City of Marion

Road Hierarchy Plan Report

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November 2005

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1. INTRODUCTION

A Road Hierarchy Plan is a tool that identifies road function, user related service needs and adjacent development with local or regional impacts, to assist Road Authorities to plan and manage transport and related infrastructure.

The development of a Road Hierarchy Plan and associated operational service levels are considered to be integral to achieving Council's Community Plan – Our People, Our Places and Our Future." It sets priority and standards in relation to urban design and infrastructure development for:

- Enhancing streetscapes;
- Developing integrated transportation plans for all types of transport;
- Providing better access and pedestrian safety while maintaining residential amenity; and
- Improving access, level of service and amenity for the community.

It is aligned with Council's Corporate Vision, Mission and Values:

1.1 Corporate Vision

- Recognised for its delivery of quality customer service by ensuring that services are of the best value and meet community needs.

- Provide leadership in the delivery of the Community Vision by developing a more sustainable city and a safe and secure city.

1.2 Corporate Mission

Our Mission is to build our communities and sustain the quality of life for the present and future generations.

1.3 Corporate Values

- Work together in partnership;
- Show leadership;
- Continue to learn and improve; and
- Embrace sustainability

This study also reflects the Community Vision,

"Marion values its people, strives to provide opportunities for all, protects and enhances quality of life for present and future generations".

This plan involves the consideration of private vehicles (including the needs of commercial and commuter movements) and public transport. Furthermore, it also involves understanding and taking into consideration future plans of other stakeholders. These stakeholders include, Transport Planning Division & Public

Transport Division of the Department of Transport, Energy and Infrastructure (formerly Transport SA) and adjoining Councils.

Pedestrian access requirements in relation to new and existing footpath infrastructure (including maintenance, construction and designing to disability standards) is also directly influenced by the Road Hierarchy Plan.

The issues related to cycling have been addressed in the City of Marion's Local Area Bike Plan and the audit of Council's bicycle facilities.

The development of a road hierarchy plan will provide the opportunity to:

- Improve Council's resource allocation and management of its road and traffic assets;
- Assist in providing a consistent and logical response to community requests;
- Effectively link with the arterial road network;
- Coordinate and inform other agencies in the development of various programs;
- Form the basis of an assessment for the provision of traffic control devices; and
- Serve as a guide to funding applications; and
- Set intervention/service standards and prioritise for maintenance upgrading and construction of new footpaths, roads and associated infrastructure.

Once the role and function of a road is understood, then decisions on the road's characteristics can be made more consistently and confidently. This can influence design and operating considerations such as pavement width, speed limits, lane configuration, on street parking, direct access or not, traffic control devices to be utilised and maintenance levels.

2. BACKGROUND

European settlers found the banks of what is now known as the Sturt Creek inviting and in 1838, just two years after the South Australian colony was founded, Colonel William Light laid out the Village of Marion. For many years the area was primarily a rural community with a sprinkling of local industries such as brick making and mining.

After the First World War, new suburbs such as Clovelly Park were opened and the bituminising of local roads began.

Whilst the Second World War caused labour and materials shortages, the period after the war was to change the face of Marion forever. In the early to mid 1950s the South Australian Housing Trust began buying up large parcels of land for industrial development and the provision of low-cost rental housing. Furthermore, large companies such as Hills and Chrysler began to establish in Marion. The post-war boom accelerated this growth, culminating in Marion gaining the status of a City in 1953. By 1954, the population had risen to over 31,000 covering an area of 55 square kms.

At the 2001 Australian Bureau of Statistics Census the City of Marion had a total population of 75,810 people.

The City of Marion is an area of contrast with an older area in the northern portion of the Council being generally developed as residential areas in the 1940's, 50s & 60's, and the newer areas in the south being established from the 1970's onwards (and still occurring today). Large sections of the older areas are now being redeveloped, with housing allotments being subdivided into two or more blocks.

The older established areas (north of Seacombe Heights) consist of a 'grid' pattern road network. The main arterial roads run north/south and are at a 2 km spacing, with east west arterial roads generally being minor in nature (Oaklands Road and Daws Road).

The road network in the southern portion of the City (Trott Park, Sheidow Park and Hallett Cove) is the 'cul-de-sac' design. There are only three arterial roads within the southern area, Majors Road (east-west), Lonsdale Road (north-south) and the Main South Road that forms the eastern boundary of the City.

The Community's aspirations, expressed in "Marion's Community Plan 2001", provides direction in relation to urban design and infrastructure, that is:

- The character and amenity of neighbourhoods is central to the sense of place and level of satisfaction of local communities.

- The community's hopes for a high quality urban environment focus on traffic management, urban amenity and design and residential development. Critical components include improving pedestrian and traffic safety, parking and road maintenance.

- The standard of appearance and maintenance of streetscapes and public places and providing suitable, adequate and flexible infrastructure are resultant outcomes that need to be realised as part of ongoing operational responsibilities of the Council.

- Well-planned and balanced development taking into account existing development, social, environmental and economic impacts is important."

3. EXISTING ROAD AND TRANSPORT NETWORK

The existing road network has a number of contributing elements that influence the operation of the road hierarchy and these are described below:

3.1 Council Roads

The City of Marion's Development Plan has a number of objectives in regard to access and transportation, especially the Movement of People and Goods, on both a City Wide and Metro Wide basis. These objectives are as follows:

"City Wide

- A network of roads, paths and tracks to satisfactorily accommodate various types of traffic; and
- An effective public transport system to facilitate travel to, from and within the council area.

Metro Wide

- A comprehensive, integrated and effective public and private transport system which will:
    a) Provide access to adequate transport services for all people, at acceptable cost;
    b) Effectively support the economic development of metropolitan Adelaide and the State;
    c) Ensure a high level of safety; and
    d) Maintain the options for the introduction of suitable new transport technologies.
- A network of roads, paths and tracks to accommodate satisfactorily a variety of vehicular, cycle and pedestrian traffic.
- A compatible arrangement between land uses and transport system which will:
    a) Ensure minimal noise and air pollution;
    b) Protect amenity of existing and future land uses;
    c) Provide adequate access; and
    d) Ensure maximum safety.
- A road hierarchy to form the basis of development controls serve as a guide to the investment of road funds in order to ensure a safe and efficient traffic flow and to promote the saving of fuel and time. Arterial roads will provide for major traffic movements".

