

St Marys Central Precinct Plan

TRAFFIC AND TRANSPORT REPORT

- Final
- May 2009



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Executive Summary

The regional transport and traffic impact of the St Marys site has been defined in is described in the *St Marys Development Revised Transport Management Plan Traffic Study* (Sims Varley, 2004) and *St Marys Development Transport Management Study* (SKM, 2007).

This report estimated the St Marys Central Precinct trips based on *St Marys Development Revised Transport Management Plan Traffic Study* (Sims Varley, 2004) trip assumptions and recommended the internal road layout, requirements for internal road intersection layout, proposed bus routes and stops, and recommended the cycle and pedestrian network.

The St Marys Central Precinct is planned to provide high accessibility by buses, pedestrians, cyclists and general traffic and create effective links into the surrounding regional road network and public transport system. This is achieved through a combination of external bus priority works, contributions towards general external traffic works and an internal development and transport network that caters for all transport modes.

Within the site a network of road, bus, pedestrian and cycle routes will be developed that will encourage the use of public transport and other sustainable modes, and reduce dependence on car travel. In particular highly convenient bicycle and pedestrian routes will be provided that will encourage movement by these modes and bus priority would minimise the bus journey time whilst ensuring reliability. The proposed transport system would thus achieve the performance objectives of the SREP30 and EPS.

The net effect would be a well planned community that has local employment, leisure and retail opportunities which would serve to contain travel along with an excellent public transport service that will reduce car dependency for travel outside the Precinct. The overall effect would be a sustainable transport outcome.



1. Introduction

1.1. Background

The St Marys Development site was endorsed by the NSW Government for inclusion on the Urban Development Program (UDP) in 1993. The site is owned by St Marys Land Limited and is being jointly developed by ComLand Limited and Lend Lease Development Pty Limited through their joint venture company, Maryland Development Company.

The site is located approximately 45km west of the Sydney CBD, 5km north-east of the Penrith City Centre and 12km west of the Blacktown City Centre. The main western railway line is located approximately 2.5km south of the site. The Great Western Highway is located another 1 km south and the M4 Motorway a further 1.5km south.

The site has an area of 1,545 ha and stretches roughly 7km from west to east and 2km from north to south. It is bounded by Forrester Road and Palmyra Avenue in the east, The Northern Road in the west, Ninth Avenue and Palmyra Avenue in the north and the Dunheved Industrial Area, Dunheved Golf Club and the suburbs of Cambridge Gardens, Werrington Gardens and Werrington County in the south.

The overall site, which has been rezoned for a variety of uses, comprises 6 development “Precincts”, namely the Western Precinct, Central Precinct, North Dunheved Precinct, South Dunheved Precinct, Ropes Creek Precinct and Eastern Precinct. The boundaries of the Precincts within the St Marys site are shown in **Figure 1-1**.

Because the St Marys site straddles the boundary between two local government areas (i.e. Blacktown and Penrith), the State Government decided that a Regional Environmental Plan should be prepared to guide and control future development of the land.

Technical investigations into the environmental values and development capability of the land were commenced in 1994, and State Regional Environmental Plan 30 (SREP30) was subsequently gazetted in January 2001.

SREP30 is the main statutory planning framework document for the St Marys site. It contains planning principles, objectives and provisions to control development. The overarching aim of SREP30 is to provide a framework for the sustainable development and management of the St Marys site. The original precinct and zone boundaries of SREP30 were altered by the gazettal of Amendment No 1 in April 2006.



SREP 30 is accompanied by the St Marys Employment Planning Strategy (EPS) which identifies the aims for the future use and management of the site and sets out specific performance objectives and strategies to address key planning issues, including: conservation, cultural heritage, water and soils, transport, urban form, energy and waste, human services, employment, and remnant contamination risk.

The St Marys EPS identifies actions to be undertaken by local and State governments, as well as the obligations of developers. A Development Agreement was entered into in December 2002 between the joint venture developer and the NSW Government setting out the developer's and State Government's responsibilities in providing services and Infrastructure. A Development Agreement has also been entered into between Penrith City Council (PCC) and the joint venture developer for the Dunheved Precinct and PCC wide transport contributions and will be updated for other contributions required as a result of the development of the Central and Western Precincts.

SREP30 requires the development control strategies contained within the St Marys EPS to be taken into account in any development proposals for the St Marys site. It also requires that a Precinct Plan be adopted by Council prior to any development taking place. Planning for any precinct is to address all of the relevant issues in SREP30 and the St Marys EPS, including preparation of management plans for a range of key issues.

On 29 September 2006 the Minister for Planning declared the Central Precinct to be a release area in accordance with the provisions of SREP30.

■ **Figure 1-1 Precinct Boundaries**





1.2. Proposed Development

The Central Precinct is bounded by existing residential development in the suburbs of Werrington County and Werrington Downs to the south, land zoned for Regional Open Space to the east and land zoned for Regional Park to the north and west. There is also an area zoned for Drainage that adjoins the northern boundary of the precinct. The Precinct has a total area of approximately 133.1 ha.

The land within the Precinct is currently zoned part Urban (129.7 ha) and part Employment (3.4 ha). Under a draft amendment to SREP30 currently being prepared, the land zoned Employment in the Precinct will increase to 38.4 ha, with a corresponding reduction in the land zoned Urban to 94.7 ha. Land zoned Urban is intended to accommodate primarily residential uses, with limited non-residential uses such as local retail and commercial uses. The Employment zone is intended to accommodate primarily employment generating land uses which are compatible with surrounding development and which will complement established employment areas and retail and commercial centres in the Blacktown and Penrith Local Government Areas.

