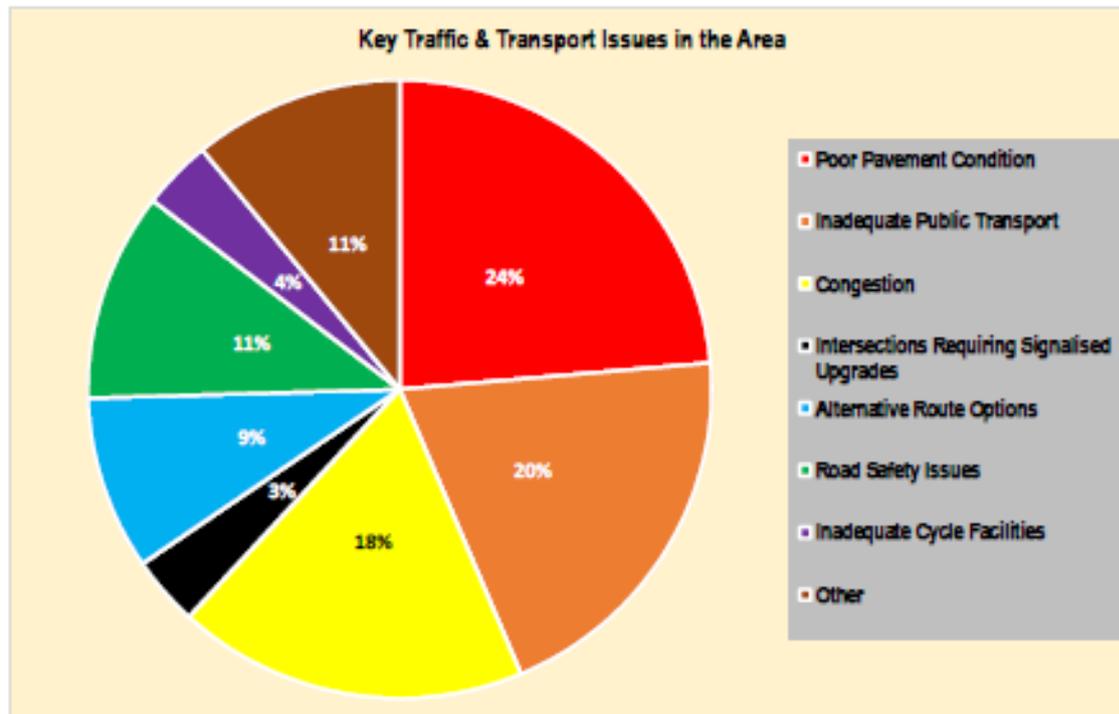
Consultation Summary

CONSULTATION OVERVIEW

Community consultation was undertaken as part of this project in the form of an online questionnaire and three workshops. The online questionnaire comprised 28 questions and sought community input about their perception on traffic, parking, public transport and active transport matters in Cessnock. In total, the questionnaire was responded to by 65 members of the community. The summarised questionnaire responses and observed trends and common themes are presented in the following subsections.

KEY TRAFFIC AND TRANSPORT ISSUES

The questionnaire posed the question about the main traffic and transport issues in Cessnock. The community responses were grouped into key themes in order to aggregate similar issues and are shown below.



The top issue identified in the community responses was poor pavement condition, with a number of responses explicitly mentioning pot holes in road surfaces as a key issue. In fact, pot holes were also explicitly mentioned in other responses unrelated to traffic issues.

Community Feedback

- *"Potholes, potholes, potholes. They are the top three."*
- *"Too many POTHLES."*

Inadequate public transport ranked as the second key issue for the area followed by traffic congestion as the third key issue. A common trend in the traffic congestion themed responses was difficulty accessing the Hunter Expressway.