3.2 Department of Transport, Energy and Infrastructure

3.2.1 Transport Planning Division

This Authority is responsible for arterial roads and has already developed a functional hierarchy network that identifies the role and preferred function for each of the arterial roads. The categories of these functions are, freight, cycling, public transport, cars and pedestrians.

The main arterial roads (indicating their hierarchical designation) within the City of Marion are listed below.

Road	Transport SA's Functional Hierarchy				
	Freight	Public Transport	Bicycles	Cars	Pedestrian Movements
Main South Road, Cross Rd to Marion Rd	Yes	Yes	Secondary	Yes	Edwardstown Shopping & Industrial Precinct
Main South Road, south of Marion Rd	Yes	Yes	Primary	Yes	Adjacent to local shopping areas
Marion Road	Yes	Yes	Primary	Yes	In the vicinity of local shopping
Morphett Road	No	Yes	No	Yes	In the vicinity of the Marion Shopping Centre
Diagonal Road	Minor	Yes	Secondary	Yes	In the vicinity of the Marion Shopping Centre
Cross Road	Yes	Yes	Secondary	Yes	Limited
Daws Road	No	Sections	Secondary	Yes	Limited
Oaklands Road	No	Sections	Secondary	Yes	In the vicinity of local shopping and the swimming centre
Sturt Road	Minor	Yes	Primary	Yes	In the vicinity of the Marion Shopping Centre
Seacombe Road	No	Yes	No	Yes	In the vicinity of the school and local shopping
Majors Road	No	Only the east end	Secondary	Yes	Only in the area of the TAFE college
Lonsdale Road	Yes	Yes	Secondary	Yes	Not encouraged

3.2.2 Public Transport Division

The Public Transport Division (formerly the Office of Public Transport) MetroGuide depicts all the transport systems within the City of Marion.

Rail

The Glenelg tramline forms the northern boundary of the Council area and services the north portion of the suburbs of Glandore, Plympton Park and Glengowrie.

The Adelaide to Noarlunga Centre and the Tonsley railway lines run through the City and have the following stations:

Adelaide - Noarlunga Centre

- Edwardstown
- Ascot Park
- Oaklands Park
- Marino
- Hallett Cove
- Woodlands Park
- Marion
- Warradale
- Marino Rocks
- Hallett Cove Beach

Adelaide - Tonsley

- Mitchell Park
- Tonsley
- Clovelly Park

In conjunction with the light rail and rail networks there are a number of bus/rail and car/ride interchanges throughout the Council area.

Bus

A variety of bus routes and services operate in the City of Marion, including;

- Inner and outer southern metropolitan routes to and from the City;
- Cross suburban bus routes;
- One "Go Zone" route along South Road. A Go Zone route is simply a bus route with more frequent services. That is, a service every 15 minutes from 7.30am to 6.30pm Monday to Friday and 30 minutes 6.30pm onwards.
- One "Roam Zone" route, in the Hallett Cove, Sheidow Park and Trott Park areas. This is a flexible route to get passengers to their doors or as close as the service can (from 7.00pm to last service every day).

There are a total of 466 bus stops within the City of Marion and Council has established a program to upgrade the various stops to comply with the "Disability Standard for Accessible Public Transport 2002".

4. TRANSPORT POLICIES

In recent times there has been a renewed focus on longer-term access and transport needs to ensure economic growth, sustainable development, utilisation of limited resources and funding renewal of road infrastructure assets.

Consequently, various levels of government have released transport plans. These plans have been summarised as follows.

4.1 Federal Government's AusLink Plan

AusLink is a new Commonwealth Government initiative to plan, fund and manage Australia's national land transport infrastructure. As part of this new approach, the Commonwealth Government proposes to amalgamate existing land transport funding programmes into a single programme. It is also proposed to expand funding for the national network by attracting additional private sector investment and more effective linkages with state, territory and local systems for the funding, planning and management of transport infrastructure.

The Federal Government in its AusLink White Paper released on 7 June 2004, has stated that it is committed to encouraging the development of regional infrastructure to:

- Support the growth of established and emerging industries;
- Respond to structural changes; and
- Strengthen regional economic and social opportunities.

The White Paper also provided details of a National Transport Plan and the new Roads to Recovery Program (R2R2).

4.2 The South Australian Transport Plan (Draft)

The State Government released the draft plan on 1 May 2003 for comment.

The draft Transport Plan is the State Government's vision for a sustainable transport system, one that is integrated, coordinated, affordable, efficient and safe. It is also intended to indicate the State Government's commitment to social inclusion, economic development, science and innovation and sustainable development in the context of South Australia's transport system.

There are eight action plans for sustainable transport within the draft Transport Plan, these are:

- Transport in South Australia, ensuring its environmental sustainability;
- Getting South Australia walking and cycling;
- Public transport in Adelaide, reaching its potential;
- Access to regional, rural and remote communities;
- South Australia's transport network, maximising its value;
- Gateway to economic development and jobs, maintaining freight competitiveness;
- Demanding a safe, secure transport system; and
- Smarter spending and decision making.

The draft Plan recognises the importance of coordinating transport decisions between State and local government. The Plan indicates that greater emphasis will be placed on coordinating decision-making between State and local government, and the private sector to enable more efficient transport investment and services.

These action plans have been incorporated into the South Australian Strategic Plan. The impacts on the City of Marion have been identified in Council's submission to the State Government.

4.3 Metropolitan Local Government Transport Strategy

The ARRB Transport Research Ltd together with Tonkin Consulting, have been engaged by the Local Government Association (on behalf of the Metropolitan Local Government Group - MLGG) to development a metropolitan transport strategy (on local roads) for Adelaide's 18 metropolitan Local Government Authorities.

It is intended that this study will provide a strategic transport system framework that will enable metropolitan Councils to work more effectively together in identifying priority transport projects and programs for funding.

The study will consider all modes of transport in formulating a holistic regional transport strategy.

The study commenced in April 2004 with a workshop involving all 18 Councils, however at this stage it is considered that this will not have any impact on the City of Marion.

5. ISSUES WITHIN THE COUNCIL AREA

5.1 Community Input

A road hierarchy plan is a high level planning tool which incorporates the goals of the Community Plan. Extensive community consultation in relation to the development of Marion's Community Plan (Our People, Our Places, Our Future) revealed the community's aspirations for environmental sustainability in relation to transport. In particular, these included:

- Promotion of alternative modes of transport;
- Encourage the use of public transport;
- Better connections; and
- Support Council's sustainability objections.

