



**Town of Bassendean
Local Area Traffic Management Plan**



Town of Bassendean Local Area Traffic Management Plan

Prepared by

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Executive Summary

The Town of Bassendean has engaged Opus to prepare a Local Area Traffic Management (LATM) Plan for the Town. This plan is required by the Town to consider local traffic issues raised by residents and Council, and to develop a conceptual plan that addresses the concerns and issues identified during the study process.

A LATM study is a formal way of investigating traffic, pedestrian and cyclist related issues within the local streets of the study area. A number of stages have been followed in order to qualify and quantify factors affecting the road network within the study area. These stages include; the review of related background documents, site reviews, assessment of available traffic and collision data, and community consultation.

The study area for this project is to include all roads within the Town's boundary and is illustrated in Figure 1 - Study Area, of this report.

The analysis of information and the mapping of issues within this study have identified a number of area-wide and corridor type issues, with multiple intersections experiencing traffic related issues along the same road or within the same area.

Such areas include a corridor approach to Guildford Road (between Pearson Street and North Road), Walter Road East corridor approach (between Rugby Street and Lord Street) and an area wide approach for North Road (between Guildford Road and Bassendean Parade and including Devon Road and Hyland Street).

The following summarises the specific areas that are recommended for LATM treatment and where possible have been grouped into area wide or corridor strategies:

- Collier Road / Grey Street / Jackson Street – roundabout proposal;
- Guildford Road corridor study proposal;
- Walter Road East corridor study proposal;
- Lord Street access issues;
- North Road including surrounding roads – area wide treatment;
- Old Perth Road pedestrian friendly treatment proposal;
- Broadway/ Ida Street intersection;
- James Street / Palmerston Street intersection;
- Collier Road / Railway Parade / Guildford Road intersection;
- Moojebing Street speed issues;
- Shackleton Street complaints; and
- Hanwell Way Hooning issues.

Road Safety Audit recommendations for:

- Old Perth Road / West Road;
- Collier Road / Iolanthe Street;
- Collier Road / Fairford Street;
- Railway Parade / Lord Street; and
- Broadway / Iolanthe Street.

Recommendations include the identification of intersections, the reduction in movements available at major/minor intersections, establishing lane order and discipline and the application of “road diets”.

These recommendations and issues have been discussed and are presented within the following report. The recommendations have been presented with both a short-term and long-term option with associated indicative costing for implementation.

1 Introduction

The Town of Bassendean has engaged Opus to prepare a Local Area Traffic Management (LATM) Plan for the Town. This plan is required by the Town to consider local traffic issues raised by residents and Council, and to develop a conceptual plan that addresses the concerns and issues identified during the study process.

The Bassendean Town Centre, extending 800m along Old Perth Road, is divided into three (3) distinct sub-precincts, each having a different but complementary function that contributes to the overall vitality of the town centre.

- Traditional “Main Street” pedestrian based commercial/retail at the intersection of Old Perth Road with Guildford Road and the train station;
- “Drive-by” commercial with interspersed retail and civic uses (including a school and aged accommodation) between Wilson and Whitfield Streets; and
- Car based retail in the Bassendean Village Shopping Centre at the corner of Old Perth Road and West Road.

The Bassendean Town Council encourages the reduction of car dependency. Vehicles will move slowly and safely around the town centre. People will be encouraged to walk to the town centre or to park their cars and walk to various destinations. Bassendean Town Centre will be a place where pedestrian access and amenity has priority. Cycling to the town centre will also be encouraged.

Although the area has traditionally incorporated a significant industrial presence, the potential for residential and mixed use development is now being fully explored within Directions 2031. Within the Directions 2031 and Beyond (Metropolitan planning beyond the horizon), the Town of Bassendean is categorised as an existing industrial centre, given the nature of their customer base and catchment, these industrial centres rely heavily on efficient movement of goods and services throughout the metropolitan region. It is therefore important that there be a balanced distribution of industrial centres across the city to reduce freight handling and improve the provision of products and services to the broader community.

The plan has been prepared through consultation with the community. The final plan is intended to provide Council and the community with a clear direction for traffic management within the precinct.

The study area is shown in Figure 1.

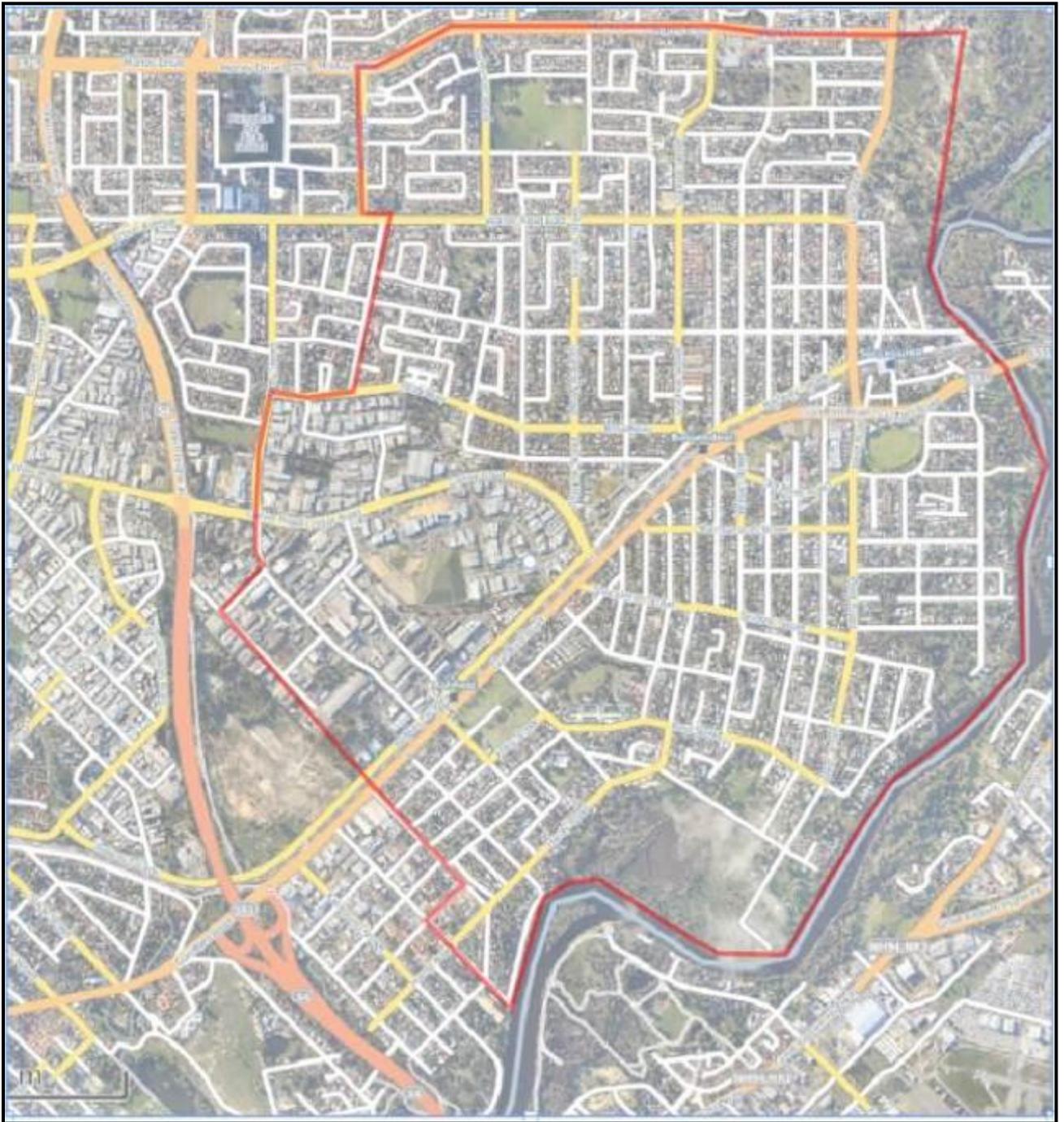


Figure 1 - Study Area

The community, or Council, often identifies traffic or parking management issues within a local street network. These issues are investigated by Council and in some incidences; simple low cost site specific treatments will address the identified issue.

In other cases more substantial treatments are required. These treatments are usually aimed at reducing traffic volumes, reducing traffic speeds or major improvements to intersections using devices such as road humps, roundabouts, road closures or driveway links etc. These more substantial treatments can create new issues or relocate an issue to other streets in the area. As a result the use of substantial traffic management treatments in the local street network need to be considered on an area wide basis. The management of traffic on the local street network as a whole area is termed Local Area Traffic Management (LATM).

A number of steps have been followed in order to qualify and quantify factors affecting the road network within the study area. These stages include; the review of related background documents, site reviews, assessment of available traffic and collision data (including a review of speed, volume and collision data) and collation of community and relevant stakeholder's comments to better determine the issues, concerns and opportunities in the area.

2 Study Objectives

The following study objectives were established for the project:

- To assess and manage traffic movements within Bassendean in order to enhance safety and amenity for all road users;
- To ensure management strategies minimise potential conflicts between road users;
- To ensure that management strategies are appropriately applied to the functional classification of the roads and are consistent with the road environment and minimise impacts on mobility throughout the area;
- To encourage the appropriate usage of distributor class roads; and
- To highlight crash problem areas and provide comment on improving safety.

2.1 Scope of Works

Investigations executed under the original brief consisting of:

- Review of strategic and local policy documents;
- Identification of parking requirements for areas where Public Transport is not conveniently located;
- Utilising community consultation identifying and responding to concerns on traffic matters and other road related issues and determine whether, and to what extent, improvement measures are warranted;
- To determine whether excessive through traffic movements are occurring on local roads within the Town;
- To identify roads where traffic speed is considered to be out of proportion with street amenity and determine whether measures are warranted;
- To identify roads having traffic volumes currently exceeding or expected to exceed, due to strategic redevelopment, the maximum volume of traffic for that class under the Town of Bassendean Functional Road Hierarchy, and produce a reduction by virtue of a decrease in non-local-resident traffic;
- To review the Town of Bassendean Functional Road Hierarchy;
- To review the effectiveness of the existing traffic management measures introduced by the Town of Bassendean and propose additional measures or modifications to address potential or existing crash issues, as warranted;
- Where appropriate, to provide detailed draft design of traffic management measures to achieve the above objectives;
- To review the Town of Bassendean's Guidelines for traffic management investigations;
- The project should assess traffic speeds of all roads within the Town of Bassendean and recommend remedial countermeasures to address the problems identified but it may satisfy community expectations.

3 Policy Review

Documents considered relevant to the form and function of roads within the LATM study area have been reviewed. A brief summary of the main points relevant to this investigation consists of the following:

3.1 Directions 2031 and Beyond (Metropolitan planning beyond the horizon)¹

New urban areas must be planned to reduce dependency on private vehicle use and thereby reduce greenhouse gas emissions and air pollution. People living in areas with limited access to public transport or jobs will experience increased travel time to access work in other areas, traffic congestion and higher private transport costs to households as well as reduced leisure time, declining community health and increasing obesity as walking and riding become less practical.

Directions 2031 also states that based on the WA Tomorrow (WAPC 2005) report, it is expected that by 2031 the estimated population will have reached 2.2 million, adding more than half a million new residents to the city. Planning for these extra residents, along with the housing, infrastructure, services and jobs they will require presents a significant challenge.

Directions 2031 is a high level spatial framework and strategic plan that establishes a vision for future growth of the metropolitan Perth and Peel region; and it provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate a range of growth scenarios.

Directions 2031 replaces all previous metropolitan strategic plans for the metropolitan Perth and Peel region and supersedes the draft Network City policy. It provides direction on:

- How you provide for a growing population whilst ensuring that you live within available land, water and energy resources;
- Where development should be focused and what patterns of land use and transport will best support this development pattern;
- What areas need to be protected so that you can retain high quality natural environments and resources; and
- What infrastructure is needed to support our growth.

To effectively implement Directions 2031, there is also a need to introduce an urban expansion management program to ensure an adequate supply of land that is suitable for urban development to meet medium to long-term residential needs. Directions 2031 is based on a vision:

“By 2031, Perth and Peel people will have created a world class liveable city: green, vibrant, more compact and accessible with a unique sense of place”.

¹ Western Australian Planning Commission (August 2010). Directions 2031 & Beyond (Metropolitan Planning beyond the Horizon).

The vision is supported by five strategic themes and objectives: Liveable, Prosperous, Accessible, Sustainable and Responsible. The most vital objectives for transport would be accessibility and sustainability. The main transport themes associated with these objectives include the following:

- Connect communities with jobs and services;
- Improve the efficiency and effectiveness of public transport;
- Encourage a shift to more sustainable transport modes;
- Maximise the efficiency of road infrastructure;
- Manage and reduce congestion;
- Protect freight networks and the movement economy;
- Consider parking in the overall transport picture;
- Plan and develop urban corridors to accommodate medium-rise higher density housing development;
- Plan and develop transit oriented developments to accommodate a mixed use and medium-rise higher density housing development; and
- Protect our natural and built environments and scarce resources; respond to social change and optimise the land use and transport conditions that create vibrant, accessible, healthy and adaptable communities.

The preferred growth scenario for the city is 'connected city'. Directions 2031 has identified six sub-regional planning areas that will form the basis of future planning and policy development. The Town of Bassendean comes under the Central sub-region. Each sub-region has its own distinctive characteristics. The central sub-region exhibits a more mature urban form, particularly in relation to land use type and intensity and infrastructure characteristics.

The Town of Bassendean is categorised as an existing industrial centre, given the nature of their customer base and catchment, these industrial centres rely heavily on efficient movement of goods and services throughout the metropolitan region. It is therefore important that there be a balanced distribution of industrial centres across the city to reduce freight handling and improve the provision of products and services to the broader community.

Directions 2031 identified high frequency public transport connections within Perth and Peel. For the Town of Bassendean there were sufficient rail connections identified but no high frequency bus routes identified.

For the central metropolitan Perth sub-region, the Town of Bassendean was identified within the connected city scenario and it is estimated that its population would have grown by 29 per cent to 910,000 by 2031. Due to the concentration of existing commercial and employment centres, the sub-region enjoys a very high level of employment self-sufficiency. This trend is expected to continue, with Perth city remaining the highest order activity centre in the metropolitan region. With high employment self-sufficiency comes the challenge of managing the movement of people and goods into, out of, and around the sub-region. Transport congestion, capacity, and travel time and cost are therefore critical issues to be addressed in future planning.

3.2 Regional Integrated Transport Strategy (RITS) for Perth's Eastern Region²

To address escalating traffic congestion and related safety concerns, EMRC and its six member Councils, in partnership with the then Department of Planning and Infrastructure (now the Departments of Planning and Transport), developed a Regional Integrated Transport Strategy (RITS) for Perth's Eastern Region (2008).

In 2009 the RITS Action Plan was reviewed to take into account progress over the past two years and to align future actions for the period of 2010 - 2013 with WA policy and planning, including the Directions 2031 Spatial Framework for Perth and Peel. The RITS Action Plan provides a coherent framework for development of the region's transport system that integrates all transport modes.

The RITS Action Plan 2010 - 2013 has five key focus areas:

- Integrated transport and land use planning;
- Public transport service provision;
- Connectivity and accessibility for walking and cycling;
- Road and freight infrastructure; and
- Community engagement, education and behaviour change.

Within this LATM report future public transport proposals (Ellenbrook to Bassendean BRT) have been considered, however, it will have minimal impact. The existing bike plan for Bassendean has been taken into account in order to consider cyclists when making treatment recommendations and considering pedestrian movement within the town centre. Road infrastructure has also been taken into account when considering treatment recommendations collectively, i.e. corridor strategies. These respond to the majority of the points identified above. The required long-term assessment within the parking strategy has also been identified looks to work toward the requirement for Integrated transport and land use planning.

3.3 Public Transport in Perth in 2031 (Draft for consultation)³

The document shows a plan of the proposed rapid transit infrastructure including bus, rail and light transit. The Plan supports the development of a rapid transit service for Ellenbrook, with the projected numbers of passengers justifying a road-based rapid transit service for the next 10 to 20 years. An option of running a Bus Rapid Transit (BRT) service between Ellenbrook and Bassendean and across to Morley is feasible.

² Eastern Metropolitan Regional Council (2008). Regional Integrated Transport Strategy (RITS) for Perth's Eastern Region

³ Department of Transport (July 2011). Public Transport in Perth 2031 (Draft for Consultation).

This provides quick transfer to the railway at Bassendean for trips to the central area and Midland, and access to commercial / community facilities at Morley. A railway reservation should be identified and secured, and a master plan prepared, to provide a long term rail option for the corridor (It is noted that the Government has allocated funding in 2012/13 for a Master Plan to be undertaken). These public transport initiatives could increase trips to and from the Bassendean Town Centre.

3.4 Liveable Neighbourhoods⁴

Liveable Neighbourhoods is a state planning framework for communities that are sustainable, safe, vibrant and efficient. The intent is to create complete integrated communities that promote local identity and create a sense of place.

This calls for an urban structure based on walkable, mixed use towns and neighbourhoods that have a strong community focus and a compatible mix of uses. The preferred urban form is “main street” mixed use centres that offer street frontage retail and high density residential with good access to public transport. The model is based on the premise that mixed use centres are inherently more socially, environmentally and economically sustainable and adaptable to change.

3.5 Metropolitan Centres Policy No 9⁵

The Metropolitan Centres Policy (MCP) (currently under review) applies to commercial activities in the Perth Metropolitan Region. It establishes a hierarchy of centres including Strategic, Regional, District, Neighbourhood and Local Centres. Bassendean is designated as a District Centre.

‘District Centres will be promoted as centres servicing the weekly shopping and service needs of the suburban population. They should provide mainly convenience goods, a range of comparison goods, local services and local employment. Shopping floor space should generally be confined to 15,000 sqm unless consistent with a Commission endorsed Local Planning Strategy or centre plan’

The Policy also refers to traditional ‘Main Street’ centres, encouraging development in accordance with traditional main street design principles and providing additional retail floor space incentives. The policy defines ‘Main Street’ as:

‘mixed land use developments fronting to a street in a manner whereby pedestrian access to the majority of individual businesses can be achieved directly from the street and / or where customer car parks on private property generally do not separate the road reserve boundary from the front of a building.’

Bassendean has both car based retail at Bassendean Village and traditional ‘Main Street’ retail along Old Perth Road. The interconnectivity between these two entity’s has been explored in both this report and the Town Centre Parking Strategy report undertaken by Opus in 2011.

⁴ Western Australian Planning Commission (January 2009). Liveable Neighbourhoods.

⁵ Western Australian Planning Commission (2000). Metropolitan Centres Policy No 9

3.6 Transit Oriented Development⁶

The State Government actively encourages intensification of development around railway stations (TOD) and is considering increased residential densities and establishment or consolidation of commercial and other employment activity nodes in the Midland rail corridor.

Bassendean Town Centre is an excellent model of an existing urban village on the Midland rail corridor with its historical main street and surrounding residential areas. It has excellent potential to become an employment node relating to surrounding industrial areas. Bassendean Train Station is a modern attractive station that could become a focus for increased commercial or education activity.

Success Hill Station could become a focus for more intense residential development as well as continuing its role as an events station for the Bassendean Oval. The 2 train stations at Bassendean Town Centre provide excellent opportunity for the future of the town centre as a highly accessible and walkable urban village. Much of the town centre is within 400 metres walk of a station.

The Perth to Midland railway line itself, however, combined with heavy regional through traffic on Guildford Road results in a town that has been divided and bypassed. North-south connections, access and visibility from Guildford Road are fostered in the Strategy Plan for the town centre.

The Town of Bassendean, with good access to transport, a robust urban structure and an established historical main street is ideally placed to promote and implement the strategic initiatives of the WAPC.