The proposed development of the Central Precinct, as shown in the Framework Plan at **Figure 1-2**, entails:

- Employment and related uses in the northern part of the Precinct;
- A Village Centre zone, comprising a mix of retail, commercial, community, open space and residential uses, in the central part of the Precinct;
- Predominantly residential development in the remainder of the precinct;
- Areas of open space; and
- Construction of roads, including connections to both the west and east, and stormwater infrastructure.

1.3. Purpose of this Report

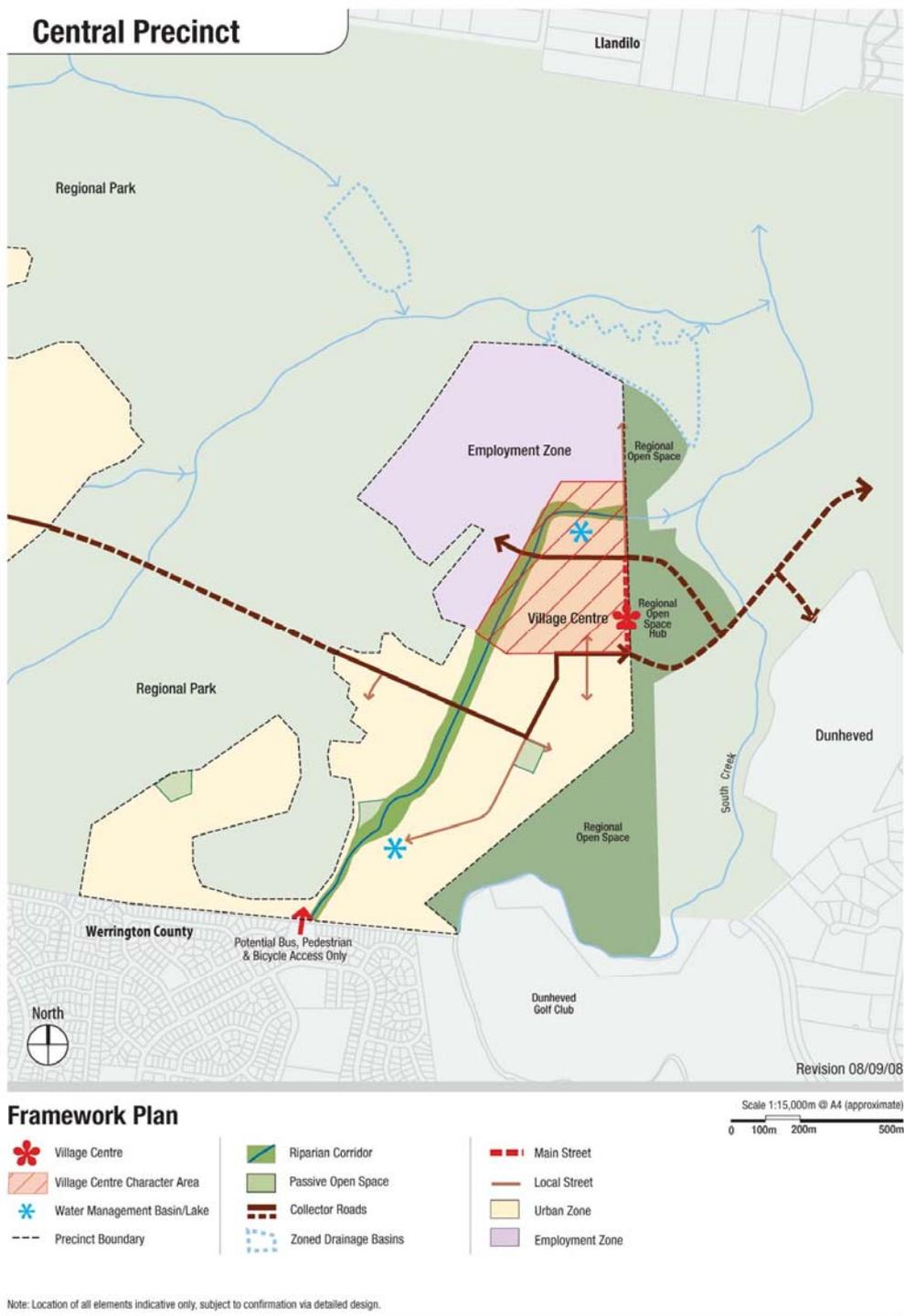
This report has been prepared in accordance with the requirements of *Sydney Regional Environmental Plan No 30 – St Marys* (SREP 30) and *St Marys Environmental Planning Strategy 2000* (EPS). It supports the draft Precinct Plan for Central Precinct and has been prepared to assist in determining the proposals for, and the planning principles, strategies and development controls that will guide the future development of all land within the Precinct in an integrated manner.

While the focus of the report is on the Central Precinct, the investigations carried out have taken into account the following:

- Relationship of the future development within the Precinct to the adjoining Regional Park; and,
- Future integration with the balance of the site and the existing surrounding neighbourhoods.



■ **Figure 1-2 Framework Plan**





2. Transport Background

The regional transport and traffic impact of the St Marys site is described in the following investigations:

- *St Marys Development Revised Transport Management Plan Traffic Study* (Sims Varley, 2004);
- *St Marys Development Transport Management Study* (SKM, 2007); and
- *St Marys Development Agreement, Part 2 Dec. 2002 and Part 3 Dec. 2004 & Dec. 2006 (the mechanism for delivery of the transport initiatives outlined in the Transport Management Study).*

This report describes the scope of works to be implemented in the Precinct with regard to the traffic generation and land use assumptions adopted in the previous studies, taking into account the recommendations provided therein.

