EAST LEPPINGTON PRECINCT

GREEN TRAVEL STRATEGY

Prepared for
DEPARTMENT OF PLANNING AND INFRASTRUCTURE

June 2013

Document Information

Prepared for	Department of Planning and Infrastructure
Project Name	East Leppington Precinct
File Reference	Green Travel Strategy
Job Reference	600319
Date	June 2013

Document Control

Version	Date	Author	Author Initials	Reviewer	Reviewer Initials
1	4/6/12	Larissa Miller	LM	Kieron Hendicott	KH
2	13/7/12	Neill Miller	NM	Clement Lim	CL
3	6/5/13	Larissa Miller	LM	Neill Miller	NM
4	10/5/13	Larissa Miller	LM	Neill Miller	LM
5	4/6/13	Larissa Miller	LM	Neill Miller	NM
6	24/6/13	Larissa Miller	LM	Neill Miller	NM

Table of Contents

Cardno
Shaping the Future

List of Tables

List of Figures

1 INTRODUCTION

The development of the East Leppington precinct presents opportunities for positive contributions to the sustainable growth of the South West Growth Centre.

Cardno was engaged to prepare a green travel strategy (GTS) for the East Leppington Precinct development on behalf of Department of Planning and Infrastructure. The proposed development will comprise approximately 4,380 dwellings (a mix of low and medium density residential), as well as a local centre, a, primary school and community facilities.

This GTS outlines the overarching scheme for the preparation of future green travel plans (GTPs) within the East Leppington precinct that will be prepared specific to each land use type to accompany further development applications.

This strategy has been developed in conjunction with Cardno's Traffic and Transport Assessment which provide traffic and transport advice to support the development of the draft precinct plan.

1.1 PURPOSE

Developments should be accessible and well-connected, with facilities that promote safe walking and cycling, good public transport facilities and easy access to local shops and services. They should also encourage and support a shift in travel mode share away from private vehicles to more sustainable modes; including public transport, walking and cycling.

1.2 CONTENT

A GTS is the principal strategic policy document which sets out how a development or area will accomplish sustainable mode share targets. It establishes sustainable mode share targets that are centred on increasing active transport and public transport mode share of all trips, as well as promoting greater car occupancies and the need for fewer vehicle trips through travel demand measures.

A GTS will provide objectives, targets and direction for delivery of an accessible community in a sustainable way. The GTS considers the site context, development proposal, existing and planned transport facilities, local demographics and travel behaviour, desired transport improvements and opportunities.

The GTS proposes appropriate actions based on the analysis, directed at achieving the established mode share targets for each land use category. To ensure the successful realisation of these actions, the strategy stipulates measures for review and monitoring.

It will also provide the overarching framework to guide the development of Green Travel Plans which will detail implementation of the recommended actions and activities to address specific land use types and community needs.

1.3 STRATEGY STRUCTURE

> **Chapter 2** describes the overall vision and objectives for sustainable travel in the East Leppington Precinct.
> **Chapter 3** provides an overview of the East Leppington Precinct, including information on the wider context of the South West Growth Centre, the site location and existing uses.
> **Chapter 4** presents information on existing and planned transport infrastructure and services.
> **Chapter 5** presents existing demographic trends and community profile information, and analyses anticipated travel behaviour based on data from the Camden, Campbelltown and Liverpool local government areas (LGA).
> **Chapter 6** specifies state and local government policy targets and translates these into mode share targets for the East Leppington precinct.
> **Chapter 7** examines the components and measures required for GTPs.
> **Chapter 8** summarises the mechanisms and processes which are to be used to measure and review the Green Travel Strategy and accompanying Green Travel Plans.

2 VISION & OBJECTIVES

This section describes the overall vision for the future travel patterns at the site, and outlines goals and objectives which have informed the development of the green travel strategy for the site and will provide an ongoing vision for the future development of the individual precinct green travel plans.

2.1 GROWTH CENTRES DEVELOPMENT CODE

The Growth Centres Development Code (2006) provides direction when planning and designing the growth centre precincts.

The Development Code outlines a number of policies to specifically address sustainable transport principles and the connectivity of the precincts:

> Improve access to public transport, including links to railway lines and manage the reliance on private vehicles.
> Improve walking and cycling pathways, especially between residential areas, shops and schools.
> Provide a network of transport corridors to disperse traffic.
> Improve environmental benefits.

The Development Code also outlines a number of objectives related to both public transport and walking and cycling. The objectives of the Development Code related to public transport include:

> To maximise the use of public transport.
> To provide a user-friendly, safe and convenient public transport network that is accessible by foot from most dwellings.
> To provide an interconnected public transport network that services the precinct as well as the region.
> To facilitate public transport infrastructure investment to underpin the ILP to maximise accessibility, support higher densities, employment and patronage.

The objectives of the Development Code related to walking and cycling include:

> To establish a non-vehicular (pedestrian and cyclist) system which connects major activities and open spaces in a direct and legible manner, incorporating a variety of spaces, and exhibiting high levels of amenity by its relationship to adjoining activities.
> To establish streets and lanes as shared spaces, providing for the needs of pedestrians, cyclists and vehicles.

2.2 EAST LEPPINGTON PRECINCT VISION AND OBJECTIVES

The vision and goals for the East Leppington GTS have been established by considering the policies and objectives for the Growth Centres Development Code.

The vision for the East Leppington GTS is **to create a mobile and active precinct community that embraces appealing and accessible sustainable transport modes for daily trips**. This will encompass the following objectives:

> To provide accessible and functional public transport options.
> To facilitate walking and cycling connections within the precinct and as part of a regional network.
> To minimise the use of private vehicles for a range of local and regional trips to and from the precinct.
> To promote the benefits of sustainable transport options.

A package of measures will be specifically catered to the unique geographical, land use and transport context of the area and will be motivated by a desire for a mobile, active precinct, with high levels of permeability, liveability and safety for all users.

Achieving high mode share for active and public transport modes will be a key indicator to the successful implementation of the GTS.

3 EAST LEPPINGTON PRECINCT

3.1 SITE CONTEXT

3.1.1 SOUTH WEST GROWTH CENTRE

The South West Growth Centre is one of two areas designated to deliver new dwellings and employment lands for Sydney over the next 30 years.

The area, which sits across the Liverpool, Camden and Campbelltown local government areas, is around 17,000 hectares which will translate into approximately 110,000 new homes.

The East Leppington precinct is located on the eastern side of the South West Growth Centre.

3.1.2 LOCATION AND EXISTING USES

The East Leppington precinct is located almost 40 kilometres from the Sydney central business district in the city's south-west. The East Leppington precinct sits across three local government areas: Camden (13%), Campbelltown (64%) and Liverpool (23%).

It is bordered by Camden Valley Way to the West, St Andrews Road to the south and Denham Court Road bisects the northern section of the site with undeveloped land to the south and east. Upper Canal provides a natural border to the north and the canal then continues into the site.

The site is largely undeveloped with just a couple of dwellings accessed from Camden Valley Way and St Andrews Road. The majority of (around 75%) the Precinct is in single ownership; however there are also small rural holdings, market gardens, bushland and some residential areas.

3.2 THE PRECINCT

The East Leppington precinct was released for planning in November 2011.

3.2.1 EAST LEPPINGTON PLANS

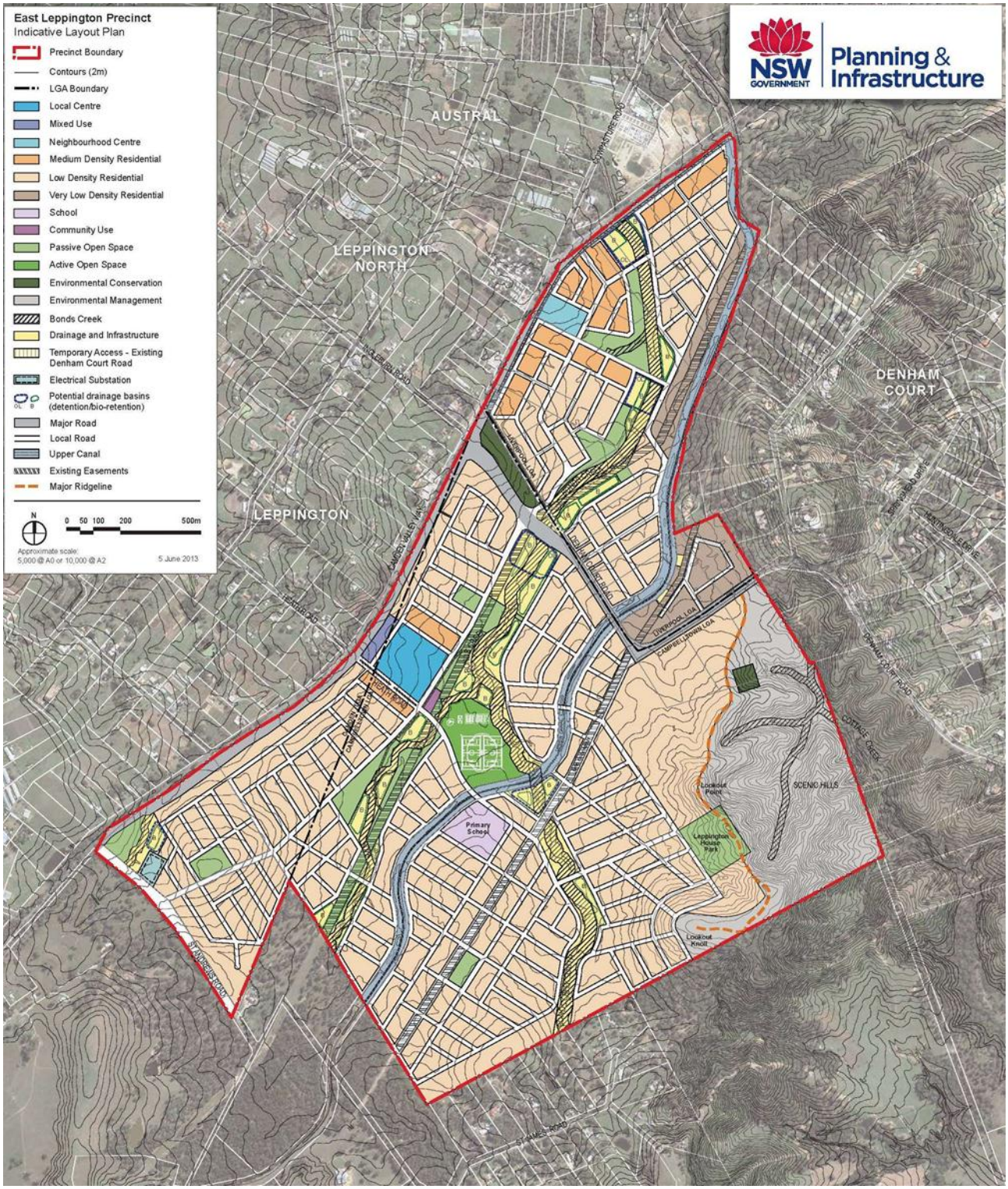
The East Leppington precinct will comprise approximately 4,380 dwellings, a local centre with provision of neighbourhood retail services, a primary school and community facilities.

The South West Growth Centre Structure Plan (Edition 3) details dwelling and population targets for the East Leppington Precinct; the 4,380 dwellings will translate to a planned target population of around 12,000.

3.2.2 DRAFT INDICATIVE LAYOUT PLAN

The Indicative Layout Plan (ILP) provides an indicative representation of East Leppington's possible placement of roads, the different housing densities, proposed infrastructure, open space, community areas and services. The current ILP v12.4 is provided in **Figure 3.1**.

Figure 3.1 Indicative Layout Plan v12.6



3.2.3 DENSITIES

The housing will be a mix of medium density, low density and very low density housing. Medium density is defined by the Growth Centres Development Code as 20-40 dwellings per hectare while low is defined as 12.5-20 dwellings per hectare.

