Background Paper Appendix B

Arup Transport Networks and Corridors Technical Note

Transport Networks and Corridors Strategy 2012 - 2031

Please note: Maps available from Strategic Planning Officers upon request

Moreton Bay Regional Council

Transport Networks and Corridors Strategy

Technical Note

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1 Introduction

Arup was commissioned by Moreton Bay Regional Council (MBRC) to provide transport planning input to Council's Transport Networks and Corridors Strategy (TNCS) and to the Transport Infrastructure component of the Moreton Bay Regional Council Priority Infrastructure Plan (PIP)

Arup's input has been delivered through the delivery of the study in two parts:

1. Part A, Stages 1-2 of Council's TNCS, which provided a base condition assessment and gap analysis of the Region's transport network.
2. Part B, Stages 3–6 of Council's TNCS, which identified solutions to address network deficiencies, and prioritisation of these potential projects for Council's PIP.

These studies have been undertaken concurrently with the update of Council's Moreton Bay Regional Strategic Multi-Model Transport Model (MBRSTM-MM)[1] for the years 2010, 2021 and 2031 and use of the model to identify road capacity upgrades.

This paper outlines the general methodology underlying the tasks carried out for both studies.

Hence, for the input to Council's PIP, it outlines the methodologies and thinking behind the formulation of:

- A Desired Standards of Service (DSS) for the region and assessments;
- A definition of trunk infrastructure, including the identification of the components of the network considered "Trunk";
- A set of Plans for Trunk Infrastructure (PFTI) that outline both the existing trunk network and the future trunk network; and
- A corresponding schedule of works that identifies the type of works, order of priority for each future trunk item.

In relation to the delivery of Part B (Stages 3-6) of the TNCS it outlines:

- The methodology undertaken to identify solutions to address both capacity and non-capacity deficiencies, including opportunities for placemaking appropriate to Council's Activity Centres; and
- Prioritisation of the identified solutions with consideration to the likely benefits to the Region's users.

For the development of the future year strategic multi-modal transport model, the report summarises:

- Updating the current model to a 2010 base;
- Development of future year 2021 and 2031 base case models;
- The methodology and development of a 'policy' based 2031 model responding to Connecting SEQ targets; and

[1] Strategic Transport Model refers to EMME/3 model for the MBRC Region

- Application of the model to identify future capacity deficiencies and testing of solutions.

1.1 Background and Study Objectives

MBRC emerged after the March 2008 local government elections, amalgamating the previous Local Government Authorities of Caboolture Shire Council (CSC), Pine Rivers Shire Council (PRSC) and Redcliffe City Council (RCC).

MBRC is currently developing a new Planning Scheme which will be based on the next generation planning 'Place Types' concept. As this will be the first Planning Scheme developed by MBRC as a combined entity, this provides MBRC with the opportunity to provide a fresh direction with regards to the long-term urban development patterns and transport requirements for the region.

With this in mind, Council's overarching desired outcomes for the TNCS is to provide a strategic framework and analysis by which to evaluate the current and future operation of the primary transport networks and corridors for all transport modes. The strategy aims to have a focus on those transport assets within the control of MBRC. The desired outcomes from the overall study which Arup's work inputs into, build upon the following principles for sustainable transport corridors:

1. Creation of a corridor network which is safe and efficient;
2. Creation of a corridor network which supports communities and places;
3. Creation of a corridor network that sustains and attracts economic activity;
4. Maximisation of transport choice;
5. Integration of the corridor network with the natural environment at all scales;
6. Respect of existing natural and built environments;
7. Emphasis of walking as the fundamental unit of the corridor network; and
8. Creation of harmony and integration with other transport networks.

The preparation of and interrogation of the Strategic Transport Model is a vital input to the identification of network deficiencies, and potential solutions. Council's objectives for the completion of a strategic transport model for the Region are given below:

- To assist with predicting future movements in the region;
- To determine and test infrastructure and land use scenarios;
- Develop and support emerging planning scheme policies and regional infrastructure strategies; and
- To help inform Council's Integrated Regional Infrastructure Strategy and associated projects and enable Council to produce a priority infrastructure plan for its trunk roads and footpaths.

1.2 Collaborative Approach

MBRC and Arup have taken a collaborative approach to carrying out the various elements of this study. This approach has ensured each stage of the TNCS study was in line with the preparation of Council's Draft Active Transport Strategy 2012-2031 and overarching MBRC Strategic Framework.

Working with Council to identify appropriate solutions from the opportunity analysis and the Strategic Transport Model has ensured this output is technically robust and targeted to address place type and network requirements for future growth.

1.3 Limits of the Study

The scope of this study and report presents the findings from both commissions: TNCS Part B, Stages 3–6; and 2031 Strategic Model development.

This is due to the synergy between both studies in delivering outcomes for input to Council's PIP and in providing Council with strategy inputs with regards to potential wider walk/cycle corridor opportunities for improving network accessibility.

This report also highlights where Arup and Council has worked collaboratively across both studies and where key decisions have been made by Council specifically for input to the Strategic Transport Model development or/and in identifying solutions for specific Places in the region.

This report also recognises that the output from the studies forms an input to Council's in-house development of the TNCS and PIP.

1.4 Report Overview

This report summarises processes and methodology to develop Arup's inputs to the MBRC TNCS and MBRC's PIP.

The report structure is as follows:

- Section 2 gives the input specific for Council's PIP;
- Section 3 outlines the identification of infrastructure for the Region;
- Section 4 outlines the prioritisation of infrastructure solutions; and
- Section 5 schedule of works identified for the PIP.

2 Input to PIP

2.1 Summary of Inputs

Council has requested the following information to assist with the preparation of its PIP:

- A definition of trunk infrastructure for the Region. This is to identify the components of the network considered "Trunk" as noted in table 4.5.1.1 in *PIP Practice Note 3 – Plans for trunk infrastructure*;
- A set of Desired Standards of Service (DSS). These are to be realistic in terms of affordability of delivery and benchmarked with other SEQ Councils. *Reference to PIP Practice Note 2 – Desired standard of service* for requirements;
- A set of Plans for Trunk Infrastructure (PFTI). This is to outline both the existing trunk network in the Region and the proposed future trunk network delivered to Council as a GIS layer in ESRI (ArcMap) format. The future trunk network is to take into consideration any agreed elements identified in previous studies, and as agreed for input into Council Strategic Transport Model;
- A schedule of works that identifies the type of works; and
- A background paper that outlines the network planning and further details on decisions made in the development of the trunk network.

2.2 Definition of Trunk Infrastructure

It is proposed for Council's consideration, that the definition of transport trunk infrastructure encompass:

- State controlled roads (these are noted only within the PIP);
- Arterial roads;
- Sub-arterial roads;
- Collector roads;
- Main streets; and
- Off road pathways for walking and cycling.

These definitions were constructed from a review of trunk infrastructure defined by the three existing planning scheme PIP's, as shown in the table below, along with Council's future direction for transport infrastructure. Consideration was also given to how other local councils in South East Queensland (SEQ), in particular Sunshine Coast Regional Council and Brisbane City Council have defined and categorised trunk infrastructure.

Table 1 shows the methodology for categorisation of trunk infrastructure and input to *PIP Practice Note 3 – Plans for trunk infrastructure* is shown in Appendix A.

Table 1: Moreton Bay Regional Council definition of Trunk Infrastructure

System	Items	Include 2013 PIP	Current PIPs		
			Caboolture	Redcliffe	PineShire
State controlled	Arterial	Yes	Yes	Yes	Yes
Local government roads	Sub arterial	Yes	Yes	Yes	Yes
	Collector roads	Yes	Yes	Yes	Yes
	State controlled roads	Note only	No	No	No
	Associated intersections, traffic lights, lighting, bridges, culverts, kerb and channel, local road drainage, pedestrian footpaths, and cycle-ways (within road reserve), on road cycle-ways, basic revegetation	Yes	No	No, pathways only	No
	Main streets ##	Yes	No	No	Yes
	Controlled distributor roads#	No	No	No	Yes
	Traffic distributor roads#	No	No	No	Yes
Public Transport	Bus stops	No	No	No	No
	Shelters	No	No	No	No
	Ferry terminal	No	No	No	No
	Dedicated public transport corridors and associated infrastructure	No	No	No	No
Off road pathways	Cycleways and pedestrian paths not within road reserve	Yes	Yes	No	No
	Associated lighting, culverts, bridges, directional and information signage, surface marking	No	No	No	No

Note: Pine Rivers Shire PIP makes reference to Traffic Distributor Roads and Controlled Distributor Roads. No definition has been provided for these roads within the planning scheme. It has been devised from the information available that Pine Rivers has further divided functions of collector/distributor roads, beyond that sought for the new Moreton Bay Regional Council PIP, and consequently these definitions have not been included in the MBRC PIP. ## Note: Main Streets are defined as "*streets which accommodate activity central for the surrounding community. This most commonly includes a combination of retail, employment, leisure, school and related activities. Main streets are generally active streets. They are active throughout the day and sometimes also at night.*" Complete Streets, section 14.

2.3 Desired Standards of Service

Council has defined a desired standard of service (DSS) to identify capacity deficiencies in the road network. The identified deficiencies will be used as an input to determine Council's 10 year PIP and the longer term 20 year transport strategy.

With reference to the work completed for MBRC's TNCS, Arup identified three "place" types for the region that saw the inclusion of multiple land use types in some place types. These "place" types were synthesised from the MBRC Place Model prepared as part of Council's *Draft Strategic Framework* for the Moreton Bay Regional Council Planning Scheme.

It was agreed that the proposed DSS will be defined separately for each place type using the type 1, 2 and 3 place type groupings as summarised in Table 2.

Table 2: MBRC TNCS Place Type groups

Place Type 1	Place Type 2	Place Type 3
Activity Centres	Urban neighbourhoods, Next Generation Suburban Neighbourhoods, Enterprise employment areas, Rural townships, and Coastal villages.	Suburban neighbourhoods, rural residential, rural areas, Mountain ranges, forests and waterways.

Appendix A provides a completed draft *PIP Practice Note 2 – Desired standard of service*. This outlines a description of the place type groupings, and qualitative and quantitative planning criteria for: road network design / planning standards; public transport design / planning standards; and cycleway and pathway design / planning standards.

The following sections outline the specific DSS for the network which have been applied as part of infrastructure identification in the TNCS study (refer to Section 3 of this report). That is, the DSS for road network, cycling provision, pathways and pedestrian crossings.

