GTAconsultants

Forestville and Everard Park
Draft Concept Report

Client // City of Unley
Office // SA
Reference // 14A1258000
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1. Introduction

1.1 Background

GTA was appointed in August 2014 by the City of Unley to undertake a Local Area Traffic Management Study for the suburbs of Forestville and Everard Park.

This LATM study for Forestville and Everard Park is being undertaken as part of a comprehensive assessment by the City of Unley of all of the City's suburbs, identifying an ongoing program of schemes to improve transport and local amenity within the context of the City's Strategic Plan. The City's Strategic 4 Year Plan 2013-2016 sets out a series of Objectives and Strategies under each of the Strategic Goals. Goal 3, "Moving our path to an Accessible City" defines the context for this study with 3 primary objectives:

- Equitable Parking throughout the City
  - On-street parking is optimised;
  - The mix of residential and business parking needs are met;
  - Commuter parking only occurs in appropriate areas;
- An integrated, accessible and pedestrian-friendly city
  - Improved connectivity and ease of movement between precincts;
  - Enhanced mobility and accessibility for our community;
  - Pedestrians can move through our city freely and safely;
  - Shared zones are a feature throughout residential streets;
- Alternative travel options
  - Safe bike and walk ways are a feature of our city;
  - Reduced motor vehicle congestion;
  - Public transport is an attractive and well used travel option.

1.2 Study Approach

The traditional approach to Local Area Traffic Management (LATM) has been to identify locations with inappropriate traffic volumes and traffic speeds and to design and implement measures that seek to reduce them or mitigate the impact. Little regard has typically been paid to wider transport and streetscape issues and opportunities. Whilst this approach has generally achieved the desired traffic results, there have been instances where the measures have subsequently proved unpopular with local residents, have unintended consequences for adjoining streets or degrade the local street environment and walking and cycling routes.

In order to evolve the LATM process and achieve the City's relevant Strategic Goals, GTA approaches such studies in a more holistic manner, ensuring that all transport modes are considered and recognising that improvements to local walking and cycling routes and connections, and minor changes to the streetscape can both mitigate the traffic impact and achieve a positive outcome that improves the street amenity and environment and encourages more walking, cycling and use of public transport. This approach is now captured in SA specific guidance documents such as Streets for People and Healthy by Design and would be considered as more of a Local Area Transport Study than a Local Area Traffic Management (LATM) Study.

This study incorporates the principles of the SA Streets for People Compendium and the Healthy by Design SA guide and considers issues and opportunities associated with all transport modes. These SA based documents provide practical advice, design principles and case studies to reduce the impact of traffic in local communities and develop more walking and cycling friendly

streets and suburbs. Opportunities for the introduction of innovative measures that have been used elsewhere in Australia are also considered and identified where they can provide proven and cost-effective outcomes.

Successfully achieving a higher proportion of the travel demand as walking, cycling and public transport trips will require a new approach to designing local streets for these modes and providing less focus on designing for the car, or designing only to manage the impact of the car. This change of emphasis is crucial to supporting higher density residential redevelopment within the Inner Metro areas and enabling a higher proportion of journeys to be by walking, cycling and public transport.

Securing community support for this changing approach will also require an innovative and informative approach, providing background information and documented evidence. This report provides information and evidence to support innovative recommendations that are presented and identifies where additional data may be required to support the recommendations.

GTA's approach to the study has been to:

- understand the community perception and use of the available transport facilities and the perception of the impact of through traffic and extraneous parking demand;
- look for the evidence to support or disprove the perceptions;
- develop options to overcome the evidential problems and reduce the impact of perceived problems; and
- Prioritise actions to deliver the outcome to support the community aspirations and Council's Strategic Goals.

1.3 Structure of this Document

This report sets out the background and process of the study and recommends a concept plan to guide upgrades and improvements to the transport network for the City of Unley over the next 5 to 10 years and beyond. Some of the recommended measures arise as a result of the need to resolve existing concerns, which are largely traffic related, whilst other recommendations provide more emphasis on local amenity and place value and the nature and design of the local streets to improve walking and cycling conditions, thereby achieving reduced traffic impacts as a result.

Section 2 of this document considers the study area, transport networks and planning context. Section 3 considers the existing conditions based on recorded data, observations, comparison with best practice and community responses. Section 4 provides a list of potential opportunities that arise from the existing conditions, strategic planning documents and best practice with section 5 providing an assessment of those opportunities as formal options. Section 6 provides the recommendations of the concept plan with the proposed scheme plan included as Appendix A. Following the community consultation on the Draft Concept Plan, priority schemes and timescales will be identified and incorporated in the Final Concept Plan.

1.4 Next Steps

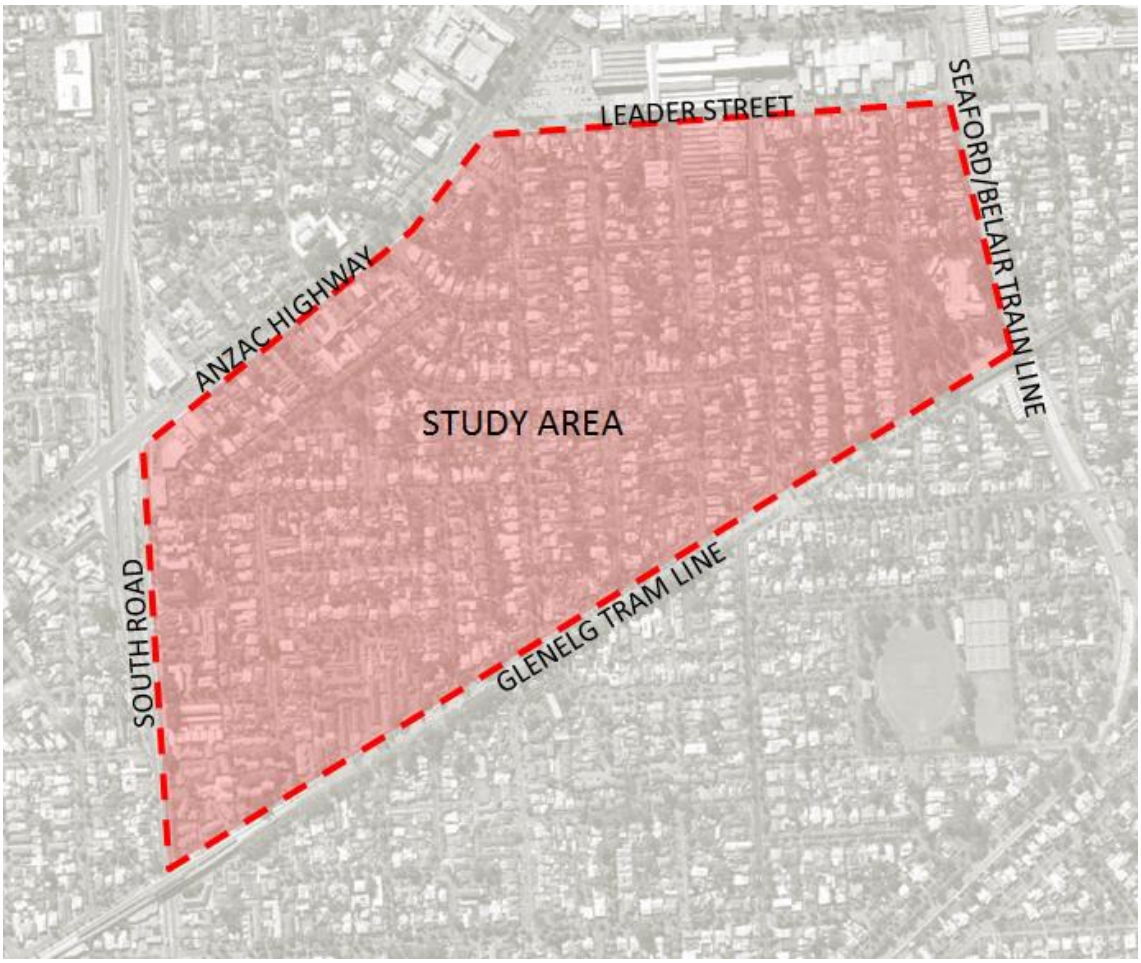
This Draft Concept Plan Report by Council has been endorsed by Council and will be used as the basis for an area wide Community Consultation. The final version of the Concept Plan will then be prepared incorporating comments and suggestions from the community where appropriate and priority schemes and timescales identified through the consultation prior to final Council endorsement and implementation.

2. Study Context

2.1 Study Area

The study area covers the suburbs of Everard Park and Forestville which are bounded by South Road to the west, Anzac Highway to the North-West, Leader Street to the north, the Seaford and Belair rail lines to the east and the Glenelg tram line to the south. The study area is shown in Figure 2.1below.

Figure 2.1: Study Area



The Forestville and Everard Park study area provides an ideal platform for a holistic approach to local traffic and transport management. With a compact study area, proximity to the Goodwood Road local centre, 3 tram stops and a railway station, frequent bus routes through the study area and on nearby arterial roads, 2 strategic bikeways and a comprehensive network of pedestrian footpaths and shared paths, there would be few locations better placed within Adelaide from a transport perspective.

At only around 3 kilometres from the Adelaide CBD, less than 1 kilometre from the Greenhill Road commercial areas and opposite the Adelaide Showgrounds, the study area is also well located for wider access to key destinations.

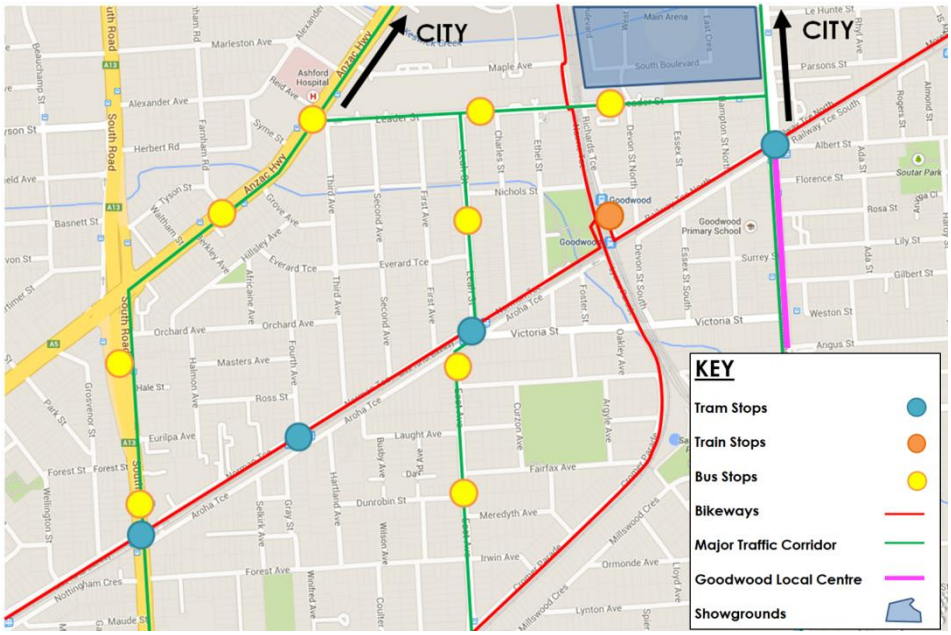
However, this proximity to the CBD, Greenhill Road commercial areas and the Adelaide Showgrounds, results in the study area also experiencing use for convenient parking opportunities and use as a traffic access route. The route through Leader Street, Leah Street, East Avenue and Winston Avenue provides a direct route as far south as Daws Road, creating a highly attractive

route in to the CBD from much of the southern suburbs. The introduction of speed cushions on Leah Street in late 2012 successfully reduced vehicle speeds, but has resulted in traffic displacement to parallel local streets, many of which are narrow and unsuitable for increased traffic volumes.

The availability of transport mode choice within the Forestville and Everard Park study area provides an ideal opportunity to develop a new approach to Local Area Traffic Management Plans. The extensive public transport choices and two strategic bike routes means that the study area will already provide significant pedestrian and cyclist activity. Ensuring that the access routes to these facilities are safe, direct and of suitable quality can assist in increasing the level and amenity of walking and cycling and improve access to public transport within the study area. This in turn creates an environment that, whilst still maintaining local access and through connectivity for vehicles, is not seen as a high speed short cut for traffic headed towards the CBD.

Figure 2.2 provides a summary of the transport context within and adjacent to the study area.

Figure 2.2: Transport Context of the Study Area



Source: Nearmap

2.1.1 Road Network

The study area is bounded by the arterial roads of South Road and Anzac Highway to the west and north-west. These roads are under the care and control of the Department of Planning, Transport and Infrastructure (DPTI). The intersection of these arterial roads was grade-separated in 2010 following the completion of the Gallipoli Underpass allowing South Road through traffic to bypass the intersection. Goodwood Road approximately 500 metres to the east of the study area is also a DPTI arterial road.

Within the local road network, Leader Street and Leah Street are both identified as major collector roads in the Unley Integrated Transport Strategy. All other streets within the study area are classified as local streets.

2.1.2 Public Transport Network

The public transport network adjoining the study area comprises the Seaford and Belair rail lines, accessible via Goodwood station, the Glenelg tram line, served by stops at Forestville, Black

Forest and South Road, and bus routes along South Road, Anzac Highway, Leah Street and Leader Street.

Table 2.1 summarises the general service frequencies of the public transport networks.

Table 2.1: Public Transport Service Patterns

Public Transport Route	Peak Hour Service	Weekday Daytime Service	Evening Service	Weekend Service
Seaford Rail Line	Approx. every 15 minutes	Approx. half hourly	Hourly	Half hourly
Belair Rail Line	Every 15 minutes	Approx. half hourly	Hourly	Hourly
Tonsley Rail Line	Half hourly	Hourly	No Service	No Service
Glenelg Tram	Every 5 to10 minutes	Every 15 minutes	Every 20 minutes	Every 15 minutes
Anzac Highway/ South Road buses	Approx. every 2 to 5 minutes	Approx. every 2 to 5 minutes	Approx. every 10 minutes	Approx. every 10 minutes
Leader Street/Leah Street buses	Approx. every 10 minutes	Every 15 minutes	Approx. half hourly	Approx. half hourly

From the above table, the tram and bus services can be generally considered to provide a good service level during all time periods. Whilst the rail services are of a reasonable frequency in the peak periods, outside of the peak periods they do not provide particularly attractive frequencies.

2.1.3 Cycling and Walking

Forestville and Everard Park both lie adjacent to the Mike Turtur bikeway which runs alongside the Glenelg tram line from Glenelg to the CBD. The route is primarily a mixture of off-road shared paths and mixed traffic on local streets, with the majority of the route having been improved to this standard. However there remain some discontinuous sections with the area around Goodwood rail station within the study area being one of the major examples.

As part of the upgrade of the Seaford rail line The Adelaide to Marino Rocks greenway has been developed on the north side of the rail line, running along the eastern edge of the study area between the tram line and Leader Street. Whilst the southern section within the study area through Forestville Reserve and alongside Unley Swimming Centre is of good quality, this too becomes somewhat discontinuous along Nairne Terrace and across Leader Street.