4 EXISTING & FUTURE TRANSPORT

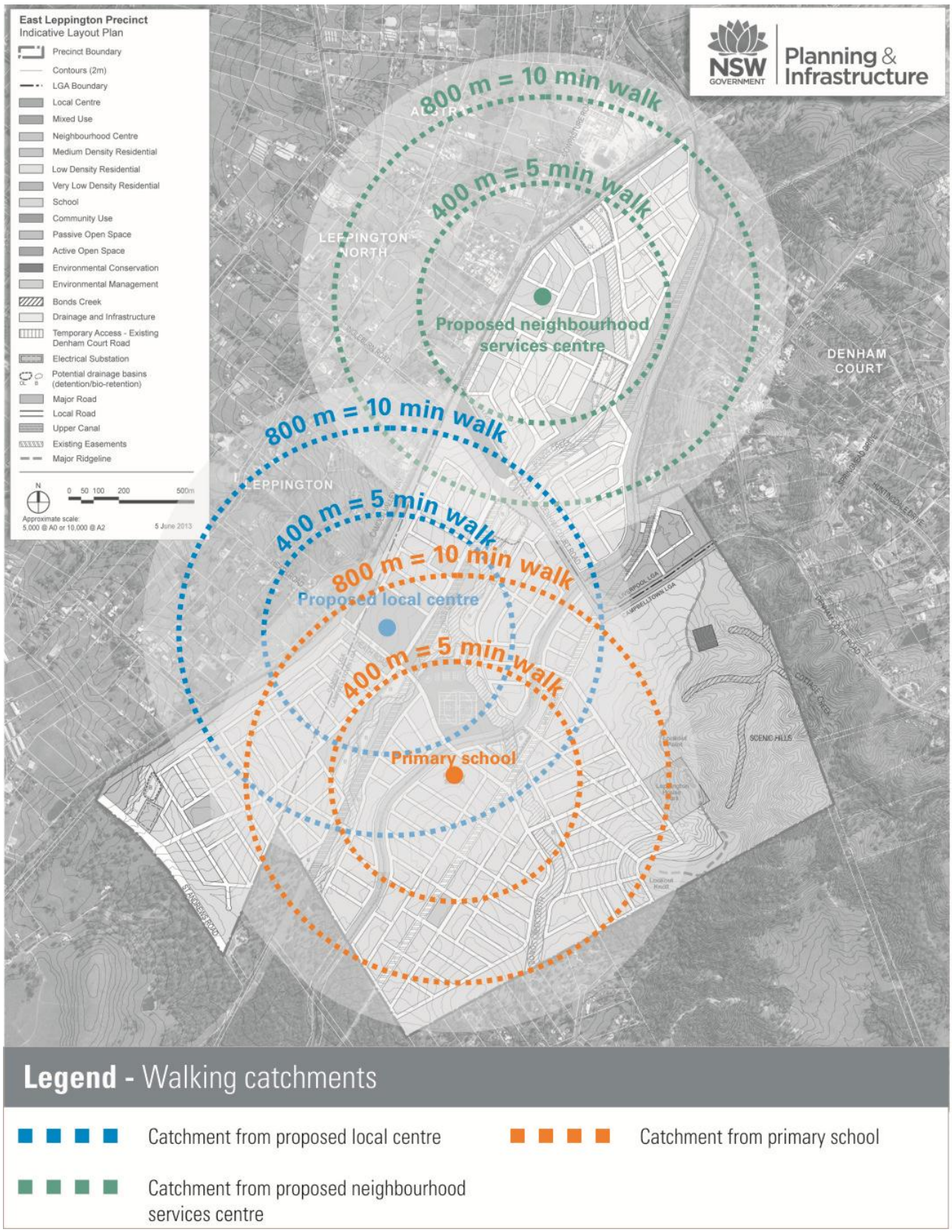
This section provides a description of existing transport infrastructure and services. It also provides an overview of the planned transport improvements proposed as part of the precinct planning and more regionally. This section is generally divided into the different mode of transport categories: walking, cycling, public transport, driving, and parking.

4.1 WALKING

4.1.1 Walking catchment

One factor when assessing a trip destination's pedestrian accessibility is its walking catchments. The NSW Government's 'Planning Guidelines for Walking and Cycling' (2004) define walking catchments of five and 10 minutes as 400m and 800m. The walking catchments for East Leppington's local centre are shown in **Figure 4.1**.

Figure 4.1 East Leppington walking catchments



4.1.2 Existing walking infrastructure

4.1.2.1 Internal

The undeveloped site has no existing pedestrian facilities.

4.1.2.2 External

There is currently no connected pedestrian network providing access to the East Leppington precinct. There are no existing pedestrian footpaths on Camden Valley Way, St Andrews Road or Denham Court Road. There are no signalised pedestrian crossings along the length of Camden Valley Way or Denham Court Road bordering the site.

4.1.3 Planned infrastructure

4.1.3.1 Internal

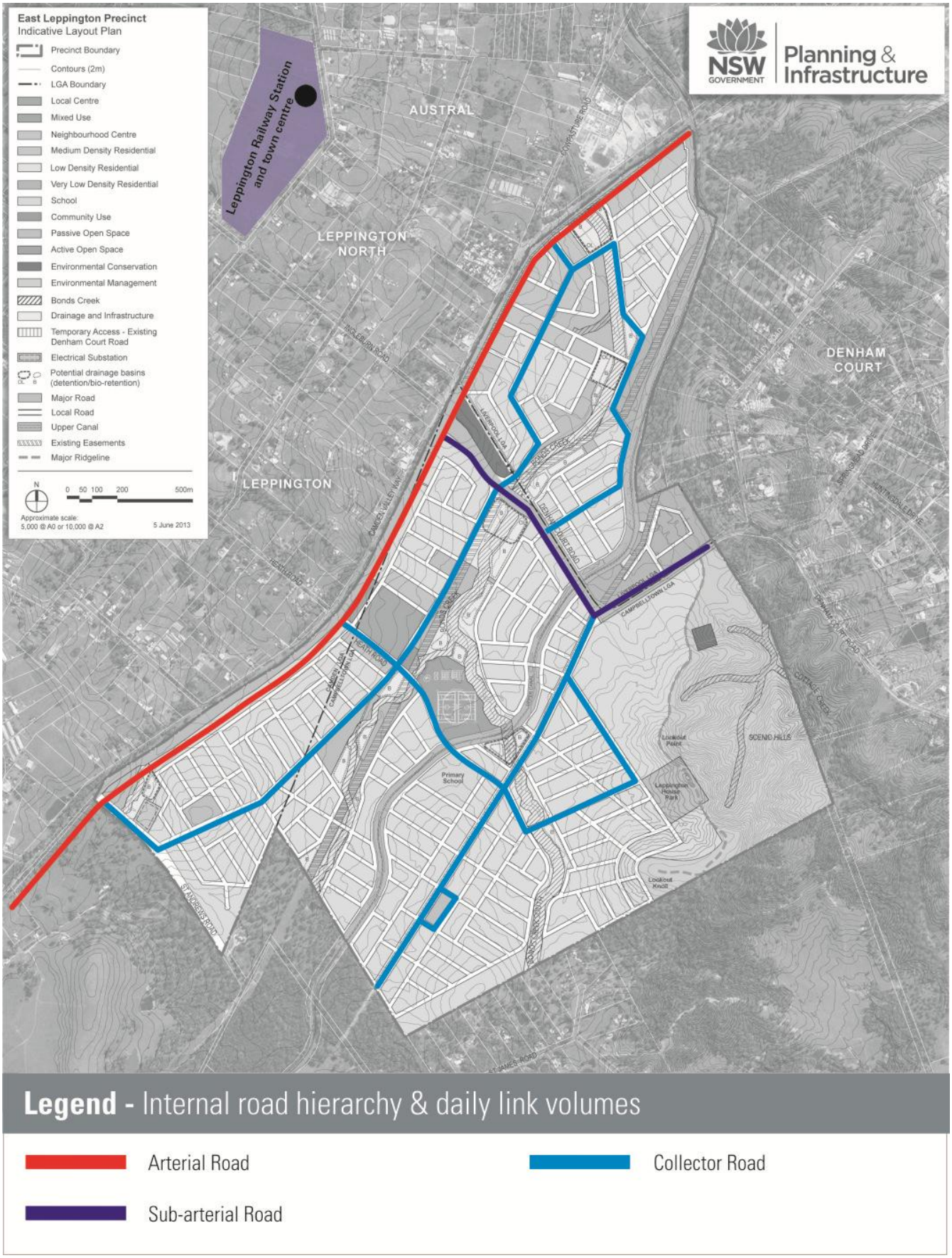
The *Growth Centres Development Code, GCC (2006)* details guidelines for the provision of pedestrian infrastructure in the Growth Centre precincts. A summary of the planned pedestrian infrastructure for the East Leppington precinct is detailed in **Table 4.1** by road type. Arterial, sub-arterial and collector roads within East Leppington are shown on **Figure 4.2** including proposed crossing of the canal and riparian corridor. The canal and riparian crossings on collector roads will be separate multi-use paths and the Denham Court Road crossing will be a separate footpath a minimum of 1.8m wide as detailed below in **Table 4.1**.

Table 4.1 Road hierarchy and pedestrian infrastructure

Road type	Role & character	Pedestrian infrastructure	East Leppington roads
Arterial	A high-capacity road that carrying large volumes of traffic (35k+ vehicles per day) between urban areas. Vehicle speed of up to 80km/hr.	Wider off-street footpath	Camden Valley Way
Sub-arterial road	Mediation between regional traffic and local traffic routes and link arterial roads with town centres. Traffic loads are 10k-35k vehicles per day. Vehicle speed of up to 70km/hr.	Footpaths with a minimum width of 1.8 metres.	Denham Court Road, shown in purple on **Figure 4.2**
Collector	Service and link neighbourhoods and towns. Collector streets are 'connecting' streets and neighbourhood 'arrival' streets. Traffic loads are 3k-10k vehicles per day. Vehicle speed of up to 60km/hr.	Separate multi use paths.	Shown in blue on **Figure 4.2**
Local	Give priority to pedestrians and cyclists. Traffic loads are 1k-3k vehicles per day Designed for a vehicle speed of up to 50km/hr.	Shared pedestrian and bike and vehicular uses with continuous pedestrian and cycle paths.	All other roads shown on the Indicative Layout Plan v6.1

Source: Growth Centres Development Code, GCC, 2006

Figure 4.2 East Leppington Road Hierarchy



4.1.3.2 External

A key destination for East Leppington residents will be the Leppington town centre and railway station. Pedestrian access will be through the Leppington precinct and/or the North Leppington precinct for East Leppington residents.

A pedestrian connection along Camden Valley Way is proposed as part of the road's upgrade. It is a shared pedestrian/cyclist off-road path on the western side of Camden Valley Way.

The pedestrian connections proposed for North Leppington and Austral on arterial, transit boulevard and sub-arterial roads in the 2010 North Leppington and Austral Traffic and Transport Assessment are shown on **Figure 4.3** along with the proposed pedestrian footpath as part of the Camden Valley Way upgrade. The Traffic & Transport Assessment also indicated a sub-arterial connection through the Leppington precinct which is illustrated as well. The Growth Centres Development Code stipulates that all Growth Centre precinct roads should provide pedestrian facilities. It can be assumed that the pedestrian network for Leppington and Leppington North will include appropriate pedestrian infrastructure in line with the Growth Centres Development Code, including all collector and local roads which require shared pedestrian and bike and vehicular uses with continuous pedestrian and cycle paths.

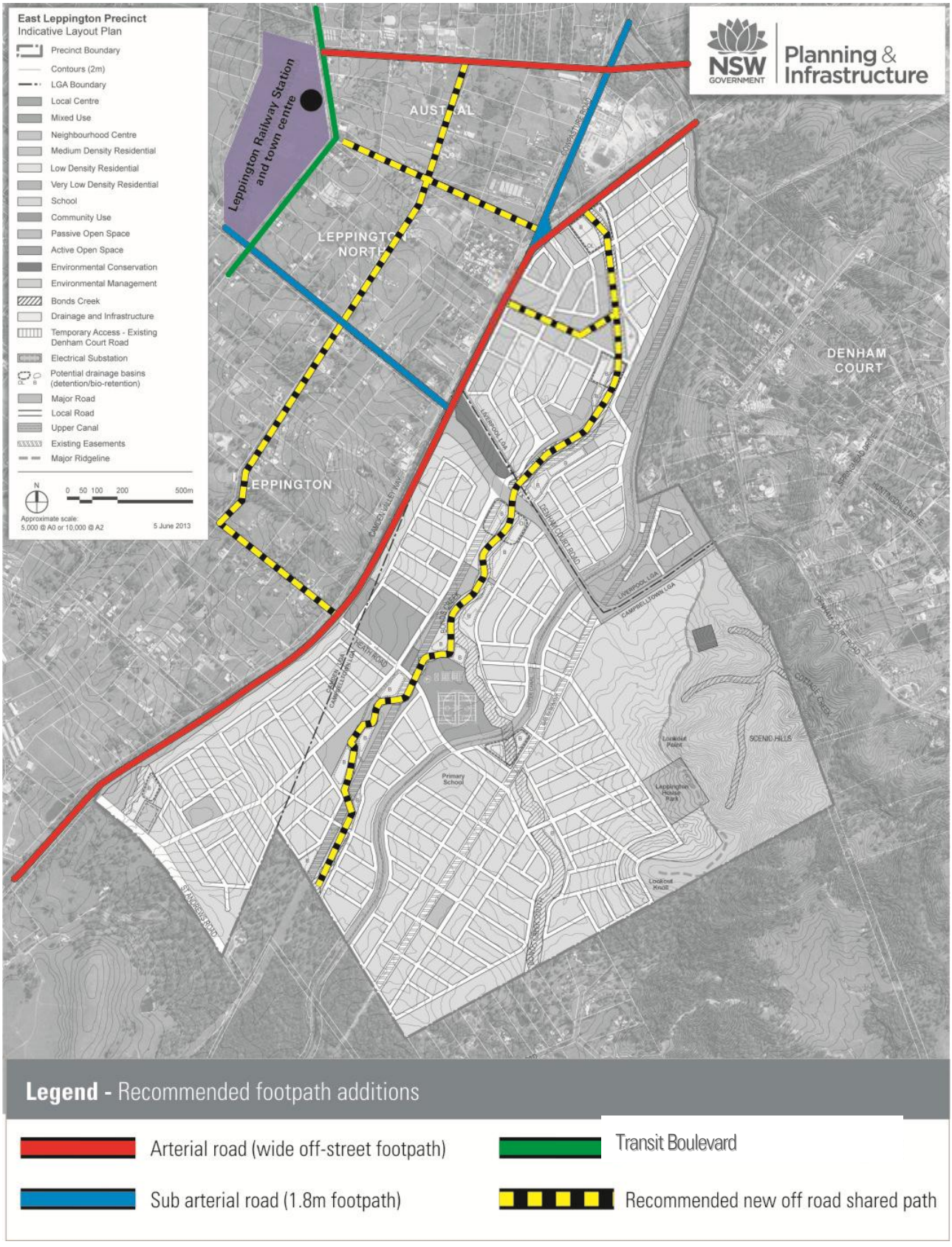
4.1.4 Opportunities for further improvements