5.2 Internal Consultation

Key stakeholders within the Council have identified the following issues:

5.2.1 Speed and Volume of Traffic

Council receives many requests to reduce both the speed of traffic and number of vehicles using residential streets within the City.

In March 2003, the State Government introduced the 50 km/h general urban speed limit, which applied to all roads in the metropolitan area unless signed otherwise. In the City of Marion all but five roads, maintained by Council, are speed zoned 50 km/h. These roads are:

- A short section of Young Street, Trott Park;
- The Cove Road, Hallett Cove;
- Lander Road, Sheidow Park;
- Morphett Road, Seacombe Heights; and
- Miller Street, Sturt.

It should be noted that all arterial roads within the Council area are speed zoned at 60 km/h or higher.

5.2.2 Inappropriate Driver Behaviour

This issue is of concern to the majority of residents in all areas of the Council, with the problem continually being raised with Council staff and the Police. Particular areas of concern are:

- Within car parks;
- Adjacent to reserves;
- Along the coast areas of the Council;
- Within the 'grid pattern' roads; and
- Steep terrain areas, such as Seaview Downs and Seacombe Heights.

5.2.3 Safety

Despite the introduction of the lower speed limit, poor driver behaviour or the 'hoon element' is still of concern to many residents. In particularly, the safety of unprotected road users (pedestrians and cyclists) around schools or proceeding along the local road network is raised as an issue. These concerns are often seen as a reason to discourage both pedestrian and cycle movements.

5.2.4 Parking

Generally there is ample on-street parking throughout the City, however within the industrial area of Edwardstown there is a lack of parking areas with insufficient on street parking to cater for both employees and customers of the various companies operating in the area.

In many situations there is competition for the available space, that is:

- Loading areas;
- Parking for staff and visitors; and
- In some cases storage areas.

5.2.5 Alternative Modes of Transport - Non-Car

As with all levels of Government, the City of Marion is attempting to promote sustainability and encourage the use of other modes of transport.

Council has and is continuing to support a number of initiatives to promote non-car transport, these are:

- Safe Routes to School Program;
- Living Neighbourhood/Travel Smart SA program (Save a K);

Furthermore, Council has implemented and is continuing develop its Local Area Bike Plan. At present Council is installing the Coast to Vines Rail Trail (formerly the Willunga – Marino Recreational Trail).

Particular suggestions for promoting alternative modes of transport within the City are:

- The provision of bicycle routes within the existing rail corridors, such as the Tonsley Railway Line;
- Identifying opportunities to provide and promote 'Park and Ride' facilities. These facilities should be mutli-modal and cater for cyclist and pedestrians;
- The design of roads in the new south sections of Council should cater for the newer low ride buses; and
- Identifying precincts that may require the provision of bus services in the future.

5.2.6 Boundaries - adjoining areas

Except for the Council boundary adjoining the City of Holdfast Bay, all other boundaries are formed by arterial roads or barriers (the Glenelg tramline or Field River).

Therefore, the most direct relationship or concerns will involve the numerous local road connections with City of Holdfast Bay.

Due to the road design and traffic flows along South Road there is very little direct access to the local road network within the City of Mitcham, except for where traffic signals have been provided. Consequently, Transport SA plans in relation to South Road will have a greater effect on traffic movements through the Council area than movements to and from the City of Mitcham.

5.2.7 The Movement of Freight

The majority of heavy vehicle movement within the City of Marion is along the arterial road network. However, for the continuing economic development of the City it is necessary to permit heavy vehicles to access the industrial areas (such as Edwardstown) from the arterial roads.

It is anticipated that the development of the Local Government Association's Metropolitan Transport Strategy (which includes all 18 metropolitan Local Government Authorities) will assist in the planning of the road network across the entire metropolitan area. This will lead to a regional approach to transport concerns and the development of strategies for all modes (including heavy vehicle transport).

5.3 The Marion South Plan

The City of Marion is proposing a range of initiatives that will enhance the southern area's (coastal area, Hallett Cove, Glenthorne and Field River) features, improve the range of services/facilities and better connect the three suburbs of Trott Park, Sheidow Park and Hallett Cove.

In regards to the road network, the most significant factor is the proposed new east – west road link from the southern side of the Hallett Cove Shopping Centre to Lander Avenue. This new link has the potential to both change traffic patterns and increase traffic volumes in the area. At this stage, the main features of this road consist of:

- Commencement with a roundabout at Gledsdale Road and Zwerner Drive;
- A main entry point into the redeveloped Hallett Cove Shopping Centre;
- Traffic signals at the new four-way intersection with Lonsdale Road;
- Connection to Lander Avenue; and
- Redevelopment of the junction of Lander Avenue and Lander Road.

6. FUTURE DEVELOPMENT AND TRAFFIC GENERATION

It is considered that the majority of traffic within the City of Marion is generated by:

- Residential population - That is, journeys to work, school, shopping related trips, medical services, recreation and sports activities.
- Employment - This relates to the number people entering the area to go to and from work and work related trips.
- Commercial and industrial related trips - These are trips generated by business activities (delivery and heavy vehicles).
- Visitors - This relates to social activities (friends and family).

6.1 Residential Population

A comparison of the 1996 and 2001 Census of population and housing (undertaken by the Australian Bureau of Statistics) indicates the following:

- Population has increased by 2%;
- The average age within the Council area has increased from 37 years in 1996 to 39 years in 2001;
- The number of people per household is 2.4 persons; and
- The number of vehicles per household has increased slightly, with 41.9% of households now having two or more vehicles compared to 39.4% in 1996;

Population Statistics 1996 – 2001

Location	1996 Population	2001 Population	% increase or decrease
Ascot Park	2533	2614	3.2%
Clovelly Park	2638	2720	3.0%
Dover Gardens	2161	2183	0.7%
Edwardstown	3988	3995	0.1%
Glandore	2650	2649	-0.04%
Hallett Cove	11400	11954	4.8%
Marino	1992	1983	-0.6%
Marion	3512	3415	-2.7%
Mitchell Park	4678	4745	1.5%
Oaklands Park	3200	3036	-5.2%
Park Holme	2568	2505	-2.5%
Plympton Park	2814	2909	3.3%
Seacliff Park	2058	2048	-0.5%
Seacombe Gardens	1947	1981	1.6%
Seacombe Heights	1562	1476	-5.1%
Seaview Downs	2417	2632	-3.0%
Sheidow Park	3438	4185	21.9%
South Plympton	3770	3791	0.7%
Sturt	2076	1968	-5.2%
Trott Park	3000	3051	1.3%
Warradale	4376	4369	-0.2%
City of Marion	74,318	75,813	2.0%

(source: ABS Census of Population and Housing 1996 and 2001)

Within the City of Marion the main areas of growth are in the following suburbs:

- Sheidow Park;
- Plympton Park
- Clovelly Park
- Hallett Cove;
- Ascot Park

Growth in Hallett Cove and Sheidow Park is the result of new development, while regeneration and younger people moving into the area would account for some of the increase in the other suburbs

.