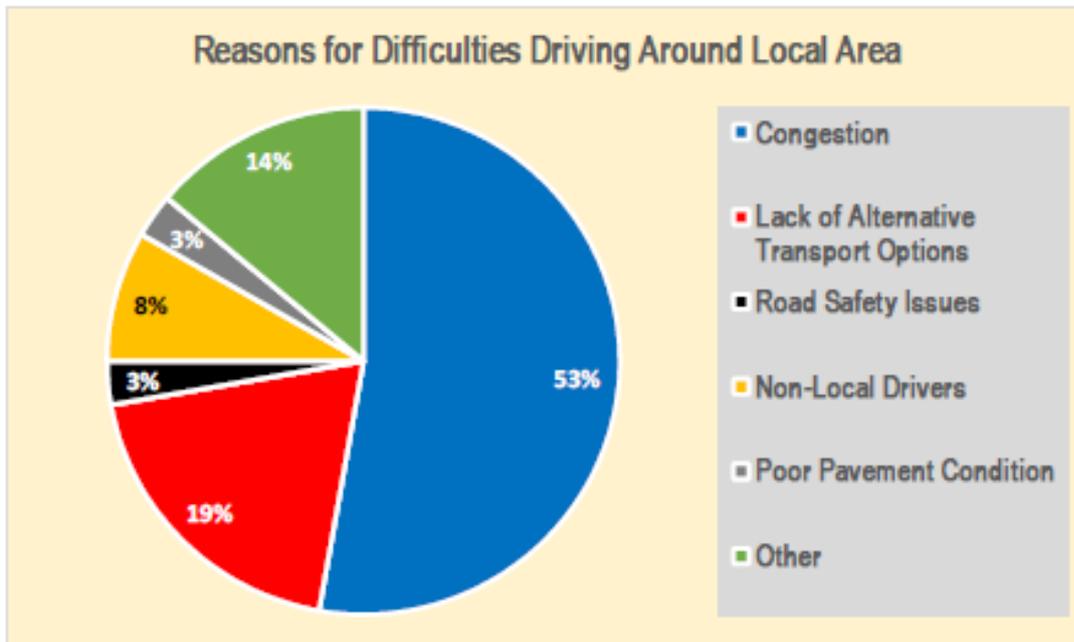
Community Feedback

- *"Road congestion and traffic flows need to be reviewed. Access from the Hunter Expressway to Cessnock and surrounding suburbs needs to be looked at."*
- *"A direct link to the new Hunter Expressway bypassing Weston and Kurri Kurri."*

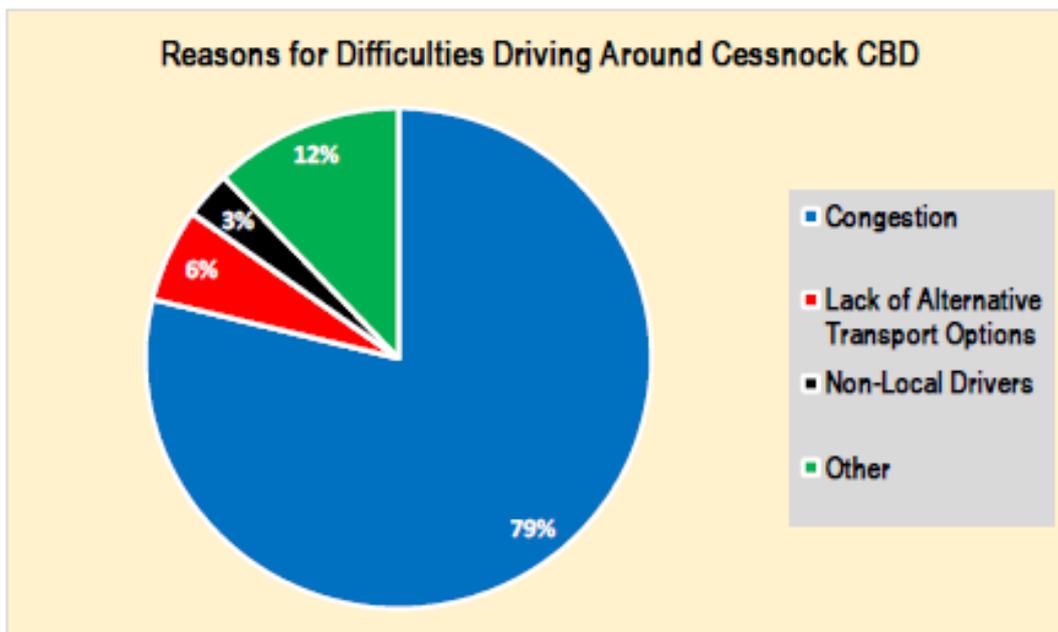
EASE OF TRAVELLING

The questionnaire included questions to gauge community feedback about ease of travelling around the responder's local area and Cessnock CBD. 57% of responses by the community found travelling around their local area difficult during peak times. The reasons described by the community for the difficulty in driving around their

local area is shown below, with the top two reasons being traffic congestion (53%) and lack of alternative transport options (19%).



58% of responses by the community identified that they find it difficult travelling around the Cessnock CBD during peak times. The top reason identified by the responses was traffic congestion, which received 79% of the responses.



Community Feedback

- *"The flow of traffic through back streets to and from the Hunter Expressway makes it difficult just to get to the main arterial roads."*
- *"Sometimes (even during the middle of the day) roads around the CBD can be clogged with cars. I'm thinking particularly of the areas near Coles, KFC and Aldi."*

PARKING

The responses to the parking related questions identified that 48% of responders found it difficult to find a parking spot with the Cessnock CBD, compared to 28% that found it easy and 24% neutral responses.