Both of the bikeways include large sections that operate as shared paths, providing good quality and well-lit pedestrian routes. All of the local streets within the study area have some footpath provision. There is also an informal walking and cycling route through Wilberforce Walk alongside Brownhill Creek, although only one section of this route has a sealed surface.

2.2 Planning Context

2.2.1 30 year Plan for Greater Adelaide

The 30 Year Plan for Greater Adelaide sets out the fundamental principles to manage the growth and change that is forecast to occur in the Greater Adelaide region. The plan seeks to create walkable neighbourhoods with housing located close to jobs, transport and services and a connected transport network which forms the backbone of the urban environment.

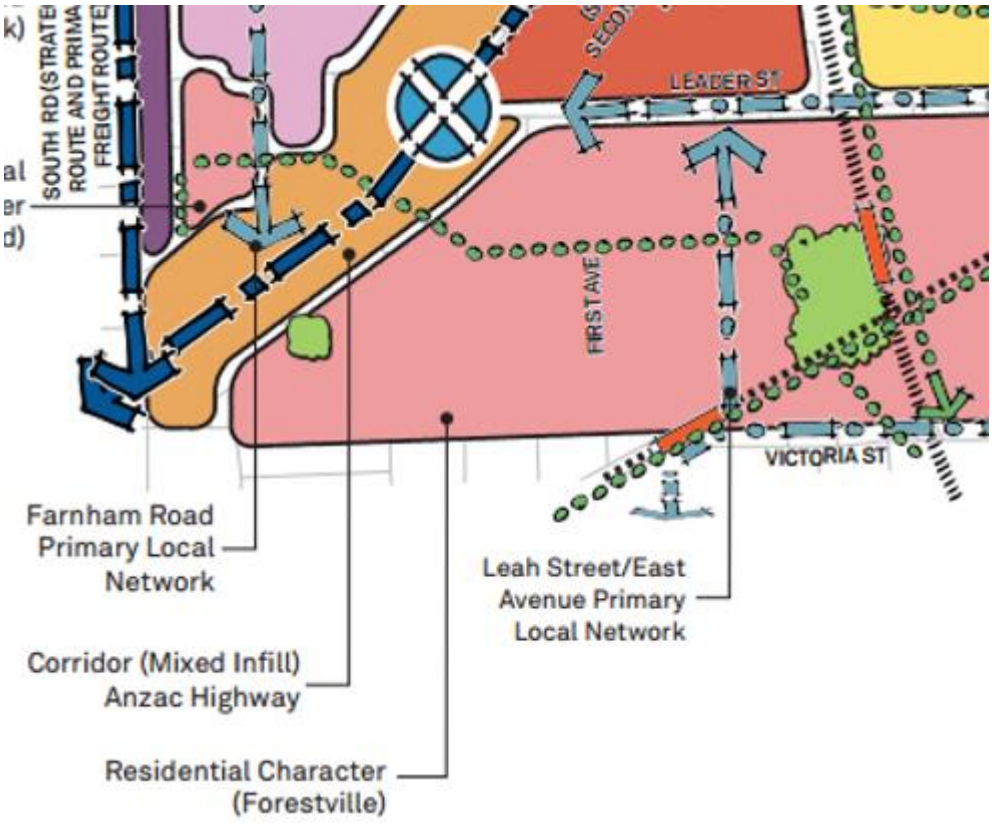
The plan recognises that local communities will always want to shape their environment and is therefore a flexible document that can be used as a guiding document for future planning and delivery of services across Greater Adelaide.

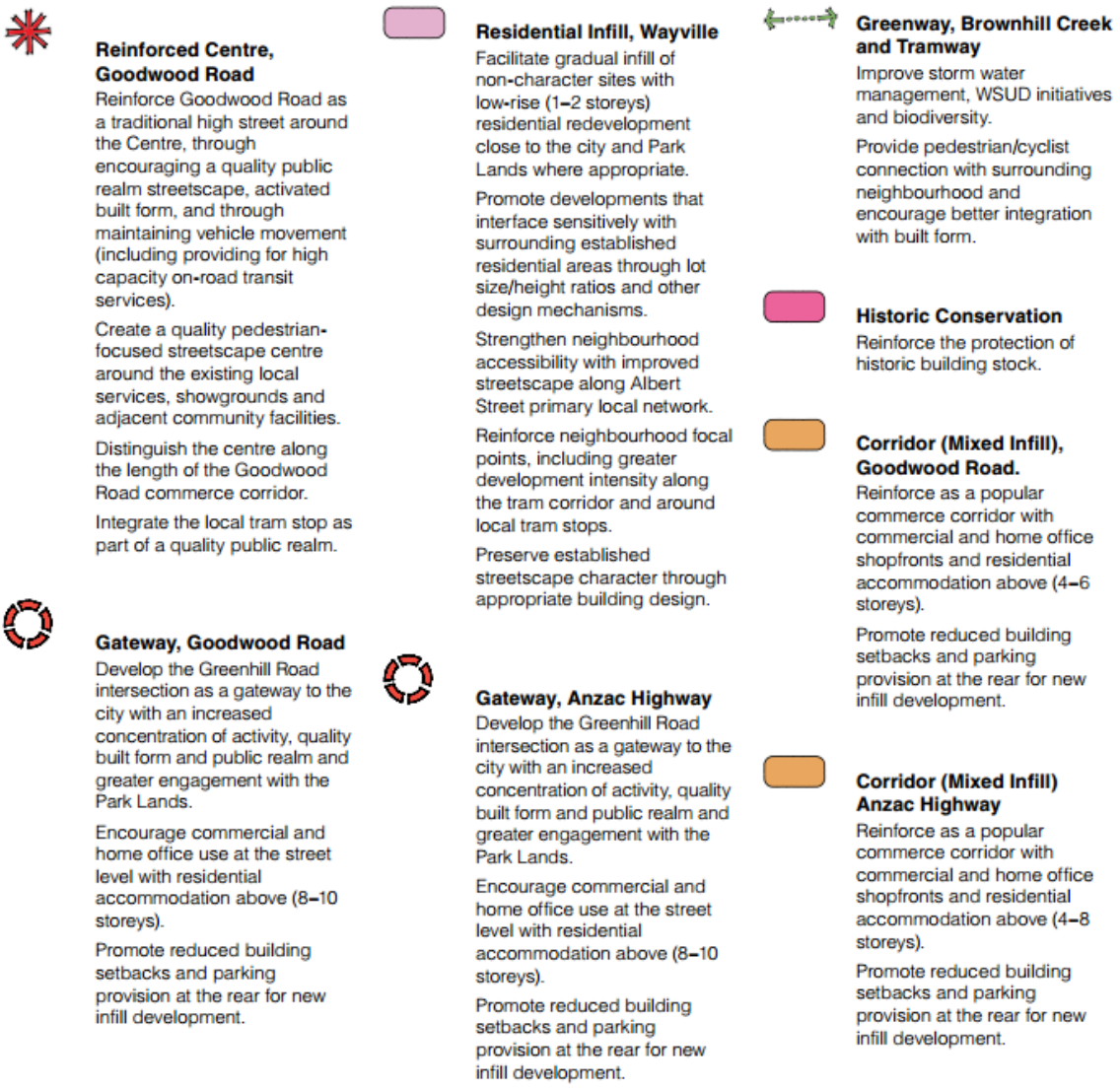
2.2.2 Inner Metro Rim Structure Plan

The Inner Metro Rim Structure Plan has been developed in consultation with the Inner Metropolitan Councils to assist the implementation of the 30 Year Plan for Greater Adelaide. The

plan is generally consistent with local strategic directions however it is a not a mandatory document. Its intention is to provide a blueprint to guide future Development Plan Amendment processes and Council Strategic Directions Reports to ensure Development Plans align with the objectives of the Inner Metro Rim Structure Plan and 30 Year Plan for Greater Adelaide.

The actions of the Inner Metro Rim Structure Plan relevant to the proposed study area are shown below.





2.2.3 The Village Living and Desirable Neighbourhoods Development Plan Amendment

The City of Unley has developed the Draft Village Living and Desirable Neighbourhoods Development Plan Amendment (DPA) to enable new development to be delivered in line with the State Planning Strategy, whilst maintaining local heritage and character through a balanced and tailored approach to state policy that supports necessary development within appropriate areas.

The Draft Village and Desirable Neighbourhoods DPA identifies specific areas within the study area for residential enhancement and/or regeneration. The proposed residential zones at the time of completing this study are shown below.

Following the first round of public consultation for this DPA, it is likely that significant changes will be made to the proposals prior to anticipated re-consultation in mid-2105 and ministerial approval in late 2015. However, these changes are unlikely to materially affect the traffic and transport considerations within the study area.

2.3 Background Documents

2.3.1 Integrated Transport Strategy

In 2002, the City of Unley completed the Unley Integrated Transport Strategy. This set out a comprehensive assessment of the city in terms of transport access and demands for all transport modes. This document identified the pressure of through traffic on the north-south routes through Unley, the opportunities and limitations of the public transport networks and the difficulties for

pedestrians and cyclists from an access and road safety perspective. Many of the actions identified remain valid today and in the context of the 30 Year Plan for Greater Adelaide and the Inner Metro Rim Structure Plan, the need for their implementation could be considered more pressing

Actions were set out within the document under six strategies:

i Strategy 1 – Reducing the pressure on Unley
This strategy identified strands relating to Arterial Road hierarchies, Travel Demand Management, People not Car movement, Transit Oriented Development and Smart Local Travel. This strategy also included a specific action to consider, in conjunction with the State Government, *"options to improve the transport hub and community facilities surrounding Goodwood Railway Station."* This was identified in the context of anticipated urban regeneration in the vicinity of the station.

ii Strategy 2 – Managing transport corridors and their associated land use environment
This strategy introduced the concept of route corridors, and specific, integrated corridor management plans reflecting the need to consider each on its own merits and activities, including variations by time of day/week. There was no specific identification or assessment of the Leah Street/Leader Street corridors.

iii Strategy 3 – Preserving and Enhancing the City of Villages
This strategy considered the function and role of each of the primary village centres.

iv Strategy 4 – Preserving and Enhancing the Quality of the Local Environment
This strategy considered the approach and identification of the residential precincts within the city, proposing integrated approaches to development and transport. Strategy 4.2 and 4.3 are considered to still provide relevant guidance informing this study and these are noted below.

- 4-2 Conditions for residential Precincts
  - Target vehicle speed is 40 km/h or less;
  - The desired driver behaviour is achieved through design and management of the road space;
  - Traffic volumes are generally less than 2,000 vpd[1];
  - Connectivity without attracting through traffic;
  - Accessibility for local bus; and
  - Safe movement of pedestrians and cyclists.
- 4-3 An action plan giving priority to street and intersection treatment, using the following criteria
  - Streets within precincts with vehicle speeds over 40 km/h;
  - Wide carriageways;
  - Long sections;
  - Intersections with an accident record; and
  - Narrow footpaths.

v Strategy 5 – Improving local accessibility safety & convenience, and increase choice in transport mode
This strategy provided further details of road hierarchies and functions for local streets, including traffic volume and speed guidelines. It also proposed criteria for local

[1] The ITS also identifies at page 18 that "local streets with traffic volumes of more than 1000 vehicles per day are considered to have an unacceptable exposure to traffic."

pedestrian accessibility standards and improvements and local and strategic cycle access to better mitigate the increasing dominance of vehicle based planning.

vi Strategy 6 – A single management strategy
This strategy recognised the need for the transport and land use functions to be properly integrated to achieve the best outcomes.

2.3.2 Pedestrian and Bicycle Plan

The Pedestrian and Bicycle Plan was prepared for the City of Unley in 2005 as a follow on document from the ITS. It provided an extremely comprehensive assessment of the pedestrian and cycle networks throughout the City, with an individual assessment provided on many streets. Many of the issues raised and the principles of proposed upgrades remain valid today.

2.4 Initial Community Consultation

As part of the initial stages of the project, the City of Unley held a community workshop to identify the community concerns and aspirations for traffic and transport within the study area.

There were a number of themes that were identified at the workshop, the principles themes being:

- Traffic using alternative local streets to avoid the Leah Street speed cushions;
- Traffic speed on some of the alternative routes used;
- Traffic speed and volume on a number of local streets;
- Inappropriate, inconsiderate or all-day parking in a number of locations;
- Quality and maintenance of local footpaths;
- Access arrangements for the Hungry Jacks on Anzac Highway;
- Pedestrian and cyclist safety on Norman Terrace.

There were also some localised issues identified. This report has sought to address as many of the identified themes and concerns as possible within the context of the study considering a wide study area and seeking to address the major issues within the context of the future funding opportunities likely to be available to the City of Unley.

3. Existing Conditions – Issues

3.1 Introduction

Despite being ideally located to take advantage of the transport opportunities, the study area is not without its issues. Existing data has been used to assess the operational characteristics of the streets and this has been supported by on-site observations. An extensive community consultation survey was also undertaken by the City of Unley and this has provided valuable information to consider against the available data.

The sections below consider each of the transport components within the study area, identifying the available data and community comments and concerns to evaluate the extent of the problem.

3.2 Urban Design

As part of the overall context the urban design fabric of the study area provides a framework that both determines the existing conditions and can be used to frame future opportunities. This is particularly relevant when considering the "Link and Place" assessment presented in the next section. There are a number of components to the urban design that inform the transport considerations.

The street layout within the suburbs is largely based on the traditional grid network which makes it very permeable for vehicles and pedestrians. The public transport corridors create some limitations on this, but also provide other opportunities for creating movement corridors and local places.

There are some existing formal and informal landscaping and streetscape locations, with Forestville Reserve, Everard Park Reserve and Wilberforce Walk Reserve providing formal landscape locations and opportunities. There have also been landscape and streetscape treatments alongside the Mike Turtur bikeway and as part of the South Road tram overpass.

The Mike Turtur bikeway and Marino Rocks Greenway also provide some of the best lit streets within the study area. Many of the streets within the suburbs have only limited street lighting resulting in locations which can be very dark and creating difficulties with narrow footpaths and potential obstructions.

The study area has a large number of street trees, with many of the local streets having a well-defined tree corridor, providing shade, shelter and amenity. There are issues with some tree locations however where they create narrow or damaged footpaths and impact on the street lighting that is available. Pruning of trees and other landscaping should ensure that they do not encroach on footpaths and roadways.

The use of street furniture of various functions can also add to the streetscape value of a street and local area. There is currently little in the way of incidental street furniture within the study area, with the tram stops and reserves providing the main opportunities, related to their primary transport or recreation functions.

3.3 Road Network

3.3.1 Traffic Volumes

This City of Unley has recent traffic data available on much of its local street network and this is shown in Figure 3.1 below.