The areas of most significant decrease in population are:

- Sturt
- Oaklands Park
- Seacombe Height
- Seaview Downs

The decline in these areas is in part a result of a reduction in household size, including a decline in couple households with children and an increase in single person households.

The Metropolitan Planning Strategy (Jan 2003) has indicated that the population projections for the various portions of the City of Marion are:

Portion of Council	2001 Census	2016 projections	Change	Comment
North (tramline to Daws/Oaklands Roads)	25,397	25,523	+ 126	Very small increase over 15 years
Central (Daws/Oaklands Roads to the southern areas)	33,394	34,377	+ 983	Very small increase over 15 years
South (Hallett Cove, Trott Park Sheidow Park and part O'Halloran Hill)	19,422	25,272	+5850	Major increase due to the Sheidow Park development

(Source: ABS Census of Population and Housing 1996 and 2001)

The residential population of Marion is aging particularly in the central and northern suburbs. This will involve consideration of facilities and improvements to infrastructure to ensure continued access and mobility for an older population.

Accompanying this trend is redevelopment of aging and rental housing involving consolidation of housing block sizes and merging density of population.

6.2 Journeys to Work

The 2001 Census indicates that:

Daily Movements **into** the City of Marion

	Mode of Transport				
	Car	Motor Bike	Truck	Public Transport	Other
North	5839	42	51	172	459
Central	8148	49	50	345	577
South	1271	3	28	32	76
TOTAL	15258	94	129	549	1112

Daily Movements **out** of City of Marion

	Mode of Transport				
	Car	Motor Bike	Truck	Public Transport	Other
North	6555	42	82	845	710
Central	8832	58	114	952	892
South	7175	21	82	480	641
TOTAL	22562	121	278	2277	2243

Of the out bound movements, the majority of trips (the top five) were to the following Local Government Areas:

- Within the City of Marion (Marion residents who work in Marion)
- City of West Torrens
- City of Adelaide
- City of Mitcham
- City of Pt Adelaide / Enfield

Transport Planning Division of the Department of Transport, Energy and Infrastructure has indicated that traffic volumes as a result of population and employment growth is expected to be relatively low, with the exception of the southern portion of the City of Marion (Sheidow Park).

6.3 Industry Related Activity

The main industry areas, and therefore the concentration of heavy vehicle activities on the local road network within the Council are in Edwardstown and Clovelly Park.

Planning SA has indicated that there is little opportunity for growth within these areas.

6.4 Tourism

The only significant tourist destination within the City of Marion is the Marion Shopping Centre although there is evidence to suggest that interest is increasing in relation to tourism along sections of the coastline between Marino and Hallett Cove.

7. ROAD HIERARCHY (THEORY)

A Road Hierarchy is a means of classifying roads within a network according to a set of criteria, which link road users, abutting land use and community priorities. It is important in determining how the future road network is planned, designed, development and funded. The road hierarchy system should:

- Identify required levels of service needs and importance.
- Specify the desired road characteristics (width, service levels, regulatory control and maintenance);
- Be utilised as a tool for decision making (priority of works etc);
- Identify deficiencies in the road network;
- Identify opportunities to enhance the public transport systems; and
- Assist in providing informed responses to the community.

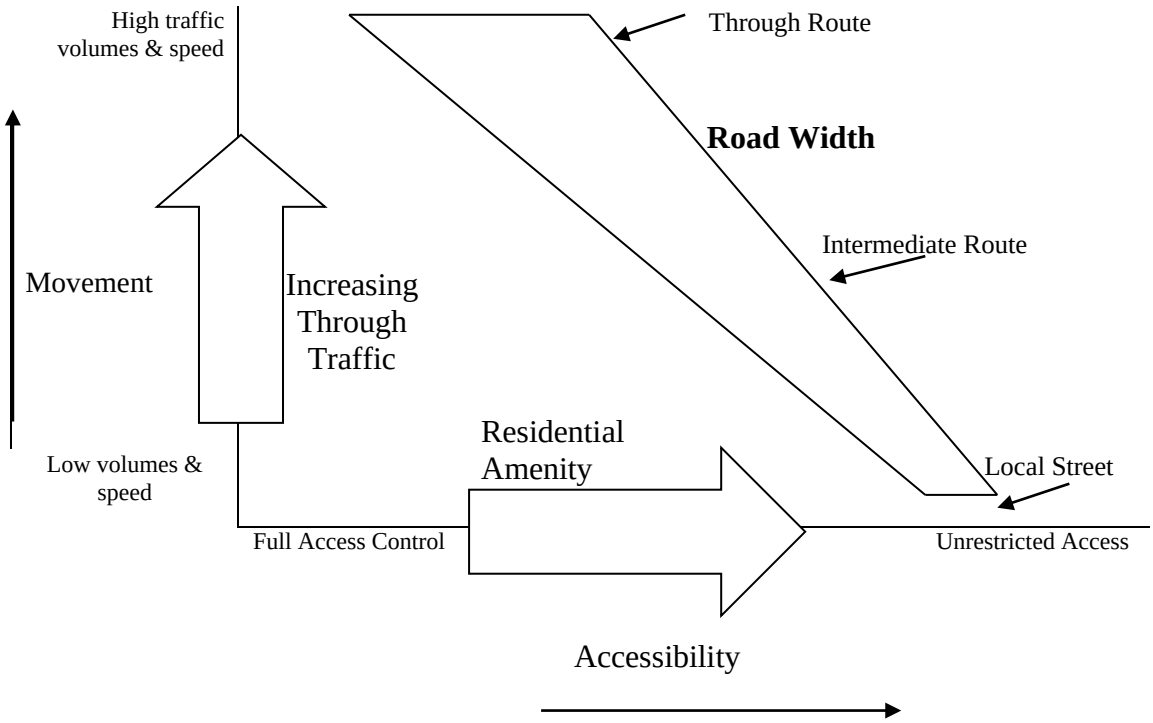
The effectiveness of any road hierarchy will be evaluated by:

- Its compatibility to other road networks or hierarchy plans (eg State Government use a functional hierarchy system);
- Whether it is understandable and makes sense to the staff that would use it.
- Its capability to deal with a variety of issues.