LOCAL BUS USE

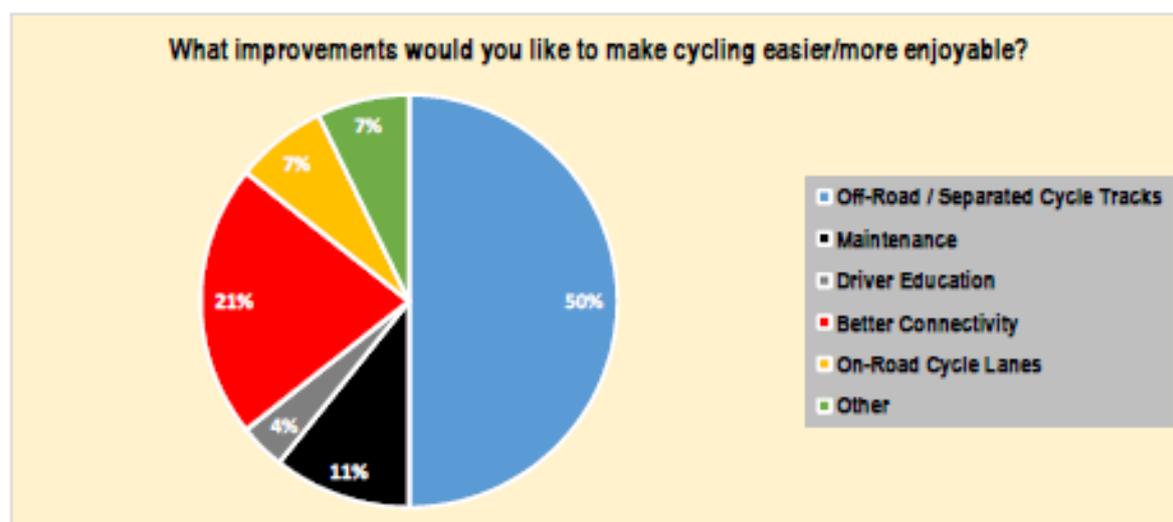
The responses to the bus usage questions identified 63% of responders do not use their local bus services. 56% of the community responses perceive bus services as being inadequate, compared to 19% considering bus services to be adequate and 25% providing a neutral response. The common trend in the community responses regarding inadequate bus services was infrequent services (58%) and no bus services nearby (31%).

Community Feedback

- "The bus network is not intrinsic or frequent enough. Especially to out of area (e.g. Link to Sydney)."
- "The times the buses run wouldn't get me to work on time or way too early."
- "University services do not extend throughout the day – attending evening classes by bus is impossible."

ACTIVE TRANSPORT

A number of questions in the questionnaire included the active transport modes of walking and cycling. The questionnaire responses to the cycling questions determined that approximately 65% of the responders perceive bike paths, lanes and racks as being inadequate. The major inadequacy was identified to be lack of on/off-road cycle facilities. The community identified a number of key improvements to make cycling easier/more enjoyable as shown below:



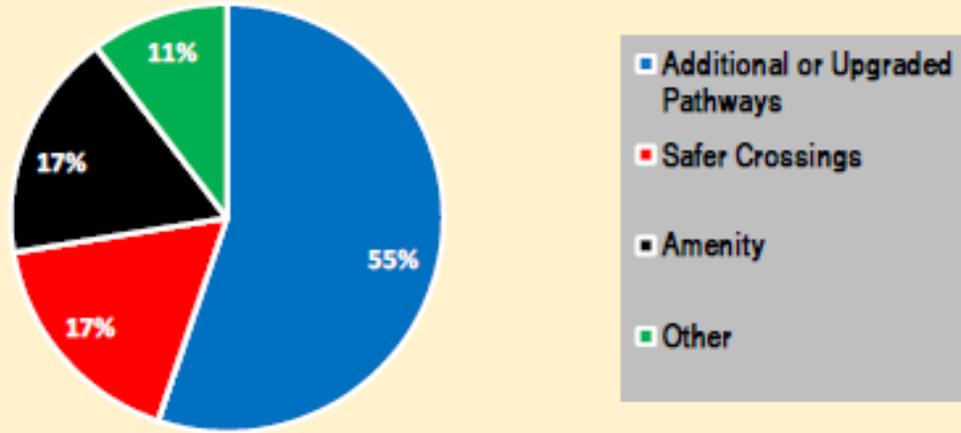
51% of the responders perceive pedestrian footpaths as inadequate, with 44% perceiving pedestrian crossings and connections to services being inadequate. The major inadequacy was identified to be lack of pathways / continuity (54%) followed by maintenance issues (25%).

Community Feedback

- "In my home area, we have zero footpaths, and would dearly love to have some!"
- "Footpaths in residential areas are often cracked, uneven, overgrown or non-existent."

The community identified a number of key improvements to make walking easier/more enjoyable as below with the key theme being additional/upgraded pathways followed by safer crossings and better amenity.

What improvements would you like to make walking easier/more enjoyable?



Appendix D

Draft Parking DCP

Cessnock Parking and Access Code

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Table 2.1:	Minimum Number of Off-Street Car Parking Spaces by Land Use
Table 2.2:	Service Vehicle Requirements

1. INTRODUCTION

1.1 APPLICATION

This document applies to all forms of development within Cessnock LGA.

1.2 PURPOSE AND OBJECTIVES

The purpose of this document is to ensure that transport needs associated with the development of land within the City of Cessnock are met in terms of adequate and appropriate off-street car and bicycle parking, access, servicing and on-site manoeuvring.