Additional DSS tables have been provided in response to Council's current PIPs for Caboolture, Pine Rivers, and Redcliffe. These include DSS for the speed environment, access, intersections and turning traffic provisions, and parking provision. Discussions with Council have noted that the likely DSS for parking provision will need to be reviewed to be in line with Council's preparation of a *Travel Demand Management Strategy* for the Region.

2.3.1 DSS for road network

It was agreed with Council that is the proposed DSS to identify capacity deficiencies in the road network would be based on an upper limit level of service (LOS) applicable during peak travel periods, as defined for each place type grouping. The LOS has been defined using degree of saturation (DOS), which is a

measure how close the road network is to capacity. The DOS for links and intersections was calculated using outputs from the Strategic Transport Model[2].

Table 3 illustrates *Table 4.4.4.1A Level of Service (LOS) for Roads / Streets per Place Type.*

Table 3: Desired Standard of Service for Road Capacity

Desired Standard of Service (Level of Service)		Place Type Grouping		
		1	2	3
		LOS D/E*	LOS D	LOS C
Road Link DOS	Arterial	0.95	0.85	0.65
	Sub-Arterial	0.95	0.85	0.65
	Collector	0.90	0.80	0.60
Intersection DOS	Signalised	0.95	0.95	0.90
	Roundabout	0.95	0.95	0.85
	Priority	0.90	0.90	0.80

** LOS E for Place Type Grouping 1(Activity Centres) relates to the level of service on links. Network capacity in Activity Centres is most likely to be determined through intersection capacity, which has an upper limit of LOS D.*

MBRC's Strategic Framework and current policies aim to ensure future infrastructure provision does not see an over provision of inappropriate capacity enhancements. The proposed DSS recognise the different expectations for acceptable peak period traffic conditions across the different place types. For example, in built-up areas such activity centres, a lower level of service is tolerated compared to rural areas.

Council seeks to encourage a wider mode choice particularly in activity centres, and hence the DSS has been targeted at D/E.

This aligns with Council's objectives for creating more sustainable transport outcomes such as an increased mode share of walking, cycling and public transport.

Note: it was agreed with Council for the Road Capacity DSS that it would be more appropriate to group "Suburban Neighbourhoods" in Place type 2.

This is due to the fact that a noticeable number of the higher order roads through the suburban areas are likely to exceed the DSS level given for Place type 3, for the more comprehensive policy based assessment, thus potentially triggering a large proportion of upgrades that are not immediately required.

2.3.2 DSS for cycling provision

Table 4 shows *Table 4.4.4.3—Desired Standard of Service for Cycling Provision*. These DSS are based upon prior research undertaken in Part A of the TNCS Study, which included case studies of best practice; Council's current provision

[2] Strategic Transport Model refers to EMME/3 model for the MBRC Region

including strengths and weaknesses; and Council's policy intentions for pathways and active transport in its AT Strategy.

These DSS facilitated the gap analysis review of existing conditions in the Region's transport network.

Table 4: Desired Standards of Service for Cycling Provision

Desired Standard of Service	Place Type Grouping		
	1	2	3
State Road	On-Road: 1.5m 60kph; 2.0m 80kph; 3.5m 100kph; (4.0-4.5m with parking 60 - 80kph), Off-Road: (Shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.0m	On-Road: 1.5m 60kph; 2.0m 80kph; 3.5m 100kph; (4.0-4.5m with parking 60 - 80kph) Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.0m	On-Road: 1.5m 60kph; 2.0m 80kph; 3.5m 100kph; (4.0-4.5m with parking 60 - 80kph) Off-Road: (shared) 3.0m both sides (or greater)
Arterial	On-Road: 1.5m 60kph; 2.0m 80kph; 3.5m 100kph; (4.0-4.5m with parking 60 - 80kph) Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.0m	On-Road: 1.5m 60kph; 2.0m 80kph; 3.5m 100kph; (4.0-4.5m with parking 60 - 80kph), Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.0m	On-Road: 1.5m 60kph; 2.0m 80kph; 3.5m 100kph; (4.0-4.5m with parking 60 - 80kph), Off-Road: (shared) 3.0m both sides (or greater)
Sub-Arterial	On-Road: 1.5m min (1.8m contra flow for speeds 60kph or less where unavoidable) Off-Road: (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones	On-Road: 1.5m 60kph, 2.0m 80kph (4.0-4.5m with parking 60 - 80kph) Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.0m	On-Road: 1.5m 60kph; 2.0m 80kph; (4.0-4.5m with parking 60 - 80kph), Off-Road: (shared) 3.0m both sides (or greater)
Collector	On-Road: 1.5m min (1.8m contra flow for speeds 60kph or less where unavoidable) Off-Road: (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones	On-Road: 1.5m min (1.8m contra flow for speeds 60kph or less where unavoidable) Off-Road: (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones	On-Road: 1.5m min (1.8m contra flow for speeds 60kph or less where unavoidable) Off-Road: (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones

2.3.3 DSS for pathways

Table 5 shows *Table 4.4.4.2 of the MBRC PIP — Desired Standard of Service for Pathways*.

The DSS for pathways was based upon prior research undertaken in Part A of the TNCS study, which included case studies of best practice; Council's current provision including strengths and weaknesses; and Council's policy intentions for pathways and active transport in its MBRC AT Strategy.

As with the DSS for cycling provision, these facilitated the identification of gaps in the existing region's provision for these users.

Table 5: Desired Standards of Service for Pathways

Desired Standard of Service	Place Type Grouping		
	1	2	3
State Road	Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.5m	Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.5m	Off-Road: (shared) 3.0m both sides (or greater)
Arterial	Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.5m	Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.5m	Off-Road:(shared) 3.0m both sides (or greater)
Sub arterial	Off-Road: (shared) 3.0m both sides (or greater) Off-Road: (Separated) 2.5m	Off-Road: (shared) 3.0m both sides (or greater) Off-Road:(Separated) 2.5m	Off-Road: (shared) 3.0m both sides (or greater)
Collector	Off-Road: (shared) 2.0 to 2.5 both sides (or greater)	Off-Road: (shared) 2.0 to 2.5 both sides (or greater)	Off-Road: (shared) 2.0 to 2.5 both sides (or greater)

2.3.4 DSS for pedestrian crossings

Table 6 shows *Table 4.4.4.4 — Desired Standard of Service for Pedestrian Crossings* from the draft *PIP Practice Note 2* (see Appendix A).

These standards of service are based upon prior research undertaken in Part A of the TNCS study, which included case studies of best practice; Council's current provision including strengths and weaknesses; and Council's policy intentions for encouraging walking and cycling in its MBRC AT Strategy.

Of particular note, the provision of adequate crossings in the network needs to be coupled with adequate provision of paths and cycle facilities. The table provided in the *PIP Practice Note 2* reflects the standards Council has given in its AT Strategy. It is noted that this has considered crossing spaces of up to 800 metres as a maximum for Place Type 3.

Table 6: Desired Standards of Service for Pedestrian Crossings

Desired Standard of Service	Place Type Grouping		
	1	2	3
State Road	200m distance is desirable. Crossings to be no further apart than 400m in centres.	400m distance is desirable. Crossings to be no further than 600m apart.	400m distance is desirable. Crossings to be no further than 600m apart.
Arterial	200m distance is desirable. Crossings to be no further apart than 400m in centres.	400m distance is desirable. Crossings to be no further than 600m apart.	400m distance is desirable. Crossings to be no further than 600m apart.
Sub arterial	200m distance is desirable. Crossings to be no further apart than 400m in centres.	400m distance is desirable. Crossings to be no further than 600m apart.	400m distance is desirable. Crossings to be no further than 600m apart.
Collector	200m distance is desirable. Crossings to be no further apart than 400m in centres.	200m distance is desirable. Crossings to be no further apart than 400m in centres.	200m distance is desirable. Crossings to be no further apart than 400m in centres.

2.3.5 PIP Practice Note 2

As aforementioned, Appendix A provides a completed draft *PIP Practice Note 2 - Desired Standard of Service*. This has been modified to incorporate various sub-tables within the relevant section for transport network desired standards of service. These DSS tables relate to levels of service for roads, pathways, cycling provision and pedestrian crossings as described in this Section.

2.4 Plans for Trunk Infrastructure (PFTI)

PIP Practice Note 3 – Plans for trunk infrastructure outlines the requirements for the preparation of plans for trunk infrastructure (PFTI), where these sit within a PIP.

For this study, based on the information available and the completion of Stages 4, 5 and 6 of Arup's input to Council's TNCS, datasets have been provided to Council to enable the preparation of required maps.

2.5 Schedule of Works

PIP Practice Note 3 – Plans for trunk infrastructure requires a Schedule of Works identifying future infrastructure items, to service the assumed growth in the Region.

This is given in Section 5 of this report.

3 Infrastructure Identification

3.1 Transport Networks and Corridors Strategy

Arup has provided input across the 6 analytical stages of Council's TNCS, as follows:

- Part A, Stage 1: undertook a base network condition review of the Region's current transport network. This review utilised available GIS mapping, aerial photography, and land use plans made available by Council. The attributes of the network were used to define conditions that then assisted with identifying gaps between these existing conditions and desired standards;
- Part A, Stage 2: undertook a gap analysis to identify network deficiencies based on an agreed desirable standard. This was carried out only for link attributes;
- Part B, Stage 3: undertook identification of current intersection capacity deficiencies, based on agreed desirable standards/ level of service;
- Part B, Stage 4: identified potential solutions for the deficiencies identified in Stage 2 and 3;
- Part B, Stage 5: tested the identified deficiencies from Stage 4; and
- Part B, Stage 6: undertook the prioritisation of identified solutions with consideration to the likely benefit the solution will realise for the network and users. The output of this stage was a list of prioritised solutions to address capacity and non-capacity deficiencies

