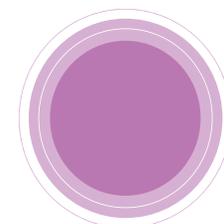
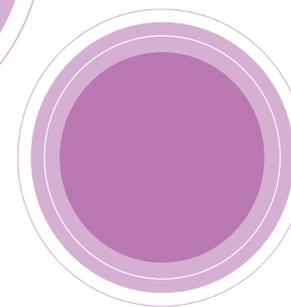
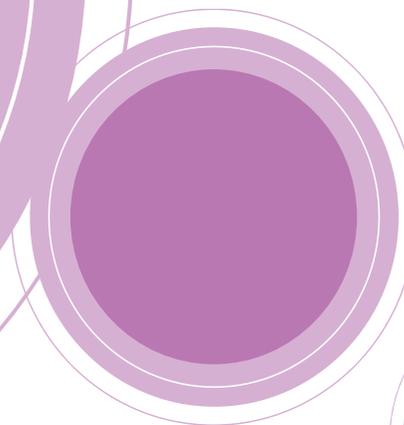




# DRAFT CESSNOCK LGA TRAFFIC AND TRANSPORT STRATEGY

Summary Report



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# 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
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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 – Summary Report	S. Brooke	M. Nikolaidis
6	24 May 2017	Cessnock LGA Traffic and Transport Strategy – Summary Report	M. Nikolaidis	

# Context

## 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 the Hunter Expressway (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 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.*

# Our Key Challenges

## Growth

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

- *new urban release areas (as per the Lower Hunter Regional Strategy 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 yet to be developed)*

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

The majority of the residential development growth is expected around Huntlee, Bellbird North and Loxford (Hydro Kurri Kurri). 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 congested traffic routes for accessing local services including health, administration and recreation facilities. Affected roads include

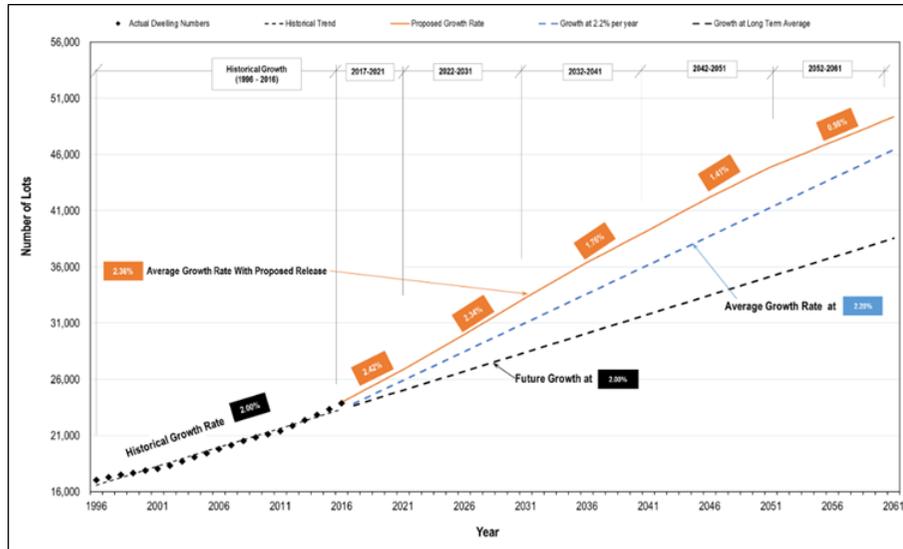
Cessnock / Maitland Road and Wine Country Drive / Allandale Road. By 2041 the number of dwellings in Cessnock is predicted to be 39,225. This represents an overall growth of 65% between 2016 and 2041.

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 shows 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, and affordable housing initiatives take effect, demand for land within the Cessnock LGA is projected to increase to 2.4%.

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.



Forecast Dwelling Growth in Cessnock LGA

## 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 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.

## Energy, Oil and Climate Change

Cessnock LGAs location, growth, development and demand for services increases 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 local 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

Traffic congestion is fast becoming a major challenge for Cessnock LGA as the city develops and grows. The completion of HEX to Branxton 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 and undermine 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.

A suitable level of service should be maintained relative to the economic value of each road and its rank in the functional road hierarchy. AUSTRROADS uses the following regime for level of service:

- a. **Good; stable flow, free to select desired speed and manoeuvres**
- b. **Satisfactory; stable flow, some restrictions to select desired speed and manoeuvres**
- c. **Tolerable; all drivers restricted**
- d. **Unstable; minor disturbance will cause flow breakdown**
- e. **Flow breakdown; forced flow with queue and delays**

One-way hourly volumes during peak hours for urban and rural roads and recommended levels of service are shown in the tables below

### *Urban Road Peak Hour Flows 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

It is generally considered impractical and uneconomical to provide a Level of Service (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.

### *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

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Roads in the Cessnock LGA that currently exceed or are approaching the preferred lower limit of LOS are:

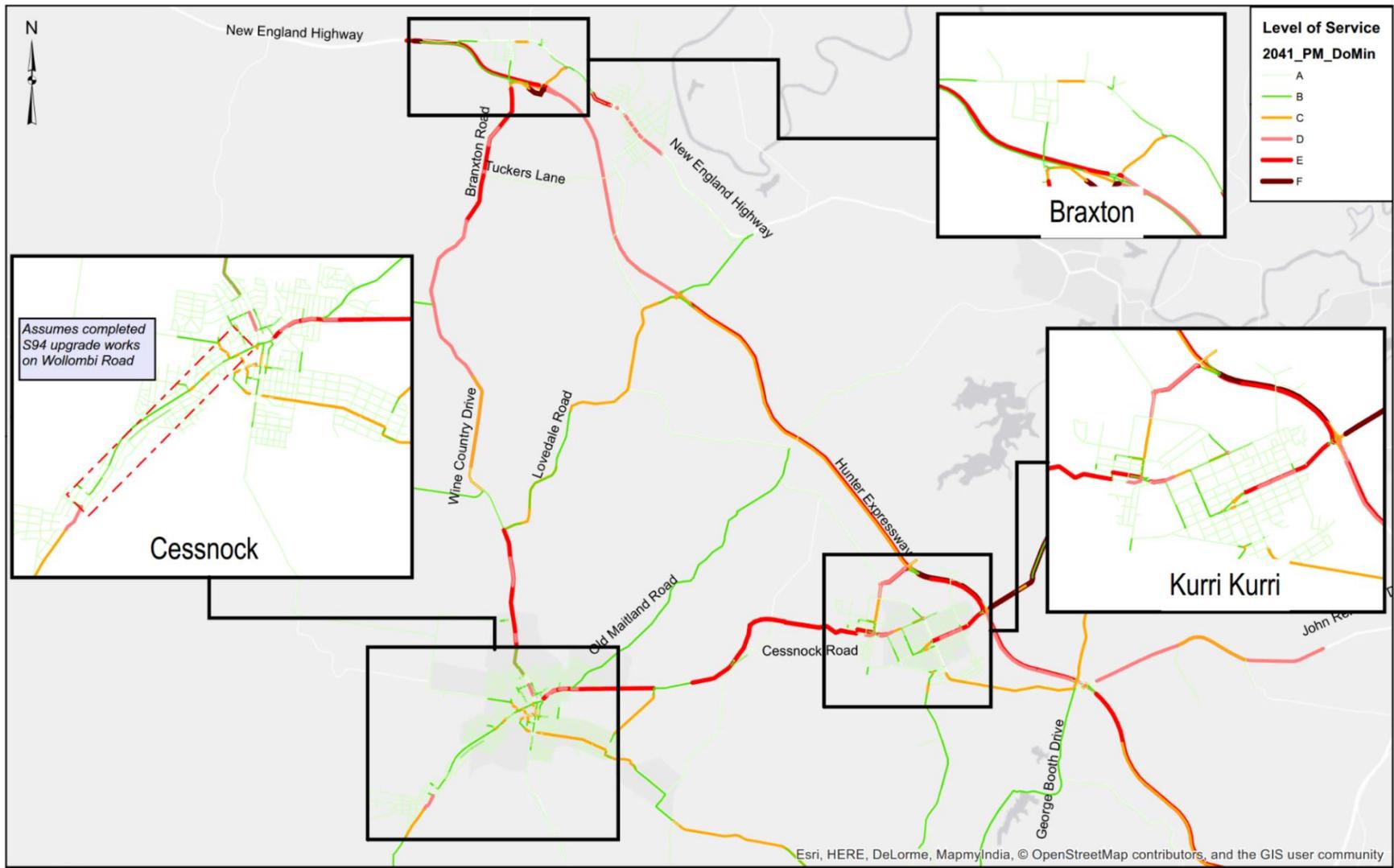
- *Wollombi Road – east of Ivan Street;*
- *Maitland Road - between Allandale Road and Duffie Drive;*
- *Cessnock Road – between Duffie Drive and Government Road;*
- *Northcote Street –between Government Road and Mitchell Avenue;*
- *Lang Street – between Mitchell Avenue and HEX;*
- *Main Street – between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

## Future Traffic Demand and Impact

By 2041 a number of key traffic routes are expected to reach or begin to approach undesirable LOS (ie. 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. The following figure shows the predicted LOS for the key routes in 2041, without no additional capacity upgrades to the network (except for the already committed Section 94 works).