The northern tip of the East Leppington precinct is around 1500 metres from the new Leppington Railway Station and town centre, providing an opportunity for people to walk if appropriate pedestrian infrastructure is provided. To ensure that East Leppington residents can connect easily and safely with these destinations on foot, additional pedestrian connections are recommended as shown in **Figure 4.3** in yellow and black, in addition to the already proposed key pedestrian infrastructure.

Safe and direct crossing of Camden Valley Way will be key to providing East Leppington residents with pedestrian access to destinations further afield. This can be achieved with signalised pedestrian crossings at the proposed intersection as part of the Camden Valley Way upgrade.

Dedicated green travel recommendations for the East Leppington precinct related to walking are detailed in **Section 7**.

Figure 4.3 Recommended additions to the proposed external pedestrian network

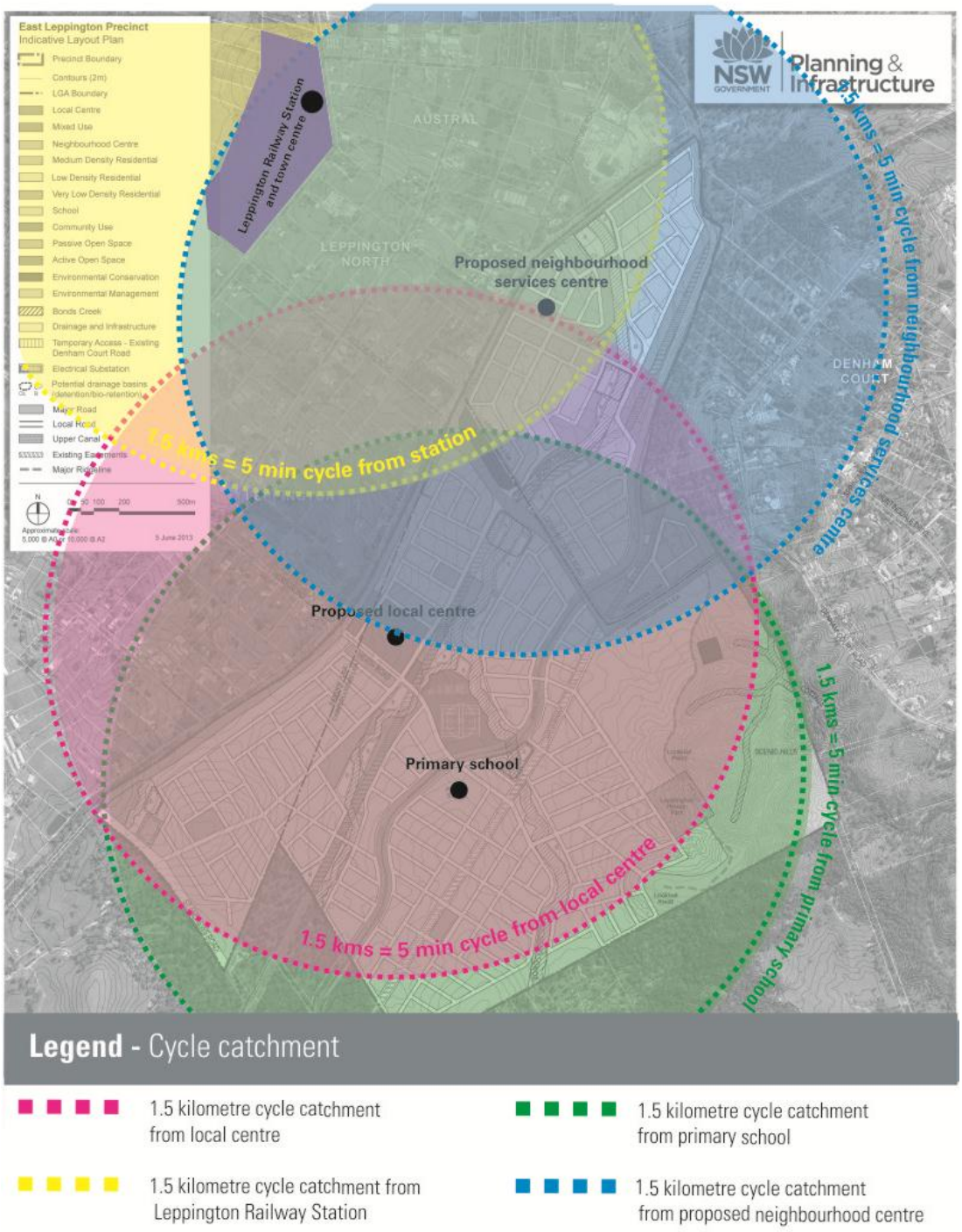


4.2 CYCLING

4.2.1 Cycling Catchment

A trip destination's cycling accessibility can be demonstrated by looking at its cycling catchments. The NSW Government's 'Planning Guidelines for Walking and Cycling' (2004) define a cycling catchment of five minutes as 1.5 kilometres. The cycling catchments for East Leppington's local centre and the Leppington Railway Station are shown in **Figure 4.4**.

Figure 4.4 East Leppington cycling catchments: local centre and Leppington Railway Station



4.2.2 Existing cycling infrastructure

4.2.2.1 Internal

The undeveloped site has no existing cycling facilities.

4.2.2.2 External

There is currently no connected cycle network providing access to the East Leppington precinct. There are no existing cycle paths on Camden Valley Way, St Andrews Road or Denham Court Road.

4.2.3 Planned infrastructure

4.2.3.1 Internal

The *Growth Centres Development Code, GCC (2006)* details guidelines for the provision of pedestrian infrastructure in the Growth Centre precincts. A summary of the planned cycling infrastructure for the East Leppington precinct is detailed in **Table 4.1**.

Table 4.2 Road hierarchy and cycling infrastructure

Road type	Role & character	Cycle infrastructure	East Leppington Roads
Arterial	A high-capacity road that carrying large volumes of traffic (35k+ vehicles per day) between urban areas. Vehicle speed of up to 80km/hr.	Off-street cycle path	Camden Valley Way
Sub-arterial road	Mediation between regional traffic and local traffic routes and link arterial roads with town centres. Traffic loads are 10k-35k vehicles per day. Vehicle speed of up to 70km/hr.	On street cycle path of 1.8 metres width in each direction	Denham Court Road, shown in purple on **Figure 4.2**
Collector	Service and link neighbourhoods and towns. Collector streets are 'connecting' streets and neighbourhood 'arrival' streets. Traffic loads are 3k-10k vehicles per day. Vehicle speed of up to 60km/hr.	On street bike lanes or separate multi use paths	Shown in blue on Figure 4.2
Local	Give priority to pedestrians and cyclists. Traffic loads are 1k-3k vehicles per day Designed for a vehicle speed of up to 50km/hr.	Shared pedestrian and bike and vehicular uses with continuous pedestrian and cycle paths.	All other roads shown on the Indicative Layout Plan v6.1

Source: Growth Centres Development Code, GCC, 2006

4.2.3.2 External

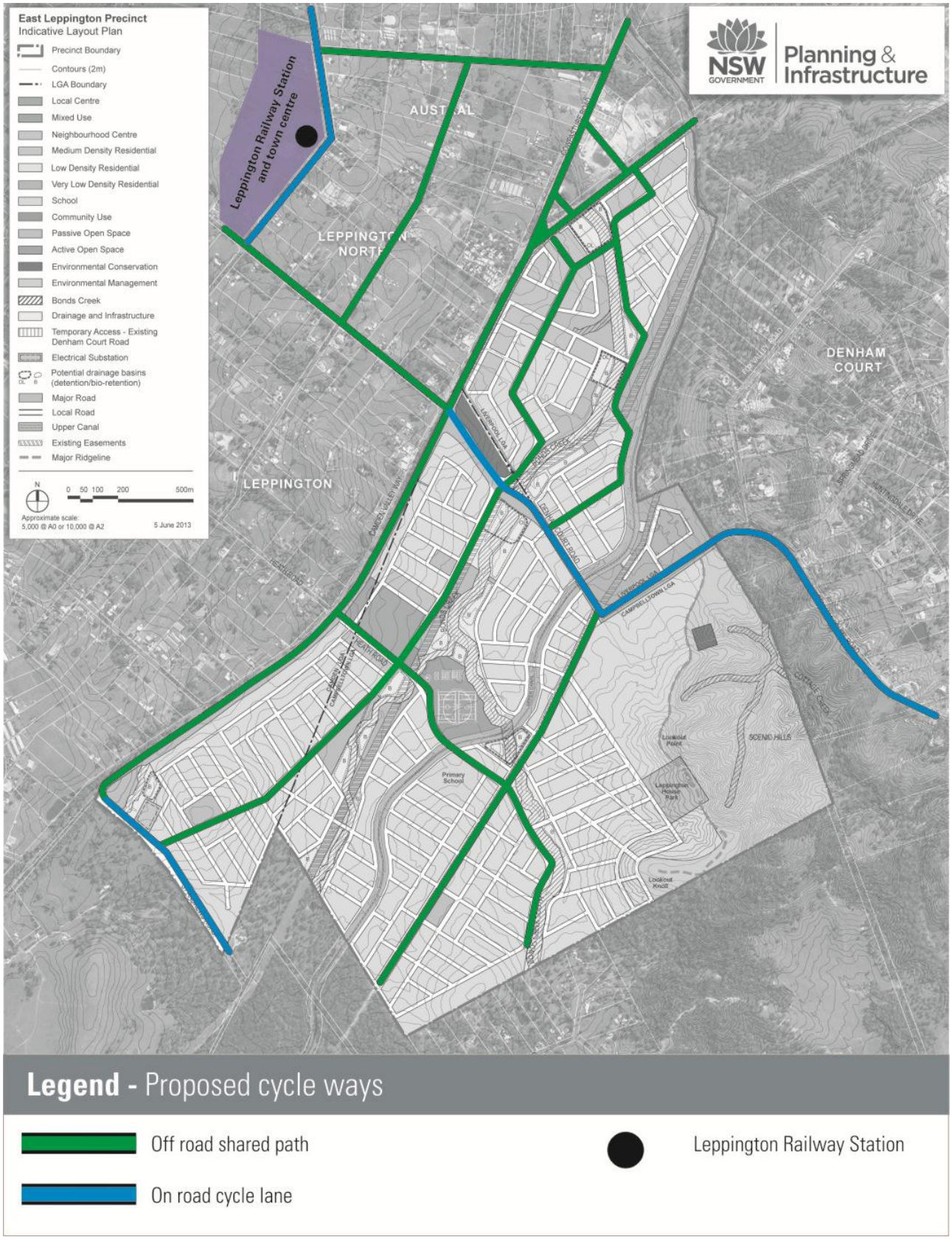
As with pedestrians, a key destination for East Leppington cyclists will be the Leppington town centre and railway station. Cycle access will be through Leppington precinct and/or North Leppington precinct for East Leppington residents.