The conventional relationships between road type, road function and traffic numbers are detailed in the following diagrams.

LAND ACCESS			TRAFFIC MOBILITY
Local Road	Collector Road	Arterial	Freeway

(Source: Camaron 1977)



(Source: Camaron 1977)

8. THE PROPOSED ROAD HIERARCHY SYSTEM

The Road Hierarchy proposed in this plan is one consistent with the conventional "Classical Road Hierarchy" used by the majority of Road Authorities but also incorporates those elements, which determine or influence its function; that is the needs of the road users and stakeholders. This is called the "Functional Road Hierarchy".

8.1 Classical Road Hierarchy (Refer to the attached Map - Appendix A)

The classical road hierarchy depicts the dominant type of movement along the road, from long distance through traffic to local access. The road hierarchy is divided into six classical types, freeway, arterial roads, sub-arterial roads, distributor roads, collector roads and local roads.

For local government purposes the category of freeways will be excluded (although as an example the Southern Expressway can be considered as a freeway) and only the classifications from arterial roads through to local roads will be considered.

According to the Austroads publication, "Urban Road Design, Guide to Geometric Design of Major Urban Roads" the various classical road hierarchy categories are described as follows:

8.1.1 Arterial Road

Arterial Roads cater for significant to high numbers of vehicles moving between regions.

These roads (which are generally maintained by the State road authority) are of a high design, often with a number of lanes separated by a wide median.

8.1.2 Sub-Arterial Road

The primary function of a sub-arterial road is to cater for reasonably high volumes of traffic travelling between regions.

These roads are normally one lane in each direction, although the travel lane is separated from parking (either road width or a parking lane). A sub-arterial road can be either maintained by the State road authority or Council. An example of Council maintained roads in this category are Lander Road and Winifred Avenue. The new "Connector" road at Hallett Cove will also be a sub-arterial road.

8.1.3 Distributor Road

This is a road that disperses traffic into or within a local area.

In general, a distributor road (maintained by Council) consists of one lane in each direction of travel, free of parking, and provides direct access to residential properties.

The Cove Road, Hallett Cove and Finniss Street are considered to be distributor roads.

8.1.4 Collector Road

A collector road generally provides a link between either arterial roads or distributor roads and local streets.

These roads usually provide for the movement of traffic, have one lane in each direction, allow parking and provide direct access to residential properties. Collector roads are the responsibility of Council.

Examples of this category of road are George Street/Dwyer Street, Oaklands Park and Capella Drive, Hallett Cove.

8.1.5 Local Road

The main purpose of a local street is to provide access to properties.

Generally this type of road caters for low traffic volumes and speeds, with parking allowed on both sides of the road.

8.2 Functional Route Hierarchy

On its own, the Classical Road Hierarchy does not provide sufficient clarity or details about road user or access needs to effectively manage the road network. There are a variety of requirements for the different types of road users and these requirements can identify the roads function. For example, freight would prefer wide lanes with higher speed, while bicycles favour an assigned lane and a low speed environment. Accordingly, it is considered that a Functional Road Hierarchy system is required to complement the Classical Road Hierarchy.

The Functional Road Hierarchy describes the predominant road or class user section of the road network.

There are a number of possible Function Route Hierarchy categories; these include:

8.2.1 Freight Route (Refer to the attached Map - Appendix B)

There are differing levels of freight movements with characteristics associated with various types of vehicles, that is:

- Single unit trucks delivering to local shopping centres etc;
- Semi trailers into factory areas;
- Over-dimensional vehicles; and
- B-Doubles or restricted access vehicles for very heavy or oversize freight movements.

Within the City of Marion there are a number of gazetted freight routes for the various classification of vehicles, as follows.

Road	Routes		
	B-Doubles	Heavy Mass Vehicles fitted with Road Friendly Suspension	Converter Dolly Route Network
Main South Road	x	x	x
Marion Road	x	x	
Morphett Road		x	
Cross Road	x	x	
Winifred Road		x	
Sturt Road		x	
Seacombe Road		x	
Diagonal Road		x	
Bray St / Regan Ave		x	
Oaklands Road		x	
Daws Road		x	
Alawoona Avenue	x	x	
Lonsdale Road		x	
Majors Road		x	
Miller Street		x	
Southern Expressway	x	x	x

Route Definitions:

B-Doubles	-	Consist of a prime mover towing 2 semi-trailers.
Heavy Mass Vehicles fitted with Road Friendly Suspension	-	Vehicles that use an air bag system combined with effective hydraulic dampers.
Converter Dolly Route Network	-	A trailer with one tandem axle group or a single axle and fifth wheel coupling design to convert a semi-trailer into a dog trailer.

8.2.2 Bicycle Routes

The City of Marion has an extensive bicycle network (trails and lanes) that is depicted within the Marion's Local Bike Plan. Although an examination of the bicycle facilities is not part of this study, it is important that the use of bikes as an alternative means of transport is recognised. Furthermore, it is essential to note the connection between the various bicycle routes and local roads in the overall planning and development of the road network.

8.2.3 Commuter Routes (Refer to the attached Map - Appendix C)

A commuter route is a road that caters for significantly large numbers of vehicles during the peak hours and very little for the remainder of the day.

Usually, up to 10% of vehicles movements would occur during each peak hour along a road (that is, for road a carrying 1000 vehicles a day, the peak hours would cater for up to 100 vehicles). Therefore, if a road is carrying significantly more than 10% in the peak hours it can be considered as a commuter route.

These commuter routes could be related to places of work or education and normally occur on the higher classification roads (sub arterial and distributor roads).