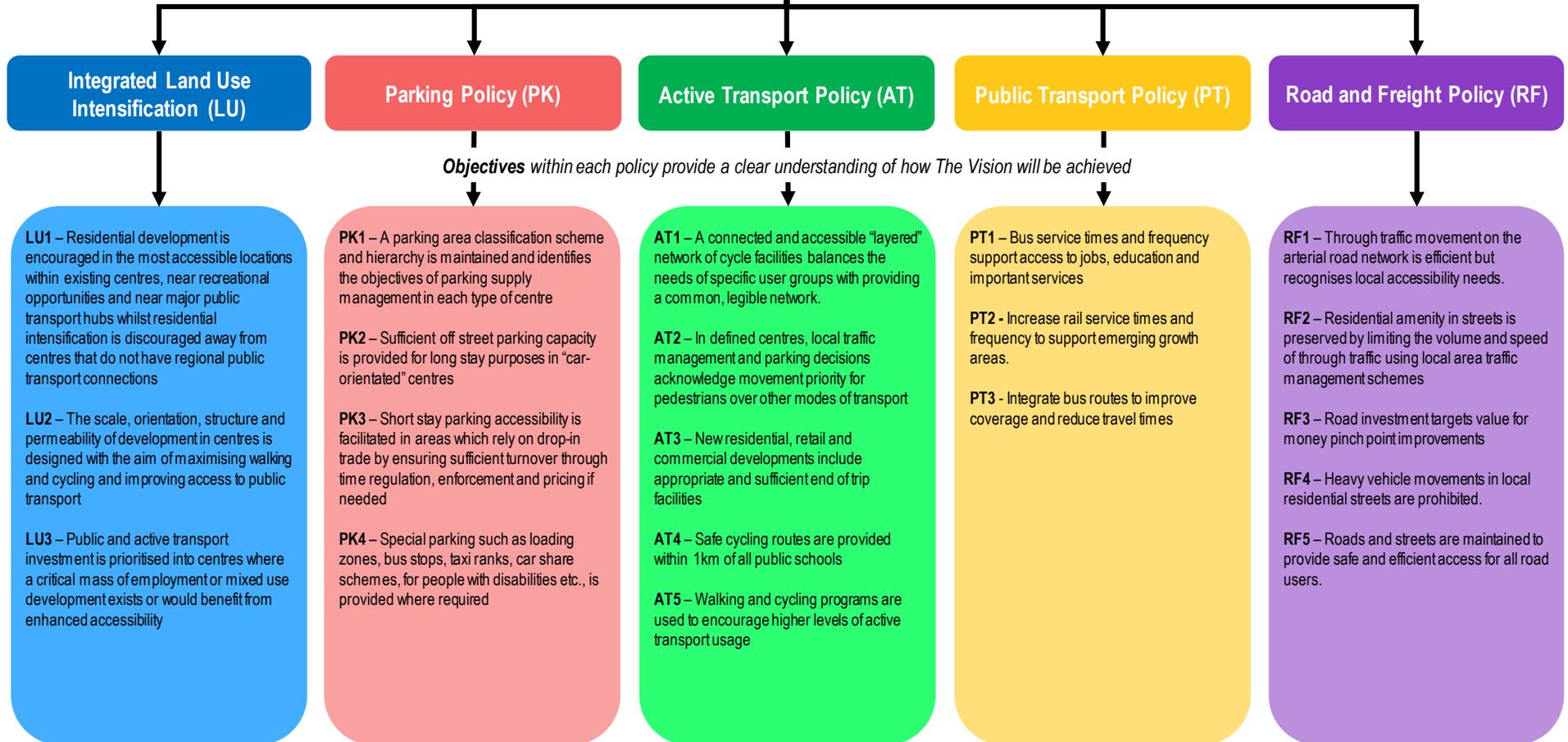


*Roads at Level of Service Thresholds (2041)*

# 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.*

## Key Policies employed to achieve The Vision



# Integrated Land Use Intensification

## Context

A number of the major roads in the 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 best be 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.

## 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, are better utilised

## 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 the 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.

## Land Use Intensification 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 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

## 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).

Council is responsible for regulating parking in the Cessnock LGA. 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;*
- *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 limit priority is given to customers, and those with 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 is not encouraged in residential area;*
- *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 and cities, 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

*PK1 - 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;
- commuter parking and “park n ride” at transport hubs (e.g. Bus Interchanges and train stations) and carpool locations (e.g. near HEX interchanges);
- medium duration parking (typically 2-4) hours for business activities or longer shopping/personal business trips (e.g. multiple shops);
- 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 different 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.

The table below 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.

### Street Types and Kerbside Used Priorities

Source: Austroads

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	

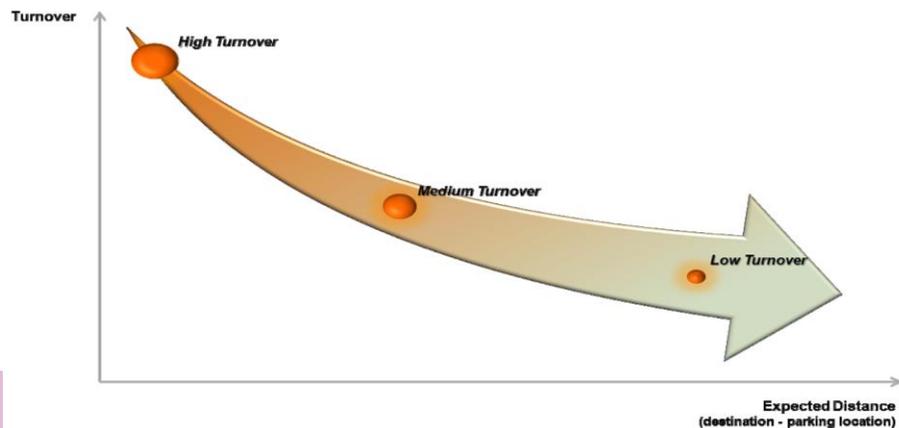
*PK2 - Sufficient off-street parking capacity is provided for long-stay purposes in centres.*

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.

Park n ride and carpooling should be encouraged through designated car parking area located near public transport hubs and HEX interchanges.

*PK3 - 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 the figure below.



## 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

## 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 for shorter trips, and 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, and in 2016 adopted the Cessnock LGA 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*

## **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, gender, 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 existing cycle network in the Cessnock LGA appears to have evolved over time considering specific user markets/needs without considering the value-adding opportunities of establishing a connected network of facilities. It will be important to establish a network that looks at regional connectivity, tourism opportunities and increase local centre accessibility and permeability.

The Cycling Strategy and PAMP programs will construct the missing cycle-way links and improve the connectivity of the cycle-way network in the LGA and give more potential users access to train stations, universities/colleges, schools, employment areas and recreational routes.

## 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.



In 2016, Council completed a PAMP for various parts of the LGA. The plan proposes 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 undertaking the key major pedestrian infrastructure improvements identified in the PAMP.

The Cycle Strategy proposes a number of improvements throughout the city centres with many of the existing cycle ways being linked together through both on and off road paths giving cyclists improved safety through heavily trafficked areas. Well-connected, direct and legible pedestrian networks will facilitate improved pedestrian safety, increased 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 Cessnock LGA Cycling Strategy provides a framework for cycling in the Cessnock area, and provides guidance on the provision of end of trip facilities.

Bicycle parking should be provided for cyclists in key destinations. Approximately 20% of respondents to the community survey (Cessnock Cycling Strategy) cited that a lack of end-of-trip facilities discouraged them from cycling. Bicycle parking facilities should be provided within 100m of common commuting or recreational destinations. These include schools, shopping centres, passenger railway stations, parks and work places. The exact location of parking facilities at each destination is vital and convenience is the most important factor to consider when choosing a location.

## 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.

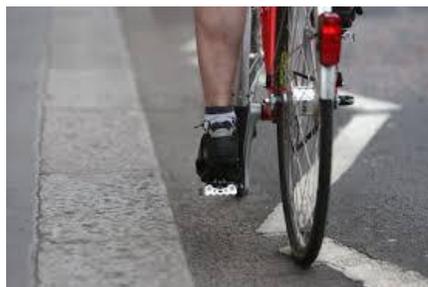
The greatest value for money for safe cycling route investment is close to each school where the largest number of cyclists would be located. Safe cycling routes should be determined outwards from each school location and into its 1km catchment. Where deficiencies exist, investment should be prioritised 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.*

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.

The Cycling Strategy outlines that one of the key actions to be undertaken is provide cycling routes, safety messaging, skills and confidence training courses to the community through a dedicated website. Bicycle education campaigns will be needed to support the growth in safe cycling and safe driving around cyclists.