2.1. St Marys Development Revised Transport Management Plan Traffic Study

The *St Marys Development Revised Transport Management Plan Traffic Study* was conducted by Sims Varley on behalf of the Department of Infrastructure, Planning and Natural Resources (DIPNR). The report provides the technical framework to consider the transport and infrastructure requirements, as well as the technical apportionment of costs to relevant parties involved in the planned developments for the area. The study focuses on the development of a road transport network strategy to sustain the future planned development of St Marys Site, in accordance with the prescribed levels of residential, employment and education land uses. This report provides the framework for the underlying traffic generating assumptions used throughout this study and this report.

2.2. St Marys Development Transport Management Study 2007

The December 2007 Transport Management Study prepared by Sinclair Knight Merz according to the planning and implementation framework for the St Marys Project was endorsed by Department of Planning Transport Committee. This strategy addresses the progress of project implementation in meeting performance objectives, transport initiatives to meet reduced developable area and defines the scope of the road, intersection and public transport contributions required from the Project. This report was also to be used as the basis for agreeing Balance Road Works comprising local, regional, and state road networks in accordance to the St Marys Development agreement.



3. Performance Objectives

The performance objectives for the transport component are detailed in the SREP30 and the EPS. The objectives are summarised in this section along with an overview of the proposed management strategies are outlined in Table 3-1. Sections of the report are referenced to identify where more information can be found.

■ **Table 3-1 Performance Objectives**

SREP 30 Clause Number / EPS Clause No	Requirement	Where Addressed
Content of draft precinct plans		
10.2.c	A draft precinct plan is to include proposals for, and information about, the following, for the land to which it applies: trunk public transport routes, pedestrian, cycle and road access and circulation networks, and flood evacuation routes.	Precinct Plan
Air Quality		
23.2 / 9.3.5	Development on the land to which this plan applies should contribute to improved regional air quality by containing growth in vehicle kilometres travelled, by achieving higher than normal public transport use, encouraging walking and cycling and promoting energy efficient businesses and homes.	St Marys TMS
Transport		
30.1 / 7.3.1	Development should support creation of effective public transport and bicycle links to the dominant centres and major transport nodes in the Blacktown City and Penrith City local government areas.	St Marys TMS
30.2 / 7.3.2	Public transport is to be provided early in the development of the land to which this plan applies to establish use patterns.	St Marys TMS
30.3 / 7.3.3	Development of the land to which this plan applies is to maximise accessibility to services and facilities for people who do not have access to a private car.	Precinct Plan
30.4 / 7.3.4	Development of the land to which this plan applies is to effectively link that land into the surrounding road network and traffic generated by the development is to be catered for at a satisfactory level of service.	St Marys TMS Dev. Agreement Part 3



SREP 30 Clause Number / EPS Clause No	Requirement	Where Addressed
30.5 / 7.3.5	Provision of transport infrastructure and services is to be coordinated with the staging of development on the land.	St Marys TMS Dev. Agreement Part 3
30.7 / 7.3.7	High trip-generating uses such as employment development, retailing and multi-unit housing are to be concentrated adjacent to major public transport routes and nodes.	Precinct Plan
30.8 / 7.3.8	The overall development of land to which this plan applies is to include a range of land uses sufficient to minimise demand for travel outside the land to which this plan applies.	Precinct Plan
30.9 / 7.3.9	Public transport infrastructure and services are to be provided to a level sufficient to achieve a significantly higher use of public transport compared to other similar development in the Blacktown City and Penrith City local government areas.	St Marys TMS



4. External Transport Context

4.1. Overview

The regional road system, rail network and stations in the area are indicated on **Figure 4-1**. **Section 2** describes the various investigations and agreements that affect the external transport to the site.