Figure 3.1: Traffic Volumes in the Study Area

The data groupings are based on the road hierarchy identified in the Unley Integrated Transport Strategy (ITS). The ITS categorised roads as L1 to L3 as noted below:

- L1 – 3,000 to 8,000 vehicles per day and a speed range of 40-60 km/h;
- L2 – 2,000 to 3,000 vehicles per day and a maximum speed of 40 km/h; and
- L3 – 1,500 to 2,000 vehicles per day and a maximum speed of 40 km/h.

The existing data confirms that Leah Street and Leader Street are the two busiest roads falling in or above the L1 road category ranges. Leah Street (south of Everard Terrace) carries up to 6,500 vehicles per day and Leader Street (west of Leah Street) carries up to 9,900 vehicles per day. All other roads within the study area were categorised as local streets, which is below the L3 category.

Traffic volume was reported as a major problem by 18 out of 20 respondents who commented on Leah Street even with the speed cushions in place.

The use of the Leah Street corridor as part of a through route from the southern suburbs results in high volumes of through traffic at certain times of the day, which then transfers on to Leader Street. Leader Street also attracts through traffic between Goodwood Road and Anzac Highway as well as access traffic to the commercial properties fronting it. Speed cushions were installed on Leah Street in late 2012 to mitigate the volume and speed of traffic. This has had some success in achieving these objectives, but is not wholly supported by residents in the local area as the best solution as it has also resulted in transfer of traffic to other local streets.

The only other locations that have recorded daily volumes in excess of 1,000 vehicles are the eastern section of Everard Terrace between Leah Street and Third Avenue and the section of Norman Terrace between Leah Street and First Avenue. Whilst these volumes are within the L3 local street category upper range, traffic speed and other considerations indicate that this level of traffic volume may be inappropriate for the street and that some form of intervention to manage the traffic should be considered.

Of these other local streets, First Avenue was the most frequently identified as a major problem with traffic volumes, with Everard Terrace, Second Avenue and Hillsley Avenue the only other streets where traffic volume was more often reported as a major problem than a minor problem or no problem.

These responses are consistent with the data in terms of the recorded volumes, particularly in the peak periods. Typically peak hour traffic would be around 10% of the daily traffic, whereas in First and Second Avenue the AM peak hour volume is 18% of the daily volume and in Everard Terrace it is 13% of the daily volume. Norman Terrace also records around 14% of daily traffic in the AM peak hour between Leah Street and First Avenue.

PM peak hour volumes in all these streets are at more typical levels. Whilst there is some evidence of the use of Grove Avenue, Third Avenue and Everard Terrace as a route through the study area in the PM peak, there is no consistent indication of peak hour or daily traffic volumes beyond those that could be expected on such streets. Outside the AM peak period, the data indicates that weekday traffic volumes are not a significant issue on these streets, although weekend volumes can be high, particularly when there are major events taking place at the Showgrounds.

There is some evidence of additional routing in the PM peak period through Ethel Street and Norman Terrace, with the southbound PM peak hour volume comprising up to 16% of the total daily traffic. Ethel Street also experiences a significant increase in traffic volumes on hot days in the summer months with visitors to Unley Swimming Centre. Daily traffic volumes in the first week of February 2014 were recorded at over 900 vehicles, compared to less than 300 per day in July 2014.

Other streets with at least one report of traffic volume being a major problem are Berkley Avenue, Charles Street, Norman Terrace, Orchard Avenue and Third Avenue.

Whilst there could be some localised issues on these streets in the peak hours, the overall recorded volumes do not indicate a persistent problem and in all cases more respondents reported minor or no problems.

As well as the diversion of cars, increasing incidents of larger vehicles diverting on to First and Second Avenues and Everard Terrace were reported by residents. During the opening season for Unley Swimming Centre, school buses were also reported to create problems around Ethel Street.

Surveys have also been undertaken to identify origin points of traffic within the Leah Street corridor and the routes that are subsequently taken through the study area. A total of 7 locations were surveyed on East Avenue, Leah Street (2 sites), Ethel Street, First Avenue, Second Avenue and Third Avenue/Everard Terrace. Figure 3.2 below summarises the recorded routes for traffic observed crossing the Forestville level crossing.

Figure 3.2: Traffic Routeing through Study Area

Figure 3.2 shows that of the 1041 vehicles recording entering the study area across Forestville tram stop level crossing, 805 (77.3%) were subsequently recorded leaving the area. Traffic that routed via Norman Terrace and Third Avenue to Leader Street would not have been recorded. However, based on recorded AM peak hour traffic volumes on Third Avenue in comparison to First and Second Avenue, this volume will be well below 50 vehicles. Of the total traffic recorded at the level crossing, 54% remained on Leah Street, with 15% transferring to First Avenue and 6% transferring to Second Avenue. Based on recorded volumes, the traffic on First and Second Avenues is likely to have slightly favoured Everard Terrace over Norman Terrace as a diversionary route.

From the surveys at the southern end of East Avenue, the proportion of longer distance routing through the area can be identified. Figure 3.3 shows the traffic recorded travelling from Winston Avenue in to East Avenue and how this subsequently distributes through the area.

Figure 3.3: Winston Avenue Traffic Routes

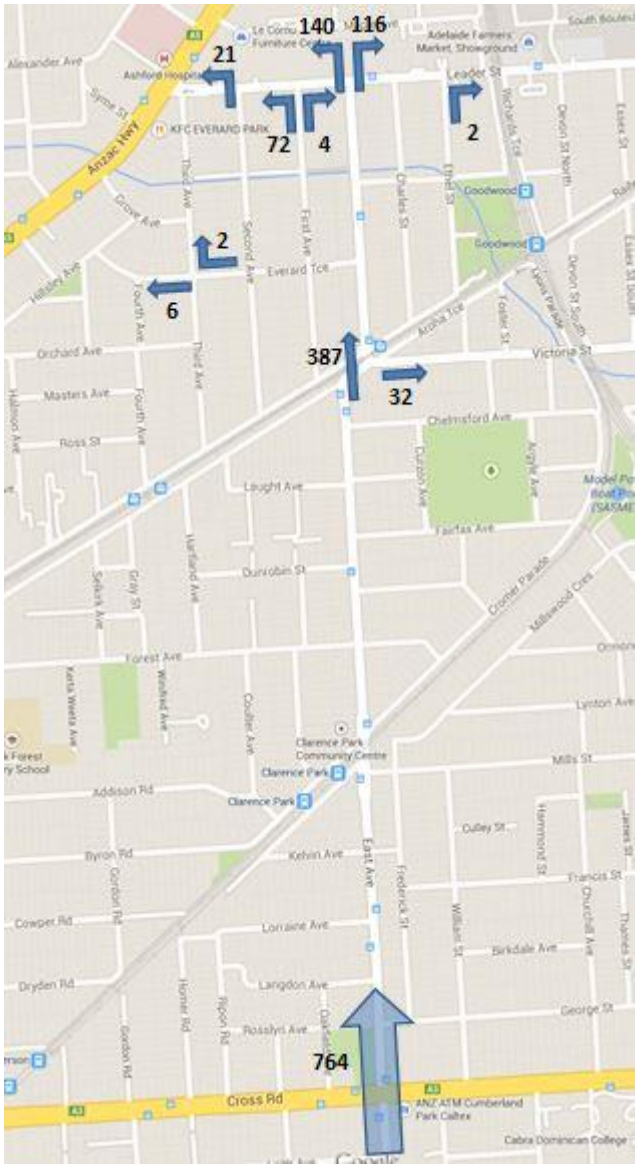


Figure 3.3 identifies that of the traffic recorded travelling from Winston Avenue, only 51% was subsequently recorded crossing the tram line in to the study area. The remainder will either have a destination south of the tram line (which may include parking for the tram at Forestville) or use intermediate routes south of the tram line to access Goodwood Road, with George Street and Mills Street providing direct routes. Some access to Black Forest Primary School could also be expected via this route. Of this longer distance traffic, 66% remained on Leah Street, 20% transferred to First Avenue and 5% transferred to Second Avenue.

Similar analysis was undertaken for traffic turning left and right on to East Avenue from Cross Road. The volumes and routes for this traffic are shown in Figure 3.4 and Figure 3.5 below.

Figure 3.4: Cross Road Left Turn Routes

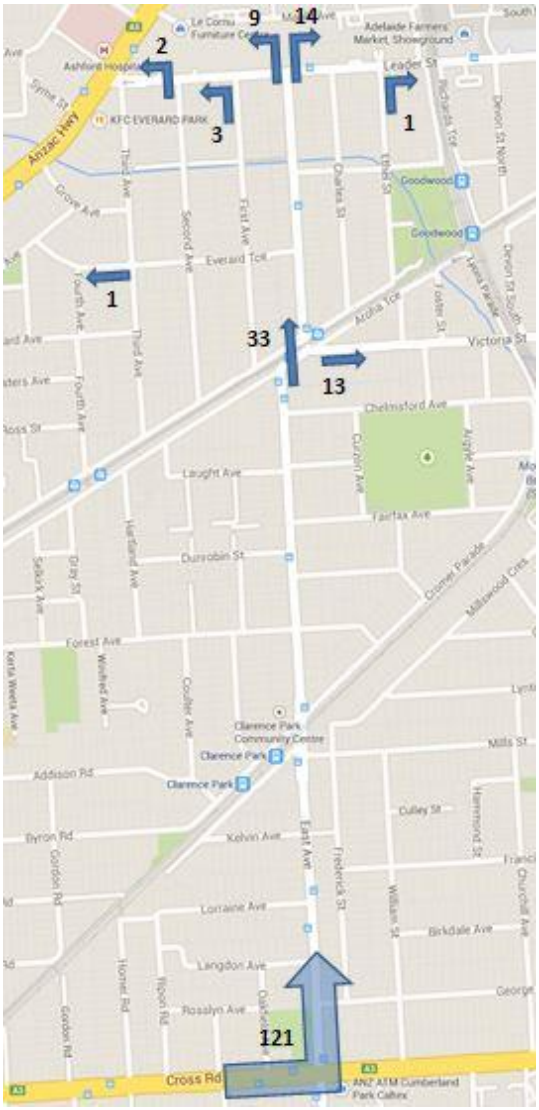


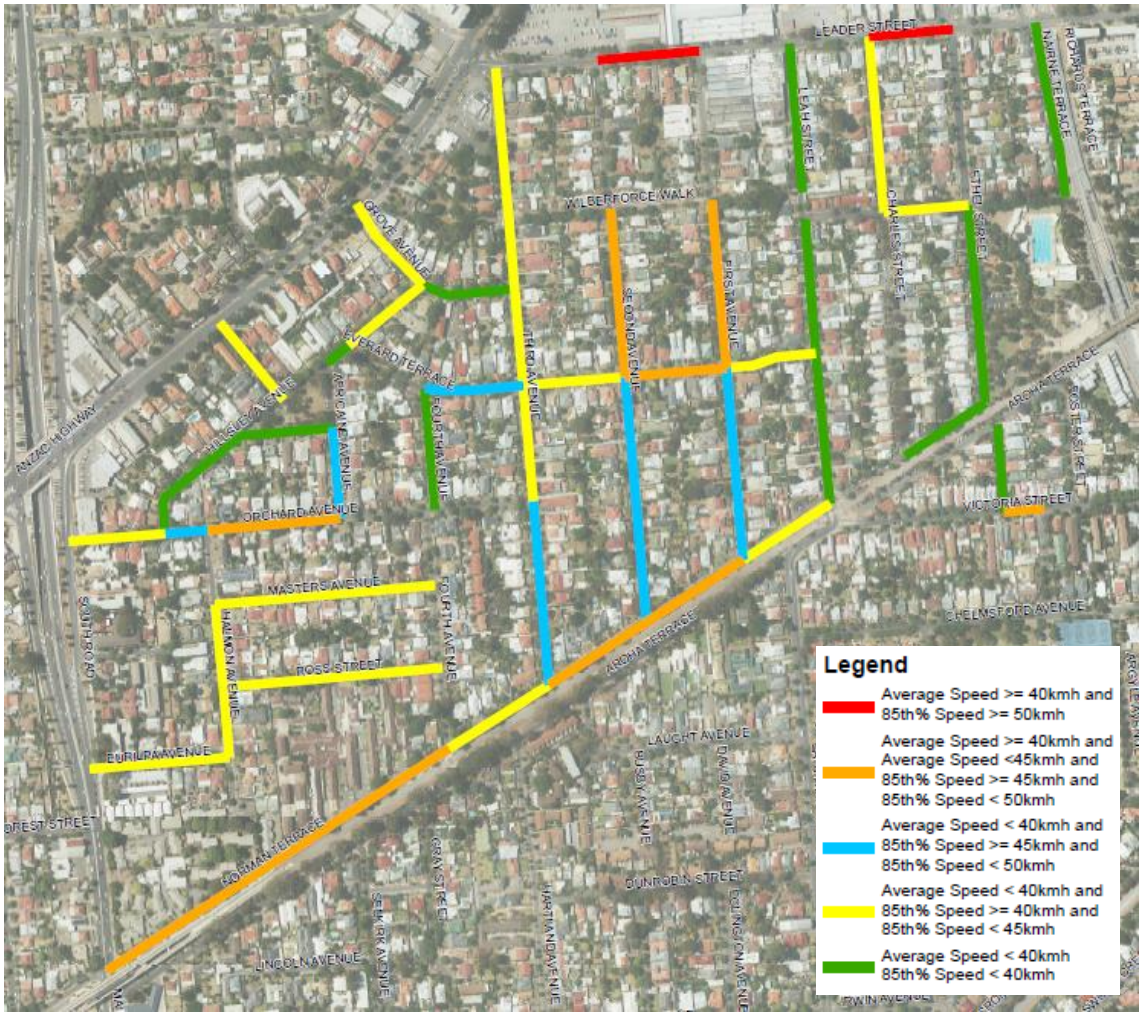
Figure 3.5: Cross Road right Turn Routes

A much higher proportion of the traffic that has turned right from Cross Road (57%) crosses the tram line than has turned left from Cross Road (27%). The right turning traffic does however have a higher tendency to divert to First and Second Avenues than the left turning traffic, which is likely to indicate a desire to travel in that general direction when compared to left turning traffic.

3.3.2 Traffic Speed

With the exception of Leader Street, all of the Council streets within the study area are subject to the City of Unley wide 40 km/h speed limit. However the recorded vehicle speeds confirm that there are a number of streets where there is a significant volume of traffic travelling above 40 km/h. Figure 3.6 below summarises the recorded average and 85th percentile vehicle speeds, identifying them in four bands.

Figure 3.6: Traffic Speeds in the Study Area



Community responses highlighted First Avenue and Norman Terrace with large majorities of respondents identifying traffic speed as a major problem. Everard Terrace and Second Avenue also had a number of respondents identifying traffic speed as a major problem.