The Growth Centres Development Code stipulates the different types of cycle facilities required for all Growth Centre precincts by road type. It can be assumed that the cycle network for Leppington will include appropriate cyclist infrastructure in line with the Growth Centres Development Code.

A cycling route along Camden Valley Way is proposed as part of the road's upgrade. It is a shared pedestrian/cyclist off-road path on the western side of Camden Valley Way.

The Draft Austral and Leppington North (ALN) Precincts Transport Assessment details the cycle routes proposed for the development of those precincts, shown in **Figure 4.5**, along with the Camden Valley Way share path.

Figure 4.5 Proposed future external cycle ways



4.2.4 Opportunities for further improvement

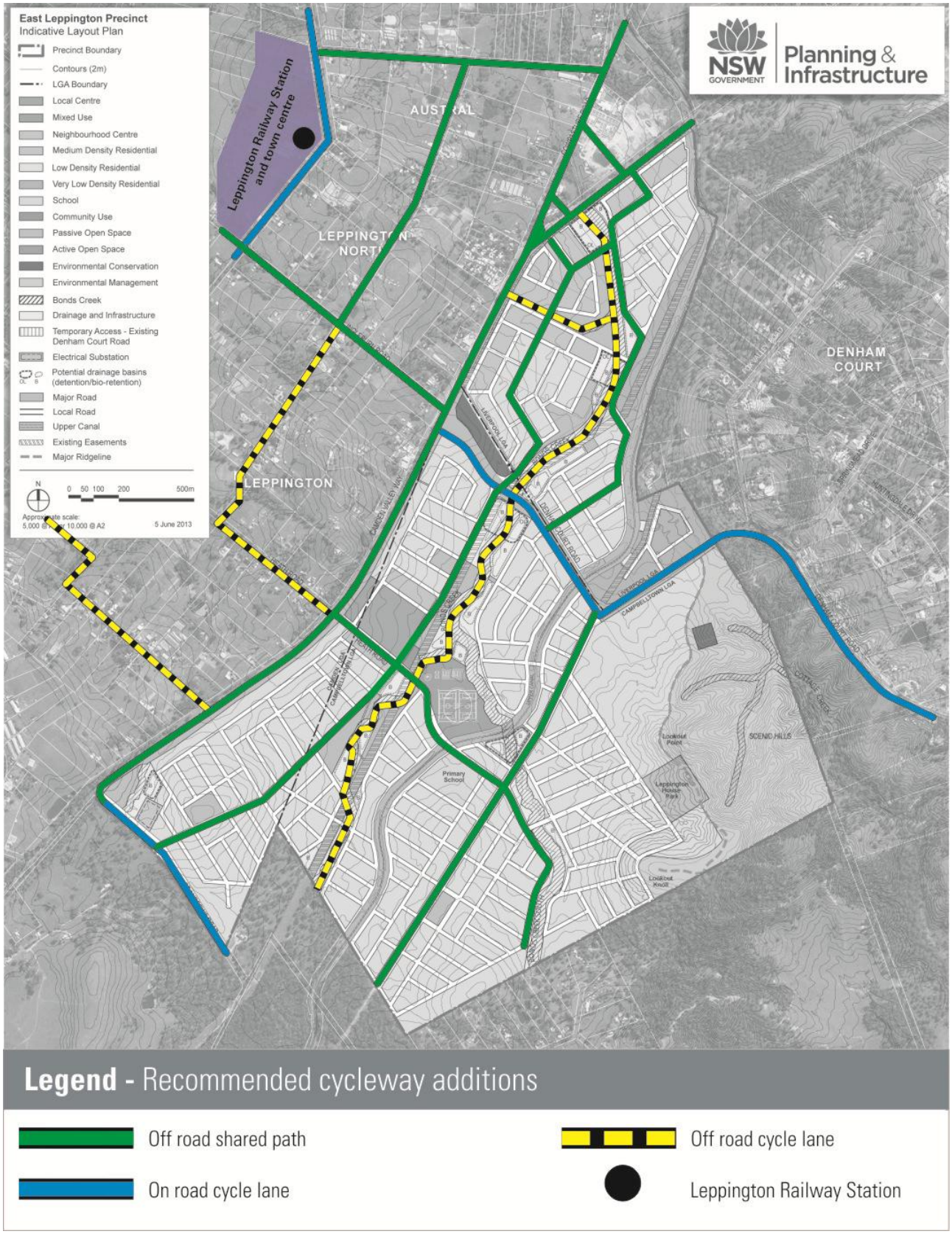
The northern tip of the East Leppington precinct is around 1500 metres from the new Leppington Railway Station and town centre, translating to a short cycle trip of around five minutes if well-connected and accessible cycling infrastructure is provided.

To ensure that appropriate cycling connections and facilities are provided to connect East Leppington with the Leppington town centre and railway station by bike, additional cycle ways are recommended to provide connection with the planned and proposed cycle ways that will be provided as part of the Camden Valley Way upgrade and the development of Austral and North Leppington.

Figure 4.6 demonstrates the recommended cycle links that should be provided between East Leppington and the Leppington town centre and train station. These new connections have been added to the existing planned routes as part of the Austral and North Leppington development. An off road cycling route through the East Leppington precinct along the riparian corridor is also proposed to provide a safe and pleasant riding experience with minimal road crossings.

Detailed green travel recommendations for the East Leppington precinct related to cycling are detailed in **Section 7**.

Figure 4.6 Recommended additional cycleway connections



4.3 PUBLIC TRANSPORT

4.3.1 Existing public transport network

The East Leppington precinct is currently not well serviced by existing public transport networks due to its undeveloped nature.

4.3.1.1 Trains

The closest railway station to East Leppington is Ingleburn; located 5.5km from site. It is serviced by three CityRail lines:

> Airport & East Hills Line
> South Line
> Cumberland Line

The Ingleburn Railway Station is circled in blue in **Figure 4.8** below along with the new Leppington Railway Station currently under construction in red. Once constructed, Leppington will be the closest railway station to the site.

Figure 4.7 Current and future rail network

Services to and from Ingleburn Railway Station, and the station's facilities, are outlined in Table 4.3 below.

Table 4.3 Existing train services

Railway lines	Direction	Period	Service frequency	Destinations	Park & Ride facilities	Taxi Rank	Bike facilities	Bus stop nearby
Airport & East Hills Line South Line Cumberland Line	City-bound	Mon – Fri AM	10 - 15 minutes	City, Airport, Macarthur, Campbelltown	Yes	Yes	Yes	Yes
		Mon – Fri PM	15 minutes					
		Saturday	10 - 15 minutes					
		Sunday	10 - 15 minutes					
	South-bound	Mon – Fri AM	10 - 20 minutes					
		Mon – Fri PM	10 -15 minutes					
		Saturday	10 - 15 minutes					
		Sunday	10 - 15 minutes					

4.3.1.2 Buses

The East Leppington site is currently serviced by two bus routes; the routes, bus stops, frequency of services and destinations for each service are provided in the table below. The existing services and bus stop locations are shown in **Table 4.4**.

Table 4.4 Existing bus routes

Routes	Period	Service frequency	Number of bus stops within 400m	Destinations
857, 856 (Busabout)	Mon – Fri AM	5:56, 6:52, 7:37, 7:40, 9:00, 9:17, 10.22,11.20	1 (Corner of Camden Valley Way and Ingleburn Rd, adjacent to the Leppington Hotel)*	Liverpool Railway Station
	Mon – Fri PM	1.22, 2.34, 4.32, 5.36		
	Saturday	7.42,8.35,10.37 11.35, 1.37 2.35, 4.37, 5.37		
	Sunday	8.08, 10.06, 11.04, 1.06, 4.06		
857, 856 (Busabout)	Mon – Fri AM	6.58, 7.50 , 8.42, 9.43, 10.43, 12.43		Narellan Town Centre
	Mon – Fri PM	1.43, 2.43, 3.53 4.17 5.02, 6.03, 6.31		
	Saturday	7.59, 9.58 10.58, 12.58, 1.58, 3.58, 4.58		
	Sunday	9.41, 12.41, 1.41, 3.41, 4.41		

4.3.2 Proposed public transport network

4.3.2.1 Rail

To support the population growth planned for south-west Sydney, the NSW Government announced a new rail line, the South West Rail Link, in 2009 connecting the South West Growth Centre precincts with Glenfield Railway Station. The new South West Rail Link is nominated as major project by the 2010 Metropolitan Plan Sydney.

The works include a major upgrade of Glenfield Station and bus/rail interchange, a new twin track passenger rail line from Glenfield to Leppington via Edmondson Park and a train stabling facility at Rossmore. Construction of the South West Rail Link commenced at Glenfield in August 2009.

It will incorporate the following features and is expected to commence operations in 2016.

> A new 11.4-kilometre rail line from Glenfield to Leppington.
> Two new stations located at Edmonson Park and Leppington, including 400 and 850 commuter car parking spaces respectively.
> Access to Penrith, the City and Campbelltown.

Leppington Railway Station will be located around 1.7 kilometres from the northern tip of the East Leppington site and will initially be served by 4 trains per hour with the potential for more in peak periods.

4.3.2.2 Bus

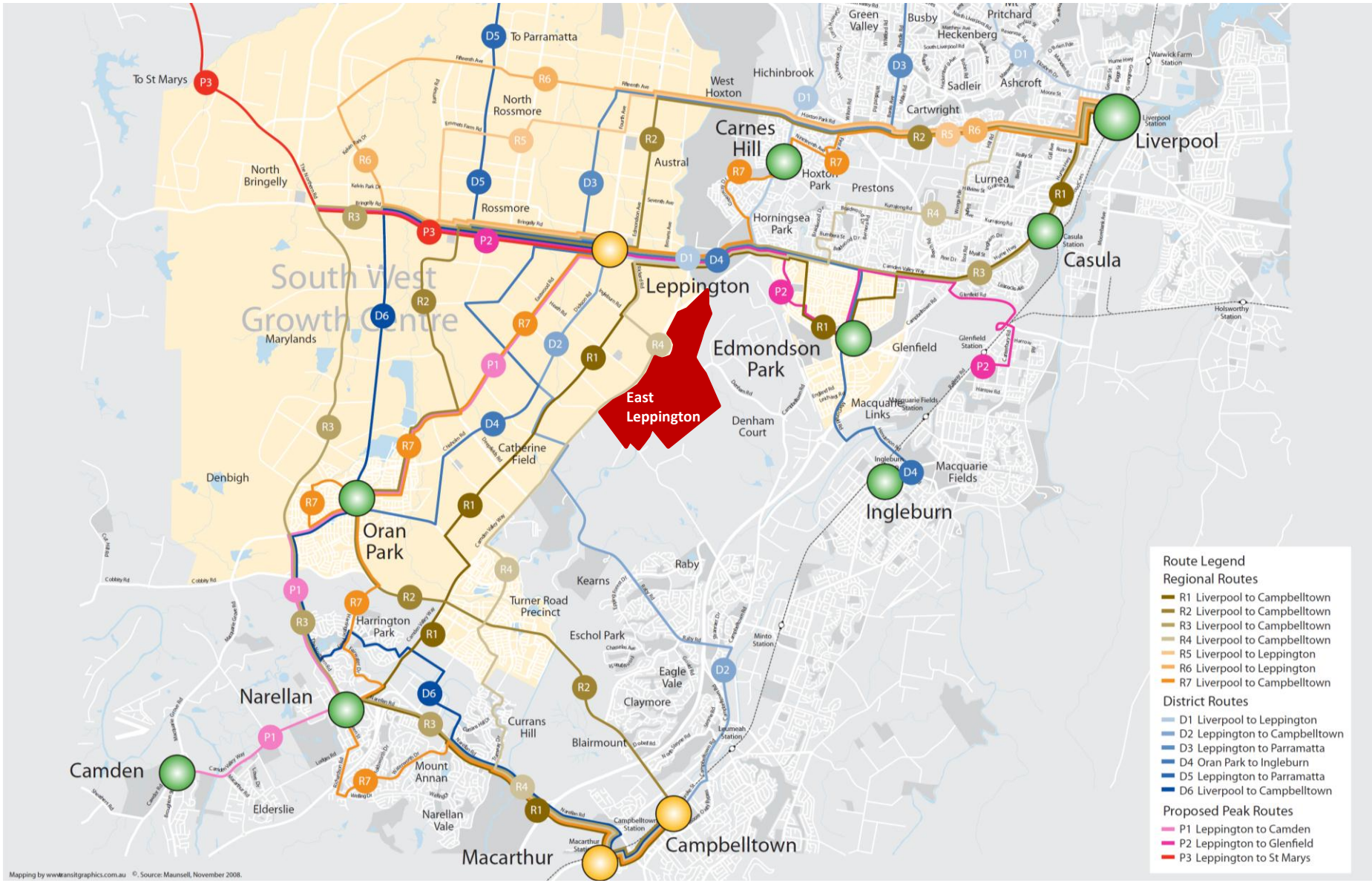
The South West Sector Bus Servicing Plan Technical Paper, 2009 (AECOM) proposes a 'long-term' bus network that consists of seven regional, six district and three peak hour only routes and is designed to demonstrates how new bus routes can link the proposed major centres and increase accessibility throughout each of the South West Growth Centre precincts. Of the seven regional routes proposed, only Regional Route 4 will service the site, along Camden Valley Way and this route has the following characteristics:

Regional Route 4

> (Liverpool to Campbelltown): Liverpool-Lurnea-Prestons-Leppington-Currans Hill-Macarthur-Campbelltown.
> Connection with Casula and Liverpool railway stations, however some sections of the route are in-direct.