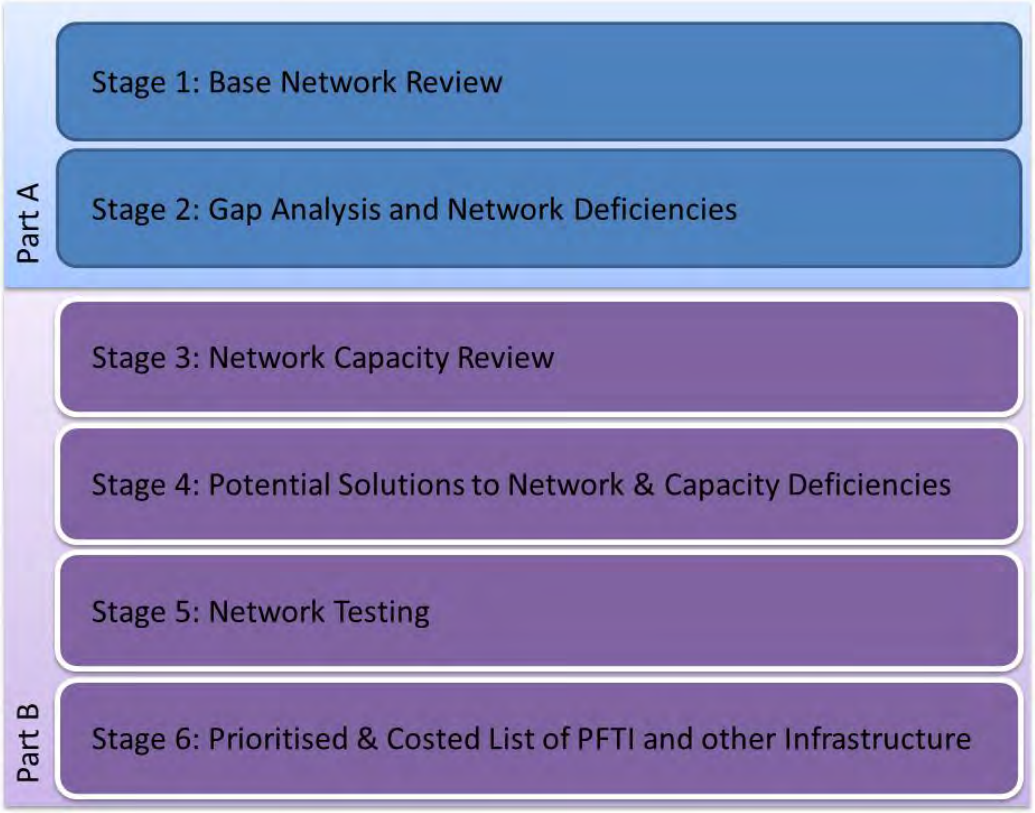

Figure 1: TNCS Six Analytical Stages

3.2 Part A Stage 1 - Base Conditions

Part A, Stage 1 of the study assessed the existing condition of the Region's transport network. Arup utilised available GIS data, aerial photos, and land use plans to carry out this review.

Network attributes were identified and used to define the existing conditions. These included:

- Pathway availability and condition;
- Nature strip / highway verge condition;
- Provision of shade tree planting;
- Provision of marked on-street cycle lanes
- Central medians and intersections;
- Shoulders – availability and condition;
- Number of lanes;
- Intersections;
- Pedestrian crossings; and
- Freight routes.

The assessment of these conditions was documented using ratings established in collaboration with Council (see Appendix B, Section B1), and coded for the 1690 road segments in the Council area GIS.

The completion of Part A, Stage 1 provided Council with an updated database of the combined databases for Caboolture, Redcliffe and Pine Rivers districts to the level of accuracy available based upon the information provided for the base condition assessment.

In addition to the review of the base network, a review of local, regional and state planning documents was undertaken and summarised in a Planning Policy Context Paper. This review assisted with helping guide the methodology for the study, in particular the determination of the place type groupings. This paper is given in Appendix B, Section B3.

3.3 Stage 2 – Corridor Deficiencies (non-capacity)

Arup working with Council identified desirable standards to assist with defining the gaps between the existing conditions and desired/ preferred conditions for the Region's transport network. These were developed for each place type grouping and by road hierarchy and are given in Appendix B, Section B2. These have been reflected in the subsequent DSS for input to Council's PIP, as presented in Section 2 of this report.

Six attributes were identified for establishing desirable standards, including: pathways, pedestrian crossings, cycle provision, verges/median width, shading and a high level review of link capacity (acknowledging that this was going to be assessed more appropriately using the model in Part B, Stage 3 of the study).

For Council's 1690 road segments coded in the GIS, an analysis of the existing conditions compared with the desirable standards determined gaps per segment

and the level of deficiency (i.e. standard, below standard and deficient). The type of gaps identified for the six attributes were considered as follows:

- Pathways: considered shared or separate paths, width, and provision on one or both sides;
- Pedestrian crossings: an average density of provision regardless of crossing type was assessed per segment;
- Cycle provision: assessed the provision of exclusive cycle lanes (on-road). As no width information was provided, its provision or not was recorded per segment;
- Verge/median width: considered an average width of 3m, with less than that below standard and not able to be used for additional infrastructure;
- Shading: assumed an average spacing between plantings to determine if any enhancement was required; and
- Capacity: v/c of 0.85-1.00 considered below standard, and v/c > 1.0 deficient.

Table 7: Identified Gaps in the current network

Attribute	As Function of # of Segments		
	Standard	**Below Standard**	**Deficient**
Pathways	0%	2%	98%
Pedestrian Crossings	25%	17%	58%
Cycle provision	1%	3%	96%
Verges	95%	5%	N/A
Medians	12%	13%	N/A
Shade Trees	4%	29%	66%
Capacity	96%	3%	1%

The identified gaps noted in Table 7 represent a summary of the actual gaps that were identified via GIS analysis in the Council area. These are presented as a function of the number of segments coded in Council's GIS (i.e. 1690 segments in total). These illustrate a significant level of deficient pathways, pedestrian crossings, and cycle provision (on-road). These results are considered to be indicative of the current priority placed by Council on roadway investment and the lack of active transport investment in recent history.

In addition to the assessment of gaps by road segment, an analysis was carried out to understand the level of provision for walking and cycling within one and five kilometre catchment areas of the activity centres (Place type 1 groupings). The ability to walk and cycle to schools and transport nodes (bus and rail) was also assessed in terms of accessibility gaps in the current region's transport network.

In contrast to the activity centre gap analyses which were conducted within radii of the centre, this analysis evaluated the network in distances "as you walk". This analysis used 400 metres for a walking distance from bus stations/stops and 800 metres for a walking distance from rail stations (typical accessibility distances as documented in Complete Streets Guidelines for Urban Street Design for ensuring legible and permeable street network for access to public transport).

The results of this assessment are given in Table 28 in Appendix B. These are summarised as: a function of the entire Council area; a function of a five kilometre catchment around activity centres; and as a function of a one kilometre catchment around activity centres. The figures of each are also presented in percentages for comparison purposes and are detailed according to the condition of each attribute coded during Part A Stage 1 of the study.

These gaps are further indicative of the level of roadway investment that has occurred and lack thereof for active transport.

3.4 Stage 3 – Network Capacity

The Moreton Bay Regional Strategic Transport Model (MBRSTM-MM) was used as the basis for identifying capacity deficiencies in the road network, assessed against the desired standard of service defined in Section 2.

This section of the report provides an overview of the modelling task.

The detail of this task is described in the *MBRC Transport Networks and Corridors Strategy Transport Model Technical Report*, which is contained in Appendix E of this report.

3.4.1 Modelling methodology

A 2010 validated base model was taken as the starting point for the creation of two forecast year models, 2021 and 2031.

For the 2031 forecast year, two mode share scenarios were developed. The 'policy' based scenario refers to the case where a higher level of public transport provision has been coded into the model and the mode share is adjusted externally to match active and public transport targets designated by MBRC. The 'trend' based scenario refers to the case where the level of public transport provision coded into the model is in line with current planning expectations and the model predicts the mode share between car, public transport and active transport travel.

Road network deficiencies were determined by calculating the degree of saturation of links and intersections using modelled AM and PM peak-hour flows and compared against the DSS thresholds shown in Table 3 Chapter 2 of this report.

A link deficiency was defined as being when additional mid-block traffic lanes would be required, for example, the upgrade of a road from two lanes to four lanes. This did not include the requirement for lane flares at intersections, which was assessed separately under the intersection deficiency analysis.

The intersection deficiencies were determined using SIDRA analysis, using peak hour traffic volumes predicted by the strategic model. An intersection was identified as being deficient if the degree of saturation of any movement exceeded the thresholds identified in the desired standard of service.

3.4.2 Network Assumptions

Refer to Appendix E and the *MBRC Transport Networks and Corridors Strategy Transport Model Technical Report* for assumptions made in consultation with Council.

3.4.3 Policy Model

A Policy based model was also developed for 2031. It includes public transport network enhancements compared to the Trend based scenario and includes adjustments to the mode share to meet planning targets.

PT Network Enhancements

The public transport assumptions (in addition to those contained within the South-East Queensland Strategic Transport Model (SEQSTM) for each of the future year model scenarios are summarised in Table 8. This table highlights the public transport enhancements assumed in the 2031 Policy scenario compared to the Trend scenario.

Table 8: Future Year Public Transport Assumptions

Public Transport Project	2021	2031 Trend	2031 Policy
Moreton Bay Rail Line feeder bus services	✓	✓	✓
North West Rail Line	×	×	✓
Alderley-North Lakes bus route	×	✓	×
Caboolture North Rail Station	×	✓	✓
CSEQ bus routes from MITS model	×	✓	✓
Northern Busway (Chermside to Bald Hills)	×	×	✓
Kippa-Ring to Redcliffe High Frequency bus route	×	×	✓
MITS recommended bus routes	×	×	✓
Caboolture to Wamuran Green Corridor	×	×	✓

Mode Share Targets

The mode share targets that were adopted for the policy based model are shown in Table 9. These targets were determined by MBRC, following a review of existing mode share splits in the region, and a comparison with other Region's and local authorities approach to responding to *Connecting SEQ 2031: An Integrated Regional Transport Plan for South East Queensland* targets and growth.

The table also shows the mode share as predicted by the 2010 and 2031 trend based MBRSTM-MM. It can be seen that the model forecasts a mode shift from car travel to public transport between 2010 and 2031 on a trend basis. This is likely to be due to the increased level of public transport provided in the 2031 trend model.

The table shows that, in 2031, to achieve the MBRC's mode share targets, car mode share would need to reduce by approximately 7.8%, public transport mode

share would need to increase 1.7% and active transport would need to increase by 6 %.

Table 9: Mode Share Targets

	Car	Public Transport	Active Transport
2010 Modelled Mode Share	87.0%	5.0%	8.0%
2031 Modelled Mode Share (for Trend Model)	82.8%	9.3%	8.0%
2031 Mode Share Target (for Policy Model)	75%	11%	14%

The mode share between private vehicle trips, public transport trips and active transport trips from the 2031 trend based model was analysed by trip purpose and place type to identify where mode shift could be realised in the policy based model.

Table 10 summarises the results of this analysis and shows how mode share would need to change in each of the place types in order to meet the overall regional targets. The table shows that the largest mode shift away from private car travel is targeted in Activity Centres, Urban and Next Generation Suburban place types.