The recorded data confirms that First and Second Avenue, and sections of Everard and Norman Terrace have the highest speeds with some sections having more than half of the vehicles travelling above the speed limit (shown as orange in Figure 3.2). This generally accords with the community responses identifying traffic speed as a major problem, although on Everard Terrace and Second Avenue there were at least as many respondents who reported speed as a minor or no problem.

On Norman Terrace it is noticeable that the two locations with the lowest speeds are adjacent to the two tram stops. The section adjacent to Forestville tram stop is very short and influenced by traffic turning in to and out of Leah Street. The section adjacent to Black Forest tram stop has been narrowed to accommodate the tram stop, bike path and landscaping treatments and has several bends all of which would be expected to contribute to the lower speed environment.

Other streets where a small number of respondents identified traffic speed as a major issue were Africaine Avenue, Berkley Avenue, Charles Street, Ethel Street, Grove Avenue, Hillsley Avenue, Leader Street, Orchard Avenue and Third Avenue.

Of these streets, Orchard Avenue (east of Halmon Avenue) was identified as having more than half of the vehicles travelling above the speed limit.

Despite the presence of the speed cushions, Leah Street was still reported as a major problem for traffic speed by three-quarters of respondents who commented on it. Many of these comments identified speed as more of an issue in the evenings and at other times when traffic volumes were lower.

3.3.3 Road Safety

Within the study area, the majority of the crashes on the local roads have occurred on Leader Street, Leah Street and around the Forestville tram stop intersections. The only other local streets that have recorded injury crashes are Everard Terrace (2), Charles Street (1), Orchard Avenue (1) and Norman Terrace (1). There are a small number of property damage crashes. Figure 3.7 below shows the location and severity of the recorded crashes between 2009 and 2013.

Figure 3.7: Crash Locations and Severity within the Study Area

Of the crashes recorded in the study area nine were recorded at the Forestville tram stop intersection, including two D.U.I related incidents and two involving cyclists. Two of these crashes resulted in an injury, one involving a cyclist.

Four crashes on Leader Street between Second and Third Avenues were recorded as involving vehicles performing U-turns, with one of these resulting in an injury. Three of these crashes appear to have potentially been caused by cars moving to the left of the carriageway to perform a U-turn and side swiping cars passing to their right in an easterly direction. Many of the U-turn manoeuvres that take place on Leader Street are reported to relate to vehicles seeking to access the Hungry Jacks and KFC outlets on Anzac Highway, which are not directly accessible to drivers approaching along Anzac Highway from the south west.

Many respondents in the western part of the study area raised the difficulties caused by the accesses to Hungry Jacks and KFC.

Further analysis of the study area data does not suggest other patterns, with varying crash types observed at locations with repeated incidents such as the Leah Street/Leader Street intersection.

3.4 Parking

In addition to resident and visitor parking, parking associated with use of the public transport facilities and events at Adelaide Showgrounds also takes place on local streets.

For Forestville and Black Forest tram stops, car parking is located on the southern side of the tram line on Aroha Terrace. This parking is mainly used by public transport commuters as an all-day park and ride facility for those that wish to use the tram to access the CBD but live beyond suitable walking distance of a tram stop. 90 degree angled parking is located along Aroha Terrace near the Black Forest tram stop (around 15 spaces) and 45 degree angled parking is located along Aroha Terrace near the Forestville tram stop (around 60 spaces east and west of East Avenue). In both locations the spaces are not individually line-marked. Additional on-street parking associated with the public transport facilities also occurs on Norman Terrace near the Black Forest and Forestville tram stops.

Although Aroha Terrace is located outside of the study area the parking along it should be considered as part of the study to ensure that the overall provision of public transport parking within the area is equitable for local land uses and appropriately located.

Two off-street parking areas are located on the eastern side of Ethel Street. The northern area is predominantly for use by visitors to the Forestville Reserve and Unley Swimming Centre with the southern area predominantly for use by public transport users at the Goodwood Railway Station. Based on observations of each parking area the provision of parking generally accommodates the typical peak demands with only limited use observed of the southern parking area in relation to the train station. However, it is anticipated that demand could exceed supply during the warmer months when the Unley Swimming Centre is operational and further observations are required during this period.

The impact of on-street parking during the Royal Show and other events at the Adelaide Showgrounds were raised as a concern in the community responses.

The Adelaide Showgrounds are located immediately to the north east of the study area. The annual Royal Adelaide Show generates heavy on-street parking demand throughout the study area (predominantly along the streets to the north and east of the study area). Temporary parking controls are installed and managed by Council during this period. Given the short term nature of the event and associated parking demand it should not be considered a major reason to permanently change parking controls.

Other events held at the Adelaide Showgrounds (such as the Sunday Farmers Markets) also generate on-street parking demand within the study area. However the demand is generally isolated to the streets in the north east corner of the study area i.e. Nichols Street, Ethel Street, Charles Street and Nairne Terrace.

On-street parking conditions in the north-west corner of the study area were also raised as a concern by some respondents.

It is reported that staff from the Le Cornu Furniture and Buttercup Bakeries businesses (located on the north and south sides of Leader Street respectively) and the Ashford Hospital (located on the west side of Anzac Highway) occupy a number of the on-street parking spaces making it difficult for some residents and their visitors to park near to their properties.

The balance of the study area has a typical mix of unrestricted and time restricted parking with most streets having ample on-street parking opportunities to accommodate the typical peak demands generated by the surrounding uses.

3.5 Cycling

Overall the Mike Turtur shared path and bikeway has been very successful in contributing to increased levels of cycling in Adelaide, to the extent that it is now the busiest peak hour cycle route in Adelaide with over 300 cyclists recorded on the section approaching Goodwood Road in the AM peak period from 7am to 9am. There are also a number of other locations where there are noticeable cycling numbers. Figure 3.8 below provides details of observed cycling volumes in the AM peak period.

Figure 3.8: AM Peak Period Cycling Activity

Community comments noted particular problems for cyclists on Leah Street, Norman Terrace and Ethel Street, with most comments related to the infrastructure being inappropriate or unsafe and aggressive attitudes by a minority of cyclists towards other road users.

Within the study area, there are a number of locations where sections of the bikeway present discontinuity or difficulty for cyclists. The section through Goodwood rail station would be considered a primary area of discontinuity with cyclists required to dismount to walk through the station underpasses for safety reasons (both for themselves and pedestrians). This requirement is not regularly observed by cyclists due to the delay it causes. Whilst many cyclists riding through the underpass were observed to be cycling in a considerate manner, a significant minority were reported to be aggressive and discourteous to other users.

The intersection of the Mike Turtur bikeway and Leah Street requires cyclists to cross each lane of traffic separately and there is limited storage space for cyclists within the median. On the approach to Leah Street, the bikeway also crosses the westbound carriageway of Norman Terrace very close to the intersection. Vehicles making left turns onto Norman Terrace, many of whom are seeking to use short cut routes in the AM peak period, have very limited sight distance to pedestrians and cyclists after the turn.

To the east of Goodwood rail station the Mike Turtur bikeway utilises Norman Terrace between Leah Street and Ethel Street. This section of Norman Terrace is narrow with unrestricted parking on the northern side of the carriageway, restricting the ability for vehicles (travelling in either direction) to safely pass cyclists on this section of the bikeway.

No formal link exists between Norman Terrace and the bikeway continuing east to Goodwood rail station. Cyclists are required to continue straight across Ethel Street into a car parking area to access the bikeway. The section of Norman Terrace from Leah Street to Ethel Street and the path through Forestville Reserve is also poorly lit in relation to its level of use by pedestrians and cyclists.

The recently implemented section of the Marino Rocks Greenway alongside the Seaford Rail Line runs from the tram line alongside Goodwood rail station within the study area. The formal path terminates at Nichols Street with no formal signage to indicate the continuity of the route along Nairne Terrace. There is then no guidance to cyclists as to the continuity of the route once they reach Leader Street.

The community comments noted particular problems for cyclists on Leah Street, Norman Terrace and Ethel Street, with a range of comments from both cyclists and non-cyclists. Most comments related to the infrastructure being inappropriate or unsafe for cycling, although aggressive attitudes by a minority of cyclists towards other road users were reported along the narrow section of Norman Terrace east of Leah Street.

3.6 Walking

The existing local street network provides a comprehensive but generally basic provision for pedestrians. All streets have some footpath provision on both sides, alongside varying width nature strips on most streets. A number of streets have footpaths that appear to have been recently renewed with block paving and provide a good width and surface suitable to accommodate most pedestrian demands, including wheelchairs, pushchairs and gophers, although adjoining areas of unsealed verge could still provide a trip hazard.

Figure 3.9 below shows an example on Leah Street.

Figure 3.9: Footpath Provision on Leah Street

However in many instances the footpaths are of minimum width (1 to 1.2 metres) and in some locations adjoining street trees are lifting the footpath surface creating uneven surfaces and trip hazards. This would also present difficulties for wheelchairs, pushchairs and gophers. Figure 3.10 below shows an example on Nichols Street.

Figure 3.10: Footpath Damage on Nichols Street

Street lighting within the study area is limited and has been identified as a minor or major problem by many residents. By far the major problem for pedestrians was reported on Leah Street

Street lighting within the study area has been identified as a minor or major problem in Leader Street, Leah Street, First Avenue, Second Avenue, Third Avenue and Hillsley Avenue. The extensive street trees in the area, whilst adding to the amenity during the daytime, further limit night time lighting where they are in close proximity to street lights.

The quality of street lighting was partly linked to general problems of pedestrian safety and security in the community consultation responses. By far the major problem for pedestrians was reported on Leah Street where of 19 respondents, 10 identified pedestrian safety as a major problem and 6 identified it as a minor problem. Difficulty in crossing Leah Street during peak hours was the most common problem. Everard Terrace, First Avenue, Second Avenue, Third Avenue, Norman Terrace and Ethel Street were also identified as minor or major pedestrian safety locations by a number of respondents.

The public transport corridors within the study area have been used to provide pedestrian as well as bike route opportunities and the Mike Turtur and Greenway routes are well used by pedestrians. However, outside the available directions of these routes, the public transport corridors themselves create barriers for certain routes, which can impact on local access for all travel modes. The pedestrian routes across the Seaford rail line are limited and the routes through Goodwood station are via narrow underpasses, which would not meet current DDA route guidelines and are likely to give rise to security concerns, particularly during hours of darkness. Similarly the tram line can increase route distances for local walking and cycling trips as permeability through the tram corridor is restricted to the stop locations.

3.7 Public Transport

The study area is very well served by public transport, although the quality of the services and the facilities at the various stops varies considerably. It should however be noted that, other than sections of the access routes on local streets and reserves, the responsibility for the provision of this infrastructure lies with the State Government through DPTI and not the City of Unley.

A number of respondents noted capacity problems on peak hour tram services, with passengers being unable to board some services.

The three tram stops within the study area are generally built to modern design standards, are easily accessible from the local streets and footpaths, well lit, provide crossing points via pedestrian mazes at each of the stops and provide some park and ride facility, particularly at Forestville. It should however be noted that the South Road stop (stop 6) is not directly accessible from the Mike Turtur shared path and is not signed as such. The service frequencies are also at an attractive level throughout the operating hours of the tram, with the frequency every 10 minutes in peak periods and remaining at 15-20 minutes during the evenings and weekends. However, the attractiveness of the service results in capacity issues with many services, particularly in the peak periods, operating at or above capacity, leading to reports of passengers being unable to board.

However, Goodwood rail station is of a much older design and would not meet current DDA design standards or safety by design (CPTED) guidelines. The station provides little in the way of street presence or signage to indicate access routes and the formal access via narrow and poorly lit underpasses would be considered unwelcoming. Personal safety and security concerns, often associated with public transport facilities, are therefore likely to be a particular issue at Goodwood station. Aside from the peak periods, and in particular at evenings and weekends, the service frequencies are at best half-hourly which is unlikely to attract significant patronage or activity around the station. This would be expected to further contribute as a deterrent to using the station.

Figure 3.11 below summarises the patronage levels at the tram and train stops from October and August 2014 respectively and indicates the access mode. Forestville and Black Forest tram stops

both report around 20% park and ride, which would be more significant at Forestville given the overall higher patronage and the more extensive parking availability. Interchange between trains at Goodwood station and tram to bus at South Road is also around 20%. Patronage figures were reported in the 2002 ITS and it is noticeable that patronage at the tram stops has generally doubled whilst the patronage at Goodwood rail station has reduced.

Figure 3.11: Tram and Train Daily Patronage Levels

Table 3.1 below also considers the changes between 2013 and 2014. This indicates that overall patronage at all 4 sites has reduced by a combined total of 300 passengers or 13.4%.

Table 3.1: Tram and Train Patronage Comparisons

Station/Stop	2013 Patronage	2014 Patronage	Change
Goodwood	485	443	-8.7%
Forestville	707	639	-9.6%
Black Forest	482	415	-13.9%
South Road	553	431	-22.1%
TOTAL	2,227	1,928	-13.4%

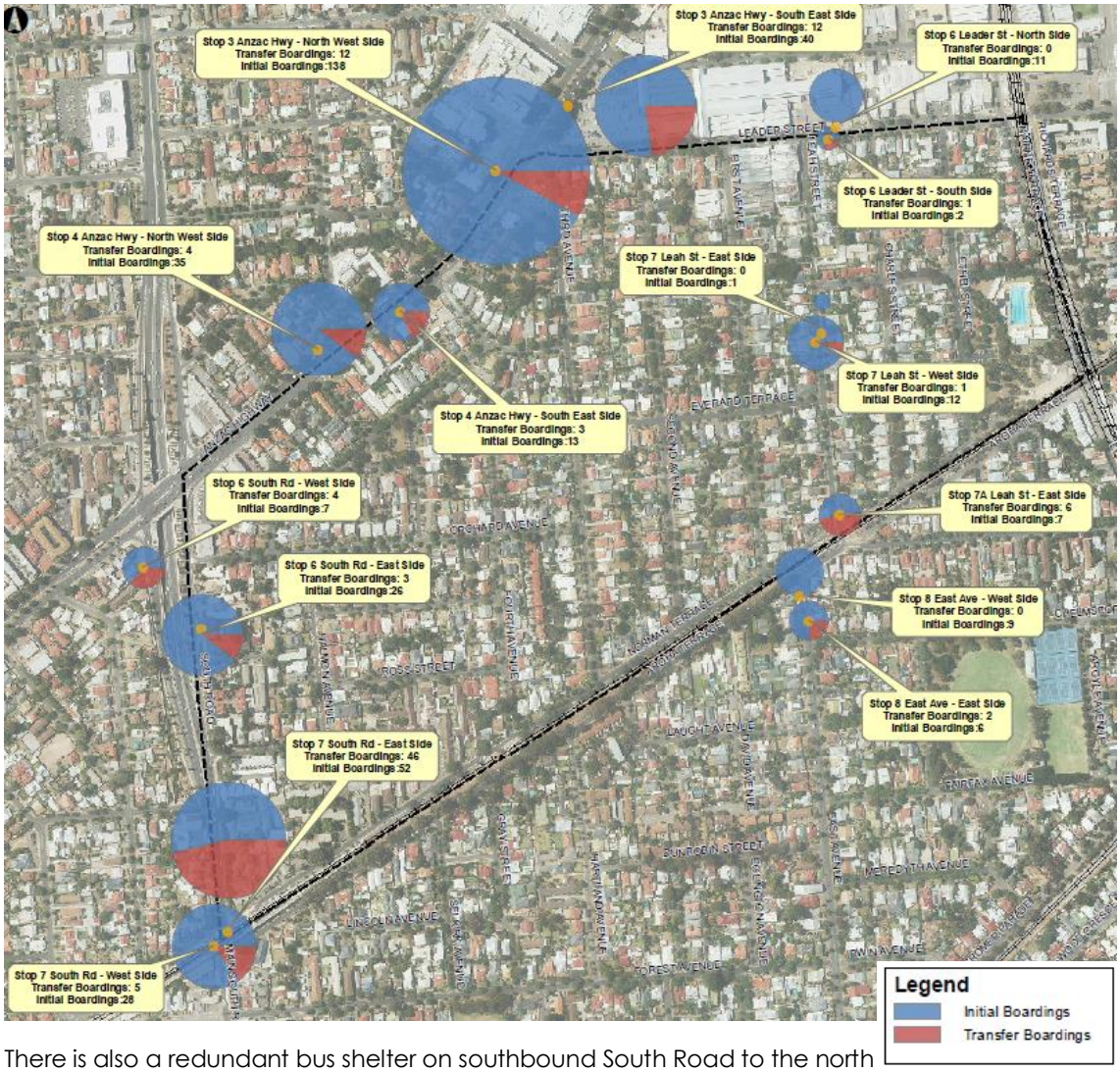
The bus services are concentrated along two primary corridors; South Road and Anzac Highway and Leah Street. The various services along South Road and Anzac Highway combine to provide high frequency services during the majority of operating periods, with the peak hour frequencies towards the CBD at levels that would be considered as a "turn up and go" frequency, with no reference to timetables required. Along Leah Street, the peak period and weekday daytime frequencies are also at a good level and as a more local service the evening half-hourly services are considered appropriate. Weekend daytime services would be seen as less attractive.