The proposed long term bus network is shown in **Figure 4.9** with the East Leppington precinct shown in red. The proposed service frequency for Route 4 is provided in **Table 4.5** following the bus network map.

Figure 4.9 Proposed long term bus network: Regional, district and peak hour routes



Source: South West Sector Bus Servicing Plan

Table 4.5 Long term bus network: Route 4 indicative service frequency

Route	Description	Minutes between services									
		Sun (6:30-18:00)	Sun Evening (18:00-21:00)	Early AM (before 6:00)	AM Peak (0:00-9:30)	Midday (9:30-15:00)	Shoulder PM Peak (15:00-17:00)	PM Peak (17:00-19:00)	Evening (19:00-24:00)	Saturday (5:30-18:00)	Sat Evening (18:00-24:30)
Route 4	Liverpool to Campbelltown	30		30	15	30	15	15	60	30	60
	Leppington to Campbelltown				15		15	15			
	Leppington to Liverpool				15		15	15			

4.3.3 Opportunities for further improvement

To ensure public transport is a viable travel option for East Leppington residents, the following range of measures should be considered as part of the precinct planning.

4.3.3.1 Integrated transport services

The NSW Government recognises the importance of providing integrated and coordinated public transport services at all stages of decision making. To encourage East Leppington residents to take advantage of the new rail service on the South West Rail Link they will need to be provided with convenient access options and good interchange facilities.

Direct bus service

Frequent and direct bus services linking East Leppington to the Leppington Railway Station are required, proposed services are detailed in **Sections 4.3.3.2** and **4.3.3.3** below.

Pedestrian path

Although the Leppington Railway Station will be located outside of the generally accepted 800 metres walking catchment for railway stations, a safe and direct pedestrian route to the Leppington Town Centre will encourage some residents to access the train station by foot. The footpath should be generally aligned with the road network and include signalised crossings where required to facilitate safe crossing movements for pedestrians and cyclists, as described in **Section 4.1.4**.

Cycling route

A safe and direct cycling route from the site to Leppington Railway Station will provide another alternative and healthy transport mode that East Leppington residents can use to access rail services. The cycle route should have coherence, directness, safety, attractiveness and comfort to adhere to the principles outlined in the *NSW Bicycle Guidelines*. Well-located and weather-protected cycling storage facilities should be provided at Leppington Railway Station. Proposed additional cycling routes are described in **Section 4.2.4**.

Interchange facilities

The Leppington Railway Station should facilitate easy transfer between transport modes, with facilities for cyclists, arriving and departing bus passengers, taxi customers, kiss & ride and park & ride users.

4.3.3.2 District bus route servicing East Leppington

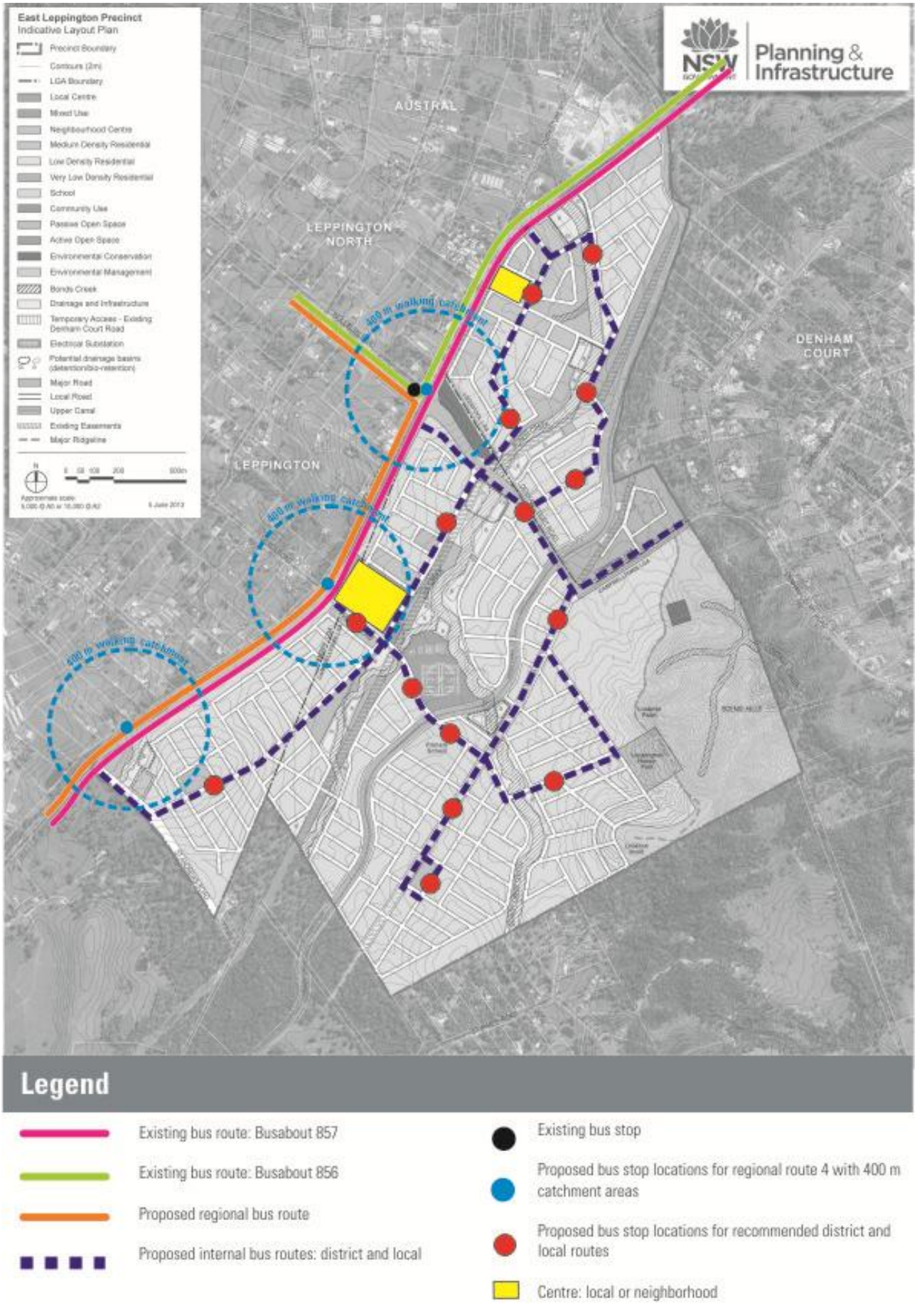
The South West Sector Bus Servicing Plan (SWS Bus Plan) defines district routes as ones that “link a residential area to with the nearest district centre and other mode operating to the nearest regional centre (e.g. train station or ferry wharf), or the nearest regional centre”. A district route servicing the East Leppington precinct is necessary to provide residents with a link to the Leppington Town Centre, Leppington Railway Station and other district and regional destinations. Potential routes for such a service are identified in **Figure 4.10**.

4.3.3.3 Local bus route servicing East Leppington

The SWS Bus Plan defines local routes as “typically ‘shopper hopper’ services which only operate at very low frequencies, generally two-hourly or less, during off-peak periods to meet a specific need”. A local route providing services within the East Leppington precinct with connection to the precinct’s local and neighbourhood centres is an important service to provide a viable alternative to private vehicles. The local route could also connect to local schools and the Leppington Town Centre. Potential routes for such a service are identified in **Figure 4.10**.

Detailed green travel recommendations for the East Leppington precinct related to public transport are detailed in **Section 7**.

Figure 4.10 Proposed and potential bus networks



4.4 LOCAL ROAD NETWORK

4.4.1 Existing road network

4.4.1.1 Arterial and sub-arterial roads

There are a number of arterial and sub-arterial roads that are within the study area. These include Camden Valley Way, Denham Court Road and Cowpasture Road.

Camden Valley Way is a road with regional significance that provides a link between Hoxton Park and Narellan. The road is a single carriageway with two lanes of width 15m, with a speed limit of 60km/hr. The AADT for the road is 20,000 vehicles. Residential and business accesses are provided along the length of the road. Majority of intersections along the length are either Give Way or Stop controlled priority intersections.

Denham Court Road serves a sub-arterial function linking Denham Court, Ingleburn and Leppington. The AADT is 7,000 vehicles. Denham Court Road is a two lane road of width 8.9m with a speed limit of 70km/hr. The road provides residential and business access and majority of intersections along the road are priority controlled.

Cowpasture Road is a linking road between Camden Valley Way and Bringelly Road, and serves a sub-arterial function despite its low AADT of 3,000 vehicles. Cowpasture Road is accessed by residential properties, but does not currently serve any local or collector roads. Cowpasture Road is a two lane road of width 6.5m with a speed limit of 70km/hr.

4.4.1.2 Collector and local roads

The following roads provide the majority of direct access for existing residential properties and businesses.

Ingleburn Road is a Collector road that serves the suburb of Leppington by connecting local roads to Camden Valley Way. The road is a two lane road of width 6.5m with a speed limit of 80km/hr.

Heath Road is a collector road that also serves the suburb of Leppington and connects to Camden Valley Way. The road is a two lane road of width 6.5m with a speed limit of 80km/hr.

St Andrews Road is a local road that serves a number of properties to the south of the proposed development. The road is two lane road of width 5m with no published speed limit. St Andrews Road is a no-through road.

4.4.2 Future road network

The internal road hierarchy planned for the East Leppington precinct is illustrated in **Figure 4.2**.

4.4.3 Opportunities for further improvement

Detailed green travel recommendations for the East Leppington precinct related to the road network are detailed in Section 7.

4.5 PARKING

The parking provisions for each road classification are outlined in **Table 4.6**.

Table 4.6 Parking provision by road classification

Road type	Parking provisions
Arterial	None. Parking to be limited to service roads
Sub-arterial	None. Access for parking should be provided through rear lanes if residential dwellings are provided on the frontage
Collector	Yes
Local	Yes

4.5.1 Opportunities for further improvement

Detailed green travel recommendations for the East Leppington precinct related to parking are detailed in Section 7.

5 DEMOGRAPHICS AND TRAVEL BEHAVIOUR

This section presents existing trends and community profile information to gain an understanding into the anticipated profile of the future residents and their travel behaviour. As the proposed East Leppington precinct is currently undeveloped, there is no existing demographic or travel behaviour data for the area. This analysis instead investigates the data for the three LGAs that the East Leppington precinct spans, providing an insight into the likely demographics and travel behaviour of the precinct's future residents.

5.1 SOUTH WEST GROWTH CENTRE DEMOGRAPHICS

General demographics data for the three LGAs is provided in **Table 5.1** below, outlining a overview of the typical residents, including age, family structure, income and participation in the labour force, that can be expected to move to East Leppington.