3.7 Vision 2030-Community Plan⁷

Vision 2030 is a long term community plan set out by the Town of Bassendean to coincide with the timeframe and principles outlined in the State Governments 'Network City' model.

3.8 Town of Bassendean Local Planning Strategy⁸

The Town of Bassendean Corporate Plan (2002) promotes careful planning involving simultaneous consideration of environmental, social and economic impacts, and balancing these three to create a sustainable future.

The purpose of this Local Planning Strategy (LPS) is to set out the vision of the Town of Bassendean for the next 15 to 20 years, with particular emphasis on the areas of population, housing, industry and commercial.

⁶ Western Australian Planning Commission. Transit Orientated Development.

⁷ Western Australian Planning Commission & Town of Bassendean (2005). Vision 2030 Community Plan.

⁸ Town of Bassendean and Dykstra Planning (June 2008 – Updated October 2011). Town of Bassendean Local Planning Strategy.

The Town of Bassendean Local Planning Strategy includes a summary and update of information already researched and presented through Local Planning Scheme No 10 (as discussed in section 3.8 below). However, the Local Planning Strategy introduces a strategic focus to further drive the preparation and outcomes of the new Local Planning Scheme.

The population objectives are promoted through specific strategies namely:

- Maintaining the existing character and attraction of Bassendean;
- Identifying suitable residential areas and housing stock for infill and redevelopment, and provide for a variety of housing types; and
- Continue to provide for families in terms of maintaining single residential areas and promoting single lot subdivisions.

The local planning strategy has identified a number of housing precincts based upon housing character and redevelopment prospect, and provides broad housing objectives that seek to:

- Ensure that the unique qualities and character of various housing areas continue to be recognised;
- Ensure the medium density housing does not undermine the identified single residential areas;
- Provide a variety of housing types and densities to cater for specific community needs, including population growth (e.g. families); and
- Reverse the interspersed evidence of urban decline.

The local planning strategy incorporates an industrial strategy, which examines the very diverse mix of business and lot sizes within the industrial zone, located generally north of the railway station and westward along Collier Road. The Bassendean industrial area is in a prime location within the regional context and hence it is important to maintain the diverse mix of industries and lot sizes. The Industrial Strategy also addresses the need for a suitable interface between the industrial and residential land uses, and the promotion of Collier Road as the central spine road in terms of its traffic function and commercial exposure. The strategy further seeks to facilitate the development of vacant industrial land planned at “Tonkin Park Stage 2”.

The local planning strategy also incorporates a commercial strategy, which in the first instance confirms the Town of Bassendean as the primary commercial retail and civic centre of the municipality. The strategy promotes the “Enquiry by design” initiatives for the “main street” pedestrian retail area adjacent to the railway, whilst also ensuring that the overall importance of Bassendean Village shopping centre is not undermined. Accordingly, the Bassendean Town centre is divided into three (3) distinct sub precincts, each having a different complimentary function that contributes to the overall vitality of the town centre. The other commercial areas dispersed beyond the town centre are to be contained as local centres only.

3.9 Town of Bassendean Local Planning Scheme (No 10)⁹

The development of a new Local Planning Scheme has evolved over a number of years and hence has preceded the promulgation of the Model Scheme Text.

The purposes of the scheme are to:

- Set out the governments planning aims and intentions for the scheme area;
- Set aside land as reserves for public purposes;
- Zone land within the Scheme area for purposes defined in the Scheme;
- Control and Guide Land Use and Development;
- Set out procedures for the assessment and determination of planning applications;
- Make provision for the administration and enforcement of the Scheme; and
- Address other matters set out in Schedule Seven of the Planning and Development Act.

The aims of the scheme are:

- To enhance the lifestyle of residents and provide community and leisure facilities for a range of socio-demographic groups;
- To encourage a housing stock that provides for a variety of lifestyle choices for a range of socio economic and age groups;
- To promote vibrant local shopping opportunities and provide for home businesses;
- To preserve local Aboriginal and European culture and heritage;
- To promote local Tourist Attractions;
- To protect and enhance the environment and natural resources of Bassendean and in particular urban bushland and the river environs; and
- To promote greater use of alternative modes of transport and public transport.

⁹ Town of Bassendean, Department of Planning (September 2009). Town of Bassendean Local Planning Scheme (No 10).

3.10 Existing Functional Road Hierarchy Plan¹⁰

The Town's Functional Road Hierarchy Plan has designated the functional purpose of all streets. Unless otherwise listed, streets are typically designated as Access Roads (the Town has provided its list of roads designated with specific road hierarchy functionality and this is included in Appendix A).

3.10.1 Access Road (Up to 3,000 vehicles per day)

Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are intended to be bicycle and pedestrian friendly.

3.10.2 Local Distributor Road (up to 6,000 vehicles per day)

Carry within a cell and link to District Distributors at the boundary access roads. The route of the local distributor discourages through traffic so that the cell formed by the grid of district distributors only carries traffic that belongs to or serves the area.

3.10.3 District Distributor B (above 6,000 vpd)

Perform a similar function to type A district distributors but with reduced capacity due to flow restrictions caused by access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart.

3.10.4 District Distributor A (above 8,000 vpd)

These carry traffic between industrial, commercial and residential areas and generally connect Primary Distributors. They are likely to be truck routes and provide only limited access to adjoining property.

3.10.5 Primary Distributor (above 15,000 vpd)

These provide for major regional and inter-regional traffic movement and carry large volumes of fast moving traffic. Some are strategic freight routes and all are National or State roads.

The information provided by the town highlights that the majority of roads within this study area are Access Roads and Local Distributor Roads.

¹⁰ Town of Bassendean. Existing Functional Road Hierarchy Plan

3.11 Traffic Management Treatment and Policy Guidelines adopted by Council¹¹

The objective of this document is to provide an evaluation process for consideration of requests for traffic management in respect of volume and/or speed within access or distributor roads serving residential properties.

The Town of Bassendean Functional Road Hierarchy Plan designates the functions of individual, or sections of streets, into the categories as discussed above in the Functional Road Hierarchy Plan. Each category has anticipated abutting land uses, traffic volumes and parking control requirements.

Safety on any street is a valid expectation for both motorised and non-motorised users, but does not unnecessarily require particular traffic volume or speed criteria to be satisfied. The purpose of this policy is to set out the criteria and process to be used in responding to requests for action to address traffic management on access or local distributor roads serving residential properties. Localised safety issues, such as individual intersections will be addressed through the use of processes such as road safety audits to determine the requirements for action and the preferred solutions to address identified needs.

Requests for action to address traffic volume or speed issues on roads other than access or local distributor roads will require the use of alternative strategies such as targeted use of speed cameras in conjunction with the Police Service, additional speed zone signage, use of the Town's mobile speed display trailer and rubbish bin stickers.

The use of road closures (cul-de-sacs) will not be considered except where reductions of crashes at a particular location can only be achieved through traffic diversion.

The provision of traffic management treatments will only be considered when all of the following criteria have been satisfied:

- Council has not considered the subject road within an eighteen month period except in circumstance where obvious and identifiable significant change in traffic pattern or characteristics has occurred.
- The road is designated as an access road or local distributor road within the Town of Bassendean Functional Road Hierarchy Plan.
- The predominant (at least 80 percent) land used served by the subject road residential.
- The traffic volumes within the subject road exceed 750 vehicles per day for access roads and 2,000 vehicles per day for local distributor roads.
- The length of the subject road exceeds 300 metres between controlled intersections (Stop, Giveaway or traffic signals).
- The 85th percentile speed is 60 km/h or greater in 50 km/hr speed zones, or exceeds the posted speed limit by more than 10 percent in other speed zones.
- Through traffic exceeds 30 per cent on access roads and 60 per cent on local distributor roads – except those streets providing access/egress to school sites.

¹¹ Town of Bassendean. Traffic Management Treatment and Policy Guidelines adopted by Council

In circumstances where investigations reveal that all of the above criteria have been met, options for addressing the particular issues will be prepared and referred to Council for consideration and priority over existing traffic management projects awaiting funding before consultation with affected property owners and residents takes place.

Council considers the need for a combination of proactive and reactive programs to manage traffic within the Town. The following actions will form the basis of a proactive program of community / motorist education and promotion of the prevailing speed limit in the streets:

- Speed Display Trailer
- Additional Speed Zone Signs
- Rubbish Bin Stickers
- Interaction with the Police Service – Speed Cameras
- Information Pamphlets.

These initiatives are explained in more detail within the traffic management information sheet 17 (this is included in Appendix B) which also provides details of the advantages and disadvantages of traffic calming, installation of 50 km/hr speed zones signs, passive and educational strategies for managing traffic and information on how to submit traffic management requests.

3.12 Traffic Management Operational Policy¹²

The objective of this operational policy is to provide a documented process for assessing vehicle speeds and managing traffic in accordance to the council adopted traffic management treatment policy and guidelines (as detailed previously).

The document process provides for a two year rolling schedule for vehicle speed assessments for local distributor or access roads within the Town and investigating requests for traffic management.

The operational policy provides information on council policy and the operational process for applications including the following: data collection schedule, data collection, data collection assessment, education and police reports, further investigation, report to council and grant application.

3.12.1 Recommendation for Traffic Management Treatment and Prioritisation

Utilising set criteria, as described in the Town's Traffic Management Treatment and Policy Guidelines is key for establishing criteria that has to be met for a complaint/request to be actioned. However, reviewing each request individually can often lead to the issue being masked and moved to a parallel street or neighbouring area.

The implementation of a LATMP is a key step in co-ordinating and responding to the local community and a wide variety of issues and can help influence and change driving behaviour and inappropriate use of residential streets.

Further to this, it is recommended that the Town give consideration to a Local Area Traffic Management Warrant System. Opus has developed a similar system for the City of Belmont and as such understand that a ranking system is a good tool for technical officers to utilise in prioritising and co-ordinating planned LATM works.

A warrant system will assist staff and residents with standard processes and procedures that will ensure all requests are dealt with in a fair, consistent and transparent manner. The objective will then be to rank the specific request in a prioritised order for the allocation of funds.

¹² Town of Bassendean. Traffic Management Operational Policy.

3.13 Austroads Guide to Traffic Management-Part 8: Local Area Traffic Management¹³

Throughout the study we will be referring to the guidelines and practice within this document when identifying the process for this LATM Plan.

This guide summarised that the primary target of LATM is to change driver behaviour, both directly by physical influence on vehicle operation, and indirectly by influencing the driver's perceptions of what is appropriate behaviour in that street. The objective is to reduce traffic volumes and speeds in local streets to increase liveability and improve safety and access for pedestrians and cyclists.

The need for LATM usually arises from:

- an intent to reduce traffic-related problems;
- orderly traffic planning and management;
- a need to modify 'transport' behaviour;
- a desire to improve the community space;
- a desire to improve environmental, economic and social outcomes; and
- traffic interventions associated with new development or the implementation of pedestrian and bicycle plans and other local policies (e.g. RTA 2002).

Traffic-related problems concern mainly:

- improved traffic safety and security, leading to programs for speed moderation and other changes in driver behaviour; and
- protection or improvement of local amenity focussing on appropriate allocation, design and use of street space, as well as driver behaviour.

Orderly traffic planning and management involves:

- coping with the pressure of traffic growth;
- the need to reduce impacts on urban life;
- spill-over from traffic routes – restraints on 'rat-running'; and
- direction of traffic to the most appropriate routes.

Pedestrian and cycle planning involves:

- the creation of compact mixed use accessible centres around public transport stops; and
- the use of walking and cycling catchment mapping, accessibility zoning and integration of regional walking and cycling networks.

Improvement of environmental and social outcomes includes:

- meeting targets in policy areas such as greenhouse gas, air quality, health and social capital.

Proactive traffic interventions:

- provide for traffic associated with new development and changing land uses, to minimise impacts on nearby areas; and
- create conditions for safe and comfortable cycling and walking.

¹³ Austroads (April 2008). Guide to Traffic Management-Part 8: Local Area Traffic Management.

3.13.1 Local Government Focus

Since LATM, by its nature, involves actions on local street networks, local government around the world has been the principal motivator and implementer of these actions.

To varying degrees, state and national authorities have an interest in policy, standards and the specialist skills and resources that are involved (e.g. as the bodies responsible for road safety). There may be legal and procedural requirements that call on state or national government involvement. However, the primary responsibility for determining the need for action and the nature of the LATM response lies with local government. Therefore, elected representatives and staff in local government need to be familiar with the benefits and techniques of LATM, and involve the community in planning LATM to reduce the impacts of traffic on communities.

3.13.2 Effectiveness of LATM

The speed reducing effects of LATM have proven to be variable, reflecting the nature and quality of the installations. The improvement in safety – the primary goal of speed management – has been consistent, if difficult to verify and scale. While the level of reporting and rigorous analysis of LATM effectiveness in Australia in recent years has not been great, a large body of practitioner experience has been built up. This may not constitute an ‘evidence base’ for the precise effects of individual schemes, but it does provide a convincing knowledge base for LATM in general.

Section 3.3.2 and Commentary 18 of the guide show how knowledge of the speed effects of specific devices can be used to simulate changes in the speed character of a street.

Other conclusions were:

- Speeds are generally reduced substantially. The numbers of vehicles exceeding 50 km/h are greatly reduced.
- Community perception of the effectiveness of LATM in reducing speeds varies between residents, drivers, and the wider community; around 60% of the public believe that LATM is effective in reducing speeds.
- LATM can be compatible with bicycle use if properly designed.
- Roundabouts are perceived by practitioners to be an effective and most acceptable device.
- Vertical devices are considered to be more effective in speed control and crash reduction than horizontal devices and, despite their lower popularity in the community, appear to be more acceptable than might have been assumed.

The guide also goes through the LATM process including the following steps:

- Preparing for an LATM Study
- Defining the Study Scope and Objectives

- Developing Plans
- Scheme Design
- Community Participation and Information
- Implementation; and
- Monitoring and review

The guide finally concludes with a selection of LATM schemes and treatments which will be considered during this study.

4 Data Collection

All roads in the study area were reviewed and driven by vehicle with specific locations investigated further on foot. The locations of existing traffic management measures have been documented, with a view to forming treatment recommendations that are consistent with existing measures.

The site inspections, undertaken from the perspective of a motorist, are important in forming an overall feel for the study area and where speeding and safety conflicts may occur.

The principles applicable to Network Road Safety Auditing were used to some extent during the inspections, for example:

- Noting conflict between parked vehicles/travelling vehicles in particular streets;
- Noting the environments which are conducive to high speeds, for example, long straight streets with no interruptions to the forward sight distance;
- The provisions for vulnerable road users such as cyclists and pedestrians;
- The traffic mix; and
- A check on land use conflicts, for example abutting residential and commercial zones.

4.1 Trip Generators

Throughout the Town of Bassendean there are numerous trip generators, including schools, local shopping centres, local activity centres and community parks etc.

However, through this study, there has been 3 trip generators that have been assessed that attract and affect traffic flow within Bassendean, these are:

- Bassendean Town Centre on Old Perth Road;
- Car based retail in the Bassendean Village Shopping Centre at the corner of Old Perth Road and West Road; and
- The three train stations (Bassendean, Ashfield and Success Hill).

It is the roads surrounding these areas that experience heavy traffic flow accompanied with speeding and crash issues.

It is also acknowledged that Bassendean train station attracts trips from outside of Bassendean such as Ellenbrook, where people are driving to Bassendean to utilise the free parking at the train station.

4.2 Existing Traffic Controls

A brief review of the existing traffic management and traffic control measures within Bassendean has been undertaken.

Measures already implemented to date within the Town include:

- Speed Restrictions;
- Traffic Signals;
- Pedestrian Actuated Crossings;
- Railway Level Crossings;
- Roundabouts;
- Road Closures;
- Indented Parking bays;
- Distinctive Pavement markings; and
- School Zones.

4.3 Traffic Volume and Speed Data

Traffic volume and speed data, where available, for the study area has been supplied by the Town of Bassendean with additional data for some distributor roads supplied by MRWA. This data was collected by the Town of Bassendean over a period of time 2007 to 2011. The 2012 and ongoing data is progressively being collected.

4.3.1 Traffic Volume Data

A review of the traffic volumes generally indicates that the traffic volumes using the roads within the study are within the acceptable range associated with the road hierarchy and consistent with the relevant functional classification of the roads. However, 10 roads within the Town have been noted as having traffic volumes differing to that associated with the road hierarchy given. These roads are shown in Figure 2.

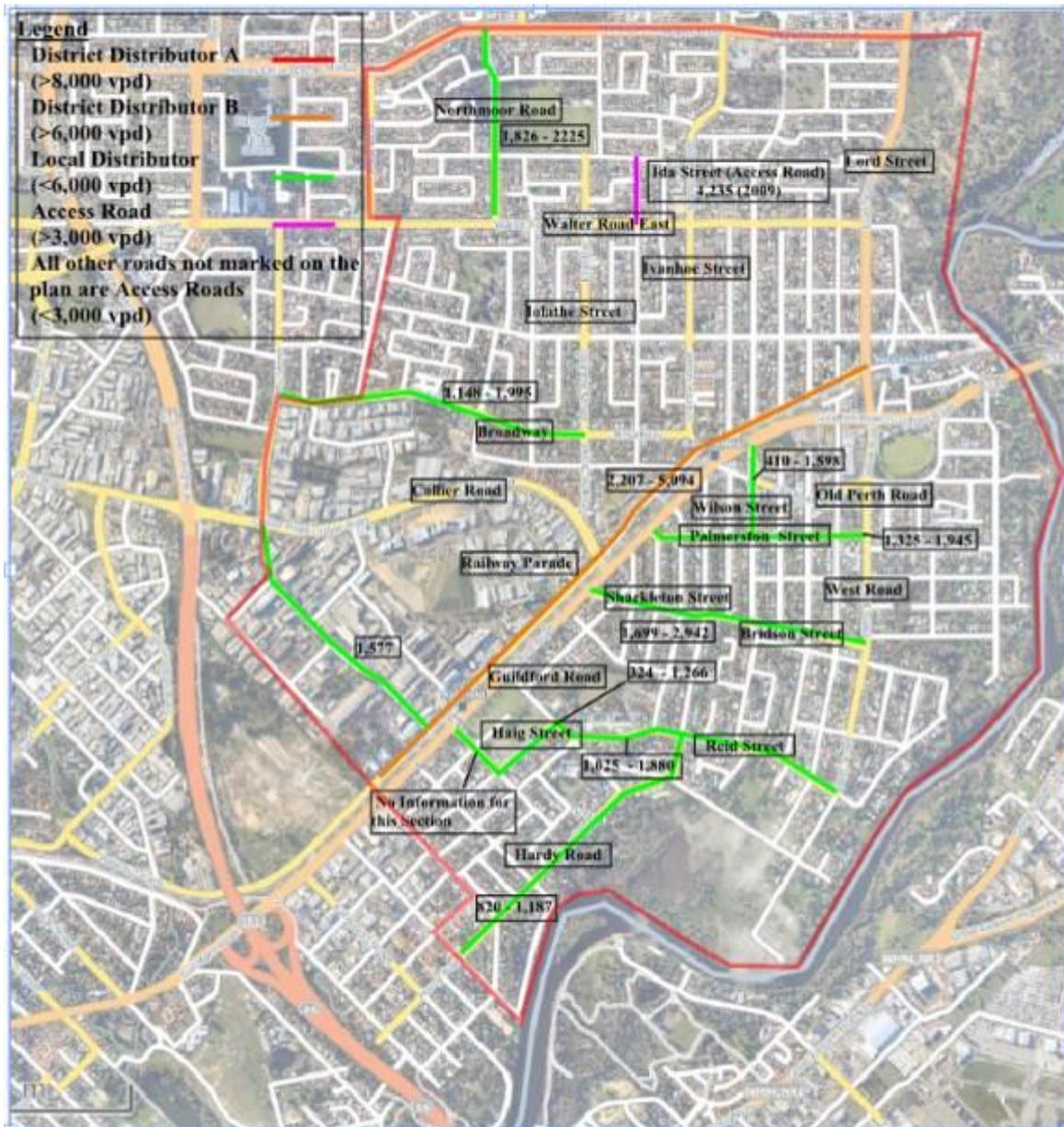


Figure 2 – existing traffic volumes differing from Road Hierarchy

The volumes identified for the highlighted Local Distributor roads on Figure 2 show substantially lower traffic volumes than would be expected for local distributor roads, hence the volumes do not indicate any uncharacteristic trends which would be typically associated with excess ‘through’ or ‘rat running’ traffic.