The bus stop facilities along Leah Street and Leader Street are generally basic with small, older style shelters on the CBD bound stops and timetable details. This provision is partly a function of the available width, with the footpaths and verges generally narrow and constrained. The stops from the CBD provide few facilities but are generally used only for alighting as noted in Figure 3.12 below. Figure 3.12 shows Stop 7 on Leah Street.

Figure 3.12: Bus Stop Facilities on Leah Street

The bus stop facilities along Anzac Highway and South Road are generally good, particularly in the CBD bound direction, with modern bus shelters, providing seating and timetable information. However, access to these bus stops is problematic with only the stops on Anzac Highway around Leader Street being in close proximity to safe pedestrian crossing routes. This access opportunity would be expected to contribute at least in part to this being the busiest bus stop within the study area as shown in Figure 3.13 below.

Figure 3.13: Bus Stop Patronage in Study Area



There is also a redundant bus shelter on southbound South Road to the north overpass, as a result of the relocation of the bus stop to better integrate with the tram. Consideration should be given to removing or relocating the shelter (which may have contractual obligations with the advertisers) as it obstructs a significant portion of the footpath.

4. Opportunities

4.1 Introduction

It is unrealistic to expect that private motor vehicles can be relied on to adequately, sustainably or equitably respond to the future travel task of the study area without significant impacts to quality of life and the City of Unley 4 Year Plan recognises this. It is therefore recommended that the opportunities available through the study ensure balanced provision for future travel through walking, cycling and public transport modes.

This section considers the opportunities that are available for all transport modes both in terms of responding to and resolving existing issues and as a means of developing an improved local streetscape and transport environment over time.

For each of the potential opportunities the following treatments have been identified on an individual street basis. However, these treatments will not be considered in isolation for the final package as some treatments will be mutually/partially exclusive to others whilst other treatments will need complementary or precedent treatments in place. This will be identified in the final recommendations and action/delivery plan. The final LATM plan will look at the area wide effects of all measures working together.

4.2 Link and Place Assessment

Current best practice widely recognises that urban streets generally have two core activity functions being a Link function (i.e. the essential need to follow a continuous linear path through the street network with minimal disruption and seamless connection) and a Place function (i.e. the street is a destination and activities occur on or adjacent to the street)[2].

A review of the study area has identified a number of Link status streets as well as a number of existing (or opportunistic) Place status streets. Some streets share a Link and Place function and the differing needs of these streets must therefore be carefully considered.

A review of the study area has identified the following key Link and Place status classifications and opportunities:

Link Status

- Leah Street
- Leader Street
- Norman Terrace (particularly east of Leah Street); major pedestrian and bicycle link
- Nairne Terrace; major pedestrian and bicycle link
- Wilberforce Walk pedestrian link.

Place Status

- Sections of streets around the Forestville Tram stop and adjoining shops (Leah Street/ Norman Terrace/Aroha Terrace/Victoria Street).
- Sections of streets around the Black Forest Tram Stop and South Road tram stops (Norman Terrace and Aroha Terrace).
- Sections of streets surrounding the Everard Park Reserve (Hillsley Avenue/Nibley Avenue/Africaine Avenue).
- Sections of streets surrounding Forestville Reserve (Unley Swimming Centre)/Goodwood Railway Station (Ethel Street, Nichols Street, Richards Terrace).
- Wilberforce Walk as a linear reserve.

[2] Streets for People - Compendium for South Australian Practice (2012)

4.3 Urban Design

There are a number of urban design improvements that could be considered within the study area and the following have been identified as potential opportunities:

- Improve lighting along major pedestrian links to public transport, particularly Goodwood station.
- Consider additional street furniture and rest areas along walking and cycling links.
- Incorporate landscaping into traffic control treatments where possible (e.g. driveway links).
- Consider reallocation of road space to improve walking and cycling modes where roadway space is well beyond the required capacity when road assets reach the end of their useful life (e.g. Nichols Street east of Ethel Street).
- Alterations to Norman Terrace immediately west of Leah Street, consider partial closure or full closure in both directions to create local public realm.

4.4 Traffic Network

4.4.1 Traffic Volumes

- Consider removal of speed cushions on Leah Street to discourage displacement of vehicles to adjacent streets.
- Consider treatments of First/Second/Third Avenues and Everard Terrace to deter displacement of traffic from Leah Street.
- Consider partial/full closures of Norman Terrace east of Leah Street i.e. No Through Road between Ethel/Charles Street and Leah Street.
- Alterations to Norman Terrace immediately west of Leah Street, consider partial closure westbound or full closure.

4.4.2 Traffic Speeds

- Consider build outs or median refuges along Leah Street at intermediate intersections/ locations as an alternative to speed cushions to create visual narrowing or realignment of the roadway.
- Retain speed cushions on Leah Street as a continued measure to manage speeds.
- Consider vehicle speed management as part of any upgrade of the Wilberforce Walk crossings of First/Second/Third Avenues.
- Consider use of additional local street roundabouts, particularly on Everard Terrace.
- Investigate options for indented parking along Leader Street in conjunction with kerb build outs.
- Consider use of driveway links (or similar treatment to Norman Terrace adjacent to Black Forest tram stop) on sections of Norman Terrace, First Avenue, Second Avenue, Everard Terrace.
- Consider reinstatement of speed humps on Everard Terrace.
- Review speed limit on Leader Street, possible reduction to 40km/h in conjunction with bicycle treatments.

4.5 Road Safety

- Investigate kerb build outs at Leah Street / Leader Street intersection and sheltered right turn lane on Leader Street into Leah Street.
- Investigate a roundabout at the intersection of Leah Street and Leader Street in conjunction with any future redevelopment of the Buttercup Bakery site.
- Liaise with DPTI regarding option of a signal controlled U-turn on Anzac Highway at the intersection of Leader Street to remove the need for U-turns in Leader Street itself.
- Consider upgrade of lighting along Norman Terrace from Leah Street to Ethel Street and through Forestville Reserve.
- Consider one-way options for Norman Terrace from Leah Street to Ethel Street.
- Alterations to Norman Terrace immediately west of Leah Street; relocate left turn north of bikeway.
- Alterations to Norman Terrace immediately west of Leah Street, consider partial closure westbound.

4.6 Parking

- Replace 45 degree angled tram parking along Aroha Terrace with 90 degree parking resulting in an estimated 26 additional spaces.
- Remove parking from Norman Terrace (east of Leah Street) and/or install short term or resident parking.
- Consider locations for possible time limits on parking to prevent all-day parking.
- Review parking in proximity to intersections where sight distance and safety issues identified.

4.7 Cycling

- Consider upgrade of Wilberforce Walk to a shared use path and explore options to extend through to Anzac Highway and Forestville Reserve as part of any future upgrade of the Brownhill Creek and Keswick stormwater infrastructure.
- Upgrade Wilberforce Walk crossings of First/Second/Third Avenues in conjunction with build-outs/driveway links/streetscape upgrades.
- Designation of Norman Terrace east of Leah Street as a 10 km/h shared zone.
- Consider longer term single surface slow speed treatment of Norman Terrace between Leah Street and Ethel Street to improve pedestrian and cyclist safety.
- Implement a pedestrian and cyclist actuated crossing of Leah Street immediately north of Forestville tram stop as part of redesigned Norman Terrace intersection.
- Consider upgrade of the Nichols Street / Nairne Terrace corner to improve the interface of the Marino Rocks Bikeway with Nairne Terrace.
- Consider longer term upgrade of Nairne Terrace as a single surface slow speed environment to improve pedestrian and cyclist safety.
- Consider installation of bicycle lanes along Leader Street (west of the level crossing) as an extension of the treatment east of the level crossing.
- Transfer the formal north-south bike route from Leah Street to Charles Street (or Ethel Street).
- Advocate to and work with DPTI for cycle overpass over Goodwood railway station.

4.8 Walking

- Consider upgrade of Wilberforce Walk to a shared use path and explore options to extend through to Anzac Highway and Forestville Reserve as part of any future upgrade of the Brownhill Creek and Keswick stormwater infrastructure.

- Upgrade Wilberforce Walk crossings of First/Second/Third Avenues in conjunction with build-outs/driveway links/streetscape upgrades.
- Designation of Norman Terrace east of Leah Street as a 10 km/h shared zone.
- Consider longer term single surface slow speed treatment of Norman Terrace between Leah Street and Ethel Street to improve pedestrian and cyclist safety.
- Implement a pedestrian and cyclist actuated crossing of Leah Street immediately north of Forestville tram stop as part of redesigned Norman Terrace intersection.
- Consider longer term upgrade of Nairne Terrace as a single surface slow speed environment to improve pedestrian and cyclist safety.
- Consider widening of existing footpaths along known pedestrian routes or to replace sub-standard footpaths, reallocating road space on lower volume streets.
- Consider provision of build-outs and median refuges along Leah Street.

4.9 Public Transport

- Improve lighting along major pedestrian links to public transport, particularly Goodwood station.
- Increase parking through revised arrangement along Aroha Terrace for use by public transport commuters.
- Advocate to and work with DPTI for additional pedestrian maze at the eastern end of Forestville station to improve access from the most eastern car parking areas.
- Consider installation of bicycle parking at tram stops and Goodwood station.
- Advocate to DPTI for increased frequencies of existing public transport.
- Advocate to and work with DPTI for upgraded access to Goodwood railway station to meet DDA and CPTED guidelines.
- Advocate to and work with DPTI for a tram/train hub/interchange at Goodwood Railway Station as part of tram and shared path overbridge.
- Advocate to and work with DPTI to provide pedestrian access improvements to existing bus stops on Anzac Highway and South Road.
- Review bus routes and stop locations with DPTI to ensure most appropriate connections are being made.
- Seek to remove redundant bus shelter on South road north of tram stop.

5. Option Assessment

5.1 Introduction

Using the identified opportunities as a framework and taking account of initial comments from the Community Reference Group (CRG), this section presents the assessment completed for each potential option.

The options have been considered within the same general headings as the opportunities, other than a consideration of the traffic volumes and speed as an overall traffic management assessment. Within this heading, each street has been considered in terms of the potential options and the likely outcomes from those options as well as the extent to which the option would meet the Council's strategic goals using a simple assessment matrix.

For each of the streets, the identified options have largely been identified on an individual street basis and the ability to resolve the specific issues on that street. However, these treatments will not be considered in isolation for the final package as some treatments will be mutually/partially exclusive to others whilst other treatments will need complementary or precedent treatments in place. This will be identified in the final recommendations set out in chapter 6 and action/delivery plan set out in chapter 7. The final LATM plan will look at the area wide effects of all measures working together.

Within the assessment matrix, the three objectives set out within the Council's 4 Year Plan for "Moving our Path to an Accessible City" are:

- Equitable Parking throughout the City
- An integrated, accessible and pedestrian friendly City
- Alternative travel options

In order to reflect the impact on traffic access and connectivity, the integrated, accessible and pedestrian friendly city objective has been categorised in two aspects, namely integrated and connected and accessible and pedestrian friendly. The accessible and pedestrian friendly objective has also been assessed as seeking to reduce or mitigate adverse traffic impacts in local streets. Thus the four objectives against which to assess options are:

- Equitable Parking throughout the City
- An integrated and connected city
- An accessible and pedestrian friendly City
- Alternative travel options

Each of the potential options has been assessed under each of these objectives and their respective sub-objectives and strategies to identify the extent to which the option would meet the objective. A five point scale has been used to indicate the outcome as noted below.

- Moderate to high benefit (✓✓)
- Small to moderate benefit (✓)
- Neutral outcome (N)
- Small to moderate impact (×)
- Moderate to high impact (××)

For each road or topic discussed below, the options are summarised in an assessment matrix.

5.2 Link and Place Assessment

The assessment of the study area and consultation with the CRG identified and confirmed a number of existing or potential link and place status streets and locations within the study area.

5.2.1 Link Assessment

As part of the assessment 5 existing or potential links were identified within the study area; two traffic related and three primarily pedestrian and/or cyclist related. These links are:

- Leah Street
- Leader Street
- Norman Terrace (particularly east of Leah Street); major pedestrian and bicycle link
- Nairne Terrace; major pedestrian and bicycle link
- Wilberforce Walk pedestrian link.

Leader Street and Leah Street are both identified within the L1 road category range under the definitions in the Unley Integrated Transport Strategy performing the function of collector or distributor roads. This road classification is the highest classification within the local road network. Whilst to some extent Leader Street is of a design and width that is capable of supporting such a function, Leah Street is less desirable for such classification being narrow and largely residential in nature. Whilst there are no recommendations to change the classification of either road in the short to medium term, it is recommended that Council develops a longer term strategy to seek to reduce the importance and classification of Leah Street for traffic and create a more residential street environment. There are however some recommendations set out below to assist with the streets link status in the short to medium term.