Table 5.1 South West Growth Centre demographics

	Camden LGA		Campbelltown LGA		Liverpool LGA		
	Number	%	Number	%	Number	%	Sydney SD %
Key Statistics							
Males	24,331	51.0	70,333	49.2	81,877	49.7	**49.3**
Females	25,314	49.0	72,744	50.8	82,726	50.3	**50.7**
Total population	49,645	100.0	143,077	100.0	164,603	100.0	**100.0**
Australian citizens	44,978	90.6	122,935	85.9	137,950	83.8	**82.6**
Indigenous population	650	1.3	3,831	2.7	2,194	1.3	**1.1**
Age Structure							
Infants 0 to 4 years	4,235	8.5	10,656	7.4	13,600	8.3	**6.6**
Children 5 to 14 years	8,450	17.0	23,363	16.3	27,325	16.6	**13.0**
Adults 15 to 64 years	32,742	66.0	98,447	68.8	110,122	66.9	**68.2**
Mature adults 65 to 84 years	3,681	7.4	9,606	6.7	12,397	7.5	**10.7**
Senior citizens 85 years and over	537	1.1	1,005	0.7	1,161	0.7	**1.6**
Total persons	49,645	100.0	143,077	100.0	164,603	100.0	**100.0**
Families							
Couple without child(ren)	3,861	25.5	9,591	25.3	10,114	24.0	**33.2**
Couple with child(ren)	7,664	56.6	31,634	50.7	24,145	57.2	**49.3**
One parent family	1,892	14.0	8,558	22.6	7,349	17.4	**15.6**
Total families	13,539	100.0	37,900	100.0	42,193	100.0	**100.0**
Dwelling Structure							
Separate house	15,274	94.1	38,507	80.5	40,237	77.0	**57.1**
Medium density	546	3.4	7,361	16.4	5,196	9.9	**17.4**
High density	272	1.7	1,239	2.9	6,587	12.6	**17.3**
Other / not stated	143	0.9	52	0.1	205	0.4	**0.8**
Total dwellings	16,973	100.0	45,747	100.0	55,065	100.0	**100.0**
Housing Tenure							
Owned	4,046	24.9	10,806	22.7	11,943	22.9	**30.1**
Purchasing	8,132	50.1	19,161	40.1	20,414	39.1	**31.1**
Renting	3,069	18.9	14,390	30.3	15,165	29.0	**29.7**

	Camden LGA		Campbelltown LGA		Liverpool LGA		Sydney SD %
	Number	%	Number	%	Number	%	
Birthplace							
Australia	39,606	79.8	95,539	66.8	88,531	53.8	**60.4**
Overseas born	7,679	15.5	37,495	26.2	62,167	37.8	**31.7**
Not stated	2,360	4.7	10,043	7.0	13,905	8.4	**7.9**
Mainly English speaking countries	3,892	7.8	7,119	5.0	8,839	5.4	**7.8**
Non-English speaking backgrounds	3,787	7.6	30,376	21.2	53,328	32.4	**23.9**
Total persons	49,645	100.0	143,077	100.0	164,603	100.0	**100.0**
Household Income (gross weekly)							
Less than $350	5,731	33.1	21,231	41.2	22,695	40.2	**12.8**
$350 to $999	2,727	15.7	10,362	20.1	11,733	20.8	**24.2**
$1,000 and over	8,877	51.2	19,942	38.7	22,097	39.1	**51.7**
Total households	17,335	100.0	51,535	100.0	56,525	100.0	**100.0**
Labour Force							
Total employed	24,754	96.1	63,253	92.5	67,718	92.3	**94.7**
Total unemployed	997	3.9	5,095	7.5	5,213	7.7	**5.3**
Total labour force	25,751	100.0	68,348	100.0	72,931	100.0	**100.0**

5.2 TRIP PURPOSE

Trip purpose data was obtained for the three LGAs from the 2007 Household Travel Survey (HTS). Details of the proportional split of all trips by trip purposes in each LGA are shown in **Table 5.2**. The survey demonstrates generally similar trip purposes between the LGAs with the following notable results and exceptions:

> The most occurring trip purpose for all three LGAs was for the purpose of ferrying passengers.
> Social/recreation trips were the second most occurring trips in all LGAs followed by commuting trips and then shopping.
> Social/recreation trips represented a higher proportion of trips in Campbelltown and Liverpool LGAs (20% and 19%) than they did in Camden (16%).
> Shopping trips represented a higher proportion of trip in Liverpool LGA (16%) than they did in Camden and Campbelltown LGAs (13% and 14%).

Table 5.2 Trip purposes by LGA, 2007

Trip Purpose	% of Total Trips		
	Camden LGA	Campbelltown LGA	Liverpool LGA
Commute	14%	15%	15%
Work related business	11%	11%	8%
Education/childcare	12%	9%	11%
Shopping	13%	14%	16%
Personal business	6%	7%	7%
Social/recreation	16%	20%	19%
Serve passenger	25%	22%	22%
Other	2%	2%	2%

5.3 CAR OWNERSHIP

Car ownership levels in the three LGAs were extracted from 2006 Census data. Car ownership is on average significantly lower in Camden than Campbelltown, Liverpool and the Sydney average. However, the Camden car owning households are more likely than to own multiple cars than the Sydney average. Camden and Liverpool LGAs had multiple car households equating to over 60% of households, compared with Campbelltown at 46.9% and the Sydney average of 41.7%. Full details of 2006 car ownership levels comparing the three LGAs with the Sydney metropolitan average are shown in **Table 5.3**.

Table 5.3 Car ownership levels

Car Ownership	Camden LGA	Campbelltown LGA	Liverpool LGA	Sydney SD
No Vehicle	3.6%	11.3%	10.9%	12.6%
1 Vehicle	25.7%	37.9%	32.5%	36.4%
2 Vehicles	46.2%	32.6%	36.3%	30.2%
3 Vehicles or more	21.2%	14.3%	15.8%	11.5%
Not stated	3.2%	3.9%	4.5%	9.3%
Total	100%	100.0%	100.0%	100.0%

5.4 MODE OF TRAVEL

5.4.1 Definitions

Mode of travel is defined as the method of transport that people use to undertake various activities throughout the day. Mode split is the proportion of people using particular modes of transport. **Table 5.4** outlines the trip mode classification system used in the examination of mode split data in this strategy.

Table 5.4 Travel Mode Classifications

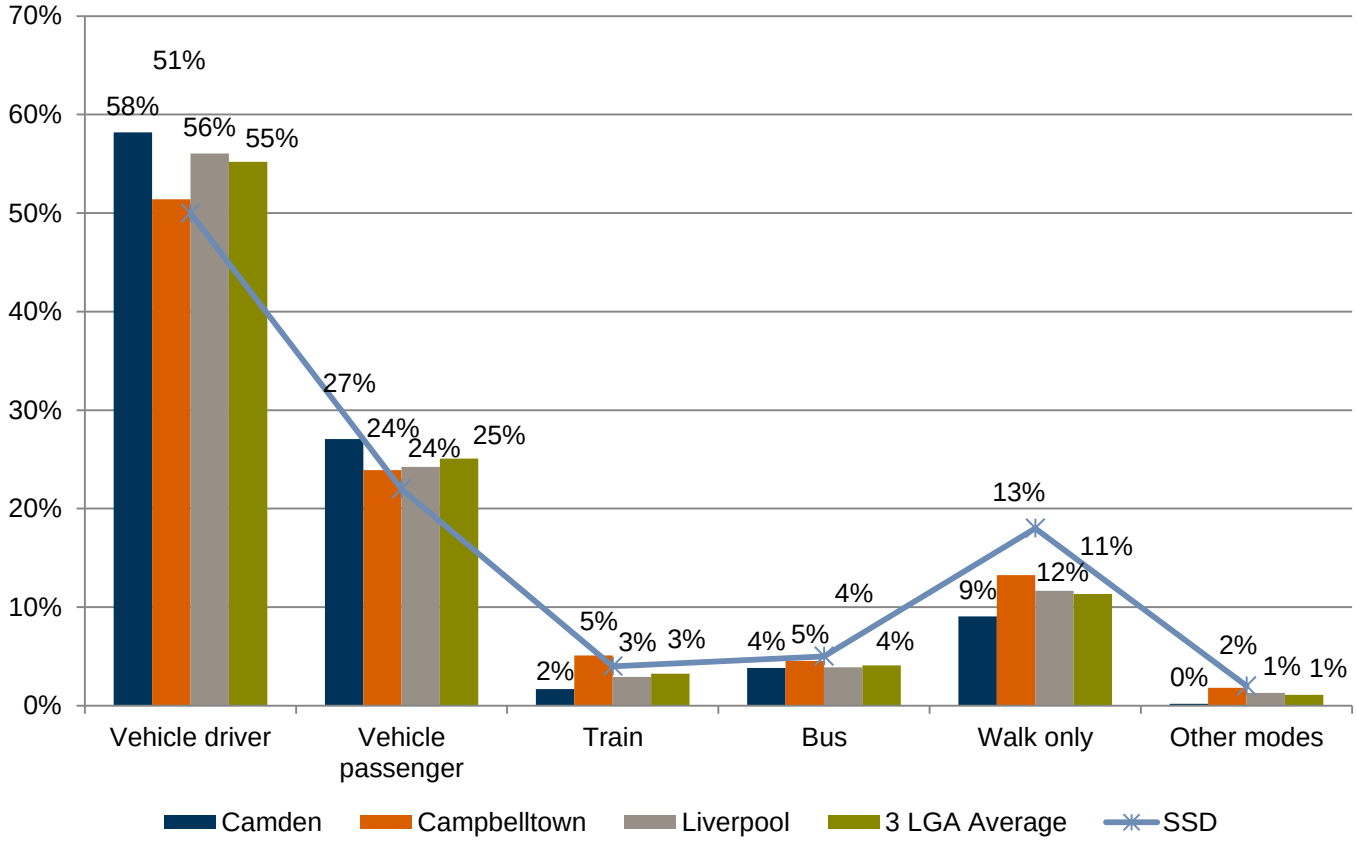
Travel Category	Travel Mode
Public Transport	Train
	Bus
	Other Public Transport (including taxi)
Active Transport	Bicycle
	Walking
Private Motor Vehicle	Car, as driver
	Car, as passenger
	Motorbike/scooter
	Truck
Other	Other

The assessments of mode of travel has excluded from the analyses those people who worked from home, did not work that day, or did not respond.

5.4.2 Mode Share – All Trip Purposes (Household Travel Survey)

Mode share data was analysed for all trip purposes based on the Household Travel Survey (HTS) 2007/08 to determine the typical modal split for all trips originating from each LGA in this period, shown in **Figure 5.1** along with the average for the three LGAs and the Sydney Statistical Division.

Figure 5.1 Mode share - all trip purposes by LGA, 2007/08



The majority of typical daily trips made in 2007/08 by Camden LGA residents were by private motor vehicles (85%), either as a driver or passenger. This was followed by walking trips (9%), while public transport accounted for only 6% of all trips. The combined sustainable travel (active transport and public transport) modal split amounted to 15% of all trips.

The majority of typical daily trips made in 2007/08 by Campbelltown LGA residents were by private motor vehicles (75%), either as a driver or passenger. This was followed by walking trips (13%), while public transport accounted for 10% of all trips. The combined sustainable travel (active transport and public transport) modal split amounted to 23% of all trips.

The majority of typical daily trips made in 2007/08 by Liverpool LGA residents were also by private motor vehicles (80%), either as a driver or passenger. This was followed by walking trips (12%), while public transport accounted for 7% of all trips. The combined sustainable travel (active transport and public transport) modal split amounted to 19% of all trips.

The three East Leppington LGAs are more dependent on private vehicle travel than the Sydney metropolitan average which has a car travel mode share of 71%. Campbelltown is the least reliant on cars and more likely to undertake walking trips than Camden or Campbelltown. Car trips as a passenger are undertaken the most in Camden at 27%, higher than both Campbelltown and Liverpool and the Sydney metropolitan average of 22%.

5.4.3 Mode Share - Journey to Work (ABS Census)

Data for Journey to Work (JTW) trips was analysed from the 2006 Census for the three LGAs to provide a picture of the area's existing commuting behaviour. JTW data is based on the 2006 Census question: 'How did the person get to work on Tuesday, 8 August 2006?' and relates only to persons aged 15 years and over.

The Census data considered trips to work within each LGA as an 'origin' (residents) and the LGA suburb as a 'destination' (employees). As there are no major employment land uses planned for the East Leppington precinct, the 'origin' data is most useful since it relates to those living in the area.

5.4.3.1 Journey to Work

Table 5.5 shows the typical JTW mode share data for residents of each LGA. Travel to work by private vehicle accounted for the majority of all work travel, highest in Camden with 86% of people travelling by car as a driver or passenger, followed by Liverpool at 80% and Campbelltown at 76%.

Of the work trips recorded from each of the LGAs, Campbelltown residents were most likely to travel by public transport to work, 19% across train and bus trips compared with 8% for Camden residents and 13% for Liverpool residents. Walking and cycling trips were poorly represented across all LGAs at between 2-3%.

Table 5.5 Mode Share of Trips to Work

Mode Share of Trips to Work	Train	Bus	Car driver	Car passenger	Truck	Motor bike	Bicycle	Other mode	Walked only	Total trips
Camden	7%	1%	80%	6%	3%	1%	0%	0%	2%	100%
Campbelltown	18%	1%	68%	8%	2%	1%	0%	0%	2%	100%
Liverpool	11%	2%	72%	8%	3%	0%	0%	1%	3%	100%
Sydney SSD	12.3%	5.4%	53.9%	5.3%	1.3%	0.5%	0.6%	16.6	4.1%	100%

5.4.4 Employment Location

Analysis of the top ten employment locations based on the 2006 Census for each LGA revealed that the top employment location for residents of each LGA was the same LGA that they lived in; this was strongest in Campbelltown where over a third of workers living in Campbelltown LGA also worked there.