As a result, this preliminary review indicates that specifically targeted strategies aimed at reducing traffic volumes on these roads are not warranted.

Only one road has been identified to have a higher traffic volume than would be expected for the class of road it is. The road is identified in Figure 2 as Ida Street, which is classed as an Access Road (up to 3,000 vpd) but has a recorded traffic volume of 4,235 (as at 2009). It is not conclusive from onsite observations of this

road and the surrounding area to suggest what this large amount of traffic could be attributed to, it is therefore recommended to re-count and assess this road to establish the reason for a higher volume of traffic than expected.

A review of the existing traffic volumes and the potential for future growth as well as utilising predicted traffic flows from Main Roads WA ROM model indicates that due to existing nature of built-form in the area future traffic increases are likely to be minimal resulting in limited growth in volumes over future years. This growth therefore is considered to be reasonable in the context of the available practical capacity of the local roads in the area and can be managed further through the implementation of relevant and appropriate traffic management measures as required.

All the local access roads in the LATM study have traffic volumes consistent within their approved function as per the “Main Roads Western Australia Functional Road Hierarchy” and despite limited information, is estimated to remain the case when the future traffic volumes forecast by Main Roads WA are considered. This would suggest therefore that there is not a significant problem with non-local traffic utilising local roads i.e. ‘Rat-running’.

However, where the Town has received residents and/or council concerns regarding through traffic, consideration must be given to the local residents when assessing the need for installation of physical means to discourage non-local traffic on local roads, as treatments can often adversely affect local residents also. Therefore, all user needs have to be taken into account and a balance between allowing access for residents and discouraging non-local traffic has to be met.

The ‘bigger picture’ needs to be considered when looking at treatments to minimise non-local traffic. Removing the desire by non-local motorists to want to use the local road network unnecessarily should be investigated in the first instance as undesirable trips on the local road network will occur when motorists seek alternative routes to roads on which they experience traffic situations that they perceive to have unacceptable levels of congestion, delay or danger. The most appropriate treatment therefore, is to ensure that there is an appropriate network of distributor roads in place and to manage those distributor roads so that they continue to perform safely and efficiently.

As the roads in the study area consist of a range of both higher order (District Distributor A and B) and lower order (Local Distributor and Access Road) roads, a review of the existing traffic patterns in the area in the main indicate that road traffic is being distributed effectively and efficiently, particularly in those closest to the Town Centre and Railway Stations.

4.3.2 Speed Data

When considering the speed data provided in this report it is important to remember that the built-up area speed limit in Western Australia was reduced from 60 km/h to 50 km/h on 1 December 2001 and that operating speeds on some roads have reduced as a result.

Vehicle speed surveys conducted indicate that at several locations within the study area the 85th percentile speeds are in excess of the nominated speed limit of 50 km/hr and can be considered to be excessive and undesirable. As a result, several strategies outlined in the proposed mitigation measures have been developed to specifically target this driver behaviour.

An analysis of the speed data has been undertaken in two formats. We have analysed the 85 percentile speeds and highlighted any roads that have an 85 percentile speed 5km/hr or more over the posted speed limit, this is presented in Figure 3.

We have also analysed the percentage of vehicles speeding above the posted speed limit, assessing the roads that experience 25% or more users speeding, this is presented in Figure 4.

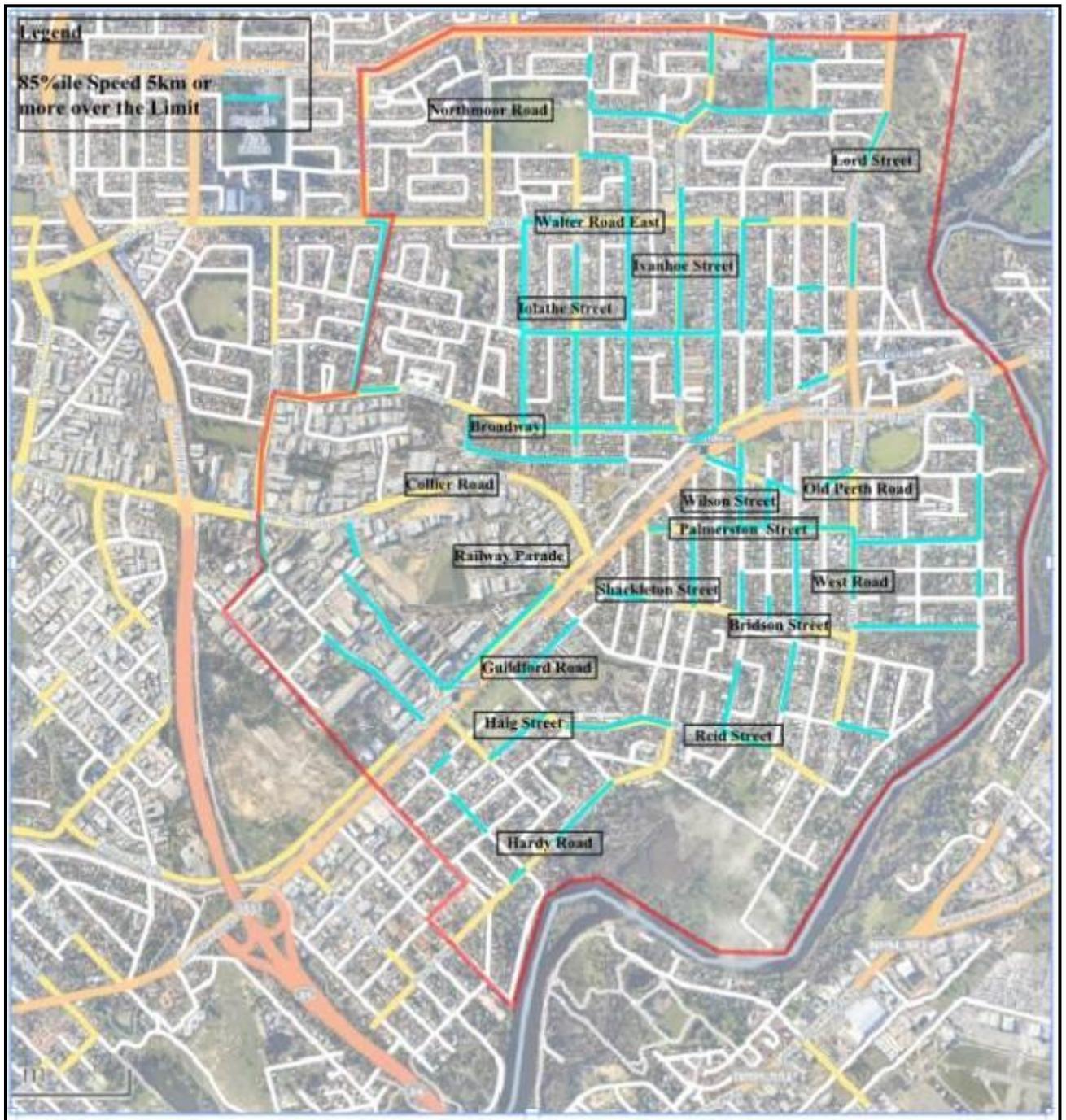


Figure 3 - 85%ile speed 5km or more over the posted speed limit

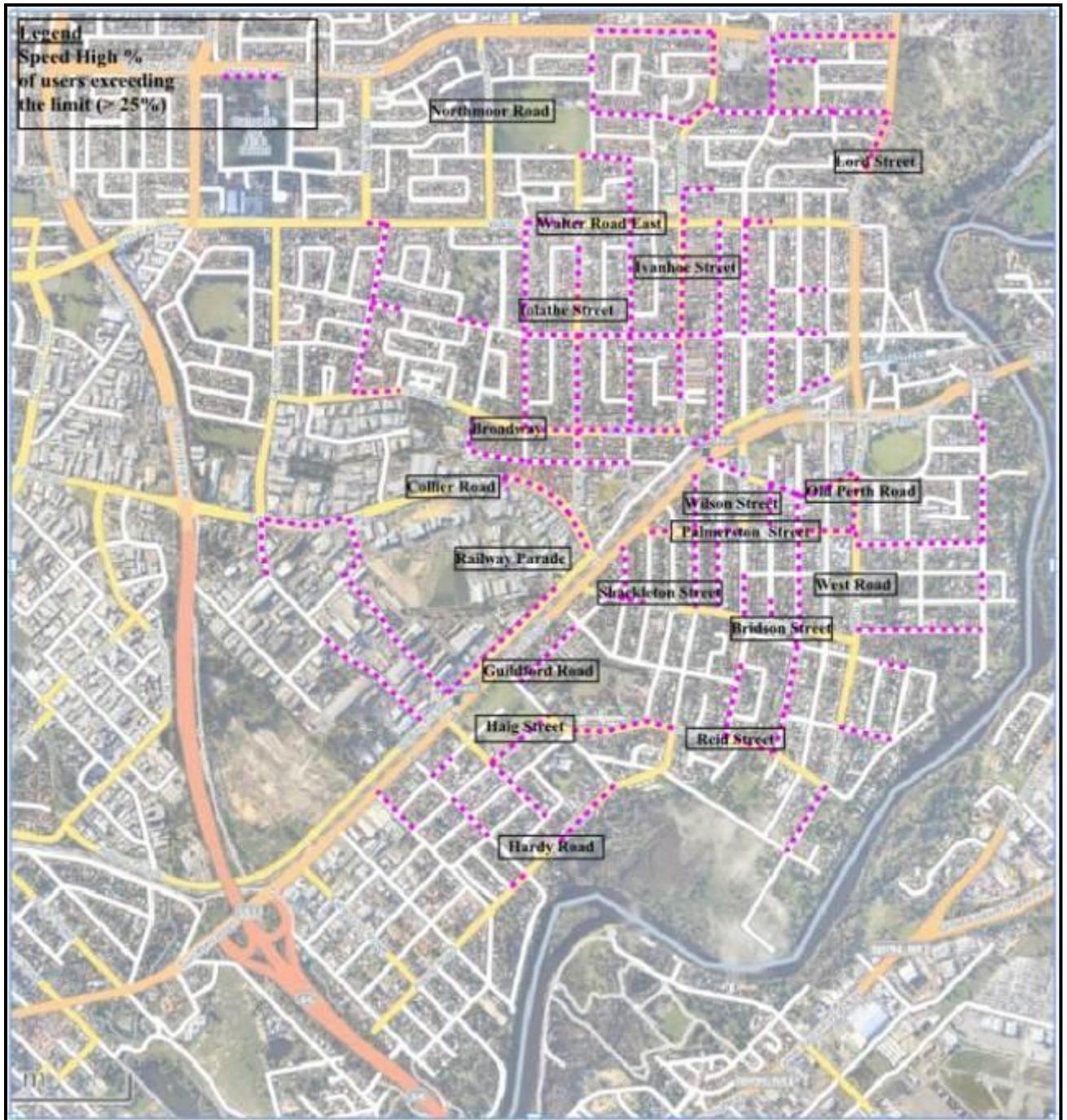


Figure 4 - 25% or more users speeding

The data presented in both Figure 3 and Figure 4 highlights that a great number of roads within the Town of Bassendean experience speeding issues. It can be seen from both Figure 3 and Figure 4 that there are two distinct areas within the town, these being south-east of Guildford Road (speed area 1) and north-east of Guildford Road (speed area 2), these two areas are highlighted in Figure 5.

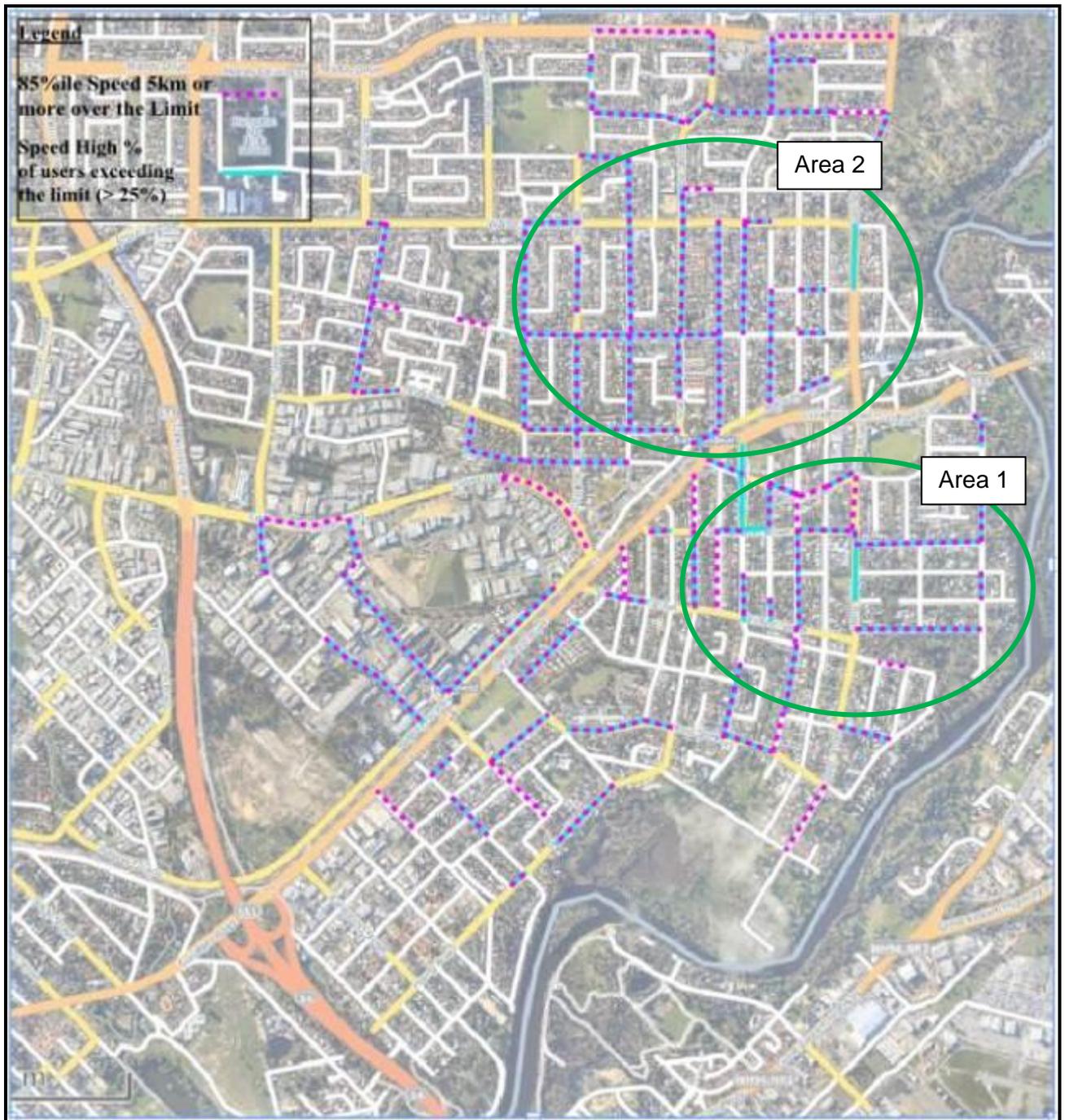


Figure 5 - identified areas with speeding issues

It is illustrated in Figure 5 that assessing speeding issues by two different methods (85 percentile and 25% or more users speeding) that the majority of roads that experience speeding issues where the 85 percentile is 5km or more over the posted speed also experience a high number (25% or more) of vehicles along that road speeding.

An assessment of the existing traffic management measures within the Town of Bassendean has been undertaken. Existing treatments include measures such as speed cushions, roundabouts, traffic lights and slow point/buildouts. Road closures are also in place throughout the town.

It is noted that along the roads that currently have speed cushions and the intersections that are controlled with a roundabout, there are no speeding issues, implying they are a successful method of traffic control within the Town of Bassendean.

4.4 Collision Data

Crash data has also been collated and assessed within this study. Crash data for the last 5 years (2006 to 2010) has been analysed and mapped, and is presented in Figure 6.

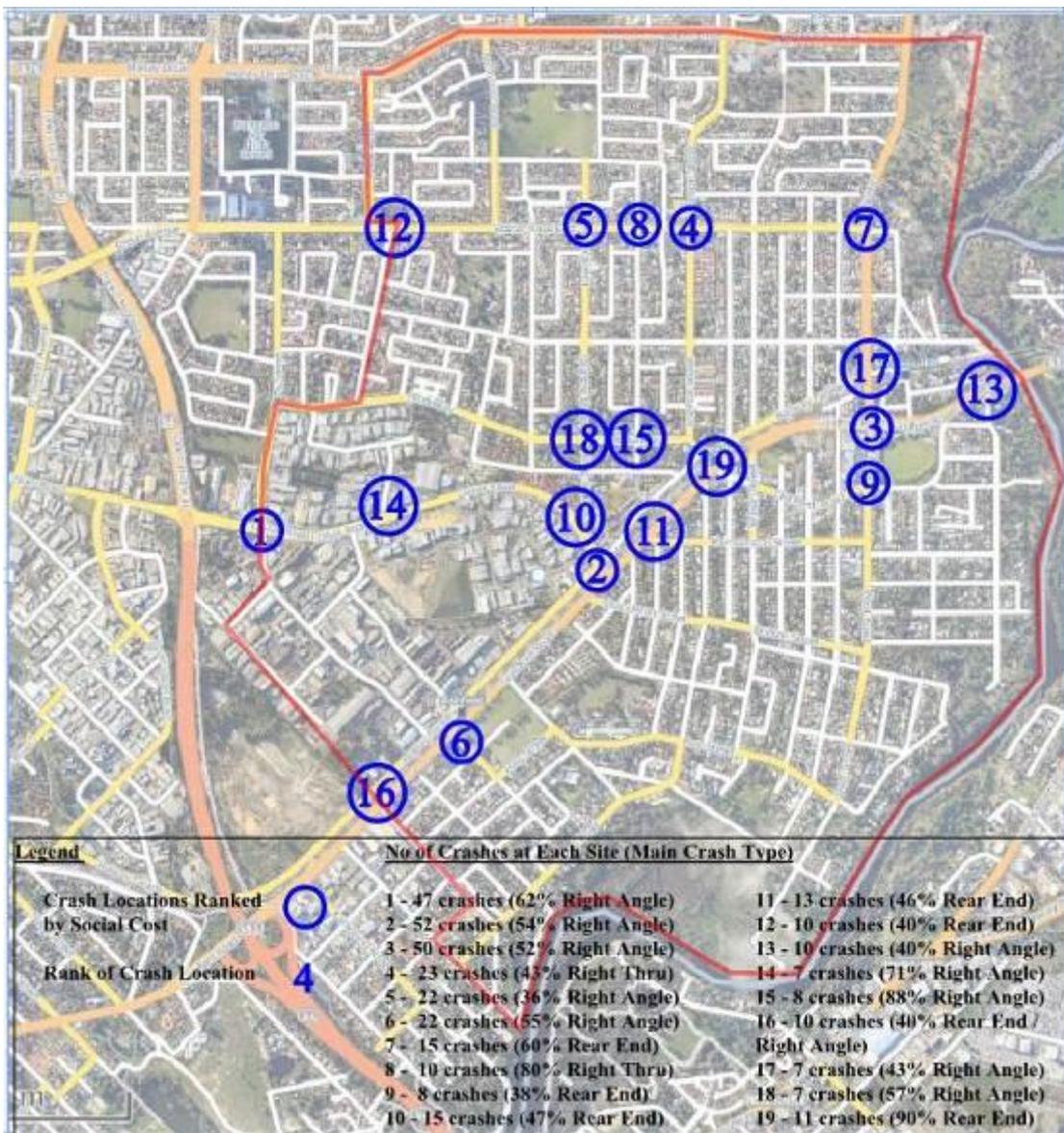


Figure 6 - Crash Locations

The top nineteen crash locations have been mapped, ranked in order of social cost, ranging from approximately \$2,245,000 for the highest social cost crash site to approximately \$320,000 for the 19th ranked crash site. The intersection crash ranking report is outlined in Appendix C.