Norman Terrace and Nairne Terrace both form part of long distance strategic bicycle routes, supplemented by local pedestrian use on some sections as a shared path format. The status and design of these streets to provide such a link should be development to reduce the priority perception and space allocation for the motor car.

Wilberforce Walk has the potential to develop a local link function for pedestrians and cyclists in the short to medium term. In the longer term, and subject to wider assessment in relation to stormwater management in the Brownhill Creek corridor, it has the potential to form part of a wider strategic pedestrian and bicycle route.

5.2.2 Place Assessment

As part of the initial opportunities, a total of 5 locations were initially identified with existing or potential place status, as set out in section 4 above. Following discussions with the CRG, it was identified that whilst the area around Black Forest tram stop would have a neighbourhood place function, the existing design and facilities provide an appropriate place function. There are therefore no options proposed relating to this location. However, the CRG felt that an area of Leader Street to the west of the level crossing had the potential to develop as a place given the proximity to the Showgrounds and other uses. This location has therefore been identified as a place with the potential for appropriate upgrades.

The identified place locations within the study area are:

- Sections of streets around the Forestville Tram stop and adjoining shops (Leah Street/ Norman Terrace/Aroha Terrace/Victoria Street).
- Section of Leah Street to the west of the level crossing around existing shops and close to the Showgrounds.
- Sections of streets surrounding the Everard Park Reserve (Hillsley Avenue/Nibley Avenue/Africaine Avenue).
- Sections of streets surrounding Forestville Reserve (Unley Swimming Centre)/Goodwood Railway Station (Ethel Street, Nichols Street, Richards Terrace).
- Wilberforce Walk as a linear reserve.

5.3 Urban Design

There are a number of urban design improvements that could be considered within the study area and the following have been identified as potential opportunities:

- Improve lighting along major pedestrian links to public transport, particularly Goodwood station.
- Consider additional street furniture and rest areas along walking and cycling links.
- Incorporate landscaping into traffic control treatments where possible (e.g. driveway links).
- Consider reallocation of road space to improve walking and cycling modes where roadway space is well beyond the required capacity when road assets reach the end of their useful life (e.g. Nichols Street east of Ethel Street).
- Alterations to Norman Terrace immediately west of Leah Street, consider partial closure or full closure in both directions to create local public realm.

5.4 Traffic Network

This section considers the traffic management options appropriate for each of the streets within the study area. Whilst before traffic volumes and speeds were considered independently, in the option assessment each Street has been considered for potential options, potential impacts on that street and adjoining streets and the likely outcomes. An assessment for each street is set out below.

5.4.1 Leader Street

The status of Leader Street is not anticipated to change in the future and therefore options have been based on improving the operation of the existing road and the amenity value. The eastern end of Leader Street within the study area was identified as having a neighbourhood to district level place function and that improvements to the street environment should support that. Leader Street is programmed for reconstruction and reseal within the next two financial years and this therefore provides the ideal opportunity. Options identified for Leader Street are:

- Build outs on the south side of Leader Street to assist pedestrians;
- Creation of indented parking between the build-outs;
- Reduced width of traffic lanes to assist with speed management;
- Extension of footpath on south side east of Leah Street to create additional pedestrian space;
- Roundabout at Leah Street intersection as a longer term option;
- Westbound bike lane.

The current street has very narrow footpaths creating a poor pedestrian environment and very wide traffic lanes which creates a higher traffic speed environment than is considered desirable. There are also no road markings within the current street layout, which exacerbates the poor pedestrian and high traffic speed environments. Providing reduced width and clearly marked traffic lanes and parking lanes will assist in managing the speeds. West of Leah Street, it is also recommended to extend the footpath beyond the existing kerb line by approximately 1.7m, which would still enable the recommended travel and parking lane widths of 3.5m and 2.1m respectively to be achieved.

The option for a westbound bike lane was considered. However existing bicycle volumes are not high and are expected to reduce significantly once the Greenhill Road shared path underpass is open, which is expected imminently. The option has not therefore been further assessed.

The roundabout option at Leah Street is considered to provide some overall improvement in terms of reducing the queue lengths on Leah Street and reducing the incentive for rat-running to avoid the queues. However, reducing the queues on Leah Street could encourage further traffic

to use the corridor and it is therefore recommended that any roundabout should be complemented, and ideally follow, the implementation of additional traffic management with the East Avenue and Leah Street corridor.

Table 5.1: Leader Street Option Assessment

Option / Objective	Kerb build-outs	Indented Parking	Reduce traffic lane widths	Footpath Extension	Leah Street roundabout
Equitable Parking	N	N	N	N	N
Integrated & Connected	N	N	N	N	N
Accessible & Pedestrian Friendly	✓	N	✓	✓✓	✓/×
Alternative Travel	✓	N	✓	✓	N

5.4.2 Leah Street

In the short to medium term, options for Leah Street relate to managing the speed and volume of traffic. In the longer term there may be options to reduce the status of Leah Street. The identified options for Leah Street are:

- Remove Speed Cushions to deter rat-running to adjoining streets;
- Retain speed cushions to continue to manage traffic speeds;
- Build outs around intersections to change visual perception along street and reduce pedestrian crossing distances;
- Median refuges to change visual perception along street and assist pedestrians crossing Leah Street.

Although the existing speed cushions have been identified as creating some impact in the study area, overall the benefits from reduced traffic speed and some deterrence to using the route that arise from their presence result in a preferred option for them to be retained with the addition of kerb build-outs around the intersections and up to 2 pedestrian refuges. The build-outs and refuges would change the visual perception of a long straight street and assist pedestrians to cross Leah Street through reducing the crossing distance or enabling them to cross one traffic direction at a time.

In the longer term there may be potential to reduce the attraction of the Leah Street corridor as a major route towards the CBD. This could include changes to East Avenue and on the Winston Avenue approach to the traffic signals with Cross Road. The option of a pedestrian/cyclist activated crossing adjacent to Forestville tram stop, discussed further below in sections 5.5 and 5.6 on Walking and Cycling could also assist in reducing the perceived speed and attraction of the Leah Street route.

Table 5.2: Leah Street Option Assessment

Option / Objective	Remove Speed Cushions	Retain Speed Cushions	Kerb Build-outs	Pedestrian Refuges
Equitable Parking	N	N	N	×
Integrated & Connected	N	N	N	N
Accessible & Pedestrian Friendly	×	N	✓	✓
Alternative Travel	×	N	N	✓

5.4.3 Everard Terrace

Everard Terrace is heavily used by drivers seeking to avoid Leah Street, particularly in the AM peak period. Vehicles using Everard Terrace are also travelling well above the speed limit due to the alignment and lack of traffic control between Leah Street and Third Avenue. Prior to reconstruction of the street in October 2012, there was a series of three speed humps between

Leah Street and Third Avenue, which were not reinstated. Options that have been identified for Everard Terrace are:

- AM peak period left turn restriction in to Everard Terrace from Leah Street;
- Kerb build-out to reduce entry width for traffic turning in to Everard Terrace from Leah Street;
- Reinstatement of speed humps between Leah Street and Third Avenue;
- Introduction of a local roundabout at the intersection with First Avenue;
- Introduction of a local roundabout at the intersection with Second Avenue.

The introduction of roundabouts at the intersections of First and Second Avenues is the primary option that is considered to assist with traffic speed management on Everard Terrace. The peak period left turn ban from Leah Street on to Everard Terrace is considered feasible, notwithstanding the risk of non-compliance. However it is considered that preventing the left turn on to Norman Terrace is more critical and implementing both will be very restrictive for residents seeking to access the areas west of Leah Street from the south.

The proposed roundabouts and additional measures on First, Second and Third Avenues are considered to provide sufficient assistance to Everard Terrace. However traffic volumes and speeds should continue to be monitored, particularly between Leah Street and First Avenue. Whilst roundabouts are not generally seen to be of assistance to pedestrians and cyclists, the reduced vehicle speeds that they create will assist in making the street safer for pedestrians and cyclists. The introduction of the roundabouts would provide traffic control measures with the recommended spacing to achieve appropriate speeds such that reintroduction of the speed humps would not be considered to provide any additional benefit.

Table 5.3: Everard Terrace Option Assessment

Option / Objective	Left turn restriction	Kerb build-outs on entry	Reinstate Speed humps	First Avenue roundabout	Second Avenue roundabout
Equitable Parking	N	N	N	N	N
Integrated & Connected	×	N	N	N	N
Accessible & Pedestrian Friendly	✓	✓	✓	✓	✓
Alternative Travel	✓	✓	N	✓	✓

5.4.4 First Avenue

First Avenue is also heavily used by traffic seeking to avoid Leah Street and therefore suffers from increased peak hour traffic and high traffic speeds. Whilst First Avenue does have to give way to Everard Terrace, this is not sufficient to deter vehicles from using it. Options for First Avenue are:

- Introduction of a local roundabout at the intersection with Everard Terrace;
- Introduction of a driveway link where Wilberforce Walk crosses First Avenue;
- Introduction of a series of angled slow points along First Avenue north and south of Everard Terrace;
- Kerb build-out threshold to reduce entry width for traffic turning in to First Avenue from Norman Terrace.

Whilst the roundabout at Everard Terrace will not have a significant effect on traffic speeds, there would be some reduction expected. The proposed driveway link would be expected to have a significant impact on traffic speeds and the attraction of vehicles using First Avenue. It will however require support from the adjoining residents due to the potential impact on driveway accesses. There would also be some loss of on-street parking, although design options may allow some parking to be retained within the driveway link, this would reduce the potential for landscaping. Angled slow points would also result in some loss of on-street parking, although the

impact would be more dispersed. The use of angled slow points would be an alternative option to a driveway link.

Between Norman Terrace and Everard Terrace, a driveway link could also be considered, although the same issues of loss of on-street parking and managing driveway accesses would apply without the advantage of the section with no frontage property provided by Wilberforce Walk. A series of angled slow points may therefore be a more acceptable option in this location and these can also be used to provide some landscaping.

Table 5.4: First Avenue Option Assessment

Option / Objective	Everard Terrace roundabout	Driveway Link	Angled Slow Points	Kerb build-out Threshold
Equitable Parking	N	×	×	N
Integrated & Connected	N	N	N	N
Accessible & Pedestrian Friendly	✓	✓	✓	✓
Alternative Travel	✓	✓	✓	✓

5.4.5 Second Avenue

The issues and options for Second Avenue are broadly similar to First Avenue, although it does attract less diverted traffic from Leah Street. Options for Second Avenue are:

- Introduction of a local roundabout at the intersection with Everard Terrace;
- Introduction of a driveway link where Wilberforce Walk crosses Second Avenue;
- Introduction of a series of angled slow points along Second Avenue north and south of Everard Terrace;
- Kerb build-out threshold to reduce entry width for traffic turning in to Second Avenue from Norman Terrace.

The assessment of the options for Second Avenue would be the same as First Avenue.

Table 5.5: Second Avenue Option Assessment

Option / Objective	Everard Terrace roundabout	Driveway Link	Angled Slow Points	Kerb build-out Threshold
Equitable Parking	N	×	×	N
Integrated & Connected	N	N	N	N
Accessible & Pedestrian Friendly	✓	✓	✓	✓
Alternative Travel	✓	✓	✓	✓

5.4.6 Third Avenue

Third Avenue is less susceptible to rat-running traffic than First and Second Avenue, although there is still some that takes place. The longer section of the street between Norman Terrace and Everard Terrace also creates additional speed concerns, although the existing roundabout at the intersection with Everard Terrace will provide some speed management. Third Avenue does however suffer from some overspill parking and traffic seeking to access Hungry Jacks and to a lesser extent KFC. The options for Third Avenue are similar to First and Second Avenues for local traffic management as well as options to mitigate the external access issues and are:

- Introduction of a driveway link where Wilberforce Walk crosses Third Avenue;
- Introduction of a series of angled slow points along Third Avenue north and south of Everard Terrace;
- Kerb build-out to reduce entry width for traffic turning in to Third Avenue from Norman Terrace;

- Investigate with DPTI the option for a U-turn to be permitted at the Anzac Highway/ Leader Street intersection.

Table 5.6: Third Avenue Option Assessment

Option / Objective	Driveway Link	Angled Slow Points	Kerb build-outs	U-turn phase at Anzac Highway
Equitable Parking	×	×	×	N
Integrated & Connected	N	N	N	✓
Accessible & Pedestrian Friendly	✓	✓	✓	N
Alternative Travel	✓	✓	✓	N

5.4.7 Fourth Avenue

The assessment and community consultation has identified few issues associated with Fourth Avenue. As it is not a through route between Norman Terrace and Leader Street, it is not attractive as a rat-run route. Whilst the staggered cross-road intersection with Orchard Avenue reduced the risk of excessive speed, there could be the potential for some traffic speed issues between Norman Terrace and Orchard Avenue. Options associated with the Orchard Avenue intersection are considered below under Orchard Avenue.

Subject to future monitoring and impact of measures being introduced elsewhere there may be a need for some localised speed management measures such as angled slow points. Alternatively in the longer term the street could be considered for reconstruction as a shared space, single surface street.

5.4.8 Charles Street

Charles Street currently has low traffic volumes and few identified issues arising from the assessment and community consultation. The existing on street parking assists with managing traffic speeds. Options identified in section 5.4.11 below for Nichols Street would be expected to assist Charles Street and therefore at this stage there are no identified options for Charles Street. The street should however continue to be monitored following the introduction of measures on other streets.

5.4.9 Ethel Street

Ethel Street has been identified to suffer from some PM peak period rat-running traffic, although the nature of the route through Norman Terrace and limited time gain discourage significant volumes. There are some localised speed issues, however the options for Nichols Street and the intersection with Norman Terrace discussed further below could be expected to assist this. Following the introduction of these measures on other streets no further measures for traffic calming and control anticipated on Ethel Street

In the longer term, and subject to the impact of measures introduced elsewhere, there would be the potential to consider reconstruction of Ethel Street, particularly south of Nichols Street. This could be delivered as part of a future road upgrade/renewal to provide a shared space, single surface street, and incorporate urban design improvements to integrate the street within the adjacent reserve.

5.4.10 Norman Terrace

There are a number of different issues and options that apply to the two sections of Norman Terrace, east and west of Leah Street, and they have therefore been considered independently.