Table 10: Comparison of Trend and Policy Mode Shares by Place Type

	2031 Trend Based Model			2031 Policy Based Model		
Place Type	**Car**	**Public Transport**	**Active Transport**	**Car**	**Public Transport**	**Active Transport**
Activity Centre	75%	7%	18%	65%	10%	25%
Enterprise/ Employment	87%	9%	5%	85%	9%	6%
Urban	81%	11%	8%	67%	14%	19%
Next Gen Suburban	84%	9%	7%	74%	11%	14%
Suburban	83%	11%	6%	78%	12%	10%
Special Area	91%	7%	2%	91%	7%	2%
Key Resource Area	93%	6%	1%	93%	6%	1%
Rural / Coastal	90%	6%	4%	90%	6%	4%
Total	82.8%	9.3%	8.0%	75.6%	10.8%	13.6%

3.4.4 Trend Model

The Trend based models (2021 and 2031) represent the base case conditions for the future years. These future year scenarios include assumed improvements to road and public transport networks, both in terms of infrastructure and services in the case of public transport.

These assumptions reflect current planning proposals within South East Queensland and have been agreed with MBRC for inclusion into the strategic model.

The 2013 Trend based model was developed and tested to provide a comparison to the 2031 Policy based model.

3.4.5 Road Network Deficiencies

Road network deficiencies were determined by calculating the degree of saturation of links and intersections using modelled AM and PM peak hour flows (which are the worst case traffic conditions) and comparing these against the desired standard of service thresholds. The desired standard of service thresholds were given in Section 2 of this report, and area also outlined in Appendix E.

Links

This assessment recognises that the delays experienced on the network, are typically experienced at intersections. Hence the assessment of deficiencies has taken this into consideration with regards to improvements likely to be required (i.e. minimising duplication of roads where it is unlikely to be warranted).

A link deficiency was defined as being when additional mid-block traffic lanes would be required. This would be when the degree of saturation exceeds the desired standard of service thresholds for links.

The degree of saturation of road links was calculated using an assumed lane saturation flow, taken to be in the range from 1,850 to 2,100 pcu/ lane – i.e. depending upon the link's hierarchy classification. This lane saturation flow is intended to only be the carrying capacity of a link, excluding the influence of intersections on the capacity of the links.

The link deficiency analysis did not identify any links on MBRC's road network that would require additional mid-block capacity (i.e. road corridor duplication) in 2021 or in 2031.

Intersections

The intersection deficiencies were determined using SIDRA analysis, using peak hour traffic volumes predicted by the strategic model. An intersection was identified as being deficient if the degree of saturation of any movement exceeded the desired standard of service thresholds for intersections.

As the MBRSTM-MM is a strategic transport model that does not explicitly model intersection delay or capacity, a process to 'flag' potentially deficient intersections using the model output was used to select candidate intersections for analysis in SIDRA.

The intersection deficiency analysis identified 15 intersections in 2021 and 40 intersections in 2031on MBRC's network that would exceed the desired standard of service thresholds. These intersections are listed below in Table 11.

Table 11: Intersection Deficiencies

Deficiency ID	Location	2021	2031
2-1	Youngs Crossing Road/Oxford Street, Joyner	✓	✓
2-2	Samsonvale Road/Lavarack Road, Bray Park	✓	✓
2-3	Kremzow Road/Leitchs Road, Brendale	✓	✓
2-4	South Pine Road/Camelia Avenue, Everton Hills	✓	✓
2-5	South Pine Road/Plucks Road, Arana Hills	✓	
2-6	Queens Road/Miller Parade, Everton Park	✓	
3-1	Burpengary Road/New Settlement Road, Burpengary	✓	✓
3-2	Narangba Road/ Alma Road, Dakabin		✓
3-3	Boundary Road/Narangba Road, Dakabin		✓
3-4	Burpengary Road/Pitt Road, Burpengary		✓
3-5	Burpengary Road/Rosehill Drive, Burpengary		✓
3-6	Burpengary Road/Fernando Street, Burpengary		✓
4-1	Old Gympie Road/Hughes Road, Kallangur	✓	✓
4-2	Old Gympie Road/Macarthur Drive, Kallangur	✓	✓
4-3.1	Halpine Drive/Shop Access, Mango Hill	✓	✓
4-3.2	Halpine Drive/Mango Hill Ring Road, Mango Hill		✓
4-4.1	Old Gympie Rd/Ann St, Kallangur		✓
4-4.2	Old Gympie Rd/ Brickworks Rd, Kallangur		✓
4-4.3	Old Gympie Rd/Alma Rd/Kerr Rd West, Dakabin		✓
4-4.4	Old Gympie Rd/Boundary Rd, Dakabin		✓
4-5.1	Dohles Rocks Road/School Road, Kallangur		✓
4-5.2	Dohles Rocks Road/Clyde Street, Kallangur		✓
4-5.3	Dohles Rocks Road/Duffield Road, Kallangur		✓
6-1.1	Oakey Flat Road/Clark Road,	✓	✓

Deficiency ID	Location	2021	2031
	Morayfield		
6-1.2	Oakey Flat Road/Anderson Road, Morayfield	✓	✓
6-1.3	Oakey Flat Road/Ridgegarden Drive, Morayfield	✓	✓
6-1.4	Oakey Flat Road/Walkers Road, Morayfield	✓	✓
6-1.5	Oakey Flat Road/ Burbury Road, Morayfield		✓
6.1-6	Oakey Flat Road/ Ashbrook Drive, Morayfield		✓
6-1.7	Oakey Flat Road/ Lakeview Road, Morayfield		✓
6-2	Anderson Road/Lindsay Road, Morayfield	✓	✓
6-3.1	Lindsay Road/O'Brien Road, Burpengary		✓
6-3.4	Lindsay Road/Hunt Road, Burpengary		✓
6-3.2	Station Road/ Jill Street, Burpengary		✓
6-3.3	Station Road/O'Brien Road, Burpengary		✓
6-4.1	Caboolture River Road/Grant Road, Caboolture South		✓
6-4.2	Grant Road/Michael Avenue, Caboolture South		✓
6-4.3	Grant Road/Beacon Street, Caboolture South		✓
6-4.4	Grant Road/Torrens Road, Caboolture South		✓
6-5	Buchanan Road/ Graham Road/ Weier Road, Morayfield		✓
6-6	Lindsay Road/Clark Road, Morayfield		✓

State Network Deficiencies

Further to the identification of deficiencies on Council's road network, the identification process has also flagged a number of deficiencies on the State controlled road network (as assessed against Council's proposed DSS). This included sections of several key corridors such as the Bruce Highway, Samford Road, South Pine Road and Linkfield Road being identified as having insufficient link capacity and up to 60 intersections that were flagged at potentially being deficient (confirmation subject to detailed intersection capacity analysis)

As the State's planning has not yet identified improvements to address these predicted and potential deficiencies, the transport modelling results, and hence the

assessment of deficiencies on Council's network, will be influenced by capacity constraints created by such deficiencies.

3.5 Stage 4 and 5 - Solution Identification and Testing

As aforementioned, Part B, Stages 4 and 5 relate to the identification of potential and appropriate solutions to address the deficiencies identified in Part A, Stage 2 and Part B, Stage 3 of the TNCS study.

3.5.1 Non-capacity

In order to identify possible solutions from Part A, Stage 2 of the NSC Study, Arup undertook an "opportunities" identification process utilising the GIS condition and gap analysis data sets developed. The methodology for this review is given in Appendix C of this report.

This assumed that for the three Place Types, there will be opportunities that readily exist for improving upon pathways, cycle facilities, and crossings. These opportunities may be through upgrading existing infrastructure and completing identified gaps, identifying suitable corridors for the reallocation of road space or capacity improvement programs, creation of boulevards or utilising for example sealed shoulders to provide cycle facilities.

In addition to this, the opportunity to improve upon shading/ embellishment where it was recorded as below average or deficient such that this may assist with improving upon the walking and riding take up in the Region.

Identifying potential qualitative benefits

From the high level GIS review of opportunities for walking and cycling, the vast majority of road segments were noted as potential short to medium term win for pathways, crossings and cycle lanes categories. This shows potential for MBRC to upgrade its active transport network by addressing gaps and upgrading existing provision to realise a high benefit for a relatively low infrastructure cost outlay.

Table 12 provides the results of this analysis for the Region overall.

Table 12: Results of opportunities analysis for qualitative benefits

	Pathway		Crossings		Cycle lanes	
	No	*%*	*No*	*%*	*No*	*%*
Short to medium term	1,596	95%	1,660	98%	1,438	85%
Longer term	92	5%	15	1%	203	12%
Upgrade not needed	-	-	13	1%	47	3%

The following table, (Table 13) illustrates the opportunities for possible improvements to footpaths, crossings and cycle provision for the Region's Place Type 1 major activity centres.

As with Table 12, this illustrates the potentially near-term timeframe for improvements to the current network and due to a significant proportion identified as being potential short to medium term wins.

Table 13: Opportunities for qualitative benefits for each major Activity Centre

Caboolture	**Pathways**		**Crossings**		**Cycle lanes**	
[total 24 segments]	*No*	*%*	*No*	*%*	*No*	*%*
Short to medium term wins	21	88%	24	100%	21	88%
Longer term	3	12%	0	0	0	0
Upgrade not needed	0	0%	0	0%	3	12%
Redcliffe	**Pathways**		**Crossings**		**Cycle lanes**	
[total 33 segments]	*No*	*%*	*No*	*%*	*No*	*%*
Short to medium term wins	29	88%	33	100%	26	79%
Longer term	4	12%	0	0%	0	0%
Upgrade not needed	0	0	0	0%	7	21%
Strathpine	**Pathways**		**Crossings**		**Cycle lanes**	
[total 20 segments]	*No*	*%*	*No*	*%*	*No*	*%*
Short to medium term wins	17	85%	19	95%	19	95%
Longer term	3	15%	1	5%	0	0
Upgrade not needed	0	0%	0	0%	1	5%
North Lakes	**Pathways**		**Crossings**		**Cycle lanes**	
[total 9 segments]	*No*	*%*	*No*	*%*	*No*	*%*
Short to medium term wins	9	100%	9	100%	6	67%
Longer term	0	0%	0	0%	0	0%
Upgrade not needed	0	0%	0	0%	3	33%

Opportunities for Reallocation of Space

The reallocation of space within the road carriageway offers a specific type of possible solution to address deficiencies along corridors, where a lane reduction or re-channelisation enables the freeing up of space for wider footpaths, cycle lanes, landscape strips, bus priority and turn lanes, for example. This process also helps with addressing the changing context of a street's function to address its place type.