A number of intersections within the study area may potentially satisfy the crash frequency eligibility criteria for either both, or one, of the National and State Black Spot Programs which include:

- Collier Road / Grey Street / Jackson Street;
- Guilford Road / Collier Road;
- Guildford Road / West Road;
- Guildford Road / Colstoun Road;
- Guildford Road / Palmerston Street;
- Guildford Road / Pearson Street;
- Guildford Road / North Road;
- Walter Road East / Rugby Street;
- Walter Road East / Ivanhoe Street;
- Walter Road East / Iolanthe Street;
- Walter Road East / Lord Street;
- Walter Road East / Ida Street;
- Broadway / Ida Street;

The criteria for each of these Black Spot Programs are noted below:

- National Black Spot Program 3 Casualty crashes in 5 years
- State Black Spot Program 5 crashes in 5 years

It should be noted here that Collier Road / Grey Street / Jackson Street intersection ranked as number 1 in the intersection crash ranking report. This intersection has already been identified by the Town who have undertaken detailed design drawings to construct a roundabout at the site. It is intended that the Town of Bassendean, City of Bayswater and Main Road WA will jointly fund the construction along with financial assistance from CSBP.

The intersection crash sites listed above are typically along the higher order roads within the study area which typically carry a higher volume at higher speeds than compared to local access roads. As a result, crashes in the study area are more prevalent at intersections along Guilford Road and Walter Road East. However, generally speaking, a review of the existing crash data on the lower order or local roads within the study area do not indicate that any particular location is an issue with regard to satisfying Black Spot criteria. It is therefore recommended that these intersections be considered for further detailed review in the context of Road Safety Audits as a separate exercise.

Specific intersections that do not specifically qualify for black spot funding but do have a crash issue include:

- Old Perth Road / West Road – this has experienced 8 crashes in total, however only 2 have been casualty crashes. Due to the nature of the crashes however, (loss of

control, single lanes rear end and person in carriageway) it is recommended that a Road Safety Audit be considered.

- Collier Rd / Iolanthe Street – this has experienced 15 crashes in total, with 1 being a casualty crash. Due to the nature of the crashes however, (vehicles in one direction, and thru-direction intersection crashes) it is recommended that a Road Safety Audit be considered.
- Collier Road / Fairford Street - this has experienced 7 crashes in total, 2 of which are classed as a casualty crash. Due to the nature of the crashes however, (thru – direction intersection crashes) it is recommended that a Road Safety Audit be considered.
- Railway Parade / Lord Street - this has experienced 7 crashes in total, with 1 being a casualty crash. Due to the nature of the crashes however, (thru – direction intersection crashes and loss of control) it is recommended that a Road Safety Audit be considered.
- Broadway / Iolanthe Street - this has experienced 7 crashes in total, 2 of which are classed as a casualty crash. Due to the nature of the crashes however, (thru – direction intersection crashes and one direction crashes) it is recommended that a Road Safety Audit be considered.

As well as a series of significant crash locations, Guilford Road and Walter Road East also experience speeding issues and have been highlighted by councillor requests.

A drive through of both Guildford Road and Walter Road East has been undertaken, along with a route study analysis of the main crash types along these roads. A study of the crashes along both roads has highlighted a high number of rear-end crashes. Figure 7 is a route plan of Guildford Road and Figure 8 is a route plan of Walter Road East depicting the movements at each intersection with the highest crash rate. The drive through of the route also highlighted the existing measures along both Guildford Road and Walter Road East, which includes traffic signals and roundabouts.

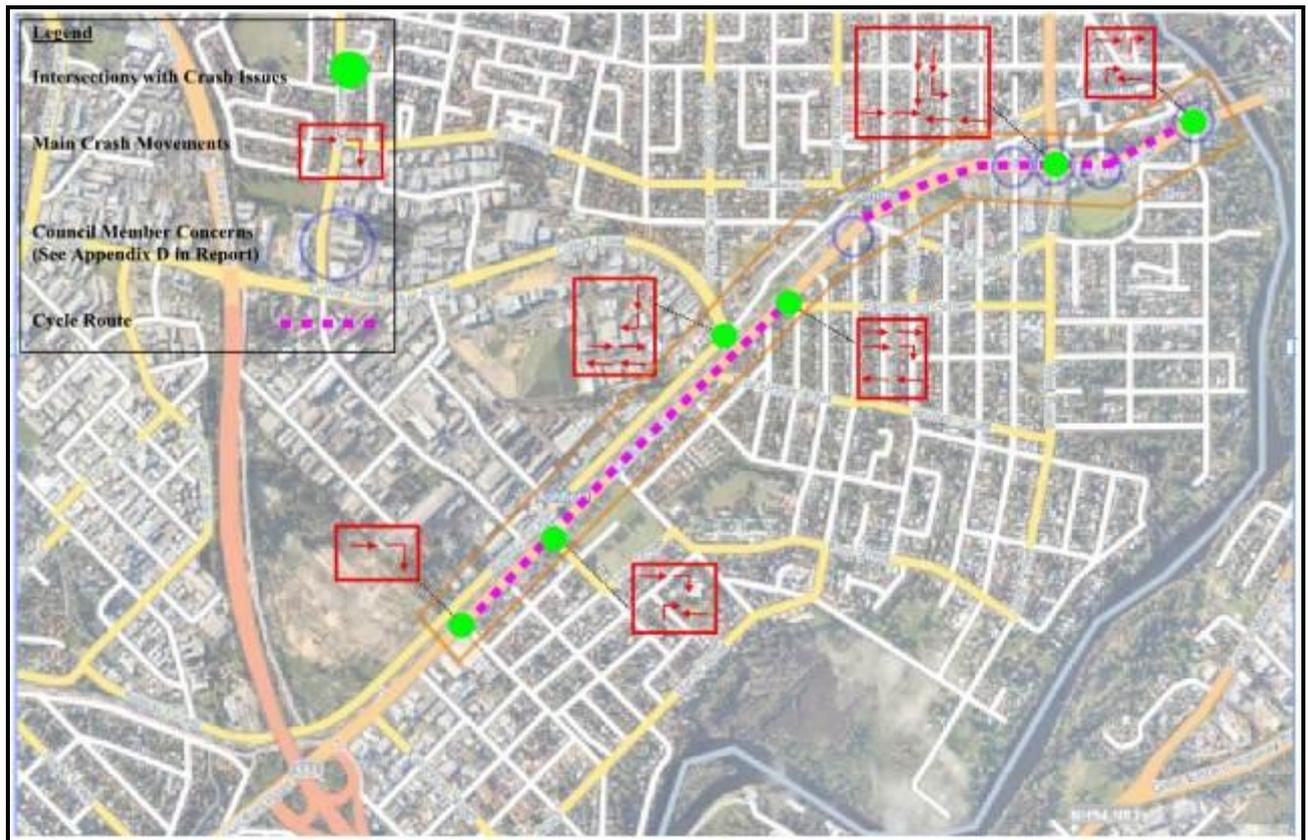


Figure 7 - Guildford Road Corridor Study

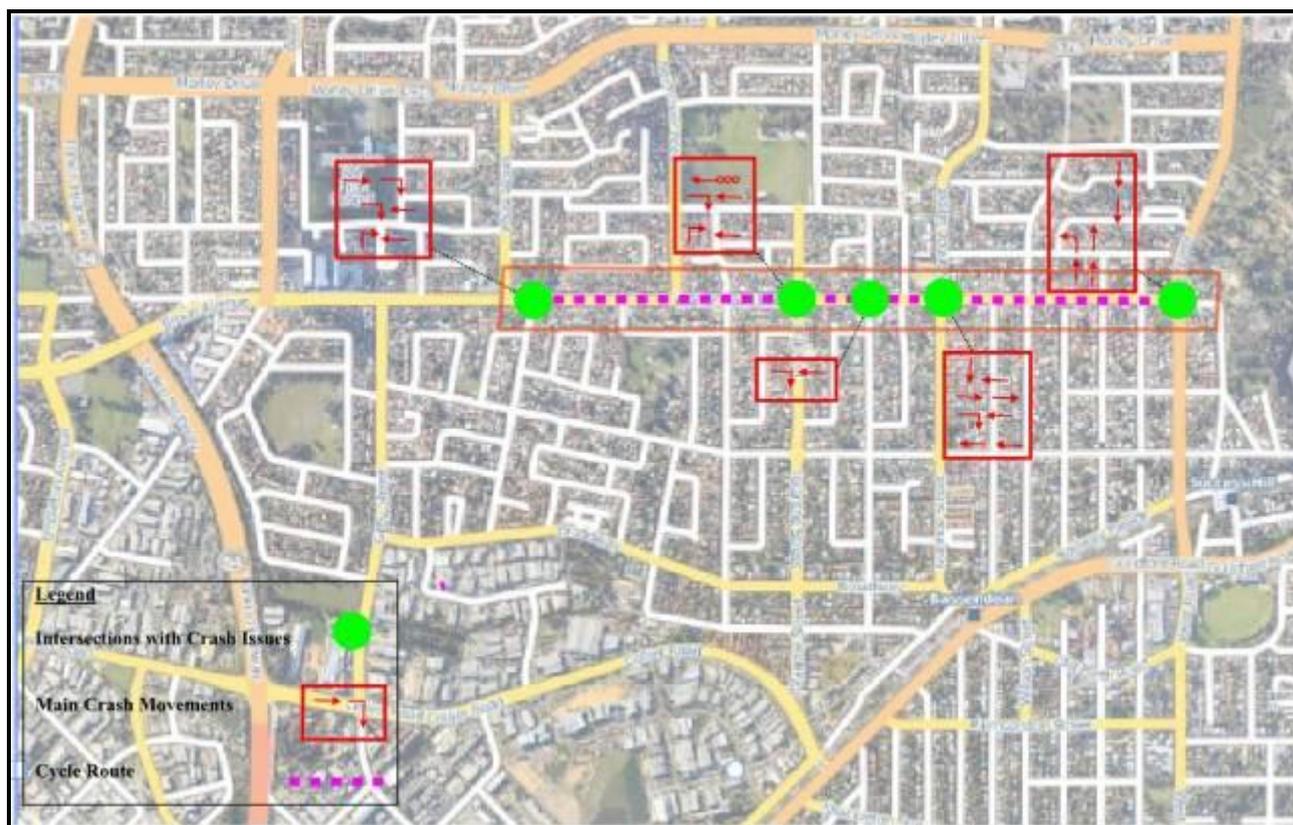


Figure 8 - Walter Road East Corridor Study

As depicted in Figure 7 and Figure 8 the majority of crashes at the intersections (of which some are signalised) are Rear-End crashes. Treatment options are provided in section 6 of this report.

4.5 Consultation

The Town has provided a list of issues and concerns that local residents and Elected Members have requested be included within the assessment of this LATMP. A list of local resident requests and councillor requests is presented in Appendix D.

The resident requests have a similar theme through all of them, these being speeding and safety concerns. Specifically North Road, between Hyland Street and Guildford Road is of concern to the local residents, with speeding and crash issues.

The Councillor requests are more general in nature, with requests to investigate entire lengths of road, specifically Lord Street and many of its associated intersections. As with the collision data presented in Figure 6, Guildford Road appears in many of the councillor requests looking at movement of traffic and issues with intersections. These issues and requests have been considered under a Guildford Road route strategy assessment.

Further to this, Opus consulted with the neighbouring authority of the City of Bayswater. Through discussions, further issues that Bayswater were aware of have been highlighted.

Table 1 illustrate the resident and councillor requests and the existing issues the City of Bayswater are aware of. Figure 9 depicts the resident and councillor requests.

Table 1 - Councillor and Resident Requests

Councillor Concerns	
Location	Issue(s)
Collier Road/Grey Street/Jackson Street	Crash History
Lord Street/Success Street	Intersection delay
Whitfield Street/Guildford Road	Intersection issues
Lord Street/Guildford Road	Intersection issues
Kenny Street/Guildford Road	Location of intersection to traffic signals
North Road/Guildford Road	Assess right turn issues
Thompson Road/Guildford Road	Turning issues
Railway Parade/Lord Street	Intersection issues
Anzac Terrace/Lord Street	Intersection issues
Lord Street/Mary Crescent	Intersection Delay
Morley Drive/Lord Street	Intersection issue
James Street/Palmerston Street	Intersection Issues
Colstoun Road/Guildford Road	Unclear sight lines
Collier Road/Railway Parade/Guildford Road	Intersection issues
Resident Requests	
Moojebing Street	Speeding
North Road	Route strategy – traffic management
Shackleton Street	Traffic Management
Hanwell Street	Hoon Activity
Old Perth Road	Pedestrian crossing speed hump
City of Bayswater suggested issues	
Collier Road / Grey Street / Jackson Street	Crash/Speed Issue
Rugby Street	Speeding Issues
Wicks Street	Speeding Issues

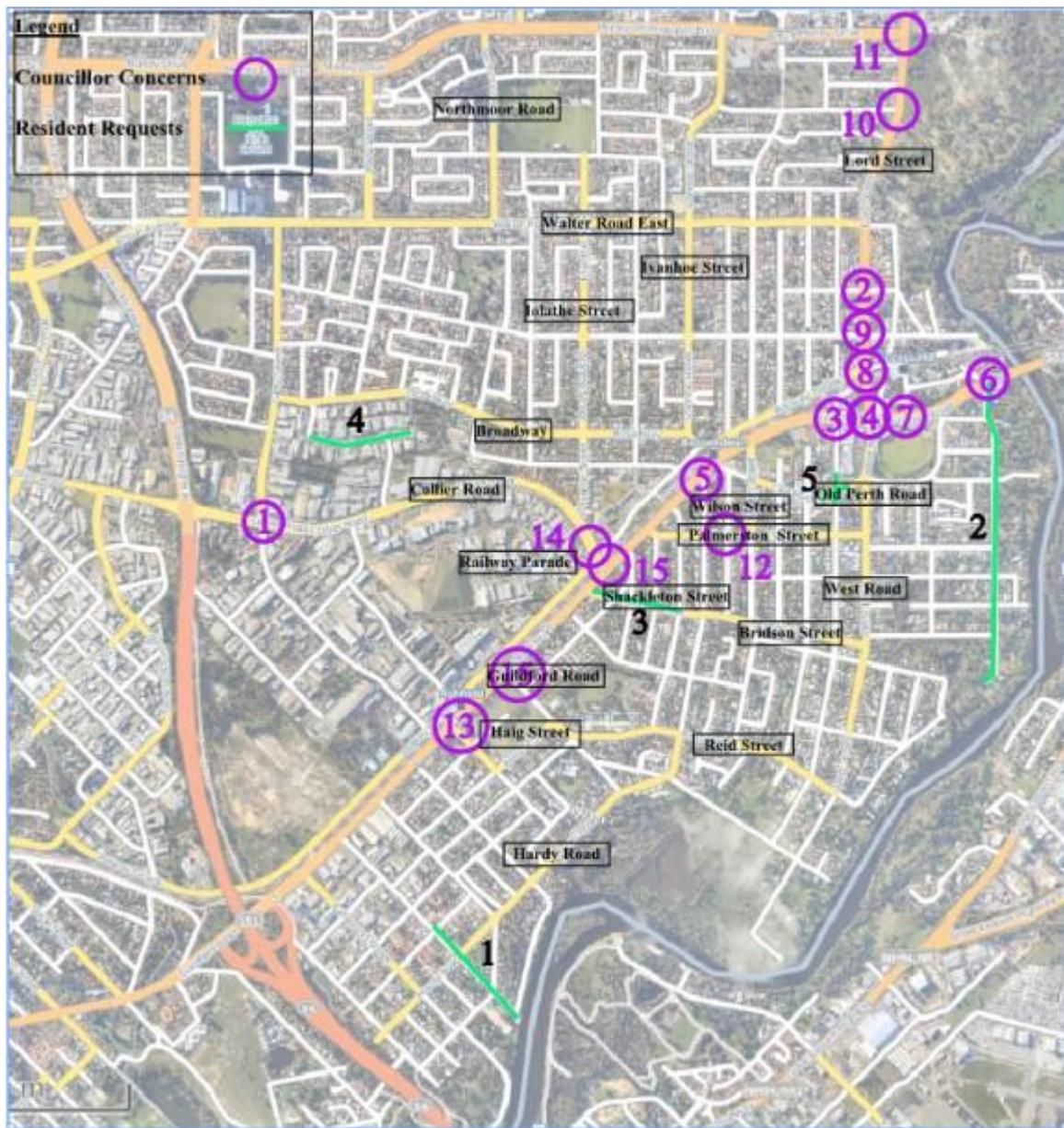


Figure 9 - Concerns and Requests

5 Considerations and Summary of Issues

5.1 Land Use Considerations

When considering and identifying issues and associated treatment options, future land use considerations need to be considered, as any changes in land use will alter traffic patterns and behaviour. The Town have indicated that the main changes to land use within the study area include:

- The Bassendean Oval – development of the Oval and residential plots, the redevelopment of the Oval (as proposed) may have an impact on trip rates within Bassendean (the impact on parking as a result of the proposed redevelopment is covered in the Bassendean Parking Strategy, Opus, 2011), a traffic impact assessment would be recommended.
- CSBP site – while not in the Town of Bassendean it will have an impact on the town's roads. The site presents significant redevelopment opportunity for light industrial, including possible commercial development bordering Railway Parade. The principle concept of the proposed road network is a connection across Tonkin Highway to Collier Road. This site, may produce an increase in trips within its surrounding road network, however it is thought that the majority of these trips would utilise the Tonkin Highway, Collier Road and Railway Parade, all of which have capacity to accommodate an increase in traffic volumes.
- Ashfield Railway Station – the main land use changes are centred on increasing residential densities, the introduction of mixed use and commercial land uses and the introduction of commercial land uses on the northern side of the railway adjacent to the relocated railway. The area is generally well serviced by major strategic transport routes, both road and rail. As a Transit Orientated Development (TOD) it is assumed that the additional car-born trips from this development will be minimal and as such the existing road network surrounding the development should accommodate this.

5.2 Vulnerable Users

5.2.1 Public transport

The bus routes servicing the study area have been sourced from Transperth and are depicted in Figure 10 below. The routes include service 55 running a local hourly service throughout the south of Bassendean connecting to the town centre at Old Perth Road; Route 955, connecting from Bayswater to Bassendean Railway Station; and Routes 340, 341 and 342 providing a service connecting from Bayswater to Bassendean and Success Hill Railway Stations and through to the City of Swan.

The study area is generally well serviced by convenient and regular bus services, with a large proportion of residents being within no more than a 400 metre walk to a road along which one of these bus services operates. This achieves the Western Australian Planning Commission's Liveable Neighbourhoods policy requirement for

walkable catchments and this short distance and the frequency of the buses should both be factors that encourage local residents to utilise these bus services when they can.

Further to this, it is noted that at least 3 bus routes service Bassendean Railway Station, along with route 55, which services Old Perth Road within close proximity to the station.