The key objectives of this document are:

- to ensure off-street parking areas are designed in such a manner as to be safe for motorists, pedestrians, cyclists and service vehicles;
- to ensure parking areas are designed in such a manner as to be functional and aesthetically pleasing in terms of landscaping;
- to ensure developments support active transport by providing direct, safe, comfortable and legible pedestrian and cycle access and connectivity;
- to ensure adequate off-street car and bicycle parking facilities are provided in association with developments; and
- to ensure that local road network impacts are appropriately ameliorated.

2. CRITERIA FOR ASSESSMENT

2.1 CAR PARKING

Design principles:

- development provides off-street car parking provision to accommodate parking demand (refer Table 2.1 for prescriptive rates)
- car parking is designed in accordance with the current version of *Australian Standards AS2890.1 Off-Street Car Parking*, *Australian Standards AS2890.2 Off-Street Commercial Vehicle Facilities* and *Australian Standards AS2890.6 Off-Street Parking for People with Disabilities* and ensures that a safe, legible and efficient layout is provided for all users
- car parking is designed and constructed to be signed, line marked and maintained to the current version of the *Manual of Uniform Traffic Control Devices* and the relevant sections of *Australian Standards AS2890*
- adequate internal vehicle queuing is provided to ensure that there are no disruptions or queuing onto the public road network
- car parking access is designed to ensure sight distances are provided in accordance with the current version of *Australian Standards AS2890.1 Off-Street Car Parking*, *Australian Standards AS2890.2 Off-Street Commercial Vehicle Facilities* and the relevant sections of *Austroroads Guide to Road Design*
- car parking design achieves separation between pedestrians, loading and heavy vehicles

Table 2.1: Minimum Number of Off-Street Car Parking Spaces by Land Use

Land Use	Minimum Number of Off-Street Car Parking Spaces
Bed and Breakfast Accommodation	0.5 spaces per staff PLUS 1 space per guest room for visitors PLUS 1 space per dwelling plus provision for driveway parking of another vehicle
Bowling Alleys	3 spaces per lane PLUS 1 space per 3 employees or part thereof
Bowling Greens	30 spaces for first green and 15 spaces for each additional green
Brothels / Sex Services Premises	2 spaces per room used for prostitution
Bulky Goods Premises	1 space per 45m ² of gross floor area
Business / Office Premises (financial institutions, real estate agents, etc)	1 space per 30m ² of gross floor area
Camp or Caravan Site or Manufactured Home Estate	1 space per site PLUS 1 space per 10 sites for visitor parking.
Cellar Door Premises	1 space per 7m ² of floor area
Child Care Centre, Kindergarten	1 space per employee, PLUS 1 space per 4 children enrolled for visitors and for parent parking
Educational Establishment	1 space per 2 staff PLUS 1 space per 15 students over 17 years for high schools and 1 space per 5 students for higher education establishments
Function centre	1 space per 5 seats
Golf Courses	4 spaces per green
Health Consulting Room	1 space per practitioner PLUS 1 space per employee PLUS 2 spaces for patients of each practitioner.
Home Occupation / Home Industry	1 space in addition to dwelling requirements.
Hospitals	0.8 spaces per bed for staff PLUS 0.8 spaces per bed for visitors
Housing for Seniors or People with a Disability: (a) Residential care facilities	(i) 1 parking space for each 10 beds in the residential care facility (or 1 parking space for each 15 beds if the facility provides care only for persons with dementia), and (ii) 1 parking space for each 2 persons to be employed in connection with the development and on duty at any one time, and (iii) 1 parking space suitable for an ambulance.
Housing for Seniors or People	(i) 1 parking space for each 5 dwellings in the hostel, and (ii) 1 parking space