Arup undertook an analysis of the make-up of links in the Region's network, its theoretical capacity and feasibility based on the agreed DSS for a reduction in lanes (i.e. reallocation of this space for other users). Appendix E illustrates the location of possible opportunities for reallocating road space within the region. It is recognised that these results illustrate some links where it is unlikely that a reallocation of space along the route would be appropriate due to the significant through-movement function of the link in the Region's network. Examples of these include the North-South Arterial, and Houghton Highway Bridge.

The following table therefore lists those locations where the "reallocation of space" along a link may be more relevant. These are illustrated alongside

identified opportunities for improving paths, cycle provision and crossings shown in maps contained in Appendix C.

Table 14: Potential opportunities for reallocation of space in the Region

Location	Road Ownership	Overlap with Active Transport Opportunities
Gympie Road, Strathpine *Samsonvale Road and South Pine Road*	TMR	Yes
South Pine Road, Strathpine *Gympie Road and Linkfield Road*	TMR	Yes
Queen Elizabeth Drive, Eatons Hill *Eatons Crossing Road to Marylin Terrace*	MBRC	Yes
Albany Creek Road, Albany Creek Old Northern Road to region boundary	TMR	Yes
Anzac Avenue *Dohles Rocks Road to North South Urban Arterial*	TMR	Yes
Endeavour Boulevard, North Lakes *North South Urban Arterial to Discovery Drive*	MBRC	Yes
Anzac Avenue, Redcliffe *Elizabeth Avenue to Oxley Avenue*	TMR	Yes
Oxley Avenue, Redcliffe *Hornibrook Esp to Klinger Road*	TMR	Yes
Elizabeth Avenue, Redcliffe *Hornibrook Esp to Anzac Ave*	TMR	Yes
Hornibrook Esp, Redcliffe	TMR	Yes
King Street, Caboolture *Morayfield Road to Lesley Avenue*	TMR	Yes
Bribie Island Road – Benabrow Avenue – Goodwin Drive, Bellara *Bribie Island Bridge to Goodwin / Sunderland Drive rbt*	TMR	Yes

The feasibility to proceed with the reallocation of road space in these locations would need to be addressed as part of more detailed studies such as Council's Transport and Infrastructure Integration Concept Plans (TIICP) studies and agreement where appropriate with TMR where the infrastructure change occurs on the state road network.

3.5.2 Road capacity

Road network upgrades to address capacity deficiencies were identified by testing solutions within the MBRSTM-MM and SIDRA. The results of this analysis identified:

- One corridor upgrade to be completed by 2021 and two corridor upgrades to be completed by 2031;

- Nine individual intersection upgrades to be completed by 2021 with a further nine individual intersection upgrades to be completed by 2031; and
- One new road link to be provided by 2021 and two new road links to be provided by 2031.

Corridor Upgrades

Oakey Flat Road - 2021

Several intersections along Oakey Flat Road were identified as requiring capacity upgrades by 2021. This included signalisation of several existing priority controlled intersection.

It is proposed that Oakey Flat Road, between from Clarke Road and Morayfield Road, be upgraded as a corridor to address intersection capacity requirements, provide right-turn safety improvements at priority controlled intersections and provide active transport facilities.

Old Gympie Road - 2031

Two intersections along Old Gympie Road were identified as requiring upgrades by 2021. A further four intersections would then require upgrading by 2031.

It is therefore proposed that the intersections of Old Gympie Road/Hughes Road and Old Gympie Road/Macarthur Drive be upgraded by 2021.

This would be followed by a corridor upgrade by 2031 of Old Gympie Road from Anzac Avenue to Boundary Road to address the residual capacity deficiencies, provide right-turn safety improvements at priority controlled intersections and the provision of active transport facilities.

Buchanan Road - 2031

Buchanan Road will be a key access route to the North East Business Park on the eastern side of the Bruce Highway and to significant residential development growth in the local area. As such, it is expected to require upgrading from two lanes to four lanes by 2031.

The timing of this upgrade will be dependent on the progress of residential development and the North East Business Park.

Intersection Upgrades

Individual intersection upgrades to be completed by 2021 and 2031 are summarised in Table 15 and Table 16 respectively.

It should be noted that the identified solutions are based on SIDRA intersection analysis using traffic volumes output from the MBRSTM-MM.

This assessment should be supplemented by a detailed analysis of the upgrade requirements using design volumes derived using project specific traffic forecasting.

The identified potential benefits in addition to capacity improvements that could arise as a result of the upgrades have also been noted.

Table 15: 2021 Intersection Upgrades

Deficiency ID	Location	Proposed Solution	Additional Benefits
2-1	Youngs Crossing Road/ Oxford Street, Joyner	Signalisation of intersection and upgrade of Young's Crossing Road to 4 lanes between Oxford Road and Francis Road. Design for 2031 volumes.	Enhance pedestrian accessibility at signals. Opportunity to provide on-road cycle facilities.
2-2	Samsonvale Road/ Lavarack Road, Bray Park	Upgrade intersection by: • Increasing capacity of the southern approach by lengthening the right turn lane.	
2-3	Kremzow Road/ Leitchs Road, Brendale	Upgrade intersection by: • Increasing capacity of the southern approach by increasing the length of 2-lane section. • Adding a slip lane from south approach.	
2-4	South Pine Road/ Camelia Avenue, Everton Hills	Upgrade intersection by: • Increasing capacity of the westbound movements by adding a third through lane on the westbound approach and departure.	
2-5	South Pine Road/ Plucks Road, Arana Hills	Upgrade intersection by: • Increasing capacity northern approach.	
2-6	Queens Road/ Miller Parade, Everton Park	No Upgrade Required - No upgrade proposed as just over DSS of 0.9 and is not deficient under 2031 analysis.	
3-1	Burpengary Road/ New Settlement Road, Burpengary	Signalise intersection and increase capacity through additional lanes on all approaches. This upgrade requires either widening of the rail crossing underpass or shifting the intersection 50m to the east, resulting in significant land requirements. Design for 2031 volumes.	Enhance pedestrian accessibility at signals Opportunity to provide wider paths and on-road cycle facilities under the railway line if underpass widening is implemented.
4-1	Old Gympie Road/ Hughes Road, Kallangur	Signalisation of intersection. Upgrade to be consistent with future corridor improvements along Old Gympie Road.	Enhance pedestrian accessibility at signals
4-2	Old Gympie Road/ Macarthur Drive	Signalisation of intersection. Upgrade to be consistent with future corridor improvements along Old Gympie Road.	Enhance pedestrian accessibility at signals

Deficiency ID	Location	Proposed Solution	Additional Benefits
4-3	Halpine Drive/ Shop Access, Mango Hill	No Upgrade Required - Intersection will be upgraded as part of Moreton Bay Rail Link (MBRL) works.	
6-2	Anderson Road/ Lindsay Road intersection, Morayfield	Signalisation of intersection, increase capacity on western arm and northern turn pocket. Design for 2031 volumes.	Enhance pedestrian accessibility at signals

Table 16: 2031 Intersection Upgrades

Deficiency ID	Location	Proposed Solution	Additional Benefits
3-2	Nerangba Road/ Alma Road	Signalisation of intersection.	Enhance pedestrian accessibility at signals
3-3	Boundary Road/ Narangba Road	Signalisation of intersection and provide a 2nd through lane on northern arm.	Enhance pedestrian accessibility at signals
3-4	Burpengary Road/ Pitt Road	Signalisation of intersection.	Enhance pedestrian accessibility at signals
3-5	Burpengary Road/ Rosehill Drive	No upgrade if Pitt Road signalised as alternative route available.	
3-6	Burpengary Road/ Fernando Street	No upgrade if Pitt Road signalised as alternative route available.	
4-3.2	Halpine Drive/ Mango Hill Ring Road, Mango Hill	No Upgrade Required - Intersection will be signalised as part of the Mango Hill Ring Road works and provide pedestrian cycle connectivity	Enhanced pedestrian accessibility at signals and improved connectivity
4-5	Dohles Rocks Road, Kallangur	No Upgrade Required - Intersections will be upgraded as part of MBRL works	
6-3.1	Lindsay Road/ O'Brien Road intersection, Burpengary	Signalisation of intersection with priority of movements changed to Lindsay-O'Brien.	Enhance pedestrian accessibility at signals
6-3.4	Lindsay Road/ Hunt Road, Burpengary	Signalisation of intersection.	Enhance pedestrian accessibility at signals
6-3.2	Station Road/ Jill Street, Burpengary	Signalisation of intersection.	Enhance pedestrian accessibility at signals
6-3.3	Station Road/ O'Brien Road, Burpengary	Provide greater capacity for west-south movements. Increase turn-lane storage on all arms.	
6-4	Grant Road, Caboolture South	No Upgrade Required - Reduce "rat-running" volumes on Grant Road by providing	

Deficiency ID	Location	Proposed Solution	Additional Benefits
		the Cundoot Creek Crossing.	
6-4.1	Caboolture River Road/ Grant Road, Caboolture South	No Upgrade Required - Upgrade not required as Cundoot Creek Crossing results in lower volumes on Grant Road.	
6-5	Buchanan Road/ Graham Road/ Weier Road, Morayfield	Signalisation of intersection.	Enhance pedestrian accessibility at signals
6-6	Lindsay Road/ Clark Road, Morayfield	Signalisation of intersection.	Enhance pedestrian accessibility at signals

Addressing masterplan requirements

It is understood that Council will review the above list of identified upgrades in terms of emerging masterplan requirements (for example MBRL).

This is likely to result in additional link / corridor upgrades to be taken forward for funding either by Council or with TMR.

New Road Links

Mango Hill Ring Road - 2021

The Mango Hill Ring Road is required to be completed by 2021. Some sections of the road already exist and further sections will be constructed as development of Mango Hill progresses. The completed ring road is required for a number of reasons:

- To provide additional connectivity across Anzac Avenue;
- To provide access to the Moreton Bay Rail Link;
- To provide pedestrian and cycle connectivity; and
- To facilitate feeder bus services around North Lakes and Mango Hill.

MBRC will be required to provide for the section of the ring road between Bowen Street and Mango Hill Boulevard East. This includes a bridge crossing over the MBRL.

Cundoot Creek Crossing - 2031

Cundoot Creek Crossing is an extension of Graham Road, providing a new link between Buchanan Road, Morayfield and Lower King Street, Caboolture. It provides an alternative north-south route to Morayfield Road for residents in the new development areas in Morayfield and Caboolture South.

Brown Street Extension - 2031

The Brown Street Extension in Caboolture provides a new link between Lower King Street (via Pettigrew Street) and Pumicestone Road (via Ardrossan Road). Together with the Cundoot Creek Crossing, this new link will deliver an eastern

distributor, providing relief to segments of Morayfield Road and Beerburrum Road.