Road System

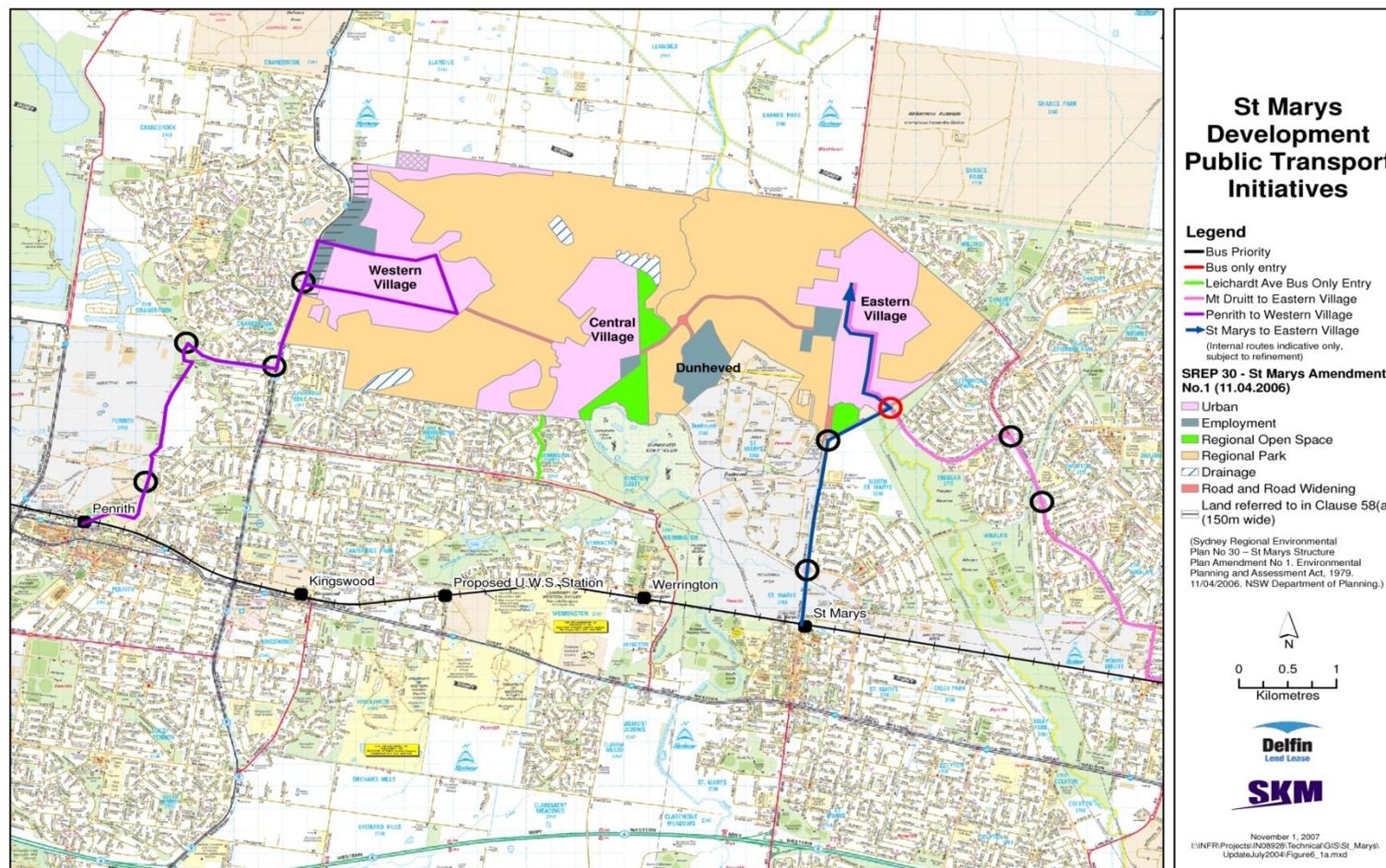
The Central Precinct can only be accessed via the Western, Eastern or Dunheved Precinct with no external access points for private traffic. However, a bus only link is permitted under the SREP30 Structure Plan from the Central Village to Leichhardt Avenue.

Public Transport

The Western Railway line runs through the Blue Mountains to the Sydney CBD. The closest station to the Central Precinct are St Marys station, approximately two kilometres to the south, and Mt DrUITT station, approximately five kilometres to the south east of the site. Bus routes would ultimately connect from these stations to the Western, Eastern and Central Precincts as indicated on **Figure 4-1**.

In order to promote the use of public transport, the *St Marys Development Transport Management Study* (Sinclair Knight Mertz, 2007) proposed bus priority routes between the Eastern Precinct and St Marys and Mt DrUITT railway stations and between the Western Precinct and Penrith station (in accordance with the Development Agreement).

■ **Figure 4-1 St Marys Public Transport Initiatives**



(Source: St Marys Development Transport Management Study, Sinclair Knight Merz (2007))



4.2. Trip Rate Assumptions

The trip rates adopted for this assessment were based on *St Marys Development Revised Transport Management Plan Traffic Study*, (Sims Varley, 2004). The trip assumptions are illustrated in **Table 4-1** and **Table 4-2**.

■ Table 4-1 St Marys Trip Generation Table

COMPONENT	TRIP GENERATION	
Residential	0.85	Peak hour vehicle trip per dwelling
	85%	Outbound in Morning Peak
Commercial	70	Employees per Hectare
	0.83	Peak hour vehicle trip per Employee
	42%	Car Driver
Retail	25	Employees per Hectare
	0.83	Peak hour vehicle trip per Employee
	50%	Car Driver
Industrial	20	Employees per Hectare
	0.83	Peak hour vehicle trip per Employee
	50%	Car Driver
Education	25	Employees per Hectare
	0.7	Peak hour vehicle trip per Employee
	50%	Car Driver

■ Table 4-2 Further Assumptions Used (Used for Eastern Precinct Assessment)

Reduction in trips due to transport initiatives	12.50%
---	--------

(Source: St Marys Development Revised Transport Management Plan Traffic Study, Sims Varley 2004.)

The performance objectives defined in **Section 3** are aimed at containing travel within the site and reducing travel by private vehicles. In summary these require:

- Urban form to maximise use of public transport;
- High trip generating uses to be located adjacent to major public transport routes and nodes;
- Public transport infrastructure and services to achieve higher public transport use than other similar established areas in the region;
- A range of uses that will reduce demand for travel outside the area; and
- Pedestrian and cycle routes to encourage travel by these modes.



These principals were incorporated in both the Central Precinct and in the overall St Marys site. A measure of effectiveness of these strategy elements is the proportion people travelling by public compared to private vehicle.

The traffic modelling¹ analysed the mode shift that would result from the land use and transport planning measures proposed and reflected these in traffic generation rates adopted in traffic modelling that was undertaken. The planning recognised that for traditional residential development in Western Sydney:

- there is a journey to work mode split of around 80 per cent by private car; and
- with 0.85 vehicle trips per dwelling per peak hour generated.