with a Disability: (b) Hostels	for each 2 persons to be employed in connection with the development and on duty at any one time, and (iii) 1 parking space suitable for an ambulance.
Housing for Seniors or People with a Disability: (i) Self-contained dwellings	(i) 0.5 car spaces for each bedroom where the development application is made by a person other than a social housing provider, or (ii) 1 car space for each 5 dwellings where the development application is made by, or is made by a person jointly with, a social housing provider.
Indoor Recreation Facility	16 spaces per court OR (if there are no courts) 1 space per 25m ² of gross floor area PLUS 1 space per 2 employees PLUS 3 spaces per court for spectators.
Industrial Premises	1 space per 75m ² of gross floor area OR 1 space per 2 employees, WHICHEVER IS GREATER.
Information and Education facility	0.5 spaces per staff PLUS 1.6 spaces per 100m ² gross floor area of display area for visitors
Landscape and Garden Supplies	1 space per 100m ² gross floor area for staff PLUS 1 space per 600m ² gross floor area for visitors (minimum 5 visitor car parks)
Medical Centre	1.6 spaces per consulting rooms for staff PLUS 3.2 spaces per consulting rooms for GP (visitors) PLUS 1.6 spaces per consulting rooms for specialist (visitors)
Mortuary, Funeral Chapel, Funeral	1 space per 5 seats
Multiple Dwelling	1 space per each 1 bedroom unit, 1.5 spaces per 2 bedroom unit, and 2 spaces for 3 or more bedroom units PLUS 1 space per 4 units for visitor parking
Places of public worship, Entertainment facilities, etc.	1 space per 10 seats OR 1 space per 10m ² of gross floor area if seats not affixed, WHICHEVER IS THE GREATER
Pub	1 space per hotel unit PLUS 1 space per 4m ² of licensed floor area PLUS 1 space per 6.5m ² of auditorium, dining room and recreation area OR 1 space per 3 seats of auditorium, dining room and recreation area, WHICHEVER IS GREATER PLUS 1 space per 3 employees
Registered Club	1 space per 7m ² of licensed floor area, PLUS 1 space per 5 seats of auditorium, dining room and recreation area, OR 1 space per 10m ² of auditorium, dining room and recreation area, WHICHEVER IS GREATER, PLUS 1 space per 3 employees
Restaurant	1 space per staff at peak operating times PLUS 3.5 spaces per 100m ² gross floor area of dining area for visitors
Service Station	6 spaces per work bay, PLUS 1 space per 20m ² of gross floor area of the convenience store, PLUS 1 space per 6.5m ² of gross floor area OR 1 space per 3 seats if a restaurant facility is provided, WHICHEVER IS GREATER
Serviced Apartments	1 space per staff PLUS 1 space per apartment PLUS 1 visitor space per 4 apartments
Squash Courts, Tennis Courts	3 spaces per court, PLUS 1 space per 3 employees or part thereof
Take Away Food and Drink Premises	1/staff at peak operating times PLUS 3.5/100sqm GFA of dining area for visitors PLUS queuing area for 10 vehicles for any drive-thru facility from the collection point
Tourist and Visitor Accommodation	1 space per bedroom
Vehicle Repair Station	1 space per staff PLUS 3.2 spaces per work bay
Vehicle Sales or Hire Premises	0.75 spaces per 100m ² of site area, PLUS 1 space per 2 employees
Veterinary Hospital	3 spaces per practitioner, PLUS 1 space per employee.
Viticulture / Winery	1 space per 75m ² of gross floor area, OR 1 space per 2 employees, WHICHEVER IS THE GREATER
Warehouse or Distribution Centre	1 space per staff PLUS 1 space per 360m ² gross floor area for visitors
Shops and General Business: (a) < or = 1000m ² gross floor area	1 space per 20m ² of gross floor area
Shops and General Business: (b)	1 space per 15m ² of gross floor area

> 1000m ² gross floor area (includes supermarkets, department stores, shopping centres)	
Shops and General Business: (c) Video Stores	1 space per 15m ² of gross floor area
Roadside Stall (not exceeding 20m ²)	A minimum of 4 off street parking spaces
Freight Transport Facility, Passenger Transport Facility, Transport Depot, Truck Depot, or the like.	1 space per vehicle at the time of estimated peak vehicle accumulation on the site
Any Other Building or Land Use (not elsewhere defined)	To be determined by Council in individual cases

2.2 SERVICING

Design principles:

- development is designed to accommodate the vertical clearance and manoeuvring requirements of the largest service vehicle in accordance with Table 2.2
- development is designed to accommodate waste collection vehicles
- development is designed to accommodate on-site service vehicle manoeuvring and loading/unloading operations wholly within the site
- service areas and access are designed in accordance with the current version of *Australian Standards AS2890.2 Off-Street Commercial Vehicle Facilities*
- service vehicles ingress and egress the development in a forward gear

Table 2.2: Service Vehicle Requirements

Land Use	Minimum Class of Service Vehicle
Bed and Breakfast Accommodation	N/a
Bowling Alleys	SRV
Bowling Greens	N/a
Brothels / Sex Services Premises	N/a
Bulky Goods Premises	HRV
Business / Office Premises (financial institutions, real estate agents, etc)	SRV
Camp or Caravan Site or Manufactured Home Estate	VAN
Cellar Door Premises	SRV
Child Care Centre, Kindergarten	SRV
Educational Establishment	SRV
Function centre	MRV
Golf Courses	N/a
Health Consulting Room	SRV
Home Occupation / Home Industry	N/a
Hospitals	SRV
Housing for Seniors or People with a Disability: (a) Residential care facilities	HRV
Housing for Seniors or People with a Disability: (b) Hostels	N/a
Housing for Seniors or People with a Disability: (i) Self-contained dwellings	MRV
Indoor Recreation Facility	SRV

Industrial Premises	AV
Information and Education facility	SRV
Landscape and Garden Supplies	HRV
Medical Centre	SRV
Mortuary, Funeral Chapel, Funeral	SRV
Multiple Dwelling	MRV (to stand on-site)
Places of public worship, Entertainment facilities, etc.	SRV
Pub	HRV
Registered Club	HRV
Restaurant	HRV
Service Station	AV
Serviced Apartments	HRV
Squash Courts, Tennis Courts	SRV
Take Away Food and Drink Premises	HRV
Tourist and Visitor Accommodation	N/a
Vehicle Repair Station	HRV
Vehicle Sales or Hire Premises	AV
Veterinary Hospital	VAN
Viticulture / Winery	N/a
Warehouse or Distribution Centre	AV
Shops and General Business: (a) < or = to 1000m ² gross floor area	HRV
Shops and General Business: (b) > 1000m ² gross floor area (includes supermarkets, department stores, shopping centres)	HRV
Shops and General Business: (c) Video Stores	HRV
Roadside Stall (not exceeding 20m ²)	N/a
Freight Transport Facility, Passenger Transport Facility, Transport Depot, Truck Depot, or the like.	AV
Any Other Building or Land Use (not elsewhere defined)	N/a