West of Leah Street

The section of Norman Terrace to the west of Leah Street is characterised by high traffic speeds due to its width and straight alignment and high volumes on some sections where it is used as a rat-run. There are also a number of safety concerns with the area around Forestville tram stop. Options for this section of Norman Terrace therefore focus on reducing speeds and improving safety perceptions and are:

- Introduction of additional meanders in the road alignment (as per existing adjacent to Black Forest tram stop) in the vicinity of Second Avenue and Parkrose Village;
- AM peak period left turn restriction in to Norman Terrace from Leah Street;
- Closure of Norman Terrace to westbound traffic immediately west of Leah Street;
- Redesign of area adjacent to Forestville tram stop to enhance place status and implement pedestrian and cyclist crossing of Leah Street;
- Kerb build-outs to reduce entry width for traffic turning from Norman Terrace in to First, Second and Third Avenues

The existing meander in the road alignment adjacent to Black Forest tram stop results in lower vehicle speeds and therefore the option to provide a further two similar treatments will maintain connectivity but reduce vehicle speeds to more appropriate levels. The additional area created adjacent to the Mike Turtur shared path can also be used to enhance the amenity of the facility. There may be some loss of on-street parking, although the use of partially indented spaces could be considered.

The left turn restriction in to Norman Terrace from Leah Street in the AM peak would be expected to deter some of the rat-running, although it will require some enforcement. Options for developing an improved place status around Forestville tram stop include realigning the shared path to be adjacent to the tram stop and south of the westbound traffic lane, thereby allowing a controlled pedestrian and cyclist crossing and creating a conjoined area for pedestrians, cyclists and public realm. This is similar to an alternative option considered at the time the current layout was implemented. The long term creation of a successful and safe neighbourhood place in this location may require the permanent closure of Norman Terrace to traffic immediately west of Leah Street.

Table 5.7: Norman Terrace western section Option Assessment

Option / Objective	Additional Meanders	Left turn restriction	Westbound road closure	Forestville tram stop redesign	Kerb build-outs
Equitable Parking	×	N	N	N	N
Integrated & Connected	N	×	××	✓	N
Accessible & Pedestrian Friendly	✓	✓✓	✓✓	✓✓	✓
Alternative Travel	✓	✓✓	✓✓	✓✓	✓

East of Leah Street

The section of Norman Terrace east of Leah Street presents a much different environment to west of Leah Street with a very narrow roadway shared with cyclists, narrow footpaths that result in pedestrians also using the roadway and high levels of on-street parking associated with the tram stop. Whilst actual traffic speeds are much lower, they are higher than desirable for the conditions. Options for this section of Norman Terrace are:

- Median treatment, entry threshold treatment and cyclist box at intersection with Ethel Street;
- Create a shared zone environment in the existing street by restricting the footpath
- Re-construction of the street as a single surface shared space;
- Creation of a one-way eastbound only street for traffic, retaining two-way for cyclists;

- Closure to through traffic with local access via Charles Street;
- Parking restricted to resident only or time limited.

The median treatment at the intersection with Ethel Street is considered an effective short term scheme to better define the vehicle entry in to Norman Terrace from Ethel Street, provide guidance to cyclists on the need to give way to vehicles when crossing Ethel Street and reduce the speeds of vehicles entering Norman Terrace. It would be similar to the existing arrangement on King William Road where the Mike Turtur bikeway diverges from King William Road, as shown in Figure 5.1 below.

Figure 5.1: King William Road Bike Lane Right Turn Box

Subject to support from residents and the City of Unley, this section of Norman Terrace could operate as a shared street through further restrictions of the existing limited footpaths. Under the Australian Road Rules, pedestrians are permitted to walk in the roadway where "it is impracticable to travel on the footpath." For a number of existing pedestrians, the Norman Terrace footpaths are already impracticable for travel, with the result that they are walking in the roadway. Through the use of planters or other physical measures, the footpaths could be made impracticable for all pedestrians, thus creating the need to share the roadway. This would need to be supported by measures to reduce vehicle speeds, such as the entry treatment at Ethel Street, relocating some car parking to the south side to create a vehicle meander and threshold treatments.

There would also be an option to support this with a formal designation as a shared zone with a 10 km/h speed limit if the vehicle speeds were not reduced sufficiently by design changes to the street. Under practices adopted in NSW, suitable local streets with low traffic volumes and speeds are designated as 10 km/h shared zones with only minor infrastructure changes. This permits pedestrians to legally walk within the existing roadway area and provides pedestrians and cyclists with priority over vehicles. A typical inner city example in Sydney is shown below as Figure 5.2.

This type of shared zone treatment is not currently permitted in South Australia and would therefore require specific approval from DPTI prior to implementation.

The option to restrict Norman Terrace to eastbound traffic only could still operate in conjunction with the shared street arrangements, with suitable speed management measures in place to ensure traffic was travelling at a safe speed. Full closure to through traffic, with access via Charles Street only for residents and a limited number of short term car parks would be unlikely to require

any vehicle speed management measures due to the low volumes and short travel distances involved.

Figure 5.2: Shared Zone in Local Street in Sydney, NSW

In the medium to longer term, once the options for the shared path bridge over the rail line are confirmed, Norman Terrace could be redesigned as a single surface street, shared by all transport modes. Even with this option, traffic volumes and speeds should continue to be monitored and if the street is still not considered safe for pedestrians and cyclists, one-way or closure options should be investigated further.

Restricting parking to residents only or time limited to prevent all day parking is also considered to be a desirable short term option. In the assessment table, all other options are assumed to retain the existing parking conditions for comparison purposes.

Table 5.8: Norman Terrace western section Option Assessment

Option / Objective	Ethel St Median	Shared Street Operation	Single Surface street	One-way eastbound	Through traffic closure	Parking Restrictions
Equitable Parking	N	N	N	N	N	✓
Integrated & Connected	N	N	N	×	×	N
Accessible & Pedestrian Friendly	✓	✓✓	✓✓	✓✓	✓✓	✓
Alternative Travel	✓	✓✓	✓✓	✓✓	✓✓	✓

5.4.11 Nichols Street

Nichols Street is used by some rat-run traffic in both peak periods, but not to a significant extent. To the east of Ethel Street it is a very lightly trafficked street, providing access to a small number of properties on Nichols Street and Nairne Terrace. It is however a very wide street, with the roadway well in excess of the extent required for the volume of traffic and localised resident on-street parking demand. Conversely the footpaths are very narrow and further impacted by a number of street trees that restrict the width adjacent to them and result in footpath damage.

Nichols Street is considered ideal for street reconstruction to create a single surface shared space, with a reduced roadway area, integrated parking spaces appropriate for the residential demand, increased pedestrian areas and street landscaping. Extending this treatment through the intersections with Charles Street and Ethel Street would also assist with traffic management on

these streets. Should a continuation of Wilberforce Walk along Brownhill Creek to the east of Leah Street not be achievable as a through route for walking and cycling, it is considered that a redesigned Nichols Street could be utilised as a suitable alternative.

To the east of Ethel Street, as part of considering a street reconstruction, potential options have been assessed for providing angled on-street parking to assist with peak parking demands for the Unley Swimming Centre and reduce the overspill in to other sections on Nichols Street and Ethel Street. Further design work is required, as some of the parking options may require Nichols Street to be converted to one-way operation for some or all of the section east of Ethel Street.

Table 5.9: Nichols Street Option Assessment

Option / Objective	Full Street Reconstruction	On-street angle parking
Equitable Parking	✓	✓
Integrated & Connected	N	N
Accessible & Pedestrian Friendly	✓✓	N
Alternative Travel	✓✓	N

5.4.12 Nairne Terrace

Nairne Terrace is very lightly trafficked providing access and egress to frontage properties and some exit for traffic from Unley Swimming Centre during peak periods. It is one-way northbound except for cyclists. It also forms part of the Marino Rocks Greenway, although the environment for cyclists is not particularly attractive. The footpath on the western side is also narrow and disrupted by street trees.

As with Nichols Street, Nairne Terrace would be ideally suited to reconstruction to provide a single surface shared space providing improved pedestrian and cyclist amenity, appropriate levels of indented on-street parking to support the residential properties and a low speed travel environment.

Table 5.10: Nairne Terrace Option Assessment

Option / Objective	Full Street Reconstruction
Equitable Parking	✓
Integrated & Connected	N
Accessible & Pedestrian Friendly	✓✓
Alternative Travel	✓✓

5.4.13 Grove Avenue

Grove Avenue is not particularly heavily trafficked but is used as part of a route in the PM peak period by traffic seeking to avoid the Anzac Highway and South Road traffic signals despite the largely free-flow left turn lane from Anzac Highway in to South Road. Traffic speeds are however of some concern with 85th percentile above 40 km/h despite the roads relatively short length. The speeds around the bend in conjunction with on-street parking have created a poor safety perception, although this has not resulted in any reported injury or damage only crashes.

Traffic management measures elsewhere within the precinct would be expected to assist in deterring through traffic from using a route that includes Grove Avenue. Nevertheless, traffic volumes and speeds on Grove Avenue should continue to be monitored.

5.4.14 Hillsley, Nibley and Africaine Avenues

These three streets front on to the Everard Park Reserve. Whilst there are no significant traffic issues identified through data and consultation responses, there is some concern over vehicle speeds

past the reserve along Hillsley Avenue. As the reserve itself is quite small, it is considered that there is potential to use the adjoining streets to blur the edge between the reserve and the street, effectively extending the reserve. There are two potential options for this to be achieved:

- the use of meanders that reduce the road width, integrating the additional space in to the reserve in conjunction with the adjoining verge and footpath.
- reconstructing the sections of road adjacent to the reserve as single surface road reserves, integrating landscape, appropriate levels of on-street parking and pedestrian routes within a reduced width formal road reserve, integrating in to the reserve.

Nibley Avenue in particular would lend itself to a reconstruction in the style of a driveway link given the short distance and low number of properties involved.

Table 5.11: Hillsley, Nibley and Africaine Avenues Option Assessment

Option / Objective	Road Meanders	Single Surface Street
Equitable Parking	×	✓
Integrated & Connected	N	N
Accessible & Pedestrian Friendly	✓✓	✓✓
Alternative Travel	✓✓	✓✓

5.4.15 Orchard Avenue

Orchard Avenue is a long straight road between Third Avenue and South Road. It has no intermediate traffic control measures resulting in high speeds on the central sections and evidence of eastbound rat-running during the PM peak period.

There are no opportunities for the introduction of roundabouts along Orchard Avenue as the intermediate intersections are T-junction format and would have insufficient space. There would however be opportunities to change the priority at some of the intersections so that Orchard Avenue traffic has to give way. Changing the through route designation at the staggered cross-roads intersection with Fourth Avenue may also be feasible subject to suitable sight distances being maintained. The use of driveway links may be feasible at some of the intersections and a series of angled slow points is also likely to be feasible along the length of the street. Build-outs could also be used at intermediate intersections to reduce the width of Orchard Avenue.

The options for Orchard Avenue are:

- Reverse the priority of existing intersections at one or more of Hillsley Avenue, Africaine Avenue, Halmon Avenue and Fourth Avenue;
- Introduction of driveway links at one or more of the intermediate intersections;
- Introduction of a series of angled slow points along Orchard Avenue;
- Kerb build-outs to reduce road width along Orchard Avenue.

Table 5.12: Orchard Avenue Option Assessment

Option / Objective	Reversed Priority Intersections	Driveway Links at Intersections	Angled Slow Points	Kerb Build-outs
Equitable Parking	N	×	×	×
Integrated & Connected	N	N	N	N
Accessible & Pedestrian Friendly	✓	✓	✓	✓
Alternative Travel	✓	✓	✓	✓

5.4.16 Other Local Streets

No specific measures have been recommended for the following local streets as they already have treatments, do not suffer from through traffic or inappropriate traffic speeds or would potentially benefit from measures proposed on other streets:

- Berkley Avenue
- Halmon Avenue
- Masters Avenue
- Ross Street
- Eurilpa Avenue

Traffic conditions should however continue to be monitored on these streets following implementation of other recommended treatments

5.5 Walking

A number of the options considered in conjunction with individual streets set out in the analysis in section 5.4 will provide benefits to pedestrians and the general walking environment within the study area. This includes:

- longer term single surface slow speed treatment on Norman Terrace between Leah Street and Ethel Street;
- longer term upgrade of Nairne Terrace as a single surface slow speed environment;
- longer term upgrade of Nichols Street to improve footpaths and consider a single surface slow speed environment, which would be an alternative to the eastern extension of Wilberforce Work if this cannot be delivered;
- provision of build-outs and median refuges along Leah Street;
- opportunities for widening existing footpaths, replacing sub-standard footpaths and reallocating road space on lower traffic volume streets.

In addition to the street specific measures, there are also a number of other general options identified for improving the pedestrian environment and specific projects:

- Ensure there is a strategy for future upgrade and maintenance of footpaths that includes renewal based on actual footpath conditions.
- Where residual verge width is below 0.6/1.0m and around transport facilities (bus stops) use full width paving and tree pits where the verge is not evidently managed or landscaped.
- Upgrade footpath widths to a minimum of 1.5m, with additional width based on use requirements, as part of planned renewal.
- Where street trees limit or damage footpaths, seek to implement footpaths around the trees as build-outs for indented parking or road narrowing.
- Seek to implement a pedestrian (and cyclist) actuated crossing adjacent to Forestville tram stop as part of a redesigned Norman Terrace intersection.

- Develop Wilberforce Walk as a linear path and explore options to extend through to Anzac Highway and Forestville Reserve as part of any future upgrade of the Brownhill Creek and Keswick stormwater infrastructure.
- Seek to remove redundant bus shelter on east side of South Road north of tram stop.

The option for a pedestrian actuated crossing adjacent to Forestville tram stop is considered feasible using an alternative design for the Norman Terrace road alignment identified at the time the current design was constructed. Norman Terrace westbound would be realigned to be north of the crossing area, with the northbound stop line for vehicles on the East Avenue approach located south of the tram level crossing. The pedestrian crossing would need to be linked to the operation of the level crossing to ensure that their operation was concurrent whenever possible.

Table 5.13: Walking Option Assessment

Option / Objective	Upgrade & Maintenance Strategy	Full width paving	Minimum width (1.5m) footpath	Footpaths around trees	PAC at Forestville tram stop	Wilberforce Walk upgrade	Remove redundant shelter
Equitable Parking	N	N	N	×	N	N	N
Integrated & Connected	✓	N	✓	✓	✓✓	✓✓	✓
Accessible & Pedestrian Friendly	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓
Alternative Travel	✓	✓	✓	✓	✓✓	✓✓	N

5.6 Cycling

As with walking options, there are a number of options identified on individual streets that would be of benefit to cyclists, as noted below.

- longer term single surface slow speed treatment on Norman Terrace between Leah Street and Ethel Street;
- longer term upgrade of Nairne Terrace as a single surface slow speed environment;
- longer term upgrade of Nichols Street to improve footpaths and consider a single surface slow speed environment, which would be an alternative to the eastern extension of Wilberforce Work if this cannot be delivered.

The Nairne Terrace option would be of particular benefit providing an improved route continuation of the Marino Rocks Greenway after Forestville Reserve.

In addition to the above options, the following options have also been identified that would be specifically for cyclists, and in some cases also providing benefits for pedestrians and assisting with reducing the impact of traffic.