For the proposed development on the St Marys site, a 10 per cent shift away from private car use was planned for which would result in:

- a journey to work mode split of 70 per cent by private car; and
- 0.75 vehicle trips per dwelling per peak hour being generated.

For employment land uses, journey to work mode split well below existing mode split (60 to 70 per cent car driver) was assumed through the close association of residential and employment uses.

These mode split assumptions would result in a reduction in total vehicle kilometres travelled by residents and employees on the site. They would also result in lower concentration of traffic on the site than would otherwise occur.

¹ St Marys Development Revised Transport Management Plan Traffic Study, Sims Varley 2004.



4.3. Land Use

Land use assumptions used by the *St Marys Development Revised Transport Management Plan* (Sims Varley, 2004) have been amended to reflect the current revised land use assumptions as illustrated in **Table 4-3**. The overall trip generation of the development using trip generation, trip distribution and mode split assumptions adopted by that study are illustrated in **Table 4-4**. The change in land use assumptions results in a slight decrease in total trips generated.

■ Table 4-3 Revised Land Use Table

	Western	Central	Eastern	Dunheved	Total
Residential (Dwellings)	2446	967	2000	-	5413
Commercial (Ha)	-	-	-	-	-
Retail (Ha)	3.4	0.85	1.7	-	5.95
Industrial (Ha)	-	32.56	-	25.76	58.32
Education (Ha)	4.9	2.55	7.65	-	15.1

■ Table 4-4 Updated Trips Table

Development	Land Use	Western	Central	Eastern	Dunheved	Total
St Marys Development Current SREP 30	Residential	1161	1005	1302	0	3468
	Employment	598	128	160	187	1073
	TOTAL	1758	1133	1462	187	4541
St Marys Development Proposed SREP 30 Amendment	Residential	1819	719	1302	0	3840
	Employment	68	264	74	187	593
	TOTAL	1888	983	1376	187	4434



5. Proposed Road System

This section presents an overview of the proposed road layout for the Central Precinct.

5.1. Site Access

Vehicular access for the Central Precinct is via the existing zoned road corridor (to both the east and west) which will provide access to and from the neighbouring Precincts within the St Marys Project.

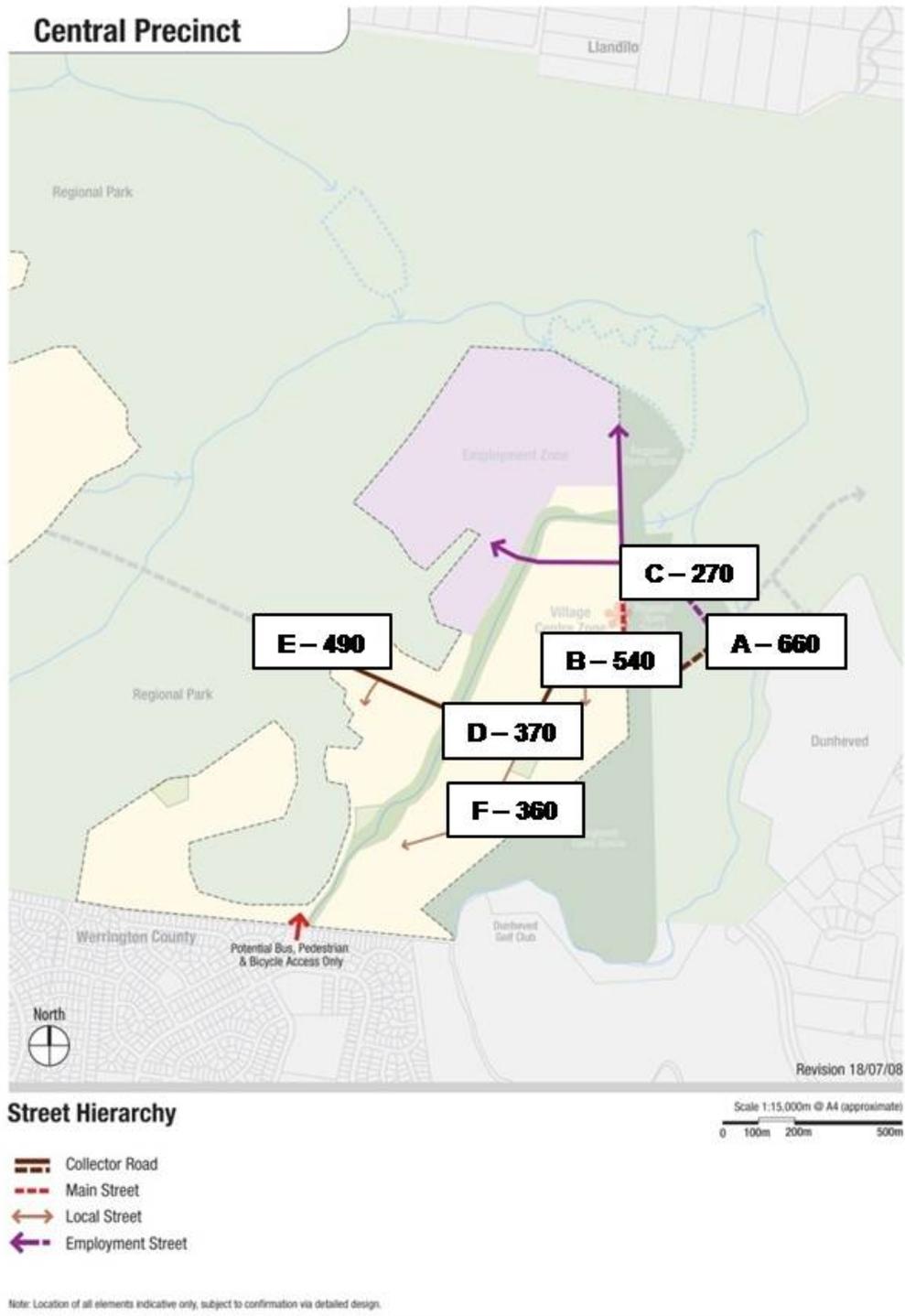
In addition to this, an external access point has been identified in the *St Marys Development Transport Management Study* (SKM, 2007) at the south of the Central Precinct, connecting it with the “Werrington Downs” residential area at Leichardt Avenue. To maintain the residential character this access point would be limited to bus only access. Appropriate measures would be undertaken preventing private vehicular access via this entrance.