8.2.4 Pedestrian Routes (Refer to the attached Map - Appendix D)

Abutting land use affects or generates the level of pedestrian activity. Areas of high level of pedestrian activity are in the vicinity of:

- Schools
- Shopping centres (local, strip, district centres)
- Commercial areas
- Neighbourhood and community centres
- Bus routes.

Pedestrian movements generally extend to within 500 metres of these facilities, and accordingly the extent of activity influence the level/width of the infrastructure (footpaths) required to accommodate the movement. Disabled access provision is also a consideration in the development of such routes.

8.2.5 Public Transport Routes

These include roads or transport corridors, which are defined bus, train or tram routes. Within the City of Marion the public transport system consists of:

- The Glenelg tram line (forming the northern boundary of the Council);
- The Adelaide to Noarlunga Centre railway line; and
- Existing bus routes.

The majority of these routes are linked to major centres or activities or work areas, eg bound for the Central Business District (Adelaide) or the Marion Shopping Centre.

9. PROPOSED OPERATIONAL PARAMETERS IN THE CITY OF MARION'S ROAD HIERARCHY

The various road classifications have different requirements and therefore different operational parameters are required. In particular, the distinct service levels and characteristics for the various road classifications include the following components:

Service Levels

- Traffic volumes (AADT)
- Vehicles speeds

Characteristics

- Parking/clearway/bike lanes
- Pavement width
- Acceptable traffic control devices
- Street lighting

9. 1 Classical Hierarchy Parameters

For details in relation to the preferred service levels and characteristics regarding the various classical road hierarchy classifications (sub-arterial, distributor, collector and local roads) refer below to the attached Table 1, Classical Hierarchy - Level of Service and Characteristics, Page 25.

These design features for the various road classifications (depicted below) are according to the Austroads publications, "Urban Road Design - Guide to Geometric Design of Major Urban Roads, Traffic Flow - Part 1, Roadway Capacity - Part 2 and Intersections at Grade - Part 5".

9.1.1 Arterial Road

- Speed environment 60 km/h and above in the urban area and 80 to 110 km/h in the rural environment.
- The spacing between roads of this classification should be 2 kms.
- The road alignment – a minimum of 75 m curve radius at 60 km/h and 165 m radius at 80 km/h.
- Stopping distance should be 105 m at 60 km/h with 160 m at 80 km/h.
- Pavement would vary as to traffic requirements (assessment required).

9.1.2 Sub-arterial Road

- Speed environment 60 km/h and above.
- The spacing between roads of this level should be 2 kms.
- The road alignment – a minimum of 75 m curve radius at 60 km/h and 165 m radius at 80 km/h.
- Stopping distance should be 105 m at 60 km/h.
- Pavement would vary as to traffic requirements (assessment required).

9.1.3 Distributor Road

- Speed environment 50 to 80 km/h.
- The spacing between this level of road can be as little as 1 km.
- The road alignment – a minimum of 75 m curve radius at 60 km/h and 165 m radius at 80 km/h.
- Stopping distance should be 105 m at 60 km/h with 160 m at 80 km/h (as per Austroads part 5)
- Pavement construction would vary as to traffic requirements (assessment required).

9.1.4 Collector Road

- Speed environment - 50 km/h.
- The road alignment – a minimum of 75 m curve radius at 60 km/h and 165 m radius at 80 km/h.
- Stopping distance should be 105 m at 60 km/h with 160 m at 80 km/h (as per Austroads part 5)
- Pavement would vary as to traffic requirements (assessment required, refer to figure 2).

9.1.5 Local Road

- Speed environment should be 50 km/h or less.
- The road alignment – a minimum of 75 m curve radius at 60 km/h and 165 m radius at 80 km/h.
- Stopping distance should be 105 m at 60 km/h with 160 m at 80 km/h (as per Austroads part 5)
- Minimum pavement width of 7.2 metres.

Classical Hierarchy
Level of Service and Characteristics

Road Classification	Service Levels		Characteristics			
	Traffic Volumes (AADT)	Vehicle Speeds (85%ile)	Parking / Clearway / Bicycle Lane	Pavement With	Accepted Traffic Control Devices	Street Lighting
Arterial	> 8,000	60 to 80 in the urban area	Either treatment maybe appropriate	Generally a Multi lane road, (depending on requirements)	Traffic signals, roundabouts or 'B' & 'C' type junction treatments at major junctions	As per Australia Standards Category V 4
Sub-Arterial	< 10,000	60 and above	The provision of a clearway or bicycle lane maybe appropriate.	> 9.6 metres depending on configuration	Traffic signals, roundabouts or 'B' & 'C' type junction treatments at major junctions	As per Australia Standards Category V 4
Distributor	< 6000	50 to 60	Bicycle lane and/or parking maybe appropriate	9.6 metres plus parking lanes if required	At major junctions: • Traffic signals • Roundabouts • 'A' type layout • Stop and Give Way signs	As per Australia Standards Category P 4
Collector	< 3000	50	Bicycle lane and/or parking maybe appropriate	7.2 to 8.5 metres wide	At major junctions: • Traffic signals • Roundabouts • 'A' type layout • Give way & stop signs Minor locations: • Road closures • Kerb protuberances • Stop and Give way signs	As per Australia Standards Category P 4
Local	< 1000	< 50	Clearway and bicycle should not be necessary, parking required.	A minimum of 7.2 metres in width	All minor traffic devices including closures and LATMs	As per Australia Standards Category P 5

Note: Lighting categories are a guide only, each road will need to be assessed. Traffic control devices within local streets will require a lighting upgrade (V 5)

9.2 Functional Hierarchy Parameters

The design of the various functional elements besides freight requirements, is based on the criteria of the different levels of the classical hierarchy.

The provision of Function Route requirements may alter the operating parameters required for a particular road, as follows:

9.2.1 Freight Routes

Minor

- Turning lanes should be 3.1 metres wide.
- Safe intersection sight distance should be based on a driver eye height of 2.4 metres and be 115 m at 60 km/h with 180 m at 80 km/h. Stopping distance is 65 metres at 60km/h and 120 metres at 80 km/h. (as per Austroads, part 5)
- A desirable lane width of 3.3 metres (a total pavement width of 6.6 metres). Parking can be provided within the pavement providing the kerb lane is 5.5 metres.