2.3 VEHICULAR ACCESS

Design principles:

- development ensures all vehicles ingress and egress the site in a forward gear (excluding dwelling house, secondary dwelling, dual occupancy or multiple dwelling where there are three dwellings or less)
- vehicular crossings are designed in accordance with the *Access Facility* requirements prescribed in the current version of *Australian Standards AS2890.1 Off-Street Car Parking* and *Australian Standards AS2890.2 Off-Street Commercial Vehicle Facilities*
- vehicular crossings are appropriately separated from other vehicular crossings and side property boundaries to prevent interference with:
 - the safety, capacity and operations of the existing or planned road network;
 - adjoining properties; and
 - cycleways or pedestrian footpaths.
- vehicular crossings should not be located less than 1.5m from the boundary of the site and are required to meet the minimum separation requirements as prescribed in current version of *Australian Standards AS2890.1 Off-Street Car Parking* and the relevant sections of *Austrroads Guide to Road Design*;

-
- vehicular crossings provide for the *Pedestrian Sightline Triangle* as prescribed in the current version of *Australian Standards AS2890.1 Off-Street Car Parking* and *Australian Standards AS2890.2 Off-Street Commercial Vehicle Facilities*
 - the location of vehicular crossings is designed to ensure sight distances are provided in accordance with the current version of *Australian Standards AS2890.1 Off-Street Car Parking*, *Australian Standards AS2890.2 Off-Street Commercial Vehicle Facilities* and the relevant sections of *Austroads Guide to Road Design*
 - vehicular crossings are aligned perpendicular between the property boundary and street
 - vehicular crossings are signed, line marked and maintained in accordance with the current version of the *Manual of Uniform Traffic Control Devices* and the relevant sections of *Australian Standards AS2890*

2.4 ACTIVE TRANSPORT

2.4.1 Pedestrian Connectivity

Design principles:

- development ensures that access for pedestrians from the street frontage is safe, direct, legible and comfortable
- where the development generates high vehicular traffic volumes, the pedestrian access from the street frontage is to be separated from vehicular driveway crossovers
- pathways are to be designed in accordance with the current relevant standards (including for disabled access)