5.2. Internal Road System

As indicated on the Precinct Plan **Figure 5-1**, from the west is a primary road system formed by a main road with a spur to the southern residential area (and the bus only access point). Access from the east would be split into two main roads with employment heading in a northerly direction and residential via the village centre. These roads would operate as collector roads distributing the traffic between the internal site access points and different sub areas within the Precinct. The predicted traffic volumes on the proposed collector roads on the site could be accommodated by a single carriageway in both directions. **Figure 5-1** identifies the initial “collector” and “local” roads. The alignment is indicative and subject to change during detailed design. The road cross sections have been developed by others and are included in the “Central Precinct Plan Development Control Strategy”.



■ **Figure 5-1 Proposed Road Network and AM Peak Hour Traffic Flows in the Central Precinct**





5.3. Traffic Flows

The *St Marys Development Revised Transport Management Plan Traffic Study* (Sims Varley, 2004) modelled traffic flows surrounding the Central Precinct as part of the overall road study. These flows are reported on and analysed separately in that report. To examine traffic flows on the internal primary road system, traffic travelling to/from five sub areas within the Central Precinct was assessed. Resultant peak hourly traffic flows on internal roads are indicated on **Figure 5-1**. The forecasts were based on assumptions described in *St Marys Development Revised Transport Management Plan Traffic Study*, (Sims Varley, 2004).

Table 5-1 below describes peak hourly traffic volumes at representative locations on the primary internal road network shown in **Figure 5-1**.

■ **Table 5-1 Central Precinct Link Traffic Flows**

Road	Location Identification	Two Way AM Peak Hour Flow
Main Road	A	660
Main Road to Village Centre	B	540
Main Road Spur to Employment	C	270
Main Road	D	370
Main Road to Western Precinct	E	490
Main Road Spur to Residential Area	F	360

It is noted that RTA guidelines (**Table 5-2**) suggest that in general collector roads should carry between about 200 and 1000 vehicles per hour. For collector roads with significant residential frontage, the guidelines suggest the following limits to protect residential amenity:

■ **Table 5-2 Road Environmental Guidelines**

Criteria	Vehicles per hour
Environmental Goal	300
Environmental Limit	500

(Source: Guide to Traffic Generating Developments, RTA, 2002.)

These values are not considered as absolute limits and in some circumstances it may be necessary for traffic flows on collector roads to exceed these volumes.

Residential areas fronting collector roads would have traffic volumes below the RTA environmental limit. The traffic volumes on the collector roads would also be below the RTA's guideline functional limit of 1000 vehicles per hour.



5.4. Internal Intersections

In order to provide sufficient capacity, and control traffic speeds, it is proposed that roundabouts be provided at the key intersections on the road network, these will be determined as the plan evolves. These would incorporate splitter islands with pedestrian refuges on approaches. Initial analysis indicates that such roundabouts would operate well within capacity (Level of Service A to C). Other intersections would be priority controlled (e.g. Stop, Give Way sign or tee intersection rule controlled.)

The proposed bus only access to the Central Precinct should be clearly marked or gated. Gating facilities can include traffic signals, physical gates/bollards (opened by a transponder on the bus), bus cushions (limiting access to an axle type), or simply “Do Not Enter” signs.

5.5. Speed Control and Traffic Management Strategies

It is proposed to minimise the potential for rat-running or shortcut routes through the St Mary’s Site. This would be done by:

- Providing roundabouts on the route through the Central Precinct;
- Imposing a 50 km/h speed limit within the Central Precinct;
- Imposing a 40 km/h speed limit in the central multiuse village area; and
- Providing raised “wombat” type pedestrian crossings at appropriate locations.

It is also proposed to manage traffic speeds on local roads by applying techniques such as:

- Limited street lengths;
- Introducing bends; and
- Introducing slow points including mountable roundabouts, central islands, road narrowing’s, parking embayment with kerb blisters.

5.6. Traffic Noise

As indicated above, the collector road system within the site, and the disposition of residential areas around the major road network, were planned to contain traffic levels passing the dwellings within the RTA’s recommended environmental limit of 500 vehicles per hour.

This traffic level was found to be consistent with good residential amenity. Noise problems are not usually encountered at such traffic intensity.



6. Public Transport

6.1. Bus Services

The *St Marys Development Revised Transport Management Plan Traffic Study* (Sims Varley, 2004) concluded that bus services would be the most effective form of transport for the site, both in terms of economic feasibility and in providing a high quality public transport service.

Bus priority routes from the site to Penrith and St Marys stations were also proposed as part of the strategy to improve public transport.