Major

- Turning lanes should be 3.3 metres wide.
- Safe intersection sight distance should be based on a driver eye height of 2.4 metres and be 115 m at 60 km/h with 180 m at 80 km/h. Stopping distance is 65 metres at 60km/h and 120 metres at 80 km/h. (as per Austroads, part 5)
- A desirable lane width of 3.5 metres (a total pavement width of 7.0 metres). Parking can be provided within the pavement providing the kerb lane is 5.5 metres.

9.2.2 Commuter Routes

- Turning lanes should be provided at major junctions, at a standard width (minimum 2.5 metres).
- Parking restrictions may be required at particular times to ensure traffic flow.

9.2.3 On-road Bicycle Routes

- Minimum bicycle lane width is 1.2 metres, if adjacent to parallel parking than additional 0.4 metres is required for a safety zone (doors opening) resulting in a total width of 1.6 metres for a 60km/h environment.
- To cater for cyclist, where there is no bicycle lane the minimum lane width should be 3.7 metres (60km/h).

As per Austroads part 14, Guide to Traffic Engineering Practice – Bicycles

9.2.4 Off-road Bicycle Routes

- The majority of these are shared facilities and should be 3.0 metres in width, 1.5 metre lanes in either direction.
- These lanes should be controlled where they meet the road network.

As per Austroads part 14, Guide to Traffic Engineering Practice – Bicycles

9.2.5 Pedestrian Network

- Footpaths should be provided on both sides of a road in the built-up area, where possible.
- Minimum footpath width is 1.2 metres on local road, with greater widths provided on the higher road classifications.
- Kerb ramps should be provided to DDA requirements
- Where the particular warrants are met, crossing facilities should be provided.

As per Austroads part 13, Guide to Traffic Engineering Practice – Pedestrians

Details of the road characteristics in relation to Functional Hierarchy have been tabled below.

Functional Hierarchy

Characteristics

Routes	Characterises		
	Pavement Width	Treatment	Comment
Freight Minor	A minimum pavement width of 6.6 metres. Desirable lane width of 3.3 metres	Pavement bar layouts are tolerable at junctions/intersections. Roundabout should be designed to cater for large vehicles.	Refer to Austroads Part 5, for warrants and guidelines for provision of traffic controls.
Freight Major	Road width should be 7.0 metres or more. Desirable lane width of 3.5 metres	Traffic control devices such a roundabouts and right turn lanes must be designed to cater for large vehicles of 17m in length. Parking restrictions	Refer to the approved Over Dimensional Vehicles Routes (eg B-Double Routes), or approval must be obtained.
Bicycle	Without bicycle lanes, 7.4m (3.7m lanes in each direction) Bicycle lanes should be a minimum of 1.2m	As per the City of Marion Local Area Bike Plan. Traffic control devices should cater for the safe movement of bikes, where possible.	Adjacent to parking lanes a 0.4 safety zone should be included into the bicycle lane, thus it should be 1.6 metres wide.
Pedestrian	Footpath width: • 1.2 metre minimum on local roads. • 1.5 metres being desirable on the higher level roads. • Greater than 1.8 metres adjacent to arterial roads	• Ramps in compliance with DDA regulations • Signs • Pedestrian Refuges • Signals All treatments to be provided in accordance with the appropriate standards/warrants	On Arterial, Sub-arterial, and Distributor Roads, narrow footpaths should not be installed at the "back of kerb"
Commuter	Pavement width should 7.8 m or more.	As per Classical Road Hierarchy	Right turn lanes maybe required at relatively important junctions to facilitate the movement of commuter traffic (2.5 metres wide).
Bus	As per Classical Road Hierarchy, however right turn lanes should be a minimum of 3.6 m.	Traffic control devices such a roundabouts must be designed to cater "low ride" buses as per the Office of Public Transport's requirements.	

10. DEFICIENCIES IN THE ROAD WORK NETWORK

Deficiencies in the road network within the City of Marion can be divided into two main categories, these are:

- Arterial Road Network (State Road Authority)
- Local Road Network (City of Marion)

10.1 Arterial Road Network (State Road Authority)

10.1.1 Network

Within the "grid pattern" of the northern portion of the City of Marion, there are a number of main arterial roads. The north-south routes are at a regular spacing of approximately 2 kms, providing an adequate system to access the major traffic generators within the Council area. The east-west routes, which are generally minor arterial roads, are at a larger and inconsistent spacing. Ideally, based on this spacing Bray Street and Raglan Avenue should be part of the arterial road network.

The road network in the Hallett Cove, Sheidow Park and Trott Park (the southern areas) is not a "grid pattern" and there are only two north-south arterial roads within this area (Lonsdale Road and South Road, which is the Council boundary). Majors Road is the only east-west arterial road serving the southern areas. This lack of arterial routes has resulted in poor definition of the road network and has resulted in traffic using a number of local roads to commute through the area, for example Lander Road and Cove Road.

10.1.2 Capacity

Capacity is defined as the maximum hourly rate at which vehicles can reasonably be expected to traverse a point (intersection) or section of a lane / roadway during a given time period. The Level of Service (LOS) is a qualitative measure to describe the operational conditions within the traffic flow. There are six levels (A to F) as defined in the Austroads publication "Guide to Traffic Engineering Practice, Roadway Capacity Part 2", depicted below:

Level A - Free flowing traffic conditions with motorists virtually unaffected by other drivers. Freedom to select travel speed and to manoeuvre. Excellent level of comfort and convenience.

Level B - Stable traffic flow and drivers still have reasonable freedom to select their desired travel speed and to manoeuvre. Slightly reduced levels of comfort and convenience.

Level C - Also stable traffic flow, but drivers are restricted to some extent in their freedom to select travel speed and manoeuvre. The general level of comfort and convenience declines noticeable.

Level D - Close to the limit of stable traffic flow. All drivers are restricted in their freedom to select their speed and manoeuvre. The level of comfort and convenience is generally poor.

Level E - Traffic volumes are at or near capacity and there is virtually no freedom to select either vehicle speed or manoeuvre. Flows are unstable and minor disturbances in the traffic causing break-down.

Level F - This is forced traffic flow. That is the amount of traffic approaching a point exceeds that which can pass it. Flow break-out has occurred, resulting in queuing and delays.