4 Prioritisation of Works

4.1 Stage 6 – Prioritisation of Solutions

Overview

One of the deliverables for input to the Network and Corridor Strategy is a prioritised list of solutions to address the identified deficiencies in the Region's transport network. Such deficiencies include those identified in Part A, Stage 2 of the study, determined by a condition audit of the network against agreed criteria (non-capacity), alongside the deficiency output from the strategic transport model (node and link capacity).

The prioritised solutions provide input to the Region's Priority Infrastructure Plan (PIP). In order to identify this prioritised list of solutions, the outputs from both studies were assessed to provide an overall assessment of MBRC's transport network.

4.2 Transport objectives for prioritisation

The prioritisation of solutions was considered on the premise of where funding may need to be allocated to fulfil the objectives and vision for the future Moreton Bay region transport corridors and network. Transport objectives as stipulated in Council's Strategic Framework, the project brief and also mirrored in TMR's Moreton Bay Integrated Transport Strategy (MITS), note the following:

- Create a safer transport network that minimises loss of life, and transport accidents, and near misses;
- A transport network that facilitates the movement of more people in response to future trend projects of a significant increase in population. Future upgrades therefore need to achieve efficiency of the existing and planned network;
- Self-containment of activity centres and the region in general. Network planning needs to be thoroughly integrated with land use planning, giving consideration to existing and future localities of employment, residential, and other trip generators and the need for travel. These uses will mainly be located in activity centres and thus connections between and to these activity centres are crucial to consider. Strengthening connections to and between activity centres; and
- Sustainability of the region. As sustainability is all encompassing, reduction in carbon emissions shall be the indication of how the transport network can contribute to regional sustainability.

Table 17 summarises how these issues have been addressed during the study.

Table 17: How strategic issues have been addressed in the network and corridor planning.

	Project stages pre-prioritisation	Prioritisation criteria	Input to solutions
Safety for all transport users		No direct emphasis. Indirect through appropriate intersection improvements, non-capacity solutions, provision of safer cycle and foot paths and crossings and improved connectivity	Specific project solutions need to include safety in design principles.
Efficient movement of people	Strategic Modelling (Trend and Policy) Recommendations derived from output Desired standard of service (DSS)	General higher prioritisation given to active and public transport modes which have greater capacity to move more people in the road corridor space.	A separate list of works is being produced for active transport mode facilities.
Strengthen connections to and between activity centres	Place type consideration and Desired Standard of Service (DSS)	Consideration given to strategic new links. Placemaking elements to define activity centres, boulevard opportunities and reinforce main connections.	Prioritised solutions by Place Type, and identified possible reallocation of space studies to enable placemaking elements to be implemented.
Increase self-containment	Place type considerations Strategic Modelling (Trend and Policy)	Active transport is given highest priority in and around activity centres, to facilitate ease of access to key locations/ land uses.	Prioritised solutions by Place Type
Sustainability-reduced carbon emissions	Mode share splits Desired Standard of Service (DSS)	Higher priority given to active transport	Addressing capacity issues and identifying a separate list of works for active transport

4.3 Project of works resulting from prioritisation ranking criteria

4.3.1 Non Capacity Projects

The outcome of the opportunities analysis for the region identified a quantum along each road segment in GIS that could potentially be a walking or cycling upgrade project.

In order to prioritise these, the following process was undertaken:

- The Region was considered according to Statistics Local Areas (SLA) – these are named priority areas for the purpose of this study. This was to provide council with a more sensible approach to the allocation of funds and prioritisation of potential works. See Appendix D for a map illustrating the priority areas;
- Each priority area was addressed according to each of the three place types identified earlier in the study;
- Considered the total % active transport provision in each priority area - i.e. across paths, cycle provision and crossings as identified during Stage 3 of the study. This illustrates that if 10% active transport is provided, then 90% of the network would need to be improved to address gaps and / or deficient/substandard provision; and
- Prioritisation in each priority area was based on this % of active transport provided.

The outcome of this assessment is given in Appendix D. The results are provided alongside the combined employment and population growth in each priority area to provide additional context for Council with respect to any further prioritisation that may be considered.

4.3.2 Capacity Projects

The intersections and corridors requiring capacity upgrades identified in Section 3.5 of this report were prioritised according to the following:

- Using the DOS results, where deficiencies with the highest DOS receiving the highest priority for upgrade; and
- Consideration was also given to grouping some upgrades together where they were located in close proximity to each other and it would be sensible for both to be completed at the same time.

5 Schedule of works

The following identifies the type of works and order of priority for each future trunk item. It illustrates affectively two lists - a schedule of works for capacity upgrades and a schedule of works for pathways, cycle lanes, and crossings (non-capacity active transport upgrades).

Table 18: 2021 Schedule of Capacity Upgrade Works

Priority	Deficiency ID	Location	Description of Works
1	2-1	Youngs Crossing Road/Oxford Street, Joyner	Signalisation and 4-laning between Oxford Road and Francis Road.
2	6-1	Oakey Flat Road, Morayfield	Corridor upgrade of Oakey Flat Road from Clark Road to Morayfield Road to address intersection capacity improvements, right-turn safety improvements and provision of active transport facilities.
3	4-2	Old Gympie Road/Macarthur Drive	Signalisation of intersection.
4	4-1	Old Gympie Road/Hughes Road, Kallangur	Signalisation of intersection.
5	6-2	Anderson Road/Lindsay Road intersection, Morayfield	Signalisation of intersection.
6	4-6	Mango Hill Ring Road, Mango Hill	Completion of the ring road (Bowen Street to Mango Hill Boulevard East, including a new bridge over the MBRL)
7	3-1	Burpengary Road/New Settlement Road, Burpengary	Signalisation of intersection - requires either widening of the rail crossing underpass or shifting the intersection 50m to the east
8	2-4	South Pine Road/Camelia Avenue, Everton Hills	Add third westbound lane
9	2-2	Samsonvale Road/Lavarack Road, Bray Park	Increase capacity of southern approach
10	2-3	Kremzow Road/Leitchs Road, Brendale	Increase capacity of southern approach
11	2-5	South Pine Road/Plucks Road, Arana Hills	Increase capacity of northern approach

Table 19: 2031 Schedule of Capacity Upgrade Works

Priority	Deficiency ID	Location	Proposed Solution
12	3-2	Narangba Road/ Alma Road	Signalisation of intersection.
13	3-3	Boundary Road/Narangba Road	Signalisation of intersection and provide a 2nd through lane on northern arm.
14	3-4	Burpengary Road/Pitt Road	Signalisation of intersection.
15	6-3.1	Lindsay Road/O'Brien Road intersection, Burpengary	Signalisation of intersection with priority of movements changed to Lindsay-O'Brien.
16	6-3.4	Lindsay Road/Hunt Road, Burpengary	Signalisation of intersection.
17	4-4	Old Gympie Road, Kallangur	Corridor upgrade of Old Gympie Road from Anzac Avenue to Boundary Road to address intersection capacity improvements, right-turn safety improvements and provision of active transport facilities.
18	6-3.2	Station Road/ Jill Street, Burpengary	Signalisation of intersection.
19	6-3.3	Station Road/O'Brien Road, Burpengary	Provide greater capacity for west-south movements. Increase turn-lane storage on all arms.
20	6-5	Buchanan Road/ Graham Road/ Weier Road, Morayfield	Signalisation of intersection.
21	6-7	Cundoot Creek Crossing, South Caboolture	Cundoot Creek Crossing (extension of Graham Road to Lower King Street).
22	6-6	Lindsay Road/Clark Road, Morayfield	Signalisation of intersection.
23	6-8	Brown Street Extension, Caboolture	Brown Street link (connection between Pettigrew Street and Pumicstone Road (via Ardrossan Road).
24	6-9	Buchanan Road Upgrade, Morayfield	Upgrade to 4 lanes.

Appendix D provides a complete list of "priority areas" for non-capacity projects and the associated length or count where upgrade works are identified for pathways, bike lanes and pedestrian crossways. Included with this list is the associated population and employment growth for each priority area.

Appendix A

PIP Practice Notes

A1 PIP practice note 2 – Desired standard of service

Attached is the completed draft *PIP Practice note 2*. This represents the discussions held with Council during the course of undertaking the TNCS Part B Stages 3-6 and the development of the 2031 Policy Based Strategic Transport Model.

It is noted in the *Design Criteria (quantitative standards) for Road network design/planning standards, Public transport design/planning standards and Cycleway and pathway design/planning standards* that it states:

- Local government road design and development manual/standards/codes in planning scheme and planning scheme policy

This statement would only be applicable in the event that MBRC has adopted such manual/standard/code/planning scheme policy.

It is noted in *Table 4.4.4.1E Functional Trunk road Planning Provisions in the Hierarchy per Place type – Parking provision* that the requirements for a DSS for Parking need to align with the preparation of Council's *Travel Demand Management Strategy* for the region.

Growth Management Queensland

Desired standard of service indicative methodology

PIP practice note 2 – desired standard of service

Template 2011

Queensland Government

About this template

This practice note includes an indicative methodology below to support local government in the development of desired standard of service. Local government have the flexibility to use all, part or an alternative to this methodology. Where an alternative methodology is used, it must clearly demonstrate how growth projections were reached and how those assumptions were converted into demand.

All text in the indicative methodology is for guidance and can be edited or deleted. Text in grey is generic and should be edited to suit the specific requirements of each local government. Text in brackets is for guidance only and must be deleted.

In relation to formatting and numbering the indicative methodology is Queensland Planning Provision version 3 compliant. Local government can edit the formatting and numbering to align with the relevant local government planning scheme.

Indicative Methodology 1

< There are two indicative methodologies provided in this practice note to support local government in the development of DSS. Both indicative methodologies perform the same function and local governments can choose which best suits their needs.>

4.4 Desired standards of service

(1) The desired standard of service details the standards that comprise an infrastructure network most suitable for the local context.

(2) The desired standard of service is supported by the more detailed network design standards included in planning scheme policies.