As indicated above, bus routes on the site would connect the Central Precinct to various railway stations via bus priority routes to be funded in part by the development. In addition, a substantial financial contribution would be made by the developer to promote public transport and, with the consent of the RTA, may be used to subsidise the early provision of bus services to the Central Precinct.

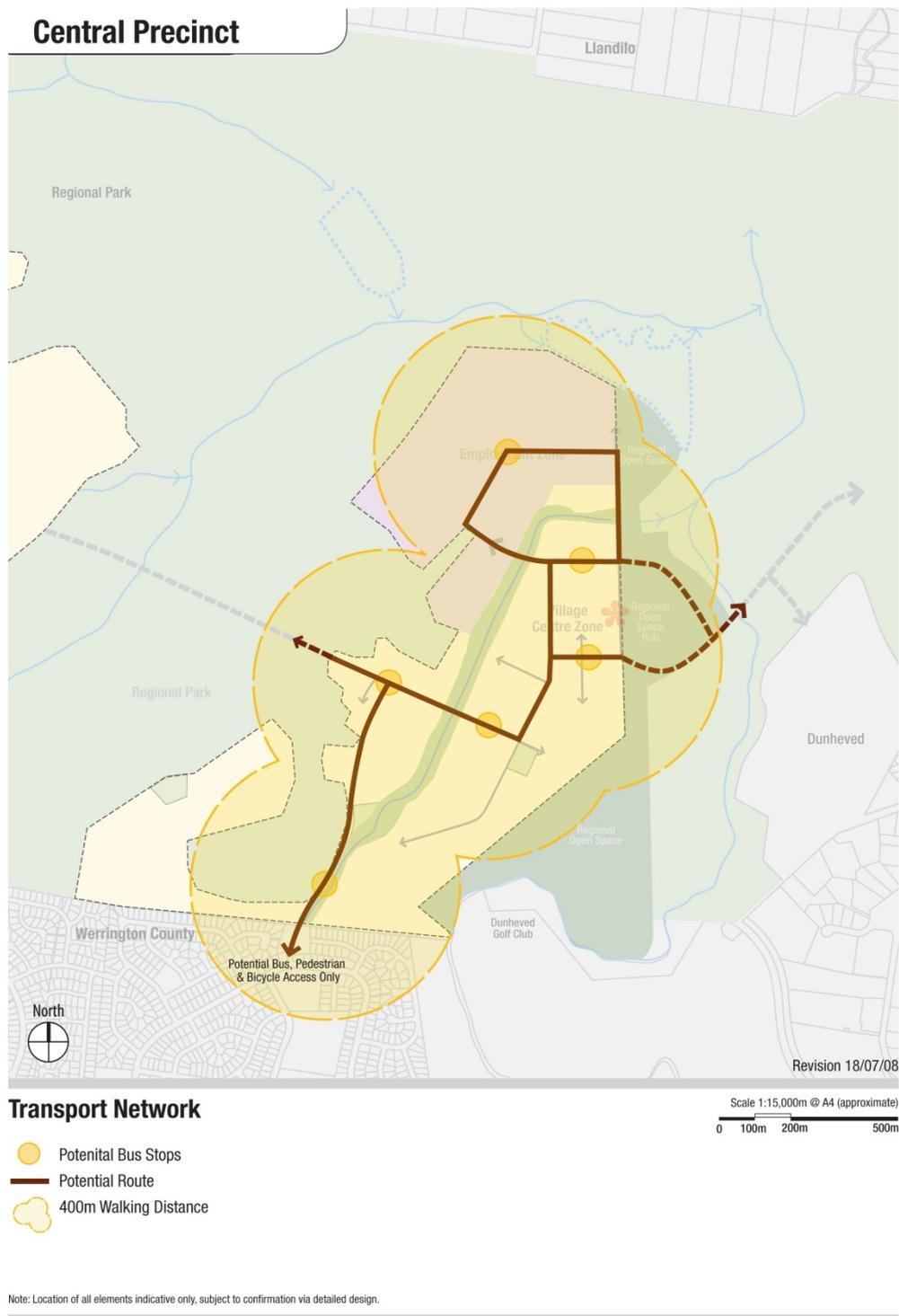
Possible bus routes within the Central Precinct together with bus stops could be provided at regular intervals and indicative locations are shown on **Figure 6-1**. The establishment of new bus routes to serve the Central Precinct would be necessary, with existing service routes possibly being extended to the new development as well. These new routes along with the exact locations of bus stops should be determined in conjunction with bus operators, the Ministry of Transport and Penrith Council.

The indicative bus stops within the site were designed to provide residents access to buses and to allow them to travel within 400m (5 minutes walk) of 90 per cent of dwellings and within easy walking distance (10 minutes walk) of all dwellings. The system would be “bus friendly” with high quality collector bus routes, a highly legible system, direct pedestrian connections and no circuitous connections between sub areas.

The combination of these measures would not only ensure a good public transport service for the Central Precinct, but it would also yield improved public transport services for established areas in the vicinity of the site.



■ **Figure 6-1 Indicative Bus Routes and Bus Stops in the Central Precinct**





7. Bicycles, Pedestrians and Parking

7.1. Bicycles and Pedestrians

The Central Precinct will be designed to be highly permeable for pedestrians and bicycles.

Pedestrian and cycle facilities have been developed by others and are included in the “Central Precinct Plan Development Control Strategy”. Initial indicative pedestrian and cycle routes are shown on **Figure 7-1** which would be refined as the project evolves.