## Active Transport Action

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 availability 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 the PAMP).	CCC	Long Term
AT5.1	Develop a series of cycling and walking guide maps of the Cessnock LGA including safe cycling and walking routes to key destination (e.g. Wineries, Arts and Community Centre, Libraries)	CCC	Short Term

# Public Transport

## PT 1: Improve Bus Service Times and Frequency

*Bus service times and frequency support access to jobs, education and important services.*

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. The route to Newcastle (Route 160) has 4 services a day in each direction Monday to Friday and 2 services a day each direction on Saturdays.

The Hunter Regional Transport Plan promotes an increase to public transport coverage as new residential areas (and associated demand develop) comes on line.

**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 hours of operation and frequency of services between Newcastle and the Cessnock LGA.

## PT2: Increase Rail Service Times and Frequency

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

With the continued development expected 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 Branxton 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 the HEX reducing the trip time and allowing passengers to transfer at North Rothbury.

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 Action Plan

No.	Action	Lead Area	When
PT1.1	Work with the State Government and local bus operators 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

## **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 be 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 laneways 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.

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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 against which Cessnock LGA local streets could be 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

## Roads and Freight Strategic 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 when occupancy levels exceed 85% capacity at peak times	CCC	On-going
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



# Future Road Network

## Network Development

### Option Development

A number of network improvement options have been developed to address future predicted traffic issues within the LGA. In order 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.

### Option Evaluation

A number of routes options were considered during the development of a preferred road network plan and tested in the traffic model. 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, Cessnock Road corridor and at interchanges;
- **Travel Time:** Bi-directional travel times along key transport corridors particularly those that would be impacted by the option; and
- **Level of Service:** Capacity of urban roads is generally determined by the capacity of intersections.

## Route Options

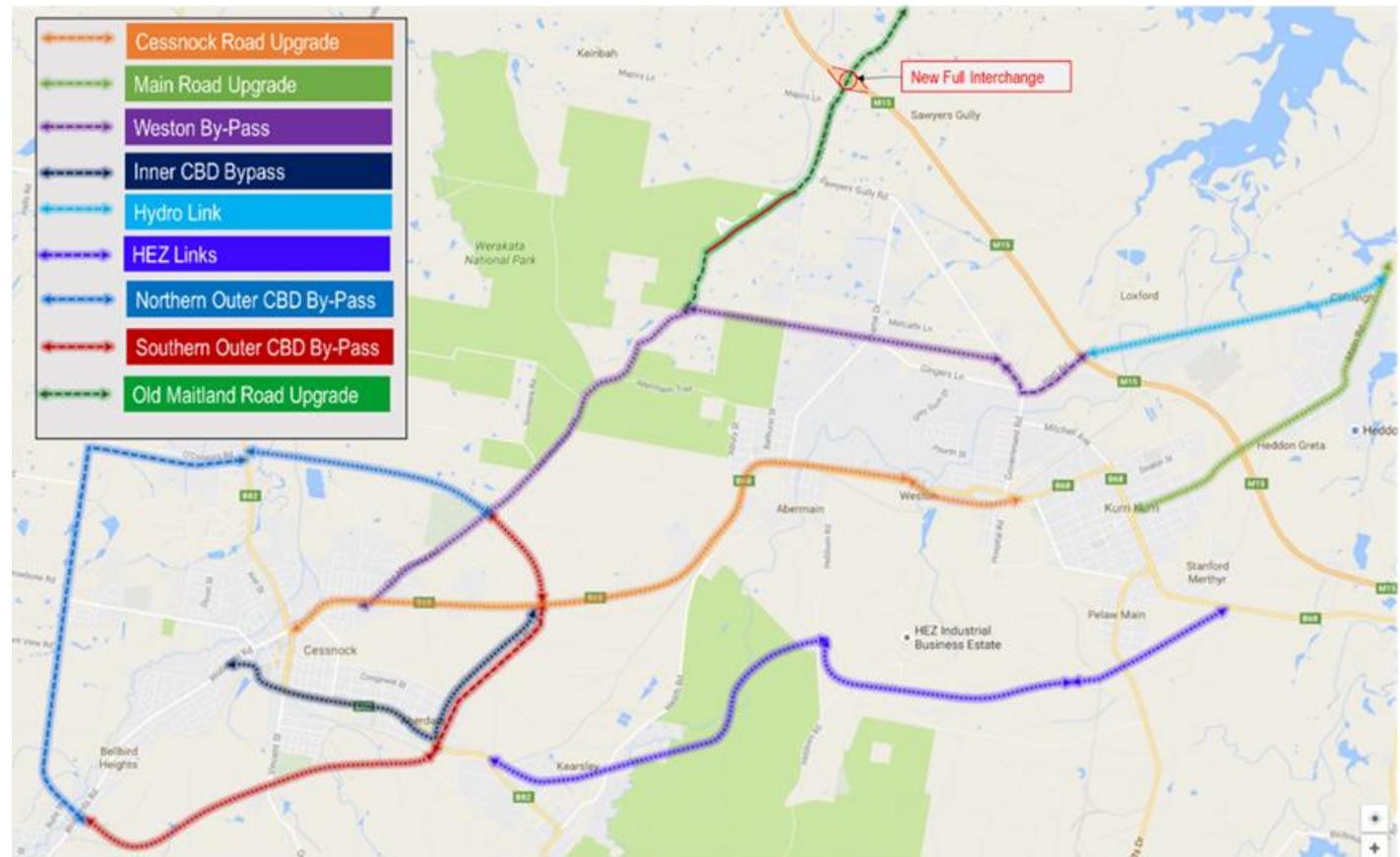
The primary route options assessed were:

- **Cessnock Road / Maitland Road upgrade:** This includes Cessnock Road / Maitland 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 Land 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.

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 considers upgrade including 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 the impacts on natural environment including deforestation and uncertainty in flood mitigation etc.;
- **Accessibility:** Considers 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; and
- **Integration:** Assesses how options support new growth areas.