In addition to these routes, it should be noted that a planned Bus Rapid Transit (BRT) route is also planned to link into Bassendean, originating from Ellenbrook. The inclusion of a BRT from Ellenbrook should reduce the demand to drive and park at Bassendean Station, thereby reducing the demand.

The impact of this on the surrounding network however will be minimal. While details are not currently known, it is thought a possible BRT route link into Bassendean from the City of Swan along Ivanhoe Street. This however would have minimal impact on the road network except perhaps for localised widening at signalised intersections to accommodate 'queue jump' lanes. This is to be confirmed with the Department of Transport prior to any upgrade works to this intersection.

5.2.2 Pedestrians, cyclists, elderly, young children and disabled

Within a LATM study, pedestrians, cyclists and disabled users also need to be considered and catered for as well as bus services. The age of the likely road user also needs to be considered, i.e. elderly users or children in school catchment areas.

The Austroads Guide to Traffic Management, Part 8 Local Area Traffic Management states, the safety and convenience of cyclists and pedestrians in the general traffic system is usually achieved through various ways of segregation from motor traffic, separate lanes and paths, signalised crossing points and other treatments.

However, the free and ubiquitous nature of pedestrian and cyclist movement at the local level means that their total segregation from other traffic is neither desirable nor possible in most cases. Local streets should be attractive and feasible for most pedestrian and cyclist movement, and it is not necessary to provide separation for pedestrians and cyclists in local streets to an excessive manner. Conditions in local streets should therefore cater for the expectation that these different road users may need to share the street space.

An underlying principle of LATM is that conditions should be made better for pedestrians and cyclists, by virtue of the intentions of LATM. The consequences of poorly designed LATM schemes are more likely to impact on cyclists than pedestrians. Although experience in countries such as the Netherlands and Denmark demonstrates the compatibility of traffic calming measures with high bicycle use (Cleary 1991), similar treatments are often criticised in Australia and New Zealand for increasing rather than decreasing risks to cyclists.

Bicycle and pedestrian safety considerations should also be included in safety audits of LATM schemes and treatments, at all stages. The needs of mobility impaired pedestrians and people with disabilities should also be carefully considered.

The consideration of the Town's bike plan cycling network has been undertaken when recommending treatment options. Pedestrian movements, desire lines and safe crossing locations have also been taken into account. Specifically, pedestrians have been the main user in mind when recommending the treatment options for Old Perth Road, section 6 goes onto discuss this in detail.

The elderly and use of mobility scooters should also be considered within an LATM plan if data identifies this as an issue or a required mode to be accommodated.

5.3 Summary of Key Issues

A summary of the key issues identified through the analysis of data is provided in Table 2 overleaf:

Table 2 - Summary of Issues

Road / Intersection	Data Assessed	Key Issue(s) identified
All roads with available data	Traffic Volumes	No assessed roads have high traffic volumes or through-traffic issues
Alice St / Anzac Ter/ Bridson St / Chedworth Way/ Cyril St / Deakin St / Devon Rd / Elder Pde / First Av / French St / Gallagher St / Haig St / Hamilton St/ Hardy Rd / Hyland St / Kenny Street / Maidos St/May Rd / Old Perth Rd / Penzance St / Railway Pde / Reid St / Robinson Rd/ Scaddan St / Second St/ Third Av / Wicks St / Wilson St / Wood St	Speed Data	All or part of these roads experience speeding issues. However, they do not have accident issues, or have been raised by local concern. The introduction of speed reducing measures throughout the Town will encourage safer driving and a reduction in speed throughout the town.
Collier Road / Grey Street / Jackson Street	Accident Data / Councillor Request / Speed Data	A very high accident record and speeding issues. Also identified as a dangerous intersection by local concern.
Guildford Road / Collier Road	Accident Data / Councillor Request	High Accident issues – part of a Guildford Road route strategy
Guildford Road / West Road	Accident Data	Accident issues – part of a Guildford Road route study
Guildford Road / Colstoun Road	Accident Data, Councillor Request	Accident issues – part of a Guildford Road route study
Guildford Road / Palmerston Street	Accident Data	Accident issues – part of a Guildford Road route study
Guildford Road / Pearson Street	Accident Data / Speed Data	Accident issues – part of a Guildford Road route study
Guildford Road / North	Accident Data / Councillor Request /	Accident issues – part of a Guildford Road route strategy

Road	Speed Data	
Walter Road East / Rugby Street	Accident Data / Speed Data	Accident issues – part of a Walter Road East route study
Walter Road East / Ivanhoe	Accident Data / Speed Data	Accident issues – part of a Walter Road East route study
Walter Road East / Iolanthe Street	Accident Data / Speed Data	Accident issues – part of a Walter Road East route study
Walter Road East / Lord Street	Accident Data	Accident issues – part of a Walter Road East route study
Walter Road East / Ida Street	Accident Data / Speed Data	Accident issues – part of a Walter Road East route study
Broadway / Ida Street	Accident Data / Speed Data	Thru traffic from Ida crashing with thru traffic from Broadway.
Old Perth Road / West Road	Accident Data / Speed Data	Same lane rear end on Old Perth Road and left carriageway/loss of control on West Road
Collier Road / Iolanthe Street	Accident Data	Iolanthe Street rear end crashed and right-thru crashes with Collier Road
Collier Road / Fairford Street	Accident Data	Fairford St right-thru and left-thru crashes
Railway Parade / Lord Street	Accident Data / Councillor Request	Lord Street rear-end and Railway Parade right-thru crashes
Broadway / Iolanthe Street	Accident Data / Speed Data	Iolanthe Street thru-thru and rear end crashes
Lord Street / Success Road	Councillor Request / Speed Data	Possible opening of Walter Road East (east of the intersection) onto Lord Street
Whitfield Street / Guildford Road	Councillor Request	Intersection Access Issues – part of a Guildford Road route study
Lord Street / Guildford Road	Councillor Request	Intersection Access Issues – part of a Guildford Road route study
Kenny Street / Guildford Road	Councillor Request	Location of intersection to traffic lights – part of a Guildford Road

		route study
Thompson Road / Guildford Road	Councillor Request	Turning issues – part of a Guildford Road route study
Anzac Terrace / Lord Street	Councillor Request	Intersection Access Issues
Lord Street / Mary Crescent	Councillor Request / Speed Data	Intersection Delay and Speeding Issues
Morley Drive / Lord Street	Councillor Request/Speed issues	Intersection Access Issue
James Street / Palmerston Street	Councillor Request / Speed Issue	Intersection visibility issues
Collier Road / Railway Parade / Guildford Road	Councillor Request	Intersection Issues
Moojebing Street	Local Resident Request	Speeding Issue (however speed data hasn't raised this as an issues)
North Road	Local Resident Request / Speeding Issues / Crash Issue	Speeding and Hooning Issues crash/access issues from Guildford Road into North Road
Shackleton Street	Local Resident Request / Speed Data	Issue with speed cushions creating noise along Shackleton Street
Hanwell Way	Local Resident Request	Hooning toward the end of Hanwell Way
Old Perth Road	Local Resident Request	Possibility of a raised pedestrian crossing on OPR

5.4 Design Standards

Where appropriate any recommendations and or suggested treatments for traffic control devices have been developed in accordance with the WA Code for the Installation of Traffic Control Devices, and associated Australian Standards and Guidelines.

6 Summary of Issues and Treatment Proposals

The information provided by the Town and from detailed investigations of the crash data has identified specific roads, intersections and areas that require reviewing and suggested mitigation treatments. Due to the large number of issues identified it is recommended that the issues that have been identified with a crash problem, or have been identified by councillors or local residents will take precedence. Speed issues that have been identified but only occur on short sections of roads, or do not have any other issues associated, have not been investigated in detail and have been put forward to utilise the Speed Awareness Monitor (SAM treatment), as a recommendation.

The following summarises the specific areas that are recommended for LATM treatment and where possible have been grouped into area wide or corridor strategies:

1. Collier Road / Grey Street / Jackson Street – roundabout proposal;
2. Guildford Road corridor study proposal;
3. Walter Road East corridor study proposal;
4. Lord Street access issues;
5. North Road including surrounding roads – area wide treatment;
6. Old Perth Road pedestrian friendly treatment proposal;
7. Broadway/ Ida Street intersection;
8. James Street / Palmerston Street intersection;
9. Collier Road / Railway Parade / Guildford Road intersection;
10. Moojebing Street speed issues;
11. Shackleton Street complaints;
12. Hanwell Way Hooning issues; and
13. Wicks Street – speeding issues.

Road Safety Audit recommendations for:

14. Old Perth Road / West Road;
15. Collier Road / Iolanthe Street;
16. Collier Road / Fairford Street;
17. Railway Parade / Lord Street; and
18. Broadway / Iolanthe Street.

Further to this list, the roads and intersections identified as experiencing speeding issues (as identified in Table 2) are suggested to receive educational measures to encourage lower speed driving.

6.1 Principles of Counter Measure Development

As stated in the Austroads Guide to Road Safety, Part 8: Treatment of Crash Locations, the aim of countermeasure development is to:

- Select countermeasures which, on the basis of professional judgement and experience, can be expected to reduce the number or severity of crashes of the type(s) dominant at the location;
- Check that adopted countermeasures do not have undesirable consequences, either in safety terms (e.g. lead to an increase in the number or severity of another crash-type) or in traffic efficiency or environmental terms;
- Be cost-effective, i.e. maximise the benefits from the whole program of expenditure over a number of sites; and
- Be efficient, i.e. produce benefits which outweigh the costs.

There are several criteria for countermeasure selection, including (Ogden 1996):

- **Technical feasibility:** can the countermeasure provide an answer to the safety problems which have been diagnosed and does it have a technical basis for success?
- **Economic efficiency:** is the countermeasure likely to be cost-effective and will it produce benefits to exceed its costs?
- **Affordability:** can it be accommodated within the program budget; if not, should it be deferred, or should a cheaper, perhaps interim solution be adopted?
- **Acceptability:** does the countermeasure clearly target the identified problem and will it be readily understandable by the community?
- **Practicability:** is there likely to be a problem of non-compliance, or can the measure work without unreasonable enforcement effort?
- **Political and institutional acceptability:** is the countermeasure likely to attract political support and will it be supported by the organisation responsible for its installation and ongoing management?
- **Legal conformity:** is the countermeasure a legal device, or will users be breaking any law by using it in the way intended?
- **Compatibility:** is the countermeasure compatible and consistent with other strategies, either in the same locality or which have been applied in similar situations elsewhere?

It can be seen that the decision to adopt a particular countermeasure may involve more than a simple matching of a solution to a problem.

6.2 Speed Management

One of the most common issues that have been identified throughout this study is the occurrence of speeding vehicles. In some instances this is coupled with a high incident crash location, although it should be noted that all crash locations identified are involving vehicle-vehicle crashes with little or no crashes involving cyclists or pedestrians.

Where speed has been identified as a contributory factor to either crash severity or cause, appropriate management of speed should be investigated as a countermeasure. Speeds can be lowered using effective speed management, resulting in fewer casualties and lower severity outcomes when crashes do occur.

At intersections, speed management techniques include the installation of channelisation, roundabouts or threshold treatments. At mid-block locations, appropriately designed traffic calming can be used to lower traffic speed, such as the use of vertical or horizontal deflection techniques.

The key to the selection of countermeasures at a particular site, route or area, or for mass application, is to concentrate on the particular crash-types which have been identified in the diagnosis phase and which are amenable to treatment with road or traffic engineering measures. Often there will be a number of alternative remedial treatments which could be applied, either individually or in combination. The final choice about which countermeasure(s) to select requires road safety engineering experience and judgement about the factors which have led to the crashes¹⁴.

6.3 Area – Wide / Corridor Strategy Treatment

As can be seen from the identified list of specific areas that require treatment (page 40) a number of opportunities have arisen where treatment options can be considered on an area-wide basis or along an entire traffic corridor and include Guildford Road Corridor Study, Walter Road East Corridor Study, Lord Street access issues, North Road area-wide treatment and Old Perth Road pedestrian treatment.

6.3.1 Guildford Road Corridor Study

Issues

A number of issues have been addressed along the Guildford Road corridor within Bassendean (see Figure 7, pg 29). These issues are crash and local concern issues and include:

- Guildford Road / Pearson Street – 11 crashes in 5 years (5 of which are casualty crashes). The prominent crash type is Rear-End on Guildford Road for vehicles turning right into Pearson Street.

¹⁴ Austroads (2009). Guide to Road Safety, Part 8: Treatment of Crash Locations

- Guildford Road / Colstoun Road – 24 crashes in 5 years (9 of which are casualty crashes). The prominent crash types are Thru-Right and Rear-End on Guildford Road for vehicles turning right into Colstoun Road and right out of Colstoun Road.
- Guildford Road / Collier Road – 52 crashes in 5 years (13 of which are casualty crashes). The predominant crash types are Rear End (on Guildford Road westbound, Guildford Road eastbound and Collier Road) and change lane crashes on Guildford Road; speeding issues are also prominent on Collier Road.
- Guildford Road / Palmerston Street - 14 crashes in 5 years (4 of which are casualty crashes). The prominent crash types are Rear-End, Right Rear-End and Thru-Right for vehicles turning on Guildford Road and right into Palmerston Street.
- Guildford Road / Kenny Street - access and speed issues are evident along Kenny Street, however there are no significant crash issues.
- Guildford Road / Whitfield Street – left turn only from Whitfield Street into Guildford Road; no crash or speeding issues for this intersection.
- Guildford Road / West Road - 51 crashes in 5 years (11 of which are casualty crashes). The prominent crash types are Rear-End, Right Rear-End and Left Rear-End for vehicles turning or travelling ahead on all approaches to the intersection.
- Guildford Road / Thompson Road – access issues into and out of Thompson Road from Guildford Road; no crash or speeding issues for this intersection.
- Guildford Road / North Road - 12 crashes in 5 years (3 of which are casualty crashes). The prominent crash types are Rear-End and Thru-Right for vehicles turning from North Road into Guildford Road.

Existing Situation

Guildford Road is 4-lane two-way road. It is classed as a Primary Distributor road with a posted speed limit of 60km/h. The road is under the jurisdiction of Main Roads WA and the Town has been campaigning for funds to improve the safety of Guildford Road. The intersections identified with issues along Guildford Road are:

- Guildford Road / Pearson Street – priority T-intersection;
- Guildford Road / Colstoun Road – priority T-intersection;
- Guildford Road / Collier Road – signalised intersection;
- Guildford Road / Palmerston Street – priority T-intersection;
- Guildford Road / Kenny Street – priority T-intersection;
- Guildford Road / Whitfield Street – left in only intersection;
- Guildford Road / West Road - signalised intersection;
- Guildford Road / Thompson Road - priority T-intersection; and
- Guildford Road / North Road - priority T-intersection.

Proposed Treatment Options

In response to the issues identified above the following measures have been recommended and account for the standard and functionality of road as well as safety requirements, further to this, unless otherwise stated, treatment measures have been introduced to ensure no additional traffic impact on the surrounding road network.

Some treatment options along the corridor will be replicated on a number of occasions, specifically at intersections. This is to ensure a consistent approach for the user of the road. Further to this, some treatment options have been assumed not to be appropriate due to the Town's required functionality of the road, treatments such as a 'Road Diet' for the length of the corridor could be explored and would improve safety along the entire length; however, it would most likely also create congestion and result in inappropriate traffic 'rat-running' through neighbouring residential areas. An explanation as to the nature of a 'Road Diet' is present in Appendix E.

- **Guildford Road / Pearson Street** (priority T-intersection) – the possibility of making Pearson Street left in/left out only has been explored facilitating the use of the right turn bay at Katanning Street; however, this may create unnecessary through traffic on surrounding streets.

It is therefore recommended that the presence of the intersection be highlighted to the driver by the use of median treatments on Guildford Road and Pearson Street (an example of this is illustrated in Figure 11 and Figure 12). A longer term measure would be to consider localised widening to facilitate a separate right turn lane for traffic turning from Guildford Road into Pearson Street.

- **Guildford Road / Colstoun Road** (priority T-intersection) – the possibility of preventing right turn movements into or out of Colstoun has been explored, however as Colstoun is a Local Distributor Road, preventing movements into or out of may result in unnecessary through traffic on surrounding streets.

It is recommended therefore, that the presence of the intersection (especially due to the adjacent footbridge that impacts on visibility) be highlighted to the driver by the use of median treatments on Guildford Road and Colstoun Road, with the median treatment on Guildford Road to the west of the intersection be extended under the footbridge to guide vehicles through the intersection (see figure 11). Further to this, surface treatment could also be applied to the entire intersection to further highlight the presence of the intersection (this is similar to threshold treatment; however it is applied to the entire intersection). A longer term measure would be to consider localised widening to facilitate a separate right turn lane for traffic turning from Guildford Road into Pearson Street.

- **Guildford Road / Collier Road** (signalised intersection) – due to the high number of rear end crashes, on all arms of the intersection (specifically Guildford Road westbound) it is recommended to ensure the visibility of the intersection and signals are clear to all users. Assessment of the warrants for advanced traffic signal warning signs indicates that the speed limit of the road is too low for these signs; however, it is recommended that this option is explored further in conjunction with Main Roads WA.

Opus obtained SCATS data for the signalised intersection from Main Roads WA, this data provided the existing phasing arrangement for the intersection and existing traffic volumes for each individual movement at the intersection.

An assessment of existing traffic movements through the intersection in association with the rear-end and lane change crashes indicates that the existing arrangement of two lanes ahead, with the right hand lane being ahead and right for Guildford Road westbound be changed to, the left hand lane being ahead only and the right hand lane being right only. This will ensure to users that vehicles in the right hand lane will be turning right and therefore slowing down.

A brief assessment utilising SIDRA indicates that changing the lane function will increase queue lengths by approximately half which results in a slight drop in Level of Service for the intersection; however, this is deemed to be acceptable when considering crash savings. To complement this, the intersection should also have a surface treatment applied, that not only improves surface friction through the intersection, but will also highlight the presence of the intersection to users, an example of this is illustrated in figure 13.

It is also noted from site observations that vegetation obscures the visibility of signal heads on Guildford Road, and as such, it is recommended that vegetation surrounding the entire intersection is assessed and either pruned or replaced with lower lying vegetation.

A further option is to consider tactile surface treatment on both sides of Guildford Road heading into the intersection as an audible treatment to indicate to the user that there is an intersection ahead. However with residential dwellings fronting Guildford Road this may face complaints of noise.

A longer term measure would be to consider widening of the intersection to accommodate for two straight ahead lanes and one right turn lane (westbound) or left turn lane (eastbound).

It is also recommended that a detailed signalised intersection assessment be undertaken to ascertain clearance intervals for the signal timings and assess clearance of intersections.

- **Guildford Road / Palmerston Street** (priority T-intersection) - the possibility of making Palmerston Street left in/left out only has been explored; however, as Palmerston is a Local Distributor Road, preventing movements into or out of may result in unnecessary through traffic on surrounding streets.

It is therefore recommended that the presence of the intersection be highlighted to the driver by the use of median treatments on Guildford Road (see figure 11 and figure 12). A longer term measure would be to consider localised widening to facilitate a separate right turn lane for traffic turning from Guildford Road into Palmerston Street.

- **Guildford Road / Kenny Street** (priority T-intersection) – there are no specific crash issues at this intersection; however, it is recommended that due to the proximity of this intersection to Guildford Road / Old Perth Road intersection the right turn movements into and out of this intersection be restricted. This will result in this intersection to be left in / left out and it is recommended that the intersection of Guildford Road and Kathleen Street also be considered for a left in/left out arrangement also. These measures will then facilitate right turn movements at the Guildford Road / Palmerston Street intersection and the Guildford Road / Wilson Street intersection.