Intersection

There are a number of busy intersections along the arterial road network within the City of Marion. The LOS at these locations seems to be low, either service D or E (that is, traffic volumes are close to capacity or at a critical levels, with little freedom to select desired speeds or to manoeuvre within the traffic stream). These locations are:

- South Road and Sturt Road
- Sturt Road and Marion Road
- Marion Road and Cross Road
- Marion Road, Daws Road and Oaklands Road
- Diagonal Road and Morphett Road

Length of Road

Generally the mid-block capacity (between intersections) of the arterial road network within the City of Marion is adequate, with the exception of two arterial roads. These roads have similar pavement width, but two different operational configurations; they are:

- Seacombe Road, with one wide lane in each direction. The wide lanes do not define the travel area for motorists and therefore this can result in confusion; and
- Morphett Road with two lanes in each direction, separated by a broken centre line. As a result the kerbside lane is only 3.4 metres, which is insufficient to cater for both vehicle and bicycle movements (as per Austroads Part 14 - Bicycles). Furthermore, during day (outside the Clearway times) many motorists perceive that it is difficult or unsafe to park along the road.

10.2 Local Road Network (City of Marion)

10.2.1 Network

There are five roads within the Council area that form a direct alterative link through the Council area and are heavy utilised by through traffic. These roads are:

- Cliff Street;
- Bray Street;

- Raglan Avenue;
- Lander Road; and
- The Cove Road

It should be noted that the road network within the area of Sheidow Park, Trott Park and Hallett Cove is not based on a grid pattern system and therefore the classification of the roads is not easy to define. In some instances, there is limited access to and from various areas and as a consequence roads such as Adam and Lemon Roads are required to cater for higher volumes of traffic.

10.2.2 Capacity

Intersections

At this stage, based on the abovementioned definition of capacity, there are no local intersections of concern. It would appear from general observations that the LOS is the mid range, level C.

Length of Road

A single lane road with one lane in either direction has a mid-block capacity of approximately 15,000 vehicles per day. Accordingly, a broad assessment of the local road network has indicated the no road maintained by Council appears to have mid-block capacity problems. It should however be noted that a section of Lander Road carries approximately 13,500 vehicles per day. This may change with the proposed construction of the new southern collector road at Hallett Cove.

The arterial and local network deficiencies discussed above are summarised in the following table.

Deficiencies	Location	Responsibility
Road deficiencies:	Marion Road	State Government
	Seacombe Road	State Government
	Morphett Road	State Government
	Lander Road, Sheidow Park	Council
	Bray Street, Morphettville	Council
	Raglan Avenue, Edwardstown	Council
	The Cove Road	Council
Intersection deficiencies	South Road and Sturt Road	State Government
	Sturt Road and Marion Road	State Government
	Marion Road and Cross Road	State Government
	Marion Road, Daws Road and Oaklands Road	State Government
	Diagonal Road and Morphett Road	State Government

These deficiencies are also depicted on the attached Map - Appendix E.

10.3 Future Deficiencies within the City of Marion

There are number of roads and intersections (either the responsibility of the State Government or Council) within the City of Marion that are considered to be approaching capacity and will therefore be operationally deficient in the future.

These are listed below.

Future Deficiencies	Location	Responsibility	Issue
Road deficiencies	Sturt Rd in the vicinity of Marion Shopping Centre	State	Anticipated growth in traffic volumes generated by the Shopping Centre.
	Diagonal Rd in the vicinity of Marion Shopping Centre	State	Anticipated growth in traffic volumes generated by the Shopping Centre.
	Cliff Street	Council	The road forms part of an east-west link.
Intersection deficiencies	Sturt Rd and Diagonal Rd	State	Expected growth in traffic volumes.
	Sturt Rd and Morphett Rd	State	Expected growth in traffic volumes
	Morphett Rd and Cliff St	State	The safe movement of vehicles and the expected growth in traffic volumes
	Seacombe Rd & Miller St	State	The safe movement of vehicles and the lack of delineation.
	Lander Rd and Lemon Rd	Council	Expected growth in traffic volumes due to the construction of the Southern Collector Road
	Bray St and Hendrie St	Council	The safe movement of vehicles and the expected growth in traffic volumes

11. ROAD TENURE

Overall the existing road tenure was considered to be appropriate, that is the higher level roads (arterial roads) are maintained by the State Government and low level streets (local roads) are maintained by Council.

However, possible problems occur within the intermediate road levels, that is the sub-arterial and distributors that are currently maintained by Council. Many roads in these categories have the character and function that results in them being perceived and used as arterial roads and with future increases in travel demand this situation will be exacerbated. Some examples are, Bray Street, Raglan Avenue, Cliff Street, Lander Avenue and The Cove Road. (It should be noted that similar information has already be related to the Local Government Association (February 2004) as part of the "Road Classification Review")

12. CONCLUSION

A road hierarchy plan (and associated operational service levels) is considered to be a high level planning tool that identifies road function, user related service needs and adjacent development with local or regional impacts, to assist Council to plan and manage transport and related infrastructure.

The proposed Road Hierarchy Plan developed for the City of Marion consists of two major components, these are:

- The "Classical Road Hierarchy" – this is the conventional system used by most Road Authorities and depicts roads as either local, collector, distributor, sub-arterial and/or arterial roads.

- The "Functional Road Hierarchy" – this incorporates those elements that determine or influence a road's function, that is, the needs of the road users and stakeholders.

On its own the Classical Road Hierarchy does not provide sufficient clarity or details about road user or access needs to effectively manage the road network. There are a variety of requirements for the different types of road users that can identify the roads function. For example, freight would prefer wide lanes with higher speed, while bicycles favour an assigned lane and a low speed environment. Accordingly, it is considered that a Functional Road Hierarchy system is required to complement the Classical Road Hierarchy.

The road hierarchy plan can be utilised to:

- Specify the desired road characteristics (width, service levels, regulatory control and maintenance);
- Identify deficiencies in the road network;
- Identify opportunities to enhance the public transport systems;
- Improve Council's resource allocation and management of its road and traffic assets;
- Assist in providing a consistent and logical response to community requests;
- Provide an effective link with the arterial road network;
- Coordinate and inform other agencies in the development of various programs;
- Assist in the assessment of the provision of traffic control devices (including the evaluation of speed limits);
- Serve as a guide to funding applications.
- Set intervention/service standards and prioritise for maintenance upgrading and construction of new footpaths, roads and associated infrastructure.