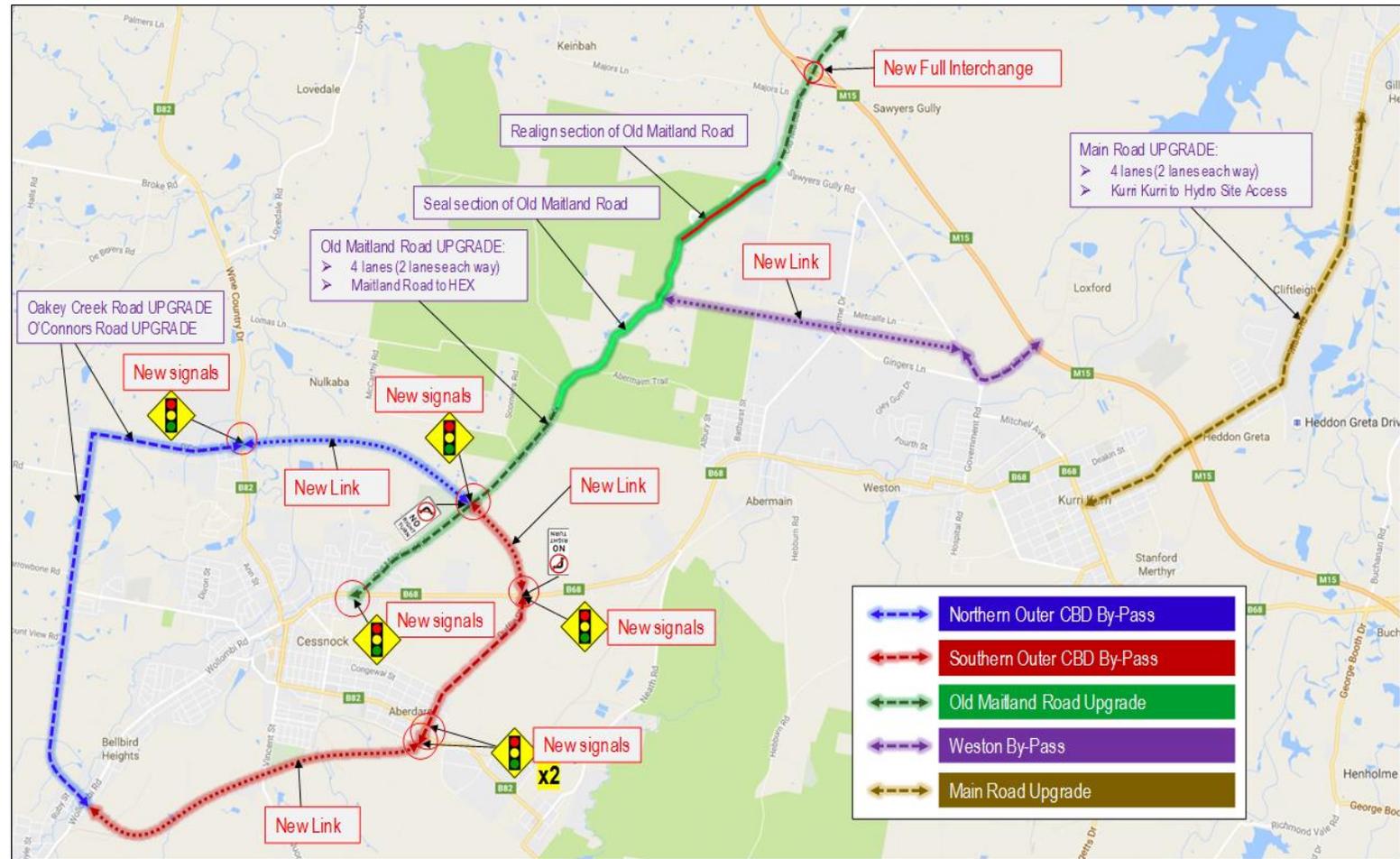


**Route Network Options**

## Future Road Network

The preferred future (ultimate) road network plan is shown adjacent. 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 with the reconsidered 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.

To develop a robust staging methodology, the 2021 and 2031 do-minimum modelling results were thoroughly analysed to identify the year that specifies network deficiencies are likely to occur.



**Preferred Future Road Network**

## Staging

This strategy recommends a number of new roads, road upgrades and intersections to be constructed over the next 25 years. Timing for the recommended infrastructure is:

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

The tables below detail the proposed new strategic roads, road upgrades and intersection works, and indicative timing for their implementation.

### Proposed New Strategic Roads

Road Name	Section	Length	Costs	Timing
Weston Bypass	Old Maitland Rd to Sawyers Gully 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