Altering these two intersections to left in / left out will ensure right turning traffic uses Palmerston Street and Wilson Street intersections which can accommodate an increase in traffic volumes and have minimal direct property frontage fronting the street.

- **Guildford Road / Whitfield Street** (left-in only intersection) – this intersection is currently left-in only, and it is assumed that this has been designed to allow for delivery vehicle access to the rear of the shopping centre. Through the parking strategy Opus has undertaken, the use of Whitfield Street as predominantly access for delivery vehicles has been recommended and this is further iterated within this LATMP with the recommendation that this intersection remains as it is.
- **Guildford Road / West Road** (signalised intersection) – as with the Guildford Road / Collier Road intersection with the high number of rear end crashes, on all arms of the intersection it is recommended to ensure the visibility of the intersection and signals are clear to all users. Assessment of the warrants for advanced traffic signal warning signs indicates that the speed limit of the road is too low for these signs; however; it is recommended that this option is explored further in conjunction with Main Roads WA.

The intersection should also have a surface treatment applied, that not only improves surface friction through the intersection, but will also highlight the presence of the intersection to users (see figure 13 and figure 14).

A further option is to consider tactile surface treatment on both sides of Guildford Road and Lord Street heading into the intersection as an audible treatment to indicate to the user that the intersection is ahead (an example of this is illustrated in figure 15).

It is also recommended that a detailed intersection assessment be undertaken to ascertain clearance intervals for the signal timings and the impact of an all red phase.

- **Guildford Road / Thompson Road** (priority T-intersection) – this intersection has no significant crash issue; however, u-turn movements at this intersection have been reported as being of concern. It is recommended therefore that a no u-turn sign be installed at this intersection for both eastbound and westbound traffic on Guildford Road. Furthermore it is recommended to install median treatment and threshold treatment on Thompson Road to ensure vehicles on Thompson Road reduce their speed heading into the intersection (as illustrated in figure 16).
- **Guildford Road / North Road** (priority T-intersection) – this intersection has been assessed for both low/medium cost options and more longer term, high cost options; however, from the assessment of the predominant crash type (thru-right) and its proximity with merging traffic it is recommended that the right turn movement into and out of this intersection be restricted. The right turning traffic will be accommodated within the existing signalised intersection of Guildford Road / West Road intersection, with localised traffic distributing from West Road along various local access roads, an example of this is illustrated in figure 17 (before and after traffic counts should be undertaken on these local

access roads to ascertain if any specific roads have been adversely affected), however review of traffic volumes indicates these roads can accommodate an increase in traffic volumes.

- **Treatment along Guildford Road corridor** – it is recommended that a median treatment at every T-intersection along Guildford Road be implemented to highlight the presence of these intersections to vehicles travelling on Guildford Road an example of this is illustrated in figure 18.



Figure 11 - existing median treatment at intersection

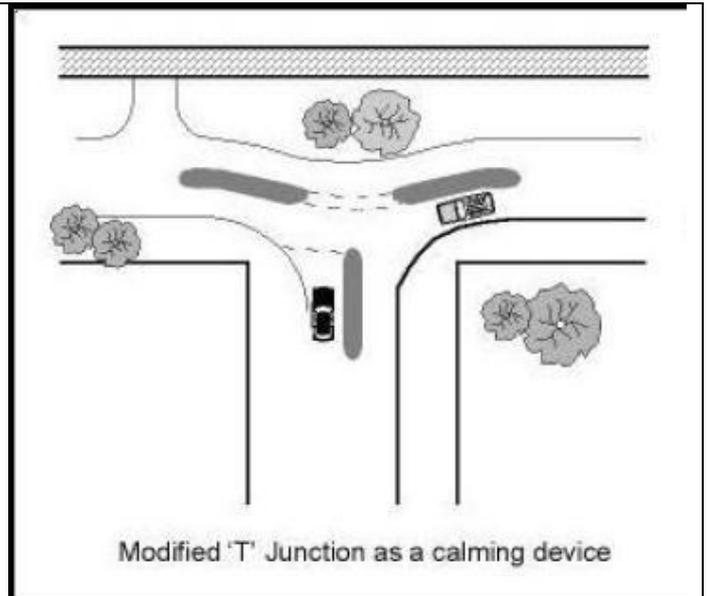


Figure 12 - illustration of median treatment at intersection



Figure 13 - example of intersection surface treatment



Figure 14 – example of intersection coloured surfacing



Figure 15 - examples of audible surface tactile treatment



Figure 16 - example of intersection threshold treatment



Figure 17 – example of left in left out intersection



Figure 18 - example of route median treatment

6.3.2 Walter Road East Corridor Study

Issues

A number of issues have been addressed along the Walter Road East corridor within Bassendean (see Figure 8, page 30). These issues are all crash associated and include:

- Walter Road East / Lord Street – 15 crashes in 5 years (4 of which are casualty crashes). The prominent crash type is Rear-End on Lord Street travelling Northbound approaching the traffic signals.
- Walter Road East / Ivanhoe Street – 23 crashes in 5 years (8 of which are casualty crashes). The prominent crash type is Thru-Right (these being right from Walter Road East into Ivanhoe Street (northbound) and from Walter Road East into Ivanhoe Street (southbound). Thru-Thru and rear-end crashes on Walter Road East are also common. Speeding issues are also present along Ivanhoe Street.
- Walter Road East / Ida Street – 10 crashes in 5 years (5 of which are casualty crashes). The prominent crash is Thru-Right. Ida Street also experiences speeding issue either side of this intersection.
- Walter Road East / Iolanthe Street – 22 crashes in 5 years (8 of which are casualty crashes). The prominent crash types are Thru – Thru, Thru – Right and right off carriageway into object or vehicle. Speeding issues are also present along Iolanthe Street.
- Walter Road East / Rugby Street – 10 crashes in 5 years (5 of which are casualty crashes). The predominant crash type is Thru – Right and Right – Rear. Speeding issues are also present along Rugby Street.

Existing Situation

Walter Road East is 4-lane two-way road. It is classed as a District Distributor A road with a posted speed limit of 60km/h. The intersections along Walter Road East are:

- Walter Road East / Lord Street – signalised intersection;
- Walter Road East / Ivanhoe Street – signalised intersection;
- Walter Road East / Ida Street – 4-way priority intersection;
- Walter Road East / Iolanthe Street – roundabout; and
- Walter Road East / Rugby Street – priority T-intersection.

(other intersections do not have a crash issue)

Proposed Treatment Options

In response to the issues identified above the following measures have been recommended and account for the standard and functionality of road as well as safety requirements.

Some treatment options along the corridor will be replicated on a number of occasions, specifically at intersections to ensure a consistent approach for the user of the road.

- **Walter Road East / Lord Street** (signalised intersection) – it was noted from site observations that vegetation obscures the visibility of signal heads on Lord Street, and as such, it is recommended that vegetation surrounding the entire intersection is assessed and either pruned or replaced with lower lying vegetation.

Further to this, surface treatment could also be applied to the entire intersection to highlight the presence of the intersection. This is similar to threshold treatment; however, it is applied to the entire intersection.

It is also recommended that a detailed intersection assessment be undertaken to ascertain clearance intervals for signal timings, to assess clearance of intersection to coincide with implementing the opening of Walter Road East (east of the intersection) at this intersection (see section 6.3.3 for details of this option).

- **Walter Road East / Ivanhoe Street** (signalised intersection) – the predominant crash issue here is Thru-Right due to right turning vehicles from Walter Road East waiting for gaps in the traffic stream to turn. It is recommended that a right turn arrow is implemented into the signals to allow for a dedicated right turn movement; however, through analysis of the Guildford Road / Collier Road intersection it is recommended that the right hand lane must be for right turning traffic only.

It is suggested that the intersection as a whole should be refurbished at the same time as installing right turn arrows, to reinstate pavement markings and highlight the raised median areas. The pedestrian crossing points at the intersection also need upgrading to current standards with suitable tactile paving.

Further to this, discussions with the Department of Transport should be undertaken to assess the possibility of localised widening at the intersection to facilitate the proposed BRT route and a possible 'queue jump' lane.

- **Walter Road East / Ida Street** (4-way priority intersection) – the predominant crash issue at this site is the right turning movement into this intersection. It is recommended that the right turn movements into / out of Ida Street are restricted creating a left in / left out only intersection. The right turn demand can then be accommodated at the roundabout of Walter Road East / Iolanthe Street thereby utilising Iolanthe Street as a local distributor as its intention (see figure 17). Additional traffic may route onto Iolanthe Street or Ivanhoe Street however from the traffic volume assessment these roads can accommodate the extra traffic.

(Note: land availability is assumed to be insufficient for a roundabout treatment).

- **Walter Road East / Iolanthe Street** (roundabout) – the vegetation within the roundabout obscures visibility of vehicles manoeuvring around the roundabout, therefore it is recommended that the vegetation is pruned back or, preferably, replace with low lying vegetation.

It is also noted that merge of traffic from two lanes into one along Walter Road East is very close to the roundabout and recommended therefore that this merge is considered further away from the roundabout.

The speed of traffic entering the roundabout is also an issue therefore it is recommended to slow traffic down by implanting pre-deflection to the roundabout (an example of this is illustrated in figure 19).

Speed management measures are also suggested for Iolanthe Street, as this currently experiences speeding issues, and with possible additional traffic re-routed from Ida Street this may become more prevalent. Measures such as utilising the Speed Awareness Monitor (SAM) activated message sign or mid-block median treatment are recommended. Longer term measures could include slow points/blister islands, as can be seen on Grey Street.

- **Walter Road East / Rugby Street** (priority T-intersection) – a low cost, short term solution to the thru-right turning crash issues is to highlight the presence of the intersection through the use of median treatments on Walter Road East and Rugby Street, however with the speeding issues along Rugby Street (assumed to be attributed to through traffic) a more restrictive measure such as creating a left in / left out at this intersection would be prudent to eliminate the right turn crashes with the right turn traffic accommodated on the Walter Road East and Grey Street intersection. However, this may attract traffic onto Anzac Terrace, in which case the slow points along Anzac Terrace should be extended and installed between Grey Street and Rugby Street.

- **Treatment along Walter Road East corridor** – it is recommended that median treatment at every T-intersection along Walter Road East be implemented to highlight the presence of these intersections to vehicles travelling on Walter Road East. It is also recommended that a painted median is implemented along the entire length of this corridor to promote a generic speed reduction along the entire route.

A Road–Diet has been considered for this corridor, and it is recommended that as a longer term solution to crash and speed issues this could be applied to this corridor, accommodating a safer environment for cyclists and promoting slower speed, an example of a road diet is presented in Appendix E. Figure 20 presents a series of schematic plans of how Walter Rad East may look with a Road Diet applied, presenting the opportunity for on-road segregated cycle routes.

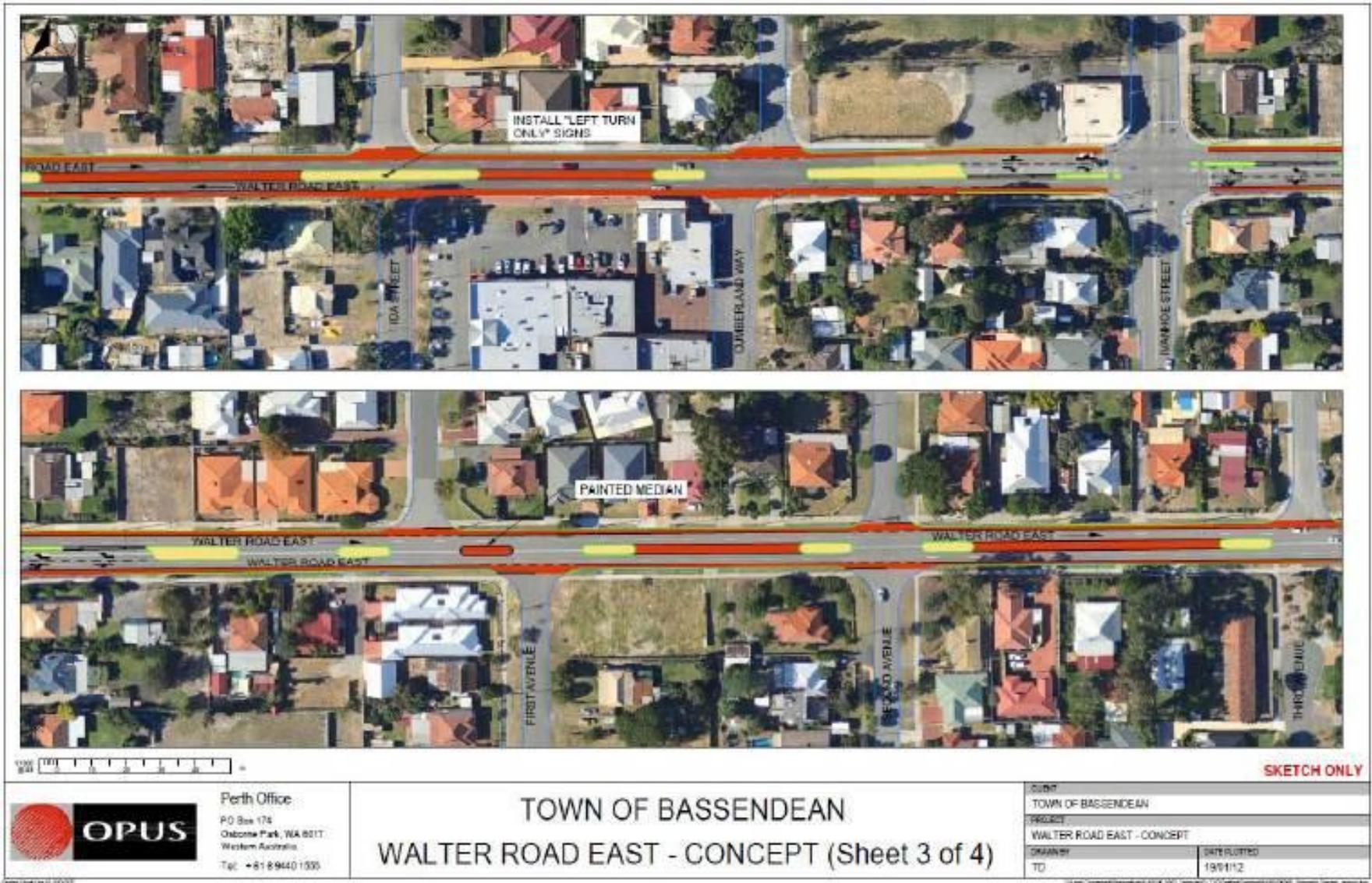
It is noted, that the Town has a long-term plan to install median treatments along Walter Road East where appropriate, this follows the roundabouts already installed.



Figure 19 - example of a roundabout pre-deflection







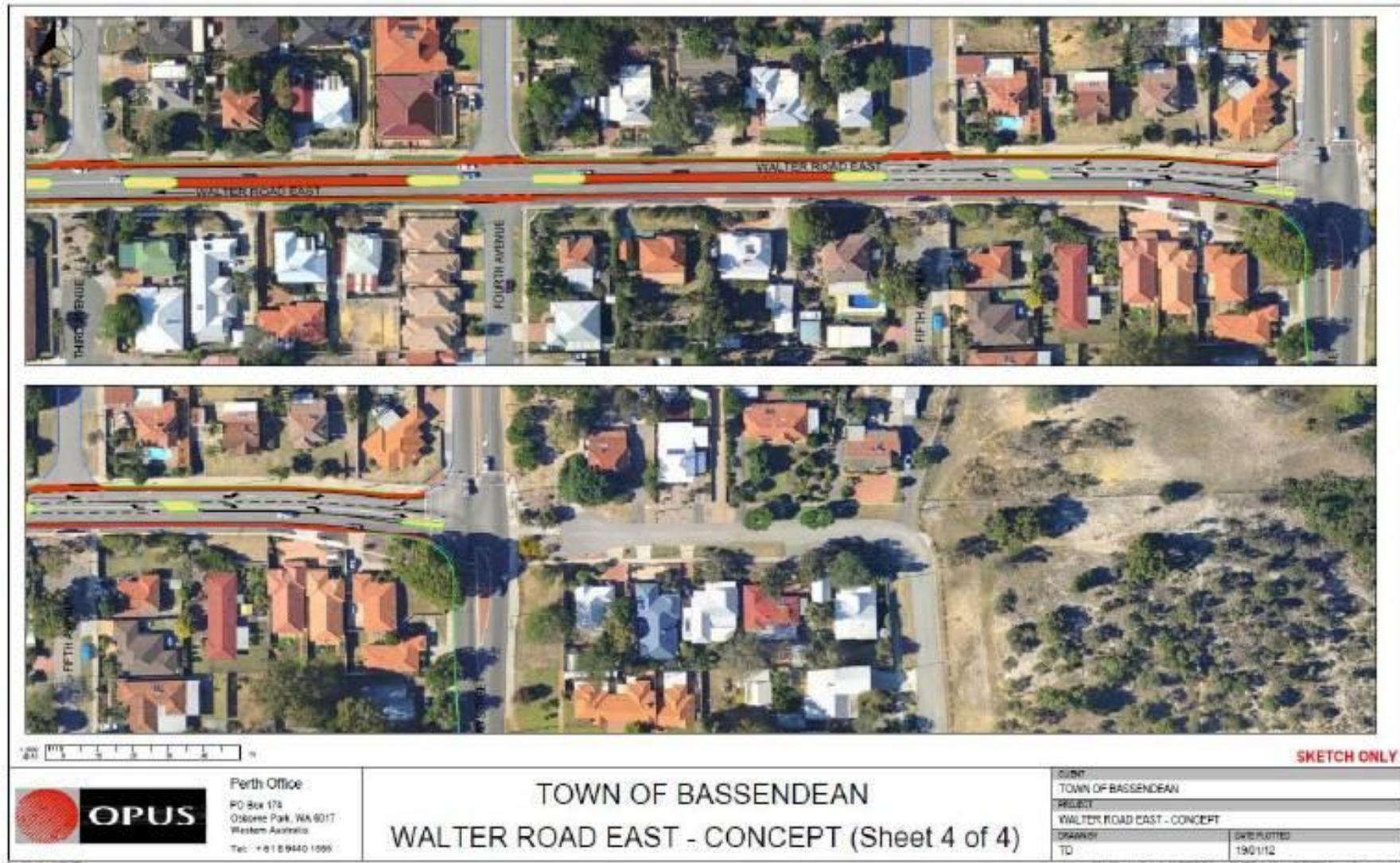


Figure 20 - Walter Road East Concept

6.3.3 Lord Street access issues

Issues

A number of issues have been addressed along the Lord Street corridor within Bassendean. These issues include:

- Lord Street / Success Road and the consideration of the opening of Walter Road East (east of the intersection) onto Lord Street. The proposal is to have left in/right in only at the intersection of Lord Street and Success Road and exit only left out/right out at the intersection of Lord Street and Walter Road East (east of the intersection);
- Railway Parade / Lord Street - Lord Street rear-end and Railway Parade right-thru crashes;
- Anzac Terrace / Lord Street, access concerns into and out of Anzac Terrace;
- Lord Street / Mary Crescent – intersection delay issues and speeding issues along Mary Crescent; and
- Morley Drive / Lord Street which experiences speeding issues along Morley Drive and access issues in / out of the intersection.

Existing Situation

Lord Street is currently a two lane, two-way road. It is classed as a District Distributor A road with a posted speed limit of 60km/h. The traffic flows for Lord Street indicate that it has capacity to accommodate more traffic if required. It is noted that PTA have proposals for bus rapid transit from Ellenbrok to Bassendean train station as proposed in Public Transport Plan 2031 and this will be accommodated in the road reserve.