- Upgrade Wilberforce Walk to a shared use path and explore options to extend through to Anzac Highway and Forestville Reserve as part of any future upgrade of the Brownhill Creek and Keswick stormwater infrastructure.
- Upgrade the Nichols Street / Nairne Terrace corner to improve the interface of the Marino Rocks Bikeway with Nairne Terrace.
- Review designation of local bike direct network.
- Seek to implement a cyclist (in conjunction with pedestrians) actuated crossing adjacent to Forestville tram stop as part of a redesigned Norman Terrace intersection.
- Identify opportunities and potential locations for formal bike parking/lockers at tram and train stops.
- Advocate to and work with DPTI to implement cycle overpass over Goodwood railway station.

GTA understands from discussions with DPTI that the proposed shared path overbridge over Goodwood Station remains an identified priority scheme but as yet there are no formal designs within the public domain and no identified funding and delivery timescales.

Table 5.14: Cycling Option Assessment

Option / Objective	Wilberforce Walk upgrade	Nichols St/ Nairne Tce upgrade	Review bike direct network designation	Cyclist crossing at Forestville tram stop	Tram/train station bike parking	Goodwood station Cycle overpass
Equitable Parking	N	N	N	N	N	N(1)
Integrated & Connected	✓✓	✓	✓	✓✓	✓✓	✓✓
Accessible & Pedestrian Friendly	✓✓	✓	✓	✓✓	✓	✓✓
Alternative Travel	✓✓	✓	✓	✓✓	✓✓	✓✓

Notes: (1) neutral impact in study area assuming parking changes implemented on Norman Terrace.

5.7 Public Transport

Although much of the public transport network is the responsibility of DPTI, the City of Unley should be working with and advocating to DPTI for improvements, particularly in light of the significant recent reductions in patronage. Improvements will support existing travel demand and encourage modal shift and ensure that as additional development is implemented through the Inner Metro DPA, enhanced public transport options and capacity are available to avoid further pressure from increased traffic demand. A number of public transport options have been identified that would be led by Unley, including:

- Review demand for and layout of designated tram parking at Forestville following parking changes on Norman Terrace; consider replacing 45 degree parks with 90 degree parks.
- Review and upgrade bus stops and provide shelters as appropriate to meet DDA requirements and timescale of 2021 for full compliance.
- Improve lighting along major pedestrian links to public transport, particularly Goodwood station.

Table 5.15: Public Transport Option Assessment for City of Unley

Option / Objective	Tram Parking Review and upgrade	Review and upgrade bus stops	Review and upgrade access lighting
Equitable Parking	✓	N	N
Integrated & Connected	✓	✓	N
Accessible & Pedestrian Friendly	✓	✓	✓
Alternative Travel	✓✓	✓	✓

Options that would require delivery through advocating to and working with DPTI are:

- An additional pedestrian maze at the eastern end of Forestville station to improve access from the most eastern car parking areas on Aroha Terrace.
- Increased tram and train capacities and frequencies for existing public transport and to accommodate future growth from development.
- Review bus routes and bus stop locations with DPTI to ensure most appropriate routes and connections are being provided.
- Upgraded access to Goodwood railway station to meet DDA and CPTED guidelines.
- A tram/train hub/interchange at Goodwood Railway Station as part of tram and shared path overbridge.
- Provision of pedestrian access improvements to existing bus stops on Anzac Highway and South Road.

Table 5.16: Public Transport Option Assessment in Conjunction with DPTI

Option / Objective	Additional Pedestrian Maze	Train & tram capacity & frequency	Bus stop routes and locations	Goodwood station access upgrade	Goodwood Interchange	Anzac Hwy bus stop access
Equitable Parking	✓	N	N	N	N	N
Integrated & Connected	✓	✓	✓	✓✓	✓✓	✓
Accessible & Pedestrian Friendly	✓	✓✓	✓	✓✓	✓✓	✓
Alternative Travel	✓	✓✓	✓✓	✓✓	✓✓	✓

5.8 Parking

Much of the study area is already covered by time limited parking and those locations where there are not time limits were not observed with significant on-street parking that would not be related to residents. However, concerns over long term parking, particularly from staff at Ashford Hospital and Le Cornu were raised, as well as concerns over vehicles being parked too close to intersections. A limited number of options and actions have therefore been identified:

- Seek to engage with Le Cornu to understand their staff parking provision and arrangements and assist with managing on-street demands.
- Seek to engage with Ashford Hospital and City of West Torrens Council to develop parking and traffic/travel management strategies for the hospital.
- Monitor on-street parking locations for possible extension of the zones covered by existing time limited parking to prevent all-day parking, in particular the western end of Everard Terrace.
- Review all signage and line marking in proximity to intersections to ensure that it is adequately and visibly marked to maintain sight distance and safe parking distances.

6. Recommendations

6.1 Introduction

From the preceding option assessment and CRG feedback, a recommended package of measures has been developed identifying the preferred option for each location or treatment. The details of the recommended preferred option package are set out below, including a brief discussion on how some of the measures within the package would need to be linked. In addition, there are a number of locations where alternative options would be feasible should the recommended preferred option not be deliverable as a result of more detailed assessment and investigations or not be supported as a result of the community engagement feedback.

6.2 Proposed Options

The recommended options contain a wide range of measures that would be expected to assist with local traffic management, provide improved local street amenity, improve pedestrian and cyclist facilities and ensure that public transport is fit for purpose to meet the demand anticipated as a result of the Inner Metro DPA and 30 year plan for Greater Adelaide.

A series of three options have been identified covering the traffic management measures within the various local streets. These are supported by a series of recommendations covering walking, cycling and public transport that would provide a wider or longer term context for the City of Unley to implement.

Details of the traffic control measures and other street and path recommendations are shown in the option figures in Appendix 1 and set out in Table 6.1, Table 6.2 and Table 6.3 below on a street by street basis, including identifying complimentary or precedent scheme requirements. Table 6.4 also provides details of some recommendations that could be considered as medium to long term measures on some of the local road network to better support adjoining land uses and operation of the street.

Table 6.5 provides details of the recommended walking, cycling and public transport measures to be implemented.

The overall package of the local street measures would be expected to take between 5 and 10 years for full delivery, with some of the major DPTI related projects potentially having a longer timescale related to the overall 30 year plan for Greater Adelaide. The proposed priority level and timescale for each of the measures will be considered further following the Community consultation on the Draft Concept Plan.

Table 6.1: Option A Treatments

Street	Recommended Measure	Complimentary/Precedent measures
Leader Street	Kerb build outs around intersections	Indented parking
	Indented parking	Kerb-build outs
	Reduced width, marked traffic lanes	None
	Leah St roundabout	None
Leah Street	Retained speed cushions	Everard Tce/First, Second Ave treatments
	Kerb build outs around intersections	None
	Pedestrian refuges	None
Everard Terrace	Roundabout at First Avenue	None
	Roundabout at Second Avenue	None
	Kerb build-outs at Leah Street	None
	AM peak period left turn restriction	Resident support. Measures on Everard Tce and adjoining streets do not reduce rat-runs
First Avenue	Driveway link at Wilberforce Walk	None
	Kerb build out and threshold at Norman Tce	None
Second Avenue	Driveway link at Wilberforce Walk	None
	Kerb build out and threshold at Norman Tce	None
Third Avenue	Driveway link at Wilberforce Walk	None
	Kerb build out at Norman Tce	None
Norman Terrace (W)	Additional meanders	None
	Left turn AM peak period restriction	Everard Tce/First, Second Ave treatments
Norman Terrace (E)	Parking relocation and restrictions	None
	Ethel St median treatment	None
	Creation of a Shared Street environment	Parking changes and Ethel Street median treatment
Orchard Avenue	Reverse Priority at Africaine Ave to be north to east	None
	Reverse Priority at Halmon Ave to be south to east	None
	Kerb build-outs on north side at Fourth Avenue	None

Table 6.2: Option B Treatments

Street	Recommended Measure	Complimentary/Precedent measures
Leader Street	Kerb build outs around intersections	Indented parking
	Indented parking	Kerb-build outs
	Reduced width, marked traffic lanes	None
Leah Street	Retain Speed Cushions	Everard Tce/First, Second Ave treatments
Everard Terrace	Roundabout at First Avenue	None
	Roundabout at Second Avenue	None
	AM peak period left turn restriction	Resident support. Measures on Everard Tce and adjoining streets do not reduce rat-runs
First Avenue	Series of angled slow points	None, alternative to Driveway link
Second Avenue	Series of angled slow points	None, alternative to Driveway link
Third Avenue	Series of angled slow points	None, alternative to Driveway link
Norman Terrace (W)	Closure to westbound traffic at Leah St	None, alternative to left turn restriction
Norman Terrace (E)	Parking relocation and restrictions	None
	Creation of a Shared Street environment	Parking changes and threshold treatments
	Closure to westbound traffic, except bicycles	None
Orchard Avenue	Series of angled slow points	None, alternative to priority changes

Table 6.3 Option C Treatments

Street	Recommended Measure	Complimentary/Precedent measures
Leader Street	Kerb build outs around intersections	Indented parking
	Indented parking	Kerb-build outs
	Reduced width, marked traffic lanes	None
Leah Street	Remove Speed Cushions	Everard Terrace treatments
Everard Terrace	Reinstate previous speed humps	None, alternative to roundabouts
Norman Terrace (E)	Closure to through traffic, resident access via Charles Street	None, alternative to westbound closure

Table 6.4 Longer Term Measures for Local Streets

Location/Mode	Recommended Measure	Complimentary/Precedent measures
Ethel Street	Whole street upgrade (south of Nichols St)	None
Norman Terrace	Leah St Intersection/tram stop redesign	None
Norman Terrace (E)	Long term reconstruction to single surface road	Cycle overpass of Goodwood Station
Nichols Street	Full street reconstruction/redesign	Brownhill Creek stormwater management
	On-street angle parking east of Ethel St	Street reconstruction/redesign
Nairne Terrace	Full street reconstruction/redesign	None
Hillsley/Nibley/ Africaine Avenues	Whole of street reconstruction/redesign around Everard Park Reserve	None

Table 6.5 Walking, Cycling and Public Transport Options

Mode	Recommended Measure	Complimentary/Precedent Measures
Walking	Footpath Upgrade & Maintenance Strategy	None
	Full width paving	None
	Minimum width footpath (1.5m)	None
	Footpaths around trees	Street reconstructions (where relevant)
	Leader Street extended footpath width Leah St-Nairne Tce	Nairne Tce desirable
	Wilberforce Walk upgrade	None (Third Ave-Leah St), Brownhill Creek stormwater plan (remainder)
	Pedestrian Crossing at Norman Tce/Leah St	None
	Remove redundant South Road bus shelter	None
Cycling	Review bike direct designation	None essential, some desirable
	Tram/train station bike parking	None
	Nichols St/Nairne Tce intersection upgrade	None essential, Nairne Tce upgrade desirable
	Wilberforce Walk upgrade	None (Third Ave-Leah St), Brownhill Creek stormwater plan (remainder)
	Cyclist Crossing at Norman Tce/Leah St	None
	Goodwood station cycle overpass	Norman Terrace upgrade
Public Transport	Forestville tram stop parking	Norman Terrace parking restrictions
	Review and upgrade bus stops for DDA	Routes review with DPTI
	Access lighting	None
DPTI Public Transport	Eastern pedestrian maze at Forestville	Cycle overpass of Goodwood Station
	Train & Tram capacity & frequency	None
	Bus routes and stop locations	Review and upgrade bus stops
	Goodwood station access upgrades	Cycle overpass of Goodwood Station
	Goodwood Interchange	Cycle overpass of Goodwood Station
	Anzac Highway bus stop access	None

6.3 Alternative Options

There are a number of locations where more than one option has been identified and assessed and the different options are presented as part of different packages above. Subject to community support on some of the specific recommendations within the option packages, there would be scope to create a final recommended package of options that included measures from each of the proposed options where these would be compatible.

7. Summary

7.1 Summary

This report outlines the Local Area Traffic Management Study completed for the Forestville and Everard Park suburbs in the City of Unley.

The study has evolved the previous approach to LATM and has considered the issues and opportunities associated with traffic and all other modes of transport. This is considered particularly relevant in the Inner Metro areas where future infill development will be expected to generate additional travel demands, which will need to be accommodated across a wide range of transport modes.

The assessment of the existing conditions identified a number of local streets there were being used as a short cut by through traffic, some of which was at inappropriate speeds based on the speed limit and local environment. The existing speed cushions on Leah Street and the delays entering Leader Street from Leah Street are likely to be the primary cause of much of this through traffic.

Walking and Cycling infrastructure provides many locations where there are good facilities that are well used, particularly along the Mike Turtur route. However in other locations, footpaths are narrow and disrupted by tree routes and key routes around Goodwood station do not provide facilitates that meet DDA and CPTED guidelines or match the remainder of the route quality.

Initial community concerns are largely supported by the evidence in terms of locations with high traffic volumes and speeds and poor pedestrian and cyclist safety. Capacity and frequency of public transport also drew some comments.

The initial review of the study area sought to identify the major transport links and also the locations within the study area that were or could have a place status beyond a local level. The areas around Forestville tram stop, Forestville and Everard Park Reserves and Leader Street west of the level crossing were identified and supported by the community Reference Group of at least neighbourhood place status.

An initial sift of the opportunities identified a wide range of potential measures that could be considered. These ranged from low cost, minor traffic control measures to major schemes that will be required in the longer term in order to ensure that the transport network for all modes is fit for purpose to assist in supporting the 30 Year Plan for Greater Adelaide and the Inner Metro DPA aspirations.

The highest priority options identified through the CRG discussions relate to managing the impact of traffic re-routing to avoid the speed cushions on Leah Street. This includes First Avenue, Second Avenue, Everard Terrace and Norman Terrace west of Leah Street. Norman Terrace east of Leah Street was also seen as a priority by the CRG due to safety concerns between pedestrians, cyclists and traffic caused by the narrow street and footpaths.

A series of measures have been identified as three option packages for local traffic management measures, together with recommendations on medium to longer term locations for changes to the street design and operation and walking, cycling and public transport measures. The final package of recommended options and priority levels and timescales will be identified following the community consultation on the Draft Concept Plan. It would be expected that the majority of the works that would be the responsibility of the City of Unley would take up to 10 years to complete, subject to other funding commitments and delivery constraints. The majority of measures that would require partnership with DPTI and potentially other external organisations would expect to have a longer delivery timescales, which in some cases would be linked to the 30 Year Plan and Inner Metro DPA timescales.

8. References

Streets for People: A Compendium for South Australian Practice, 2012

Healthy by Design SA, 2013

The City of Unley 4 Year Plan 2013-2016; A Community of Possibilities

Unley Integrated Transport Strategy, 2002

The City of Unley Pedestrian and Bicycle Plan, 2005

30 Year Plan for Greater Adelaide, 2010

Inner Metro Rim Structure Plan, 2013

City of Unley Draft Village Living and Desirable Neighbourhoods Development Plan Amendment (DPA), 2014.

Appendix A

Recommended Schemes

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