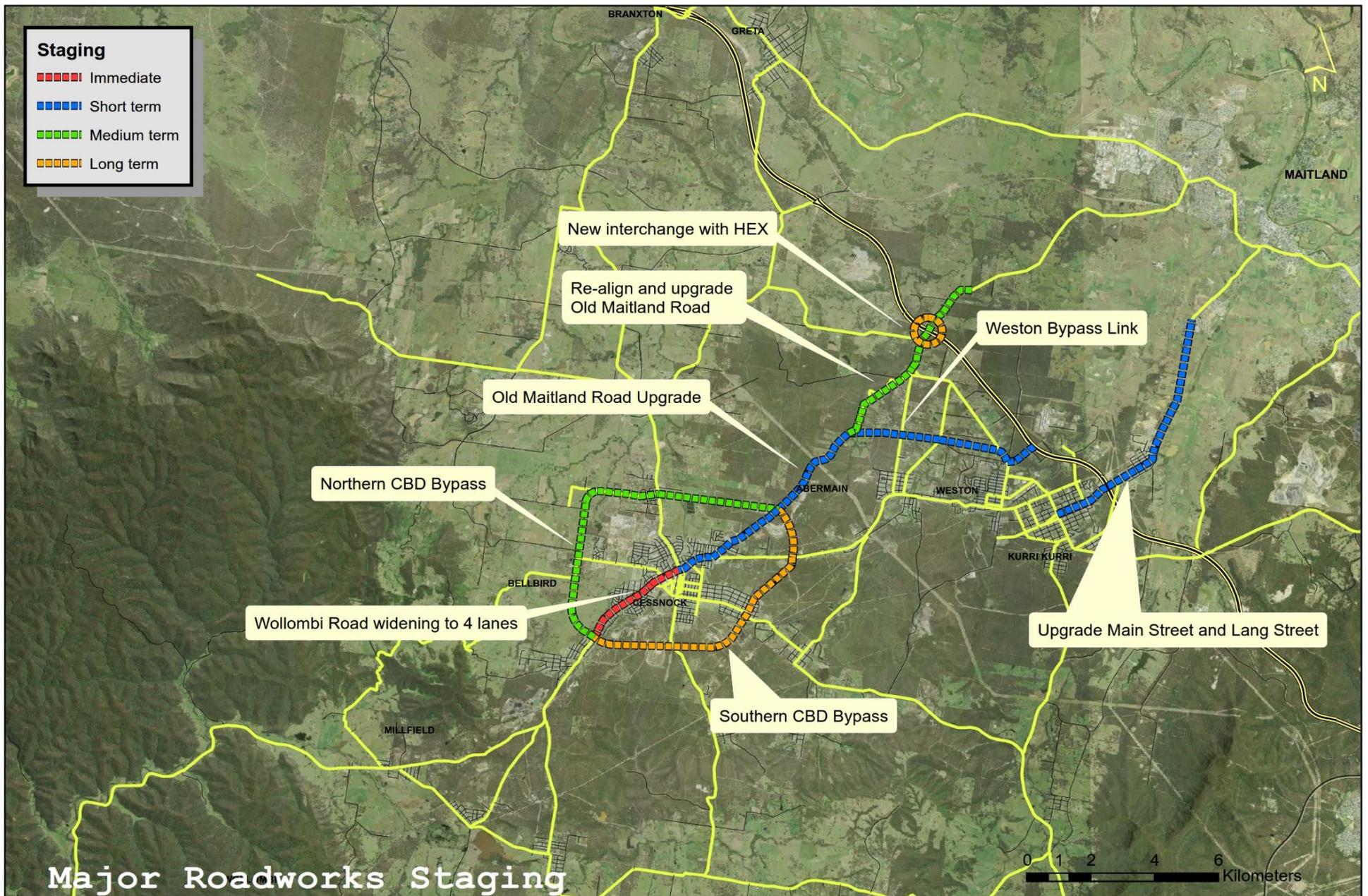
### Proposed Strategic Road Upgrades

Road Name	Section	Length	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

### 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



*Major Roadwork Staging*

# Road Hierarchy

## Need for a Road Classification System

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 appropriate design standard for new roads; and*
- *ensure that the roads are 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.

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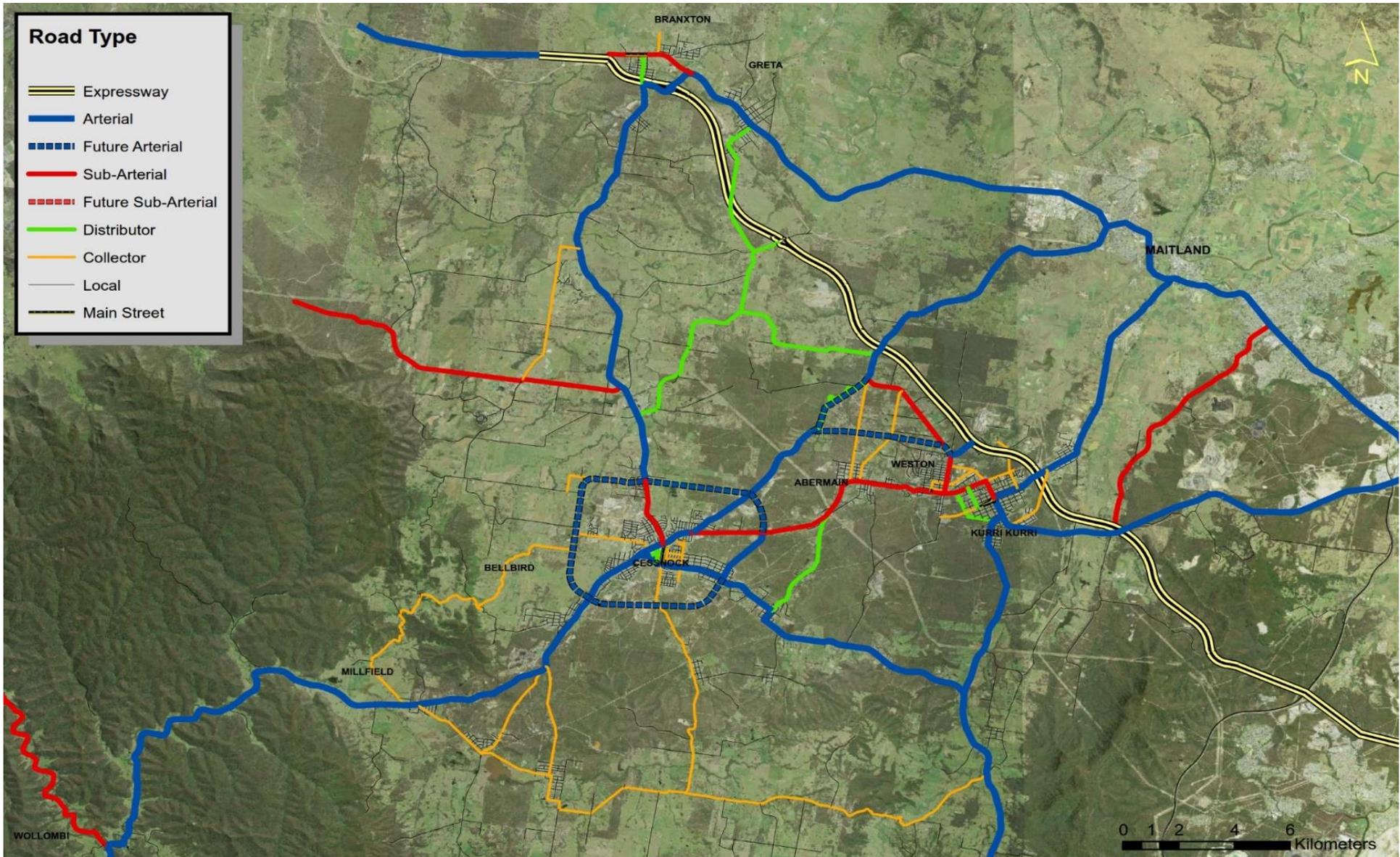
## Future Strategic Road Network Hierarchy