Proposed Treatment Options

In response to the issues identified above the following measures have been recommended and account for the standard and functionality of road as well as safety requirements:

- **Lord Street / Walter Road East (east of the intersection)** intersection and Success Road has been analysed to assess opening Walter Road East (east of the intersection) as an exit only to form part of the existing Walter Road East and Lord Street Intersection.

Opus obtained SCATS data for the signalised intersection from Main Roads WA, this data provided the existing phasing arrangement for the intersection and existing traffic volumes for each individual movement at the intersection. For modeling purposes we provided the traffic exiting Walter Road East (east of the intersection) their own phase (all other phases within the existing phasing arrangement for the intersection remained the same).

There was no traffic data available for Walter Road East (east of the intersection), so we assumed the existing traffic exiting Success Road would now exit from Walter Road East (east of the intersection). We used existing daily traffic figures for Success Road, from the Traffic Summary provided by the Town. The traffic figure provided was from 2005 so we used a growth factor of 2% (a default growth rate for an urban area for modelling) to reflect what the traffic figure would be for 2011 (Existing). We estimated for the peak hour that the number of vehicles exiting Walter Road East (east of the intersection) would be 30 vph.

The SIDRA analysis indicates that the existing intersection was within capacity with a Level of Service C, and with the opening of Walter Road East (east of the intersection) as an exit only, the level of service for the intersection did not change still remaining within capacity.

From a safety perspective considering the existing crashes occurring at the intersection, an additional exit only road should not impact on the utilisation of the intersection.

It is recommended therefore that should the Town wish to open this road as an exit only then the appropriate measures should be taken to accommodate for an additional phase turning right out of both Walter Road East and Walter Road East (east of the intersection) to avoid waiting for gaps in traffic.

To compliment this, it is proposed that Success Road will be changed to be entry only with an entry treatment designed to reflect this.

- **Railway Parade / Lord Street** - this has experienced 7 crashes in total; however, only 1 has been a casualty crash. Due to the nature of the crashes (thru – direction intersection crashes and loss of control) it is recommended that a Road Safety Audit be considered.
- **Anzac Terrace / Lord Street and Mary Crescent / Lord Street** – both of these intersections do not currently have a significant crash problem; however, speed and the overall visibility of the intersection is an issue that has been raised. It is therefore recommended that a threshold treatment to enhance the presence of the intersections (see figure 16) and long-term modifications to implement a raised median treatment at the intersection (see figure 11) to reduce speed be implemented.
- **Morley Drive / Lord Street intersection** experiences access issues and minor speeding issue (specifically along Morley Drive). There are no traffic flow or crash issues associated with this intersection. It is proposed therefore, to utilise the Speed Awareness Monitor (SAM) activated message sign on Morley Drive to educate drivers of their speed and to implement a raised median treatment on Lord Street at the intersection with Morley Drive to highlight the presence of the intersection and reduce vehicle speeds.

6.3.4 North Road area-wide treatment

Issues

A number of issues have been addressed within the North Road area of Bassendean. These issues include:

- Speeding and Hooning issues along North Road, Devon Road and Hyland Street; and
- Crash issue at the intersection of Guildford Road / North Street (assessed as part of the Guildford Road Corridor Study).

Existing Situation

North Road is currently a two-way road that due to the lack of pavement markings and slow points facilitates speeding. Further along, at the point North Road turns into Bassendean Parade, slow points are implemented to reduce speeds. Further to this North Road has long, straight lines of sight which also facilitates speeding, breaking these sight lines may reduce the temptation to speed in this area.

Proposed Treatment Options

In response to the issues identified above and with no specific accident issues to report, the following measures are suggested as speed reducing measures.

- Implement a 'Gateway Feature' on North Road, approximately 100m from its intersection with Guildford Road. The gateway feature could include, 50km/h signs, 50 sign pavement marking on the road forming part of a threshold treatment including raising the pavement in this area (acting as a flat top road hump) an example of this combination of the treatments illustrated in figure 21 and figure 22.
- The same gateway feature as described above could also be applied to North Road approximately 40m to the south of its intersection with Hyland Street, applied to Devon Road, approximately 75m east of its intersection with West Road, and applied to Hyland Street approximately 50m east of its intersection with West Road.
- Further to these gateway treatments, centre line markings and edge line markings can be implemented to create a narrowing of the road way.

- A Long term approach to reduce speeding and improve the safety of the area is suggested in the form of 'Driveway Links', which effectively take the form of a meandering two way road. They are an extended form of a slow point that provides a greater visual and physical impact on the street and the amount of traffic using it. It is recommended to apply this treatment on both Devon Road and Hyland Street. This will still allow for passing traffic (unlike road closure that has been implemented on Harcourt Street and Lovelock Place) but will facilitate a reduction in speed; an example of this is illustrated in figure 23.
- For North road a long-term approach is to reduce speeding and improve the safety of the area suggested in the form of slow points/blister island treatments or one-lane chicane style slow points.

Measures to promote horizontal deflection have been recommended in this instance due to the requirement to allow for the safe passage of cyclists and to minimise the noise impact of vertical deflection measures on neighbouring residential properties, a schematic plan as to what the effect of North Road Area Wide treatment may look like is presented in figure 23.



Figure 21 – gateway style treatment



Figure 22 – speed pavement markings





Figure 23 - North Road Area Wide Treatment

6.3.5 Old Perth Road pedestrian treatment

Issues

A number of issues have been addressed within the Old Perth Road (OPR) corridor area. These issues include:

- The vehicle dominance feel of the OPR town centre area (between Wilson Street and Guildford Road);
- The on-street parking along OPR is confusing and varies in duration of stay along its length;
- Pedestrian crossing across OPR near to its intersection with Whitfield Street; and
- The intersection of OPR and West Road experiencing crash issues.

Further to these issues, an analysis of the background data has indicated that traffic volumes are within the acceptable level for the road hierarchy type and that this will remain so with future growth. There are no crash issues (except that associate with West Road); however, OPR does experience speed issues along the majority of its length with some areas experiencing more than 50% of vehicles speeding.

Existing Situation

OPR is very well designed and while data indicates a possible speeding trend, the feel of the road environment is one of a slower, safer road. This is attributed to the existing median and landscaping treatments along its length as well as embayed on-street car parking and wombat style pedestrian crossings.

Proposed Treatment Options

In response to the issues identified above, the following options can complement existing treatments along the road and contribute to reduced speeds and encouraging a pedestrian priority feel to the town centre.

- Raise the road pavement for OPR town centre along its length from Wilson Street to Guildford Road so that it is level with the footway creating a shared space environment. Ensure all existing pedestrian crossing points in this section are clearly marked and introduce a 'gateway feature' with '40' pavement markings on the road to re-enforce to the driver that they are entering a low speed area (near to its intersection with Guildford Road) an example of this is a combination of the treatments illustrated in figure 21 and figure 22.

- The on-street parking along the entire length of OPR is confusing and varies in length of stay allowed. Opus has undertaken a review of parking for the Town, and this is covered within the Parking Strategy report. The report suggests applying the same time restrictions for on-street parking along its entire length, and cycle parking areas to be implemented to the front of the shops of OPR town centre to reinforce the lower speed feel to the area. This is further supported through the Department of Planning's Activity Centre Discussion Paper that on-street parking can lower speeds and enhance pedestrian safety.
- The existing pedestrian crossing located on OPR near to its intersection with Whitfield Street should be upgraded to a Wombat Style crossing to match the existing Wombat Crossing further along OPR (nearer to the Library). This will not only afford more confidence to pedestrians, but also act as a speed calming device to slow vehicles down travelling along OPR.
- A wombat style pedestrian crossing to complement those already installed along OPR should also be installed to the east of the Hamilton Street / OPR intersection, across OPR approximately 15 meters to the east of Hamilton Street.
- A wombat style pedestrian crossing to complement those already installed along OPR should also be installed to the west of the West Road / OPR intersection, across OPR approximately 30 meters to the west of West Street which is also depicted as required through the Bassendean shopping centre redevelopment.
- Figure 24 is a schematic plan of how OPR would look following these recommended treatments.
- Old Perth Road / West Road – this has experienced 8 crashes in total; however, only 2 have been casualty crashes. Due to the nature of the crashes (loss of control, single lanes rear end and person in carriageway) it is recommended that a Road Safety Audit be considered.

6.3.6 Summary of treatment options

Table 3 summarises the treatment options recommended for the above described area-wide treatments, as well as treatment options of isolated intersections and midblock that have been assessed as having an issue.

Further to this, other issues identified within the LATM include:

- Recount Ida Street to ascertain if the existing traffic count of 4,235 is correct and if so, undertake a study to assess where the traffic is coming from;
- Explore with Main Roads WA the possibility of advanced traffic signal signs; and
- Removal of vegetation as specified within the report.

Table 3 - Treatment Options

Ref	Location	Brief Description of Issues	Bus Route Present	Cycle Route Present	Pedestrian Activity	Suggested Treatment	Treatment Options	
							Low-Medium Cost	Medium – High Cost
1	Collier Rd / Grey St / Jackson St	Very High accident rate (45 accidents in 5 years, 12 being casualty crashes)	✓	✓	✓	Due to a high number of intersection turning crashes (such as thru-right and thru-thru, as well as rear-end crashes) treatment to minimise the number of movements required.	Blackspot funding application already submitted for a Roundabout.	
2	Guildford Road Corridor Strategy	High crash rates and access issues	x	✓	✓	Highlight the presence of the intersections and restriction of certain movements	Median treatments, surface treatments, lane balancing, vegetation pruning/removal, tactile surface treatment and detailed signal assessments	Advanced traffic signal warning signs, localised intersection widening, restriction of right turn movements
3	Walter Road East Corridor Strategy	High crash rates and speeding issues	✓	✓	✓	Highlight the presence of the intersections and restriction of certain movements and inclusion of segregated movements at signalised intersections.	Vegetation removal, median treatments, surface treatments	Accommodation of segregated movements within signalised intersection, restriction of right turn movements, slow points, Apply a Road Diet to the whole corridor
4	Lord Street access issues	Access and Speed issues	✓	✓	✓	No crash or traffic volume issue it is suggested to utilise non-physical speed enforcement measures and measures to	Utilise the Speed Awareness Monitor (SAM) activated message sign	A modified T-intersection could be installed to reduce traffic speed and highlight the presence of the intersection

Ref	Location	Brief Description of Issues	Bus Route Present	Cycle Route Present	Pedestrian Activity	Suggested Treatment	Treatment Options	
							Low-Medium Cost	Medium – High Cost
						highlight the presence of the intersection to oncoming vehicles		
5	North Road Area Wide Treatment	Speed Issues	x	✓	x	Measures to slow vehicles speed down	Gateway Features, centre line and edge line pavement markings	Driveway Links and one-way slow points
6	Old Perth Road pedestrian treatment	Car dominance feel and speeding issue	✓	x	✓	Measures to slow vehicle movements down and provide a pedestrian friendly feel	Wombat Crossings	Wombat Crossings, rationalising on-street parking and raising the pavement level of OPR between Wilson Street and Guildford Road.
7	Broadway/ Ida Street intersection	Predominant crash type is thru-thru crashes travelling south along Ida Street and west along Broadway and speed of traffic along Ida and Broadway	✓	✓	✓	Measures to reduce the speed of traffic through the intersection will improve the safety for all users and reduce the thru-thru crashes	Median treatments on Ida street appear to have been installed recently. It is suggested to install similar median treatments on Broadway to alert the driver to the presence of the intersection. Alternatively a raised pavement treatment could be installed to highlight the presence of the intersection and slow driving speeds through the intersection.	Assessing the likely routing of traffic travelling through this intersection, installing a raised median along Broadway to physically stop right turning and straight on movements out of Ida Street. The re-routing of this traffic will impact on Iolanthe Street and Ivanhoe Street both of which can accommodate extra traffic.

Ref	Location	Brief Description of Issues	Bus Route Present	Cycle Route Present	Pedestrian Activity	Suggested Treatment	Treatment Options	
							Low-Medium Cost	Medium – High Cost
8	James Street / Palmerston Street intersection	Councillor concern for visibility of the intersection, especially during sun set/rise James Street experiences speeding, however there are no crash issues associated with this intersection	✓	✓	✓	Implement measures to highlight the presence of the intersection to drivers on James Street and Palmerston Street to complement the existing raised median and STOP signage existing on Palmerston Street	Implement coloured surface treatment to the intersection so it is highlighted to all users	A modified T-intersection could be installed including median treatment on James Street to reduce traffic speed and highlight the presence of the intersection NB: a raised pavement treatment could also be considered however, in this location it could present drainage issues that may increase costs further
9	Collier Road / Railway Parade / Guildford Road intersections	Councillor concerns with intersection safety and accessibility	✓	✓	✓	Crash issue with Guildford Road/Collier Road intersection (this forms part of the Guildford Road corridor strategy). Collier Road / Railway Parade intersection has not presented any issues associated with speed or crashes	No specific measures are required for this intersection, however, an assessment of the existing road markings indicates they should be renewed and signage to inform the driver which lane to be in on Collier Road should be installed to ensure no lane change approaching and travelling through the railway crossing intersection.	
10	Moojebing Street issues	Local resident request concerned with speeding vehicles along the road	x	✓	✓	Traffic Volume and Speed Data does not indicate speed to be an issue	Undertake a traffic volume and speed count for this road to establish if this is a real or perceived issue	If the data does show speeding to be an issue, utilise the Speed Awareness Monitor (SAM) activated message sign

Ref	Location	Brief Description of Issues	Bus Route Present	Cycle Route Present	Pedestrian Activity	Suggested Treatment	Treatment Options	
							Low-Medium Cost	Medium – High Cost
11	Shackleton Street complaints	Local resident complaints concerned with uncomfortable use and noise of speeds cushions that have recently been installed	x	x	✓	The traffic data assessed illustrates no speeding issue along this street – therefore they have achieved their purpose, however noise issues (vibration) should be addressed	Ensure speed cushions are appropriately implemented, consult a noise consultant to assess possibility of noise reducing techniques to existing cushions, i.e. to reduce amount of vibration	Remove speed cushions and replace with LATM device that provide Horizontal deflection instead of vertical deflection. It is recommended to utilise a series of slow points along the length of the road to reduce traffic speeds. These could also double as pedestrian refuge points if located at intersections where pedestrians are likely to be crossing Shackleton Street.
12	Hanwell Way Hooning issues	Local resident hooning concern (evidence of tyre burn outs)	x	x	x	No speeding or traffic volume issues presented in the data provided. Further to this, assessing the warrants required for a successful anti-hoon program – the likely traffic flow, speed, crash and environment data would not be sufficient to receive funding through this program	Evidence of Burnout marks on the road but insufficient data to warrant funding – contact the Police for further assessment of the problem	Consider engineering measures to reduce the likelihood of 'burn outs' and other anti-hoon behaviour such as implementing a turning circle in the cul-de-sac end of Hanwell Way which could include landscaping
13	Old Perth Rd/West Road; Collier Rd/Iolanthe St; Collier	These intersections have been identified has experiencing	✓	✓	✓	Road Safety Audits to ascertain specific issues for non-casualty crashes	N/A	

Ref	Location	Brief Description of Issues	Bus Route Present	Cycle Route Present	Pedestrian Activity	Suggested Treatment	Treatment Options	
							Low-Medium Cost	Medium – High Cost
	Rd/Fairford St; Broadway/Iolanthe St.	a high number of non-casualty crashes						
14	Wicks Street	Consultation with City of Bayswater has highlighted this road as experiencing speeding issues	x	x	✓	Implement educational and reinforcement techniques to warn drivers of their speed	Utilise the Speed Awareness Monitor (SAM) activated message sign	Undertake a signage and lining study to ensure posted speed signs are in place and visible. Other measures may include the consideration of the implementation of slow points to reduce driving speed.
15	Alice St/ Chedworth Way/ Cyril St/ Deakin St/ Devon Rd/ Elder Pde/ French St/ Gallagher St/ Haig St/ Hardy Rd/ Hyland St/ Maidos St/May Rd/ Railway Pde/Reid St/ Robinson Rd/ Scaddan St/ Third Av/ Wood St	Speeding Data identifies speeding along part or all of the roads		N/A		Implement educational and re-enforcement techniques to warn the drivers of their speed.	Utilise the Speed Awareness Monitor (SAM) activated message sign	Undertake a signage and lining study for each road to ensure posted speed signs are in place and visible. Other measures may include edge line and centre line markings.

Local Area Traffic Management Plan, Town of Bassendean

16	Anzac Terrace/ Bridson Street	Speeding issue along a section of road without LATM devices leading into section of road with LATM devices	✓	✓	✓	Implement LATM treatment along remaining section of road to ensure consistency along the entire route	Continue with speed cushions to be consistent with the rest of the route, however ensure appropriately installed to reduce vibration and noise issues	Remove speed cushions and replace with LATM device that provide Horizontal deflection instead of vertical deflection along entire route, build outs/slow points could be considered
17	Speed Area 2 (Figure 5) First Avenue / Ida St / Iolanthe St / Ivanhoe St / Penzance St / Second Avenue	These roads have been identified as all experiencing speeding issues most likely associated with traffic wishing to get to Bassendean Train Station	✓	✓	✓	Implement educational and re-enforcement techniques to warn the drivers of their speed. Ensure any measures considered/implemented are consistent on each road to ensure issues are not transferred to parallel streets	Utilise the Speed Awareness Monitor (SAM) activated message sign	Undertake a signage and lining study for each road to ensure posted speed signs are in place and visible. Other measures may include edge line and centre line markings.
18	Speed Area 1 (Figure 5) Kenny St/ Hamilton St/ Parker St/ Wilson St	Speeding issue along a section of road without LATM devices leading into section of road with LATM devices	x	✓	✓	Implement educational and re-enforcement techniques to warn the drivers of their speed. Ensure any measures considered/implemented are consistent on each road to ensure issues are not transferred to parallel streets	Utilise the Speed Awareness Monitor (SAM) activated message sign	Undertake a signage and lining study for each road to ensure posted speed signs are in place and visible. Other measures may include the consideration of extending the LATM treatments to these roads.

7 Conclusion

The Local Area Traffic Management Plan for the Town of Bassendean has been produced to ensure all traffic volume, speed data and crash issues are addressed in a systematic approach and not on an ad-hoc basis.

Through the development of this LATM Plan a series of recommendations have been provided as solutions to specific issues. These recommendations, where appropriate have been provided in a short-term and longer term basis.

Through the recommendations of specific treatment options, public transport access, cycling needs and pedestrians have all been considered.

Where detailed traffic data, or a detailed study to further investigate issues is required this has been recommended. This has mainly been suggested where specific issues and information are required to ensure appropriate and adequate treatment measures are recommended.

The treatment options summary (table 3) will provide a working programme and can be utilised to populate the Town's forward capital works programme, the associated costs for each proposal is presented in Table 4. This cost schedule has also been put into a proposed priority order based on number of crashes along routes, and other issues, complaints etc.

Table 4 - estimated cost schedule

Ref	Treatment		Cost	
	Low/Medium	Medium/High	Low/Medium	Medium/High
1	N/A		N/A	
2	Median treatments lane balancing	Localised intersection widening	\$220,000	\$300,000
3	Median treatments/surface treatments	Apply Road Diet	\$185,000	\$240,000
4	SAM	Modified T-intersection Lord St/Walter Rd East intersection change	\$0	\$160
5	Gateway and Road Lining	Driveway links and slow points	\$130,000	\$400,000
6	Wombat xing	OPR shared space/gateway	\$65,000	\$180,000
7	Raised median / Surface treatment	Raised median barrier	\$30,000	\$30,000
8	Surface treatment	Modified T-intersection	\$20,000	\$40,000
9	Signing/lining	N/A	Renew signage	
10	Traffic count	SAM	Town of Bassendean costs to undertake counts	
11	Check cushion installation	Slow points	TBC	\$60,000
12	Contact Police	Turning circle	\$0	\$15,000
13	Road Safety Audits		\$3,000	
14	SAM	Signing study	\$0	Renew signage
15	SAM	Road Lining	\$0	Renew signage
16	Speed cushions	Build outs	\$4,000 per speed cushion	\$100,000
17	SAM	Road Lining	\$0	Renew signage
18	SAM	Signing Study	\$0	Renew signage

*No costs for SAM treatment, costs for studies to be confirmed only costs for physical works
 Costs provided in the above table are estimated costs only and do not include costs that maybe occurred due to land purchase, service relocation, drainage etc. this may add cost specifically to medium/long term measures

Further to this it should also be noted that treatments suggested in areas where crashes are an issue have considered the Austroads Guide to Road Safety, Part 8 Treatment of Crash Locations, with suggested measures likely to reduce crash types by between 20% (median islands on approach) to 50% (banning of right turns).