Local roads would carry low traffic flows and would be suitable for use by cyclists in mixed traffic conditions. In addition to cycle and pedestrian routes along the major internal roads, a network of priority routes within the future street layout is proposed generally as indicated on **Figure 6-1**. These would focus on the schools and shops in the village centre so as to make access thereto as safe and convenient as possible. These routes would also provide convenient pedestrian access to bus stops on the collector road system.

The network would be able to be integrated with future cycle ways within the Regional Park and to the proposed external cycle routes as indicated on **Figure 5-1**.

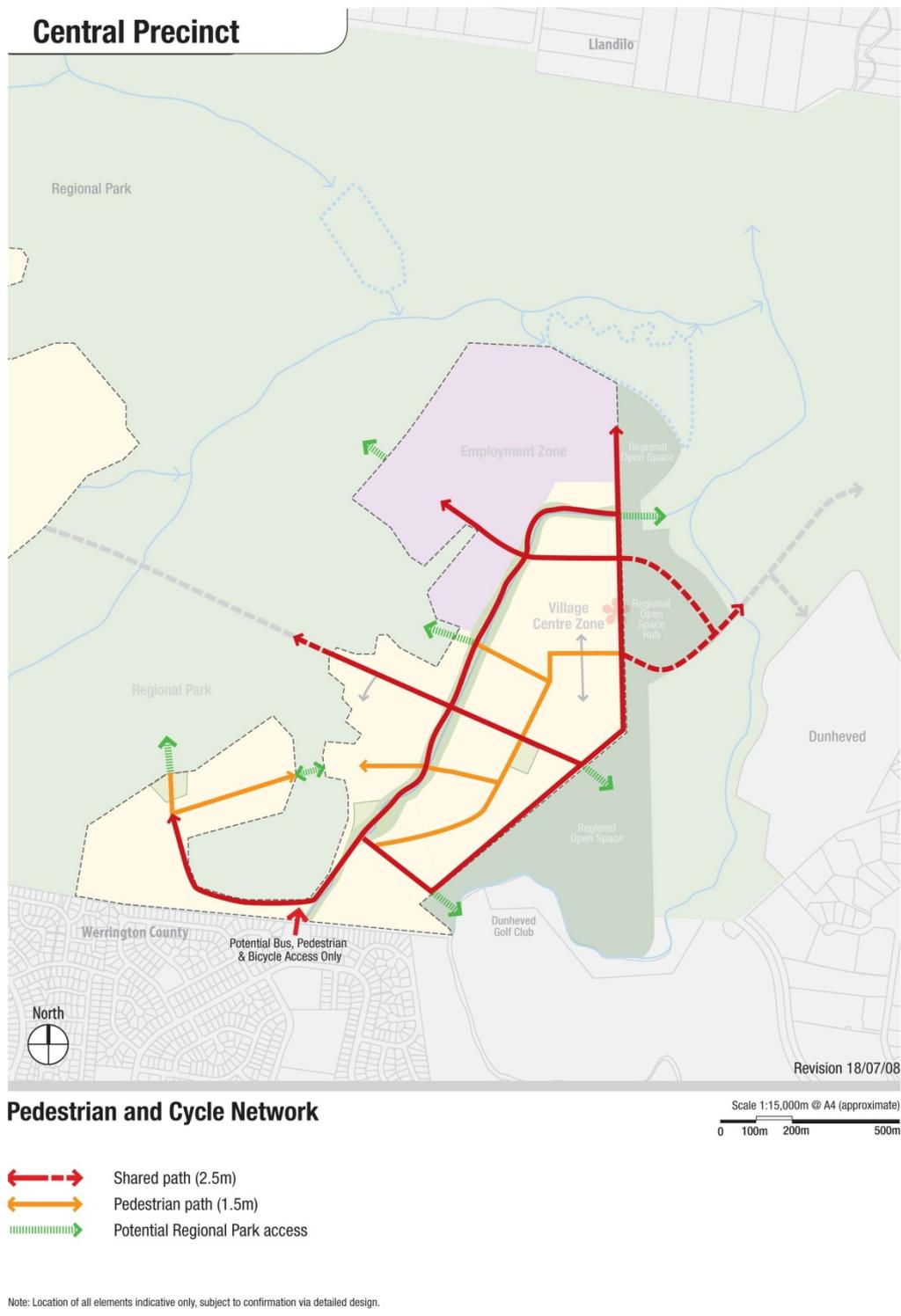
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7.2. Parking

Parking facilities have been developed by others and are included in the “Central Precinct Plan Development Control Strategy”.



■ **Figure 7-1 Indicative Pedestrian and Cycle Routes in the Central Precinct**





8. Conclusions

The St Marys Central Precinct will be planned to provide high accessibility by buses, pedestrians, cyclists and general traffic and create effective links into the surrounding regional road network and public transport system. This is achieved through a combination of major external bus priority works, contributions towards general external traffic works and an internal development and transport network that caters for all transport modes.

Within the site a network of road, bus, pedestrian and cycle routes would be developed that would encourage the use of public transport and other sustainable modes, and reduce dependence on car travel. In particular highly convenient bicycle and pedestrian routes will be provided that will encourage movement by these modes and bus priority would minimise the bus journey time whilst ensuring reliability. The proposed transport system would thus achieve the performance objectives of the SREP30 and EPS.

The net effect would be a well planned community that has local employment, leisure and retail opportunities which would serve to contain travel along with an excellent public transport service that will reduce car dependency for travel outside the Precinct. The overall effect would be a sustainable transport outcome.