The proposed road hierarchy for the existing and proposed roads in the Cessnock LGA is presented in the following figure. 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 will 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 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

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, 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

## Future Road Hierarchy



# 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.

The intersections 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;*
- *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.*

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 has very heavy conflicting turning movements,

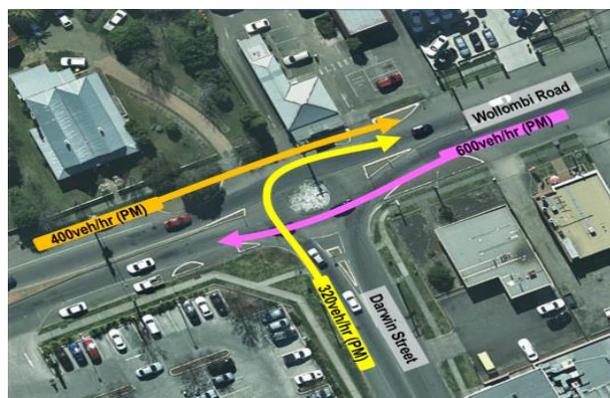
particularly during peak time. The roundabout has a very small central island for traffic circulation and in combination with poorly balanced traffic flows results in large queues and delays on all approaches.

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 volumes expected to grow Wollombi Road, congestion and delays would likely worsen.

## 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

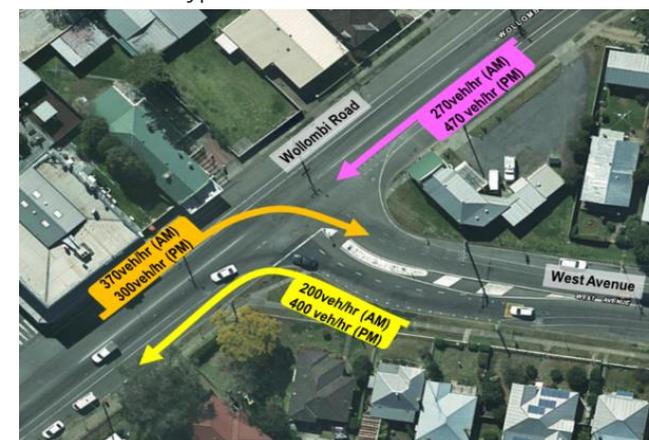
West Avenue is used as a bypass of the CBD for trips from the south-west of Cessnock to Aberdare Road or via Duffie Drive to Cessnock Road, towards Kurri Kurri. It also provides a key access to the TAFE and Cessnock High School.

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.

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.



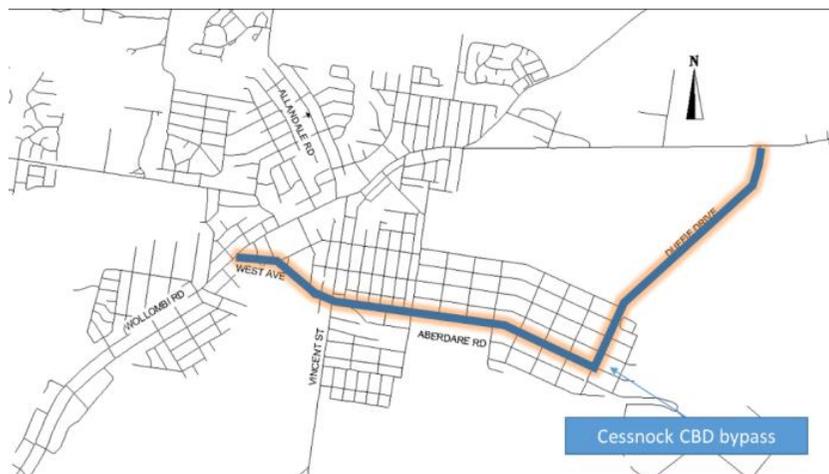
## Cessnock Inner CBD Bypass

Future traffic growth will further increase congestion levels on Wollombi Road, Cessnock Road and Allandale Road, especially through the town centre. The Volume/Capacity ratio on Wollombi Road and Maitland Road is approaching 1.0 or Level of Service E.

## Volume/Capacity Cessnock Town Centre

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.



## Parking - Cessnock CBD

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.