4.4.1 Water supply network desired standards of service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Reliability/continuity of supply	All development receives a reliable supply of potable water with minimal interruptions to their service.	• Standards in planning scheme, planning scheme policies and/or Netserv Plans[1] • Customer service standards • Customer service obligations
Adequacy of supply	All development is provided with a water supply that is adequate for the intended use.	• Water Service Association of Australia codes • IPWEA standards • Customer service standards • Standards in planning scheme, planning scheme policies and/or Netserv Plans
Quality of supply	Provide a uniform water quality in accordance with recognised standards that safeguards community health and is free from objectionable taste and odour.	• The *Australian Drinking Water Guidelines* developed by the National Health and Medical Research Council
Environmental impacts	The environmental impacts of the water supply network are minimised in accordance with community expectations.	• Compliance with the requirements of the *Environmental Protection Act 1994* and associated Environmental Protection Policies and the *Water Act 2000*
Pressure and leakage management	The water supply network is monitored and managed to maintain the reliability and adequacy of supply and to minimise environmental impacts.	• System Leakage Management Plan (Chapter 3, Part 3, Division 1A Water Act 2000)

[1] <Refer to definitions in *Statutory Guideline 01/11 – Priority infrastructure plan*>

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Infrastructure design/planning standards	Design of the water supply network will comply with established codes and standards.	• Water Supply Code of Australia—Water Services Association of Australia—WSA 03–2002 • The *Australian Drinking Water Guidelines* developed by the National Health and Medical Research Council • *Planning Guidelines for Water Supply and Sewerage*—Department of Natural Resources and Water (NRW) • Standards in planning scheme, planning scheme policies and/or Netserv Plans

4.4.2 Sewerage network desired standards of service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Reliability	All development has access to a reliable sewerage collection, conveyance, treatment and disposal system.	• Standards in planning scheme, planning scheme policies and/or Netserv Plans • Customer service standards • Customer service obligations
Quality of treatment	Ensures the health of the community and the safe and appropriate level of treatment and disposal of treated effluent.	• Local water quality guidelines prepared in accordance with the National Water Quality Management Strategy • *Queensland Water Quality Guidelines 2006*—Environmental Protection Agency (where local guidelines do not exist) • *National Water Quality Guidelines—National Water Quality Management Strategy* (where local or regional guidelines do not exist)
Environmental impacts	The environmental impacts of the sewerage network are minimised in accordance with community expectations.	• Compliance with the requirements of the Environmental Protection Act 1994 and associated Environmental Protection policies
Effluent re-use	Reuse effluent wherever possible.	• *Guidelines for Sewerage Systems: Reclaimed Water —February 2000* • *Queensland Water Recycling Guidelines—December 2005*
Infrastructure design /planning standards	Design of the sewerage network will comply with	• *Planning Guidelines for Water Supply and*

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
	established codes and standards.	*Sewerage*—NRW • *Sewerage Code of Australia*— Water Services Association of Australia—WSA 02—2002 • *Sewerage Pumping Station Code of Australia*—Water Services Association of Australia—WSA 04—2005 • Standards in planning scheme, planning scheme policies and/or Netserv Plans

4.4.3 Stormwater network desired standards of service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Quantity	Collect and convey stormwater in natural and engineered channels, a piped, drainage network and system of overland flow paths to a lawful point of discharge, in a safe manner that minimises the inundation of habitable rooms and protects life.	• *Queensland Urban Drainage Manual*—NRW • Local government standards in planning scheme and planning scheme policies • Transport and Main Roads - Road Drainage Design Manual
Quality	The water quality of urban catchments and waterways is managed to protect and enhance environmental values and pose no health risk to the community.	• Local water quality guidelines prepared in accordance with the National Water Quality Management Strategy • *Queensland Water Quality Guidelines 2006*—Environmental Protection Agency (EPA) (where local guidelines do not exist) • *National Water Quality Guidelines*—National Water Quality Management Strategy (where local or regional guidelines do not exist)
Environmental impacts	Adopt water-sensitive urban design principles and on-site water quality management to achieve EPA water quality objectives.	• Section 42 Environmental Protection [Water] Policy 1997) • Local Government standards in planning scheme and planning scheme policies
Infrastructure design/planning standards	Design of the stormwater network will comply with established codes and standards.	• *Queensland Urban Drainage Manual*—NRW • Local government standards in planning scheme and planning scheme policies • Natural Channel Design

		Guidelines • Transport and Main Roads - Road Drainage Design Manual

4.4.4 Transport network desired standards of service

For the purpose of trunk road network planning, the Desired Standard of Service (DSS) provided by an element or combination of elements making up the trunk road system in the region is to be assessed against service levels appropriate to the relevant "place types" which form the basis for the Strategic Framework of the new Moreton Bay Regional Council Planning Scheme. The "place types" for the Planning Scheme have been grouped into three categories/types to reflect the broad type of access and transport integration intended for each of the areas across the Moreton Bay Regional Council area. This will assist in achieving key strategic outcomes for the Moreton Bay Regional Council area including integrated movement networks, streets that prioritise the needs for pedestrians and cyclists, embracing more sustainable travel behaviour, as well as ensuring a transport network that meets the required needs of other road users in appropriate locations.

The "place type" groupings include:

- Category Type 1: Principal, Major and District Activity Centres
- Category Type 2: "Urban" Neighbourhoods, Next Generation Suburban Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages
- Category Type 3: Suburban Neighbourhoods and Rural Residential areas, and Rural areas, Mountain ranges, forests and waterways

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Road network design/planning standards	The road network provides a functional urban and rural hierarchy that supports settlement patterns, commercial and economic activities, and freight movement. Design of the road system will comply with established codes and standards. In Activity Centres (place type 1) and to other key destinations the urban road network will promote safe, accessible and convenient walking and cycling connections And effective public transport operations as part of an integrated and cohesive movement network. Commensurate with the highly urbanised environment within Activity Centres, a lower level of service for motor vehicles and freight is considered acceptable to promote an improved walking and cycling environment and the	• Local government road design and development manual/standards/codes in planning scheme and planning scheme policy • Interim Guide to Road Planning and Design Practice developed by the Department of Transport and Main Roads • Australian Standards • AUSTROADS guides • Level of Service for road links and intersections refer to table 4.4.4.1A. • Desired standard of service for functional road elements refer to tables 4.4.4.1B to E for Speed, access, parking, intersections, turning facilities.

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
	greater use of public passenger and active transport modes. In comparison a higher level of service is considered acceptable in “place type 2 and 3” where the balance of users requires a greater need to ensure movement across the network for other traffic including freight.	
Public transport design/planning standards	New urban development is designed to achieve safe and convenient walking distances to existing or potential bus stops, or existing or proposed demand-responsive public transport routes. Promotes the provision of public transport infrastructure consistently across the movement network that is compatible with land uses, demand and is fully accessible.	• Local government design and development manual/standards/codes in planning scheme and planning scheme policy • Design accords with the performance criteria set by Department of Transport and Main Roads • Design accords with the performance criteria and guidance set out in TransLink’s Public Transport Infrastructure Manual (PTIM) • AUSTROADS guides for road-based public transport and high-occupancy vehicles
Cycleway and pathway design/planning standards	Cycle ways and pathways provide a safe and convenient network that encourages walking and cycling as acceptable and attractive alternatives. Design of the network will comply with established codes and standards. Promote networks that are functional and connected and that reflect desire lines to key destinations, and meet appropriate standards of convenience, comfort and amenity.	• Local government road design and development manual/standards/codes in planning scheme and planning scheme policy • Australian Standards • AUSTROADS Guide to Road Design – Part 6A: Pedestrian and Cycle Paths. • Complete Streets • Desired Standard of Service for Pathways refer to table 4.4.4.2. • Desired Standard of Service for Cycling provision refer to table 4.4.4.3. • Desired Standard of Service for Pedestrian Crossings refer to table 4.4.4.4. •

Table 4.4.4.1A Level of Service (LOS) for Roads / Streets per Place Type

Desired Standard of Service (Level of Service)		Place Type Category		
		1 Principal, Major and District Activity Centres	2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages	3 Rural Residential areas and Suburban Neighbourhoods
		D*/E	D	C
Road Link DOS	Arterial	0.95	0.85	0.65
	Sub-Arterial	0.95	0.80	0.65
	Collector	0.90	0.80	0.60
Intersection DOS	Signal	0.95	0.95	0.90
	Roundabout	0.95	0.95	0.85
	Priority	0.90	0.90	0.80

Table 4.4.4.1B Functional Trunk Road Planning Provisions in the Hierarchy per Place Type – for the Speed Environment

Desired Standard of Service (Speed Environment)		Place Type Category		
		1 Principal, Major and District Activity Centres	2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages	3 Rural Residential areas and Suburban Neighbourhoods
Hierarchy	State	Note 1	State	State
	Arterial	Note 2	60 – 80 km/h	60 – 100 km/h
	Sub-Arterial		60 – 80 km/h	60 – 80 km/h
	Collector		50 – 60 km/h	60 km/h

Note 1: Where a State Road passes through a Place Type 1 (e.g. Activity Centre) negotiations with the State will consider the appropriate speed environment such that it should be commensurate with the road design and the environmental context of the road link (i.e. land use, status of "place", and level of pedestrian and cycle activity).

Note 2: the speed environment should consider pedestrian and cycle provision, adjacent land uses and overall environmental context where the desired level of service favours walking and cycling as a priority.

Table 4.4.4.1C Functional Trunk Road Planning Provisions in the Hierarchy per Place Type – for Access

Desired Standard of Service (Access)		Place Type		
		1 Principal, Major and District Activity Centres	**2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages**	**3 Rural Residential areas and Suburban Neighbourhoods**
Hierarchy	State	Note 1	State	State
	Arterial	Note 2	Intersections and limited commercial and industrial access	Intersections
	Sub-Arterial		Intersections and limited commercial and industrial access	Intersections and Frontages
	Collector		Intersections and limited commercial and industrial access	Intersections and Frontage
	Residential Streets(low speed environment)	Frontage	Frontage	Frontage

Note 1: *Where a State Road passes through a Place Type 1 (e.g. Activity Centre) negotiations with the State will consider the appropriate level of access, commensurate with the road design and environmental context of the road link (i.e. land use, status of "place", and level of pedestrian and cycle activity).*
Note 2: *Level of access provided to be commensurate with the environmental context of the road link in Place Type 1*

Table 4.4.4.1D Functional Trunk Road Planning Provisions in the Hierarchy per Place Type – for Intersections and Turning Traffic Provisions

Desired Standard of Service		Intersections	Turning Traffic
Hierarchy	State	State	State
	Arterial	C-0.5 to 1.0 km	Protected acceleration and deceleration lanes
	Sub-Arterial	C – 0.2 to 0.5 km	Protected acceleration and deceleration lanes
	Collector	C/P – 0.1/0.2 km	Localised protection
	Residential Streets(low speed environment)	P- 0.06 km	None

Note: C- Controlled intersections, P – priority intersections
Provision exclusive of "place" type category

Table 4.4.4.1E Functional Trunk Road Planning Provisions in the Hierarchy per Place Type – Parking provision