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Appendix A Town of Bassendean's Road Hierarchy specification

FUNCTIONAL ROAD HIERARCHY PLAN

The Town's Functional Road Hierarchy Plan has designated the functional purpose of all streets. Unless otherwise listed below, streets are typically designated as Access Roads.

1. Access Road (up to 3000 vehicles per day (vpd))

Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are intended to be bicycle and pedestrian friendly.

2. Local Distributor Road (up to 6000 vpd)

Carry within a cell and link to District Distributors at the boundary to access roads. The route of the Local Distributor discourages through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serves the area.

- Hardy Road – Kenny Street: Moojebing St to Reid St
- Colstoun Street: Guildford Rd to Haig St
- Haig Street: Colstoun Rd to Reid St
- Reid Street: Haig St to West Rd
- West Road: Reid St to Guildford Rd
- Shackleton Street – Bridson St, Guildford Rd to West Rd
- Palmerston St
- Old Perth Road: Guildford Rd to West Rd
- Wilson Street: Palmerston St to Guildford Rd
- Railway Parade: Ivanhoe St to Lord St
- Ivanhoe St
- Iolanthe St: Collier Rd to Walter Rd - East
- Broadway
- Grey St
- Jackson St
- Northmoor Rd

3. District Distributor B (above 6000 vpd)

Perform a similar function to type A district distributors but with reduced capacity due to flow restrictions caused by access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart.

Railway Parade

4. District Distributor A (above 8000 vpd)

These carry traffic between industrial, commercial and residential areas and generally connect Primary Distributors. They are likely to be truck routes and provide only limited access to adjoining property.

- Collier Road
- Walter Road – East
- Lord Street
- Morley Drive

5. Primary Distributor (above 15000 vpd)

These provide for major regional and inter-regional traffic movement and carry large volumes of fast moving traffic. Some are strategic freight routes and all are National or State roads.

- Guildford Road

Appendix B Traffic Management Information Sheet 17



TRAFFIC MANAGEMENT

Introduction

Speeding vehicles and reckless driving continue to be a source of concern for Council and the residents of the Town of Bassendean. Whilst many see speed humps, roundabouts and other traffic calming devices as a means of reducing incidents of speeding or reckless driving, the truth of the matter is that some offenders consider these measures a challenge and not a deterrent.

Advantages and Disadvantages of Traffic Calming

The advantages and disadvantages of traffic calming will depend on the type used. Whilst most people support in principle the need for traffic calming devices, some are not as keen to have them installed in front of their house. This is quite understandable as they will be the people most affected by the installation.

Advantages of traffic calming include:

- It may slow traffic by 20 to 40 km/h.
- It may slow traffic for the entire length of the street when used in series.
- It may discourage through traffic and reduce traffic volumes.
- It may enhance the streetscape when landscaped.
- It may provide refuge for pedestrians and cyclists crossing the street.

Disadvantages of traffic calming include:

- It may increase vehicle noise through braking, accelerating and vertical load displacement.
- It may adversely affect access for emergency and commercial vehicles.
- It may adversely affect on-street parking.
- It may adversely affect access to and from residential properties.
- It may transfer traffic flow to other residential streets in the area.
- It may interfere with the flow of stormwater resulting in additional drainage costs.
- It may create a squeeze point for motorists and cyclists thus creating confrontation between users.

Installation of 50 km/h Speed Zone Signs

A common request from residents of the Town when asking for traffic calming is for 50 km/h speed signs to be placed in residential streets. The provision of these and other roadside signs in the responsibility of Main Roads Western Australia. Main Roads guidelines do not allow for the installation of 50 km/h speed signs covered by the default "built up area" speed limit. The onus is on the motorist to determine if they are driving within a built up area and to adjust their speed accordingly. 50 km/h speed signs are not installed on roads where the Road Traffic Code's 50km/h speed limit applies unless there is a change in speed limit, or the road is a dual carriageway.

Passive and Educational Strategies for Managing Traffic

Council uses various passive and educational strategies for managing traffic in the Town. These include:

- Using the speed display trailer in streets to show motorists the speed at which they are traveling. Motorists driving within the speed limit are greeted with the message "well done" whilst speeding motorists are advised to "slow down". There is a program for the use of the trailer in the streets of Bassendean however, residents may request the trailer be located in their street for a short period (this will be subject to approval by Council Officers). It is also worthwhile noting that the Town uses this trailer in school zones for the two weeks immediately following school holiday breaks.
- Using a message board from the residents of the Town thanking motorists for slowing down. This follows the speed trailer program and is located in streets for one week after the speed display trailer.
- The provision of road safety stickers "Please Slow Down – Consider Our Kids" for display of the 240 litre rubbish bins. These are available from the Town's Administration Office at 48 Old Perth Road.

Requests for Traffic Management

The Town has a Traffic Management Treatment Policy and Guidelines with which to assess requests from residents for the installation of traffic calming devices. Criteria for the assessment include:

- Traffic volumes in the street.
- Traffic speed.
- Whether the street is an access or local distributor road.
- The length of the road being assessed and whether there are existing traffic control measures in place (Stop, Give Way, Traffic Signals).
- The number of crashes in the street during the previous five years (reference to Main Roads Western Australia crash statistics).

If the assessment supports the need for traffic management, affected residents are consulted to gauge whether there is support for the installation of traffic calming devices in the street. The results of the assessment, including the level of support from affected residents, are reported to Council for their determination and possible allocation of funding.

All requests for traffic management should be in writing to the Town's Manager Asset Services (PO Box 87, Bassendean, WA 6934).

Appendix C Intersection Crash Ranking Report

Intersection Crash Ranking Interactive Report

home
 intersection query
 ranking query
 definitions
 help

**LocalAuthority Intersection Crash Ranking
by Cost Report**

L

S

L = Local Road
S = State Road

Rank	Int. No	Street 1	Street 2	Street 3	Road Class	Authority	Freq.	Cost	Details
434	37538	JACKSON ST	COLLIER RD	GREY ST	L / L	BASSENDEAN (	47*	\$2,245,895	<input type="checkbox"/>
595	4181	GUILDFORD RD	COLLIER RD		S / L	BASSENDEAN (	52	\$1,810,893	<input type="checkbox"/>
606	4580	GUILDFORD RD	WEST RD		S / L	BASSENDEAN (	50	\$1,783,624	<input type="checkbox"/>
862	37399	WALTER RD_EA	IVANHOE ST		L / L	BASSENDEAN (	23*	\$1,277,017	<input type="checkbox"/>
928	37395	WALTER RD_EA	IOLANTHE ST		L / L	BASSENDEAN (	22*	\$1,187,215	<input type="checkbox"/>
1139	14286	GUILDFORD RD	COLSTOUN RD		S / L	BASSENDEAN (	22	\$971,790	<input type="checkbox"/>
1577	37408	WALTER RD_EA	LORD ST		L / L	BASSENDEAN (	15	\$876,659	<input type="checkbox"/>
1581	37398	WALTER RD_EA	IDA ST		L / L	BASSENDEAN (	10	\$674,166	<input type="checkbox"/>
1711	37447	WEST RD	OLD PERTH RD		L / L	BASSENDEAN (	8	\$615,010	<input type="checkbox"/>
1736	37410	IOLANTHE ST	COLLIER RD		L / L	BASSENDEAN (	15	\$605,449	<input type="checkbox"/>
1847	14700	GUILDFORD RD	PALMERSTON S		S / L	BASSENDEAN (	13	\$564,114	<input type="checkbox"/>
2073	37391	WALTER RD_EA	RUGBY ST		L / L	BASSENDEAN (	10	\$487,229	<input type="checkbox"/>
2307	12300	GUILDFORD RD	NORTH ST		S / L	BASSENDEAN (	10	\$430,749	<input type="checkbox"/>
2405	37682	COLLIER RD	FAIRFORD ST		L / L	BASSENDEAN (	7	\$414,371	<input type="checkbox"/>
2481	37487	BROADWAY	IDA ST		L / L	BASSENDEAN (	8	\$398,443	<input type="checkbox"/>
2600	14289	GUILDFORD RD	PEARSON ST		S / L	BASSENDEAN (	10	\$366,312	<input type="checkbox"/>
2870	37430	LORD ST	RAILWAY PDE	WEST RD	L / L	BASSENDEAN (	7	\$326,923	<input type="checkbox"/>
2923	37412	IOLANTHE ST	BROADWAY		L / L	BASSENDEAN (	7	\$320,795	<input type="checkbox"/>
2928	91532	GUILDFORD RD	OLD PERTH RD		S / L	BASSENDEAN (	11	\$319,517	<input type="checkbox"/>
3023	131611	MAIDOS ST	MILLARD CL		L / L	BASSENDEAN (	1	\$310,600	<input type="checkbox"/>
3439	37502	SHACKLETON S	KATHLEEN ST		L / L	BASSENDEAN (	5	\$266,678	<input type="checkbox"/>
3617	37413	IOLANTHE ST	ANZAC TCE		L / L	BASSENDEAN (	5	\$243,185	<input type="checkbox"/>
3659	37411	IOLANTHE ST	SCADDAN ST		L / L	BASSENDEAN (	5	\$238,737	<input type="checkbox"/>
3732	14310	GUILDFORD RD	SHACKLETON S		S / L	BASSENDEAN (	7	\$233,846	<input type="checkbox"/>
3733	37393	WALTER RD_EA	NORTHMOOR RD		L / L	BASSENDEAN (	4	\$233,753	<input type="checkbox"/>
3793	37527	RAILWAY PDE	COLLIER RD		L / L	BASSENDEAN (	5	\$229,607	<input type="checkbox"/>
3828	37419	MORLEY DR EA	IVANHOE ST		L / L	BASSENDEAN (	5	\$227,280	<input type="checkbox"/>
3879	37524	RAILWAY PDE	JACKSON ST		L / L	BASSENDEAN (	4	\$221,397	<input type="checkbox"/>

Appendix D Local Resident and Councillor Member Requests

Local Resident Requests

1. Speed Humps in Moojebing Street – *received 10/8/11*
2. Traffic Management request for speed restricting measures along North Road – *received 19/8/11*
3. Traffic Management request for North Street, Shackleton Street and Palmerston Street – *received 17/8/11*
4. Hoon activities in Hanwell Street cul-de-sac – *received 22/8/11*
5. Petition for a flat top speed hump near OPR/Whitfield intersection – *received 3/8/11*
6. Speed Humps along Moojebing Street – *received 29/9/11*

Council Member Requests

1. Collier Road / Grey Street / Jackson Street proposed roundabout to be included – *received 30/8/11*
2. Traffic Management issues for Success Road/Lord Street. Suggested measures is to investigate opening up Lord St/Walter Road East (east of the intersection) as an exit only from the estate using the traffic lights and have the Lord St / Success Hill intersection as one way, entrance only – *received 30/8/11*
3. When considering all issues – consult the ToB existing Bike Plan network
Other requests sent as listed below – *received 30/8/11*
4. Whitfield St left turn onto Guildford Road to head west (missing road entrance)
5. Lord Street and Guildford Rd Intersection
6. Kenny St and Guildford Rd (closeness to traffic controlled intersection)
7. North Rd and Guildford Road (possible need for islands for various right turn options)
8. Thompson Rd and Guildford Rd (possible U turns on Guildford Rd in both directions & Thompson Rd turning right onto Guildford)
9. Railway Pde and Lord St (blind traffic entry)
10. Anzac Terrace and Lord St
11. Success Rd and Lord St
12. Mary Cres and Lord St
13. Morley Drive and Lord St
14. James St and Palmerston heading west (Autumn & spring setting sun, possible stop signs, median strips)
15. Colstoun Rd and Guildford Rd (unclear lines with overpass infrastructure)
16. Collier Rd and Railway Pde
17. Collier Rd and Guildford Rd
18. Greater surrounds of the Ashfield Railway Station (This area is a District Location identified in 2031 and the TOD Studies)
19. Access linkages back to the river and to Bassendean.
20. Coulston St. Shopping area.

Appendix E Road Diets

Road Diets

Impacts of Capacity Reduction

The concept of 'road diets' – a term used to describe a reduction in the number of traffic lanes and road widths particularly on arterial roads, has been applied for a number of years. This reduction of road space, has typically occurred for a number of reasons elsewhere and includes:

- Street enhancement/amenity improvement projects.
- Road safety.
- Introduction of bus lanes.
- Construction of bypasses or increased capacity on alternative routes.
- Road closures due to maintenance.
- Sudden and unexpected environmental effects.

The impact of reducing road space needs to be considered in a number of ways as set out below.

Traffic Capacity

Notwithstanding the reason for the reduction in road space, research carried out in the UK¹⁵ indicated the following key findings from 60 case studies related to road space reallocation:

- When road space for cars is reallocated, traffic problems are usually far less serious than predicted.
- Overall traffic levels can reduce by significant amounts.
- Traffic reduction is partly explained by recognising that people react to a change in road conditions in much more complex ways than has traditionally been assumed in traffic models.

Research indicates that where 'road diets' have been applied by reducing roads from four lanes down to two lanes plus turning lanes¹⁶ (and cycle lanes), there has been little impact on daily traffic flows.

US research¹⁷ suggests that four-lane roads carrying between 12,000 - 18,000 vehicles per day are ideal for receiving such treatment, with an upper comfort range for such conversions being between 20,000 - 25,000 vehicles per day. Above such levels, congestion may be such that traffic will divert to other routes.

¹⁵ Cairns S, Atkins S and Goodwin P (March 2002). Disappearing Traffic? The Story so Far. Proceedings for the Institution of Civil Engineers.

¹⁶ Turning lanes referred to in the examples are 'common two-way' lanes - i.e. the centre lane is used by turning traffic in either direction to wait and make turning movements into side streets and driveways.

¹⁷ Burden D and Lagerwey P (March 1999) Road Diets – Fixing the Big Roads. Walkable Communities.

Wider Network Impacts

Specific quantifiable research on the wider network impacts of reallocating road space in terms of overall traffic levels does not appear to be available. Nevertheless, research carried out by Cairns et al¹⁸ suggests that traffic reduction on the wider network which could possibly have been affected by road space reallocation is “a real phenomenon” and that this reduction can be substantial.

Whilst reductions in traffic volumes may occur for any number of reasons, such results may help explain why pre-scheme predictions over the impact of reducing road space are often overly pessimistic.

It should also be noted that many schemes utilising a reduced number of traffic lanes are not implemented due to increased road capacity elsewhere in the road network, e.g. through the provision of a bypass around a town. Where this has occurred, for instance as part of a UK trial in the mid 1990's of six towns that had bypasses implemented and then the town centre's traffic calmed, traffic flows reduced through the town centre but traffic volumes on the alternative route(s) increased significantly¹⁹. This trial found that traffic calming measures on the old route “brought further reductions in traffic on the former trunk routes (i.e. the roads through the towns) with a further transfer of traffic to the bypass.” A reduction in traffic in the bypassed area can have positive impacts in terms of improving the environmental amenity of the area – for instance through less vehicle emissions, noise and vibration for local residents.

Road Safety, Mobility and Access

Accident data from the US suggests that overall, for nine sites examined, a 35% reduction in accidents occurred following the reallocation of road space, with a 7% reduction in the number of injury accidents. It should be noted that in some instances at specific locations, an increase in the number of injury accidents was also reported.

Further research²⁰ based on 11 ‘road diet’ sites and 24 comparison sites in six cities in California and Washington indicated that “a significantly lower (approximately 6%) proportion of accidents occurred at road diets in the after period than at comparison sites in the after period.” However, little or no change was found in terms of accident rates (in terms of actual vehicle numbers) and accident severity.

Additional studies²¹ building upon the previous research found that for 15 ‘converted’ and ‘unconverted’ (i.e. comparison) sites in Iowa, overall accident frequency reduced by 21%, with a corresponding decrease in total accident rates.

¹⁸ Cairns S, Atkins S and Goodwin P (March 2002). Disappearing Traffic? The Story so Far. Proceedings for the Institution of Civil Engineers.

¹⁹ Department of Transport. UK (1995). Better places through bypasses - report of the bypass demonstration project. Bypass Demonstration Project.

²⁰ Hunang H, Richard Stewart J and Zeeger C. Evaluation of Lane Reduction “Road Diet” Measures and their Effects on Crashes and Injuries.

²¹ Centre for Transportation Research and Education (April 2006). Four Lanes to Three Lane Conversions. April 2006.

Local Examples

A number of sites around the Metropolitan area of Perth that have had four lanes reduced to two lanes plus turning lanes have been examined previously. The impact on two such routes are summarised below.

Berwick Street, East Victoria Park

Changes to this road running through a residential area from four lanes to two lanes plus right turn lanes at intersections underwent extensive public consultation and community input. It is part of a larger staged project. Measures along its length include painted and raised solid central median islands, restricted parking and wider area treatment to minimise rat-running on adjacent roads.

A number of alternative parallel routes with connecting roads exist in close proximity to Berwick Street.

Traffic flows have generally decreased following the introduction of the measures, with volumes also decreasing on some adjacent roads and/or parallel routes. Traffic flows of 14,000 to 16,000 vehicles per day are well within the volume range identified from the research as being suitable for road space reallocation.

Discussions with the Council have indicated a high level of satisfaction with the study.

James Street, Guildford

This road underwent a number of changes following pressure from the local council to improve the amenity in the area and to provide parking in the area. Accordingly, the road changed from two lanes in each direction to a single lane, with protected turning lanes and raised central median, plus 'sheltered' on-street parking.

Traffic flows along James Street have decreased following the reduction in traffic lanes. However, traffic flows of 29,000 to 32,000 vehicles per day are in excess of the upper limit recommended from overseas examples for such treatment. Nevertheless, it is noted that the existing two lane Road Bridge to the west of the site already formed a pinch-point on the network.

Only a limited number of alternative routes to James Street exist. One such alternative route has experienced a large increase in traffic flows whilst fluctuating traffic volumes have occurred on the other viable route.

Implementation

The reduction of road space is often a controversial event. Although the UK research by *Cairns et al* indicates that "traffic conditions following the introduction of a scheme are rarely as bad as expected" and that "current experience suggests that it is rare that road space reallocation schemes cause substantial and unacceptable levels of congestion and disruption", a great deal of care and attention needs to be given to public acceptance of the scheme prior to its implementation.

As such, the first impressions of a scheme are highly important. Based on implementation elsewhere²², a number of lessons should be heeded:

- Ensure that schemes are designed correctly at the beginning, and ensure that the details are installed and implemented in accordance to the plan.
- Be aware of any potential controversial issues and monitor them so that critics can be met with facts. Ensure that all facts are available as soon as possible.
- Use the press and public consultation work to emphasise that there are likely to be initial problems.
- If necessary, implement controversial schemes in stages and ensure that the benefits from each are obvious. Try to influence any potential side effects so that they are positive rather than negative.

²² Cairns S, Atkins S and Goodwin P (March 2002). Disappearing Traffic? The Story so Far. Proceedings for the Institution of Civil Engineers.