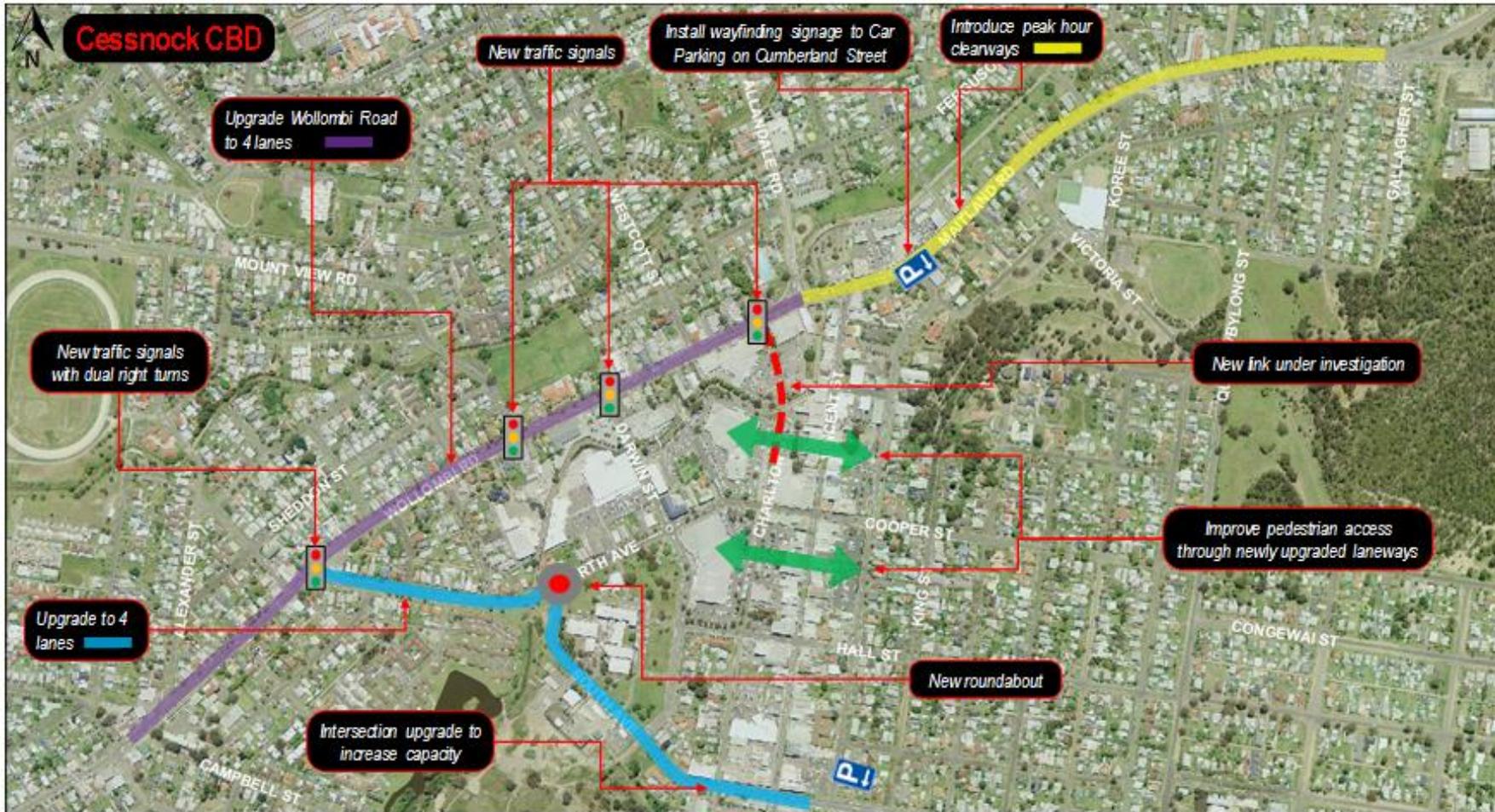
The parking strategy that is proposed for the CBD includes encouraging a "park-once" principle within the CBD which will be reinforced with the addition of improvements to pedestrian connectivity which is outlined in the *Cessnock LGA PAMP*.

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 to 3 hour parking district is proposed within the CBD with off-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.



**Proposed Parking Strategy - Cessnock CBD**



*Cessnock CBD Local Traffic Improvements*

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## 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 these 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 these delays, but it would come at a significant cost to the community. 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 complete. This provides 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 provide 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.

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.

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

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

## Parking - Kurri Kurri

Parking spaces along Lang Street, in Kurri Kurri is heavily utilised, while the parking along Barton Street is relatively 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. The figure below outlines the core and fringe areas within Kurri Kurri's town centre as well as the likely parking locations.



*Proposed Parking Strategy - Kurri Kurri*

## Parking - Weston

Parking in Weston is mostly unregulated, which results in some of the prime parking spots, along Station Street, being occupied by long-stay parkers. Local businesses rely on this on-street parking for customers (and servicing), needing close and convenient access. Space being occupied for long periods or all day, reduce accessibility to close-by parking.

Introducing a 2-Hour parking limit for on-street parking in Station Street, between Cessnock Road and First Street, would increase parking turnover and improve customer accessibility to local businesses in Kurri Kurri.



**Kurri Kurri and Weston Local Traffic Improvements**

## Branxton

The opening of HEX significantly reduce 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.

Localised treatments have been identified to support the Branxton Masterplan. They focus on improved accessibility, rationalised parking and improving connectivity and walkability around the centre.

## Parking Branxton and Greta

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 2-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.

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.



**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.



**Proposed Parking Strategy – Greta.**



***Branxton Local Traffic Improvements***

## Wollombi

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

Measures have been proposed to strengthen connections to parks and recreational areas, improve parking management and walkability around the village and to improve improved safety through the intersection for all road users.

## Parking 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.



*Wollombi Local Traffic Improvements*

# Implementation and Actions

## 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 road (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 needed in the transport system is required over the next 25-30 years to ensure that Cessnock LGA continues to grows 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 \$177 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. A breakdown of the estimated costs into immediate, short, medium and long term timeframes is presented in the below table.

Timeframe	Period	Estimated Cost
Immediate	2017 - 2021	\$8,495,000.00
Short-term	2021 - 2031	\$59,226,000.00
Medium-term	2031 - 2041	\$77,150,000.00
Long-term	2041 -2061	\$31,730,000.00
<b>Total</b>		<b>\$176,601,000</b>

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*

## Action Plan

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 end of trip facilities required in each area. Development controls are to include a component of visitor cycle facilities.	CCC	Short term

No.	Action	Lead Area	When
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

## Road Capital Works Priorities

ID_Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Indicative 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

ID_Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Indicative Lead Agency
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 Clifftleigh	Upgrade to provide four lanes	U	\$15,612,500	capacity upgrade and road safety improvement	Short-term	State
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

ID_Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Indicative Lead Agency
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 Clift 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
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

ID_Ref	Location	Section	Proposed Works	Treatment	Indicative Cost	Comment	Timeframe	Indicative Lead Agency
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



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