Neighbouring LGAs were also key employment destinations for residents of Camden, Campbelltown and Liverpool LGAs as well as Sydney City and Fairfield and Bankstown.

Details of employment locations for residents of each LGA are shown in Table 5.6.

Table 5.6 Top Ten Employment Locations by LGA, Census 2006

	Camden LGA residents			Campbelltown LGA residents			Liverpool LGA residents		
	Work location	Total trips	% of total trips	Work location	Total trips	% of total trips	Work location	Total trips	% of total trips
1	Camden	6,953	28%	Campbelltown	21,097	34%	Liverpool	19,068	28%
2	Campbelltown	4,183	17%	Sydney City	6,522	10%	Sydney City	5,921	9%
3	Liverpool	2,325	9%	Liverpool	6,063	10%	Unknown	5,784	9%
4	Sydney City	1,475	6%	Unknown	4,495	7%	Fairfield	5,728	9%
5	Unknown	1,392	6%	Bankstown	3,379	5%	Bankstown	4,988	7%
6	Outside GMA	1,225	5%	Outside GMA	2,751	4%	Outside GMA	3,156	5%
7	Bankstown	981	4%	Camden	2,621	4%	Parramatta	2,823	4%
8	Fairfield	925	4%	Fairfield	2,124	3%	Campbelltown	2,667	4%
9	Wollondilly	571	2%	Parramatta	1,852	3%	Holroyd	1,938	3%
10	Parramatta	568	2%	Auburn	1,264	2%	Auburn	1,794	3%

6 MODE SHARE TARGET

6.1 NSW STATE PLAN GOALS AND TARGETS

The NSW State Plan 2010 sets a broad goal (Goal 8) to "*Grow patronage on public transport by making it a more attractive choice"* for the Sydney Metropolitan Region by 2016.

6.1.1 State Plan Targets

6.1.1.1 Target 8.2. Increase the share of commuter trips made by public transport

The State Plan sets specific targets for each of the key Sydney CBDs for travel during peak hours, detailed in **Table 6.1**. Of particular relevance to East Leppington is Target 8.2.5 which sets out public transport mode share target for the Liverpool CBD. The Sydney CBD and Parramatta are also key employment destinations for the residents of the East Leppington LGAs.

Table 6.1 State Plan commuter travel targets

Destination	Baseline measurements in 2009-10: to and from during peak hours	2016 Target: to and from during peak hours
Sydney CBD	75.8%	80%
Parramatta CBD	39.6	50%
Newcastle CBD	14.5%	20%
Wollongong CBD	8.7%	15%
Liverpool CBD	15.7%	20%
Penrith CBD	20.2%	25%

6.1.1.2 Target 8.3. Increase the proportion of journeys to work by public transport in the Sydney Metropolitan Region to 28% by 2016

This is a 4% increase from the 2009-10 financial year when the proportion of journeys to work by public transport was 23.9%.

6.1.1.3 Target 8.4. Increase walking and cycling

The State Plan also sets targets for increased walking and cycling in Sydney:

> 8.4.1. More than double the mode share of bicycle trips made in the Greater Sydney region, at a local and district level, by 2016.
> 8.4.2. Increase the mode share of walking trips made in the Greater Sydney region, at a local and district level, to 25% by 2016.

These targets are based on baseline measurements from 2009-10:

> Cycling: In 2010 the mode share of bicycle trips made in the Greater Sydney region, at a local and district level was 1.8%.
> Walking: In 2009-10, the mode share of walking trips made in the Greater Sydney region, at a local and district level was 22.5%.

6.2 METROPOLITAN PLAN TARGET

The Sydney Metropolitan Plan's Transport for a Connected City section outlines a vision for Sydney's future of transport network. The Plan references the NSW State Plan's journey to work public transport mode share target of 28% of trips to work to be taken by public transport by 2016 and also sets a number of objectives to improve Sydney's sustainable transport performance.

6.3 LOCAL GOVERNMENT TARGET

6.3.1 Camden and Campbelltown Councils

Camden and Campbelltown Councils propose a number of targets as part of their combined Integrated Transport Strategy (2006). The target recommended for modal split is a 10% shift away from the private car in both *journey to work* travel (provided by the Census) and for *all trips* (provided by the Household Travel Survey) over a 10 year period. This is based on the travel modes splits, that were current at the time the strategy was developed, provided below in **Error! Reference source not found.**.

6.4 EAST LEPPINGTON TARGET

It is recommended that the East Leppington precinct sets a **mode share target of 68% for private vehicle use**, for both journey to work as well as all-purpose trips, by 2026. The central rationale for the mode share target is to strive for an accessible and active precinct with a high use of active and public transport.

The target has been determined by applying a 10% reduction to the current private vehicle usage in the three local government areas, and weighting their contribution to the East Leppington precinct target based on the percentage of the precinct that falls under their authority. This target is detailed in **Table 6.2**.

The East Leppington mode share target adopts the 10% reduction used in the 2006 Camden and Campbelltown Integrated Transport Strategy, applying it to current mode shares across all three LGAs and setting a target date of 2026 when the precinct is anticipated to be developed and inhabited.

Table 6.2 East Leppington private vehicle use mode share target

LGA	*% of East Leppington in LGA*	JTW – Current mode share - origin	HTS Current mode share - origin	Contribution to East Leppington private vehicle mode share target	
				JTW	HTS
Camden	*13%*	86%	85%	11.18	11.05
Campbelltown	*64%*	76%	76%	48.64	48.64
Liverpool	*23%*	80%	80%	18.4	18.4
			Current weighted mode share	78.2%	78.1%
		-10% Private vehicle mode share target by 2026		**68.2%**	**68.1%**

7 GREEN TRAVEL PLANS

7.1 INTRODUCTION

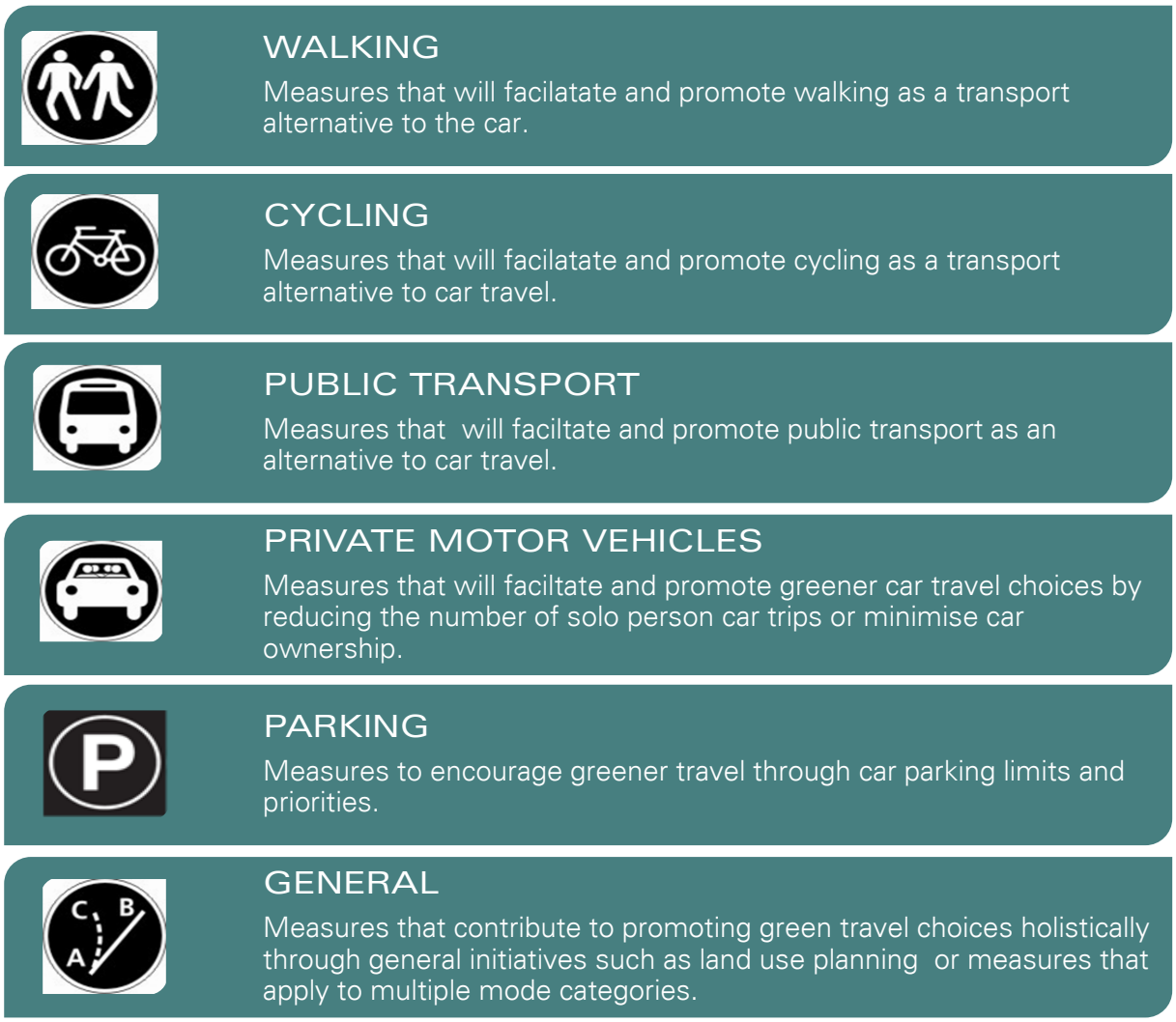
Green Travel Plans (GTPs) involve the provision of infrastructure, information, education and assistance to reduce car dependency for a community, workplace, event or other organisation. They outline strategies, activities, and the parties responsible for implementation, to influence travel behaviour towards alternative transport modes that reduce carbon pollution and improve air quality.

This section recommends a series of measures to be considered in the development of one or more East Leppington GTPs. The development and implementation of the GTP will fall under the responsibility of different parties to fund and implement, unless otherwise classified as having shared responsibility. While the significant majority of development in the East Leppington precinct is residential, separate GTPs could be developed for other land uses such as the primary school, local centre, recreational areas and neighbourhood services, dependant on need.

7.2 DEFINITIONS

7.2.1 Modes of travel

Measures are divided into modes of travel. Where a measure is related to more than one travel mode, this is also indicated. These modes of travel are:

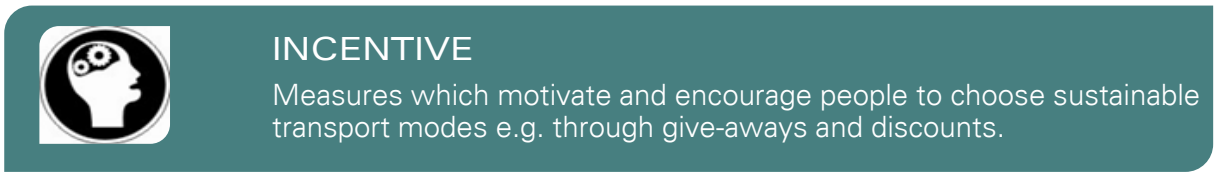


7.2.2 Measure category

Each measure is coded as one or more category; as either 'hard' measures (infrastructure & services), or 'soft' measures (education, advocacy or incentive). These measures are proposed as potential inclusions in the development of one or more Green Travel Plans for East Leppington to achieve the precinct's mode share target for private vehicles. The measures are categorised as follows:

7.2.2.1 HARD MEASURES

7.2.2.2 SOFT MEASURES



7.3 GTP MEASURES AND ACTIVITIES

East Leppington will generally require GTPs for residential areas, with specific consideration given to both the diversity of needs and number of residents. The measures and activities identified for consideration when developing residential GTPs for individual precincts are outlined in **Table 7.1** and are linked specifically to the achievement of the targets outlined in **Section** 6.

While the measures listed following are for use in the development of residential GTPs, they can also be adapted for any workplace or school GTPs if required. Parties responsible for individual measures described in this section include developers and local councils. As the East Leppington precinct sits across three local council areas, a joint working group made up of representative from all three councils may need to be created to oversee the local government's sustainable transport responsibilities in the precinct.