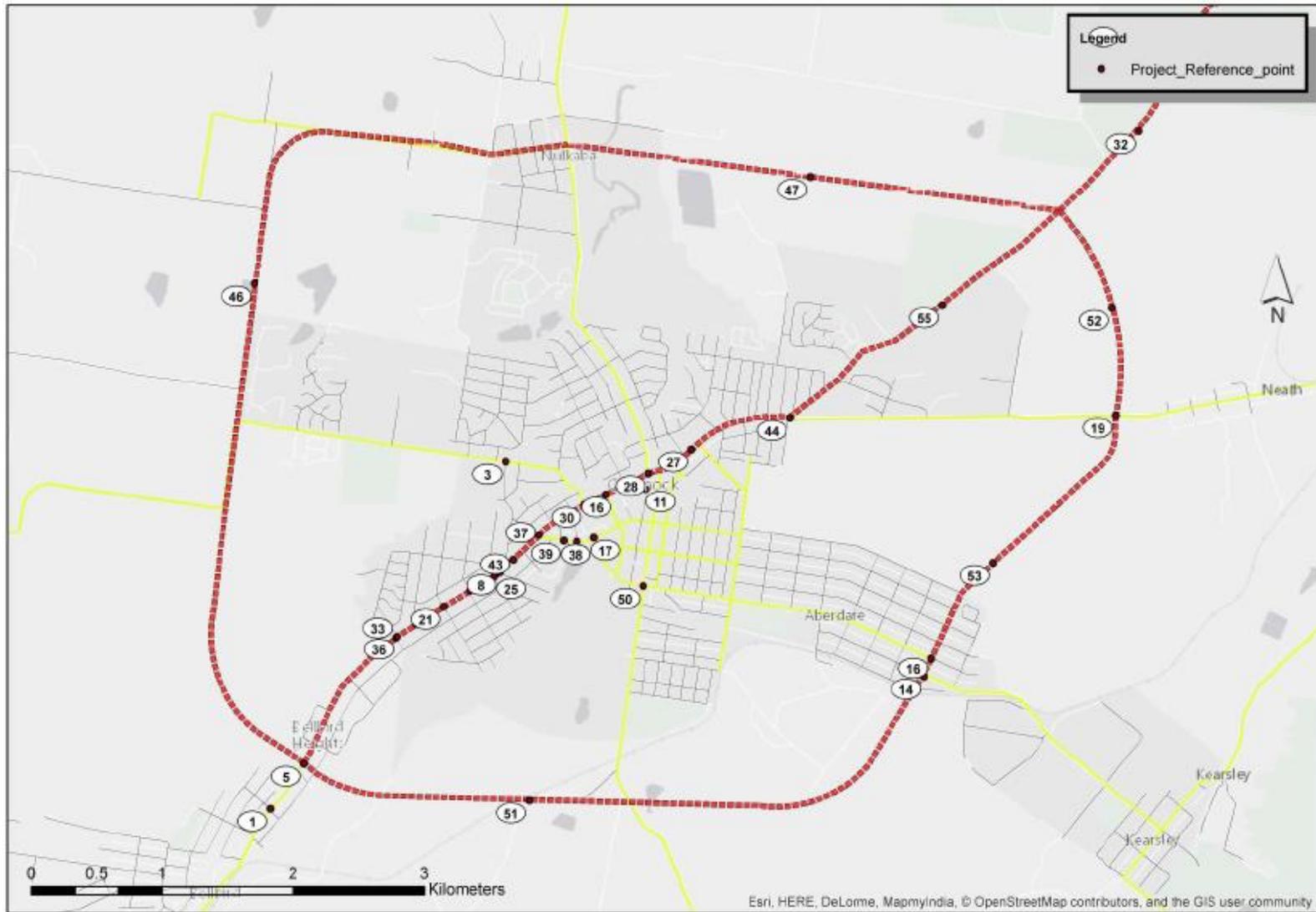
2.4.2 Bicycle Parking

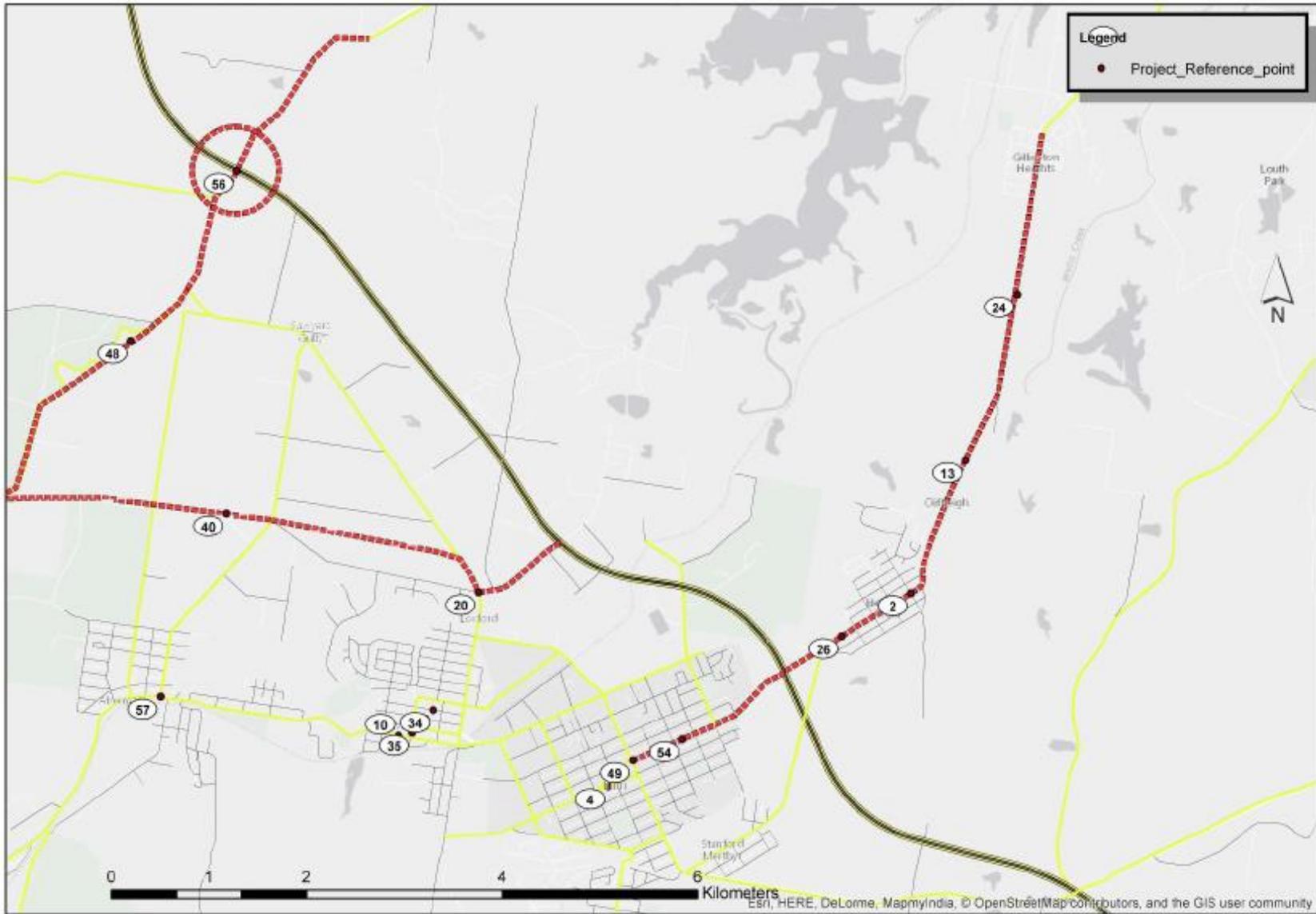
Design principles:

- development ensures that bicycle parking is provided in accordance with the rates, respective user class and end of journey requirements prescribed in *Cycling Aspect of Austroads*
- bicycle parking is designed in accordance with the current version of *Australian Standards AS2890.3 Bicycle Parking Facilities*
- staff and residential bicycle parking is required to be secure (accessed with key or security device) and protected from weather
- visitor bicycle parking is located such that it is visible from the street, easily accessible from the road, proximate to the main building access point and clear of pedestrian and vehicle movements

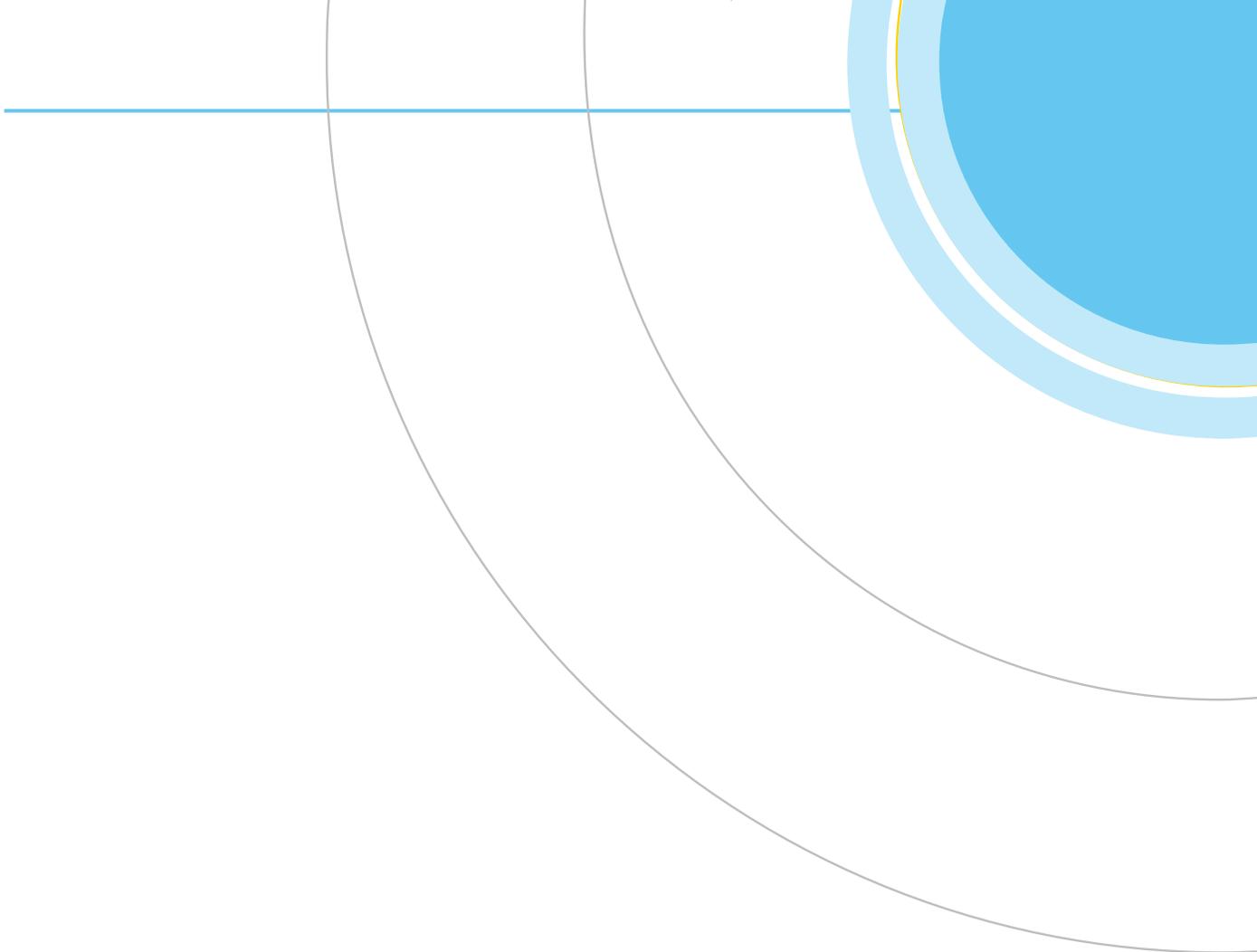
Appendix E

Roadwork Implementation Reference Map









62-78 Vincent Street
Cessnock, NSW
Australia



Contact:
tel:0249934300
tel:0249934100



Online help:
council@cessnock.nsw.gov.au
<http://www.cessnock.nsw.gov.au>