Table 7.1 Green Travel Plan measures and activities

No.	Primary Mode/s	Type	Strategy	Rationale/Benefits	Responsibility
WALKING & CYCLE STRATEGIES					
G 1			Improve the permeability of the neighbourhood by allowing **high quality on-street and off-street public pedestrian and cycle connections** throughout East Leppington. New pedestrian and cycle pathways need to connect to the external network that will be developed as part of the Leppington, North Leppington and Austral precincts as well as the Camden Valley Way upgrade.	A permeable pedestrian movement network would minimise walking distances through the site and accord better with peoples desires to minimise their journey length. It also promotes a more integrated development into the surrounding area by promoting movement and activity through the area. Pedestrian permeability will also encourage new residents to take advantage of those facilities in close proximity to their residence by foot.	Developer
G 2			Install **lighting** along pedestrian/cycle routes and promoting passive surveillance with appropriate **architectural design** of residential buildings fronting park areas.	Ensure active travel is an attractive mode choice through improving safety of pedestrian and cycle routes to local bus stops, shops and other destinations.	Developer / Council
G 3			Implement **way-finding signage** throughout the precinct to improve legibility. Details of sign locations, sign content and design, as well as responsibility for maintenance should be developed as the precinct planning progresses.	Way-finding signage is an essential measure which assists in promoting legibility. These measures will assist unfamiliar and new walkers and cyclists with directions, making walking and cycling an easier option.	Developer / Council
G 4			Install **way-finding signage in the neighbouring precincts**, Leppington, North Leppington and Austral to assist legibility for pedestrians and cyclists trying to locate destinations further afield such as the Leppington Railway Station or town centre.	Way-finding signage is an essential measure which assists in promoting legibility. These measures will assist unfamiliar and walkers with directions, making walking and cycling an easier option.	Developer / Council
G 5			Provide **pedestrian and cycle access** to community facilities and public areas, with an emphasis on direct and logical routes. In particular, provide pedestrian crossings of the Upper Canal to allow efficient access to walking destinations such as the school, local and neighbourhood centre, recreational space and	Provides pedestrian and cyclist accessibility within East Leppington, encouraging active transport choices.	Developer

No.	Primary Mode/s	Type	Strategy	Rationale/Benefits	Responsibility
			bus stops.		
G 6			Ensure network of footpaths and shared paths are of **sufficient width, grade, illumination and surface condition**.	Provides for a comfortable and safe walking and cycling environment.	Developer
G 7			Hold **promotional activities and special events**, such as 'walk to work day', 'cycle to work day'. On special days such as these a breakfast for participants can be organised in association with local councils with awards, prizes and recognition of local cyclists.	These activities and events will help residents to be aware of the importance of walking and its application to typical daily trips. Walking and cycle events are easy to organise and are a great way to capitalise on national and state events.	Developer / Council
G 8			**Encourage state and local government** to ensure the precinct connects with appropriate pedestrian and cycle infrastructure.	Pursuing improvements and working collaboratively with stakeholders and governments can lead to achievement of the desired pedestrian and cycle infrastructure improvements.	Developer
G 9			Provide **input into future State and Council Bike Plans** to encourage the creation of regional routes that link East Leppington to key land uses and regional centres.	Pursuing improvements and working collaboratively with stakeholders and governments can lead to achievement of the desired cycle infrastructure improvements.	Developer
G 10			**High quality bike parking** should be placed in prominent locations around the precinct including sports fields, the local centre and community land uses. Bike parking spaces should be provided at a rate determined in consultation with Councils.	Implementing bike parking in a free, secure and convenient fashion will help to elevate cycling as a preferred mode of choice for short trips.	Developer
G 11			Request provision of **high quality end of trip facilities** for bike users at the Leppington Railway Station. Facilities to lobby for include: › change rooms › showers	High quality end of trip facilities overcome a substantial barrier to the use of active transport for all trip purposes.	TfNSW

No.	Primary Mode/s	Type	Strategy	Rationale/Benefits	Responsibility
			› lockers		
G 12			Establish and support an **East Leppington Bicycle User Group** (BUG)	A local group can assist in the socialisation of the community and build local support for more action on active transport	Council / Developer
G 13			Offer **incentives for bicycle use** such as free cycling lessons or bicycle maintenance classes	Providing lessons in basic road skills for cyclists will increase confidence and encourage residents to consider cycling for trip purposes beyond recreation. Similarly, bicycle maintenance classes can encourage a renewed interest in cycling.	Developer
PUBLIC TRANSPORT STRATEGIES					
G 14			Implement a **direct bus service** linking East Leppington to the Leppington Railway Station. The bus stops on this route should be located so that the majority of residents can access them by walking less than 400 metres. This should be established on collector roads through the precinct.	The Leppington Railway Station will be located well beyond a typical walking catchment for a public transport interchange. So that East Leppington residents have access to the train station, direct bus services needs to be established to discourage private vehicle travel to the railway station.	State Government
G 15			A **district route** servicing the East Leppington precinct is necessary to provide residents with a link to the Leppington Town Centre, Leppington Railway Station and other district and regional destinations.	This will be an important service providing a viable alternative to private vehicles for trips within the South West Growth Centres district.	State Government
G 16			A **local route** providing services within the East Leppington precinct with connection to the precinct's local centre. The local route could also connect to local schools and the Leppington Town Centre.	This will be an important service providing a viable alternative to private vehicles for short, local trips.	State Government
G 17			Issue all residents with **free public transport tickets**, pre-loaded with credit as part of their welcome pack upon settlement.	Trial of sustainable transport modes is a significant hurdle to overcome. Once people are familiar with the public transport system they are more likely to consider it as an alternative to private vehicles. Providing free tickets will be an incentive to try the precinct's public transport services.	Developer

No.	Primary Mode/s	Type	Strategy	Rationale/Benefits	Responsibility
G 18			Hold **promotional activities and special events**, such as free public transport tickets and a prize for public transport fidelity.	These activities and events increase resident's awareness of the public transport system, its benefits and its application to typical daily trips.	Developer
G 19			**Free public transport day** – organise a special day, pre-promoted, where residents are allowed on public transport for free.	These events can be organised to give residents a taste of public transport and build awareness about services and facilities.	Developer
G 20			Consider **free shuttle bus** services to the Leppington Railway Station.	Provides an incentive to use public transport in daily trips, with minimal expense to the user.	Developer / TfNSW
G 21			TfNSW to ensure the Leppington Railway Station facilitates easy transfer between transport modes, with facilities for cyclists, arriving and departing bus passengers, taxi customers, kiss & ride and park & ride users.	Encourages East Leppington residents to use public and active transport modes to access the Leppington Railway Station.	TfNSW
ROAD INFRASTRUCTURE STRATEGIES					
G 22			Maintain adherence to the Growth Centres Development Code guidelines for street layout and design: > A grid based street network through the neighbourhoods to improve permeability and to assist walking and cycling routes. > Avoid cul de sacs wherever possible. > Give priority to pedestrians and cyclists on local streets > Minimise vehicle speeds on local street	Ensures equal priority and permeability for pedestrians and cyclists on local streets, and direct routes for bus services.	Developer

No.	Primary Mode/s	Type	Strategy	Rationale/Benefits	Responsibility
G 23			Installation of traffic signals at the intersections along Camden Valley Way should include pedestrian and cycle crossing phases.	The inclusion of pedestrian and cyclist phasing will help to improve pedestrian and cyclist safety when crossing at the intersections of this busy road.	State Government
PRIVATE MOTOR VEHICLE STRATEGIES					
G 24			**Develop carpooling program guided by a formal framework** in which participants can sign up to for carpooling support, news and special event information, as well as being the springboard for a host of other measures to do with carpooling. The scheme should consider use of carpooling intranet matching software.	Carpooling can be an effective way to reduce private vehicle usage. Careful planning and committed ongoing organisational support will be required.	Developer
G 25			Hold **promotional activities and special events** to facilitate growth in the carpooling scheme. Examples include a recurring carpoolers' prize draw, and social events for carpool match-making.	These are the kind of practical benefits which offers an immediate inducement for potential drivers in a car pool.	Developer / Council
G 26			Engage a **car share scheme** to allow residents vehicle access when they need to without the high upfront costs of car ownership and parking. Car share spaces should be provided in accordance with an appropriate rate advised by a car share company such as Go-Get. A car share company should be engaged to perform a comprehensive car share feasibility study for the precinct. This will determine the appropriate number of spaces as well as specification for car share spaces to be provided.	Car share schemes can reduce private vehicle usage, particularly for short discretionary journeys. Prevalence of a car share scheme in a local neighbourhood may, over time, encourage residents to reconsider the need for a second car.	Council / Developer / Car share scheme
PARKING STRATEGIES					
G 27			Provide **maximum car parking rate**s for East Leppington to be used in conjunction with the preparation of detailed Green Travel Plans for individual precincts	Maximum parking rates will ensure parking is not in oversupply in the precinct's medium density housing and encourage residents to reconsider the need for additional vehicles.	Developer

No.	Primary Mode/s	Type	Strategy	Rationale/Benefits	Responsibility
G 28			Provide **priority parking** for car share, car pool vehicles and motorbikes, within the East Leppington precinct local and neighbourhood centres.	Providing sustainable car transport solutions with preferential parking acts as a incentive to encourage people to consider these alternatives to private and solo car use.	Council / Developer
GENERAL STRATEGIES					
G 29			Consider the creation of a **Travel Plan User Group** to be in charge of the implementation of the GTP, its ultimate design and contributing components.	The implementation and success of the modal shift will require continual effort and momentum. Creating a user group will ensure a dedicated resource is responsible for the on-going implementation and coordination of initiatives and the travel plan, as well as reporting and communication with the East Leppington community. The group could consist of representatives from local residents, businesses, the school, councils, developers, RMS and transport operators.	Council / Developer
G 30			Develop a **travel information pack** to be distributed to all new residents by the travel champion as they move into East Leppington.	Providing a high level of information to residents, including details of all their travel options, will inform them of their travel choices and options. Residents should be directed to places where they can obtain more information, including information specifically catered to their circumstances. Information on facilities, routes and services for walkers, cyclists and public transport users will encourage the uptake of sustainable transport.	Developer
G 31			**Travel Fair** – to introduce the new GTP and educate residents about the available transport options in the area. Transport for NSW, the State Transit Authority, Councils, local bus companies, CityRail, cycling and walking organisations, as well as environmental groups will be invited to present their services in a friendly environment in a social atmosphere.	This can provide residents with a significant exposure to their options and will have a more lasting impact. It will give them the opportunity to ask questions and get/give feedback to the service providers	Developer
G 32			**Activate external street frontages and public spaces** wherever possible through orientation of development towards these corridors.	This will promote active and safe walking environments as a result of passive surveillance created by appropriate development orientation.	Developer

8 MONITORING AND REVIEW

This section details the mechanisms and processes which are to be used to measure and review the Green Travel Strategy and subsequent Green Travel Plans.

The next steps for implementation of the East Leppington Green Travel Strategy will include:

- Implementation of the infrastructure improvements required to support green travel to and from the precinct.
- Improvements to the transport services for the East Leppington precinct.
- Development of Green Travel Plans for residents, schools and centres.

The use of observation and monitoring of implemented elements is simple and quick to undertake. It is also important to understand behaviour and attitudes of the East Leppington residents.

Following the adoption of the Green Travel Strategy and development of Green Travel Plans, on-going monitoring and review should occur; suggested methods are outlined in **Section 8.1**. These methods are generally simple to undertake; allowing snapshots of behaviour to identify immediate issues which require attention.

8.1 REVIEW AND EVALUATION TECHNIQUES

8.1.1 Travel behaviour data analysis

Travel behaviour data analysis should be undertaken to understand how, when, where and why East Leppington residents are travelling.

8.1.2 Qualitative surveys

Travel mode behaviour data is only available yearly from the Household Travel Survey and every five years from the Census. Qualitative surveys will provide a useful interim indication of the success of the GTS and GTPs. Regular survey results help to pre-empt a poor result in delivery against the travel mode targets and highlight areas of the GTS and GTPs to improve, aspects to change and aspects to cease.

Surveys can also assess respondents' level of knowledge regarding travel knowledge and collect suggestions and feedback for improvement of GTPs.

Surveys should be undertaken six months after occupancy, online and/or paper, and then on a regular basis every 12 months to continuously monitor the situation.

8.1.3 Observation and review of activity usage

Evaluation of the GTP usefulness can be as simple as observation of implemented activities such as the use of bicycle parking facilities and review of measures such as the uptake of free travel passes and membership of car share schemes.

8.1.4 Feedback mechanism

Residents should be provided with, and informed about, the opportunity to provide feedback on the GTP measures at any time. This could be as simple as providing contact details for the Green Travel User Group or distribution of feedback forms. This on-going feedback should be encouraged and the feedback avenues promoted so that small issues inhibiting the uptake of public and active transport can be quickly addressed.

By undergoing a regular process of review, the GTS and GTPs will be regularly improved and refined, ensuring that they meet the needs, objectives and targets of the East Leppington precinct and deliver a functional and accessible sustainable transport system.