Desired Standard of Service (Parking)		Place Type		
		1 **Principal, Major and District Activity Centres**	**2** **"Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages**	**3** **Rural Residential areas** **and Suburban Neighbourhoods**
Hierarchy	State	State	State	State
	Arterial	Limited/ low provision	Limited / Controlled	None
	Sub-Arterial	Limited/ low provision	Limited / Controlled	Limited/ Controlled
	Collector	Limited/ low provision	On road / shared off road	On road
	Residential Streets(low speed environment)	Controlled provision	On road	On road

Table 4.4.4.2 Desired Standard of Service for Pathways

Desired Standard of Service (Pathways)		Place Type		
		1 Principal, Major and District Activity Centres	**2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages**	**3 Rural Residential areas and Suburban Neighbourhoods**
Hierarchy	State Road	Off-Road (shared) 3.0m both sides (or greater) Off- Road (Separated) 2.5m	Off-Road (shared) 3.0m both sides (or greater) Off- Road (Separated) 2.5m	Off-Road (shared) 3.0m both sides (or greater)
	Arterial	Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.5m	Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.5m	Off-Road (shared) 3.0m both sides (or greater)
	Sub Arterial	Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.5m	Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.5m	Off-Road (shared) 3.0m both sides (or greater)
	Collector	Off-Road (shared) 2.0 to 2.5 both sides (or greater)	Off-Road (shared) 2.0 to 2.5 both sides (or greater)	Off-Road (shared) 2.0 to 2.5 both sides (or greater)

Table 4.4.4.3 Desired Standard of Service for Cycling Provision

Desired Standard of Service (Cycling Provision)		Place Type		
		1 Principal, Major and District Activity Centres	**2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages**	**3 Rural Residential areas and Suburban Neighbourhoods**
Hierarchy	State Road	On-Road 1.5m 60kph; 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater) Off-Road (Separated) 2.0m	On-Road 1.5m 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.0m	On-Road 1.5m 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph), Off-Road (shared) 3.0m both sides (or greater)
	Arterial	On-Road 1.5m 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.0m	On-Road 1.5m 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.0m	On-Road 1.5m 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater)
	Sub Arterial	On-Road 1.5m 60kph (*1.8m contra flow for speeds 60kph or less where unavoidable*) Off-Road (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones	On-Road 1.5m 60kph, 2.0m 80kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater) Off Road (Separated) 2.0m	On-Road 1.5m 60kph, 2.0m 80kph (4.0-4.5m with parking 60-80kph), Off-Road (shared) 3.0m both sides (or greater)
	Collector	On-Road 1.5m (min) (*1.8m contra flow for speeds 60kph or less where unavoidable*) Off-Road (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones	On-Road 1.5m (min) (*1.8m contra flow for speeds 60kph or less where unavoidable*) Off-Road (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones	On-Road 1.5m (min) (*1.8m contra flow for speeds 60kph or less where unavoidable*) Off-Road (shared) 2.0m to 2.5m both sides (or greater) Bicycle awareness zones or shared zones

Table 4.4.4.4 Desired Standard of Service for Crossings

Desired Standard of Service (Crossings)		Place Type		
		1 Principal, Major and District Activity Centres	**2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages**	**3 Rural Residential areas and Suburban Neighbourhoods**
Hierarchy	State Road	Note 1	Note 1	Note 1
	Arterial	>2 Lanes 200 metres spacing Signalised crossing 2 Lanes 200 metres spacing Signalised crossing, Zebra or refuge	>2 Lanes 400 metres spacing Signalised crossing 2 Lanes 400 metres spacing Signalised crossing, Zebra or refuge	>2 Lanes Up to 600 metres (max 800 metres) spacing Signalised crossing. 2 Lanes 600 metres (max 800 metres) spacing Signalised crossing Zebra or refuge
	Sub Arterial	>2 Lanes 200 metres spacing Signalised crossing 2 Lanes 200 metres spacing Signalised crossing Zebra or refuge, raised platform or shared zone	>2 Lanes 400 metres spacing Signalised crossing 2 Lanes 400 metres spacing Signalised crossing Zebra or refuge, raised platform or shared zone	>2 Lanes Up to 600 metres (max 800 metres) spacing Signalised crossing 2 Lanes 800 metres spacing Signalised crossing Zebra or refuge, raised platform or shared zone
	Collector	200 metres spacing, Zebra or refuge, raised platform or shared zone. Uncontrolled crossing where sightlines are adequate Sub collector 200 metres spacing, Zebra or refuge, raised platform, shared zone. Uncontrolled crossing where sightlines are adequate	400 metres spacing, Zebra or refuge, raised platform or shared zone. Uncontrolled crossing where sightlines are adequate Sub collector 400 metres spacing, Zebra or refuge, raised platform, shared zone Uncontrolled crossing where sightlines are adequate	Up to 600 metres(max 800 metres) spacing, Zebra or refuge, raised platform or shared zone. Uncontrolled crossing where sightlines are adequate Sub collector 600 metres (max 800 metres) spacing Zebra or refuge, raised platform, shared zone. Uncontrolled crossing where sightlines are adequate

Desired Standard of Service (Crossings)		Place Type		
		1 Principal, Major and District Activity Centres	**2 "Urban" and "New Generation Suburban" Neighbourhoods, Enterprise and Employment areas, Rural Townships, and Coastal Villages**	**3 Rural Residential areas and Suburban Neighbourhoods**
	Residential Streets(low speed environment)	Uncontrolled crossing where sightlines are adequate	Uncontrolled crossing where sightlines are adequate	Uncontrolled crossing where sightlines are adequate

Note 1: *Review with State on appropriate level of crossing provision, in line with ensuring high level of prioritisation to pedestrian and cycle access commensurate with the environmental context of the road link. Ideally for "place type 1" crossing provision would be at least every 200, for "place type 2" crossing 400 metres spacing, and up to 600 metre spacing (maximum 800 where circumstances warrant) in place type 3.*

4.4.5 Public parks and land for community facilities network desired standards of service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Functional network	A network of parks and land for community facilities is established to provide for the full range of recreational and sporting activities and provide for development of community facilities.	• Parks and land for community facilities is provided at a local, district and LGA-wide level • Parks and land for community facilities addresses the needs of both recreation and provides for development of community facilities.
Accessibility	Public parks and land for community facilities will be located to ensure adequate pedestrian, cycle and vehicle access.	• Accessibility standards are identified in Table 4.4.5.2
Land quality/suitability Area/1000 persons minimum size maximum grade Flood immunity	Public parks and land for community facilities will be provided to a standard that supports a diverse range of recreational, sporting, health and services–promoting activities to meet community expectations. This includes ensuring land is of an appropriate size, configuration and slope, and has an acceptable level of flood immunity.	• The rate of public park and land for community facilities is identified in Table 4.4.5.1. The size of public park and land for community facilities is identified in Table 4.4.5.2. The maximum gradient for public park and land for community facilities provision is identified in Table 4.4.5.4. The minimum flood immunity for public park and land for community facilities is identified in Table 4.4.5.5
Facilities/embellishments	Public parks contain a range of embellishments to complement the type and purpose of the park.	• Standard embellishments for each type of park are identified in Table 4.4.5.6
Infrastructure design / performance standards	Maximise opportunities to co-locate recreational parks and community facilities in proximity to other community infrastructure, transport hubs and valued environmental and cultural assets.	• Local government standards in planning scheme and planning scheme policies • Australian Standards

Table 4.4.5.1—Rate of land provision

Infrastructure type	Rate of provision (Ha/1000 people)		
	Local	District	Local government–wide
Recreation park			

Sport park			
Land for community facilities			

Table 4.4.5.2—Accessibility standard

Infrastructure type	Accessibility standard (km)		
	Local	District	Local government–wide
Recreation park			
Sport park			
Land for community facilities			

Table 4.4.5.3—Size of parks and land for community facilities

Infrastructure type	Minimum size (Ha)		
	Local	District	Local government–wide
Recreation park			
Sport park			
Land for community facilities			

Table 4.4.5.4—Maximum desired grade

Infrastructure type	Maximum gradient		
	Local	District	Local government–wide
Recreation park			
Sport park			
Land for community facilities			

Table 4.4.5.5—Minimum desired flood immunity for parks

Infrastructure type	Minimum flood immunity (%)								
	Local			District			Local government–wide		
Flood immunity	>Q5	>Q50	>Q100	>Q5	>Q50	>Q100	>Q5	>Q50	>Q100
Recreation park									
Sport park									

Infrastructure type	Minimum flood immunity (%)								
	Local			District			Local government–wide		
Land for community facilities									

Table 4.4.5.6—Standard facilities/embellishments for parks

Embellishment type	Recreation parks			Sport parks	
	Local	District	Local government–wide	District	Local government–wide
Internal roads	<✓>				
Parking					
Fencing/ bollards					
Lighting					
Toilet					
Paths (pedestrian/ cycle)					
Seating					
Shade structures					
Covered seatings and table					
Tap/bubbler					
BBQ					
Bins					
Landscaping (including earthworks, irrigation and revegetation)					
Signage					
Activity areas					

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A2 PIP practice note 3 – Plans for Trunk Infrastructure

Growth Management Queensland

Plans for trunk infrastructure indicative methodology

PIP practice note 3 – plans for trunk infrastructure

Template 2011

Queensland Government

About this template

This practice note includes an indicative methodology below to support local government in the development of planning assumptions. Local government have the flexibility to use all, part or an alternative to this methodology. Where an alternative methodology is used, it must clearly demonstrate how growth projections were reached and how those assumptions were converted into demand.

All text in the indicative methodology is for guidance and can be edited or deleted. Text in grey is generic and should be edited to suit the specific requirements of each local government. Text in brackets is for guidance only and must be deleted.

In relation to formatting and numbering the indicative methodology is Queensland Planning Provision version 3 compliant. Local government can edit the formatting and numbering to align with the relevant local government planning scheme.

Indicative Methodology 1

4.5 Plans for trunk infrastructure

(1) The plans for trunk infrastructure identify the existing and proposed trunk infrastructure networks intended to service the assumed development at the desired standard of service stated in the PIP.

(2) The plans for trunk infrastructure are identified in <insert reference to relevant component of PIP such as maps and tables>.

4.5.1 Trunk infrastructure networks, systems and items

(1) Table 4.5.1.1 broadly outlines the trunk infrastructure networks, systems and items covered by the PIP.

Table 4.5.1.1—Trunk infrastructure networks, systems and items

Network	System	Items
Transport	Local government and State controlled roads (separately identified)	• Arterial, sub-arterial, major collector roads and main streets • State controlled roads • Associated intersections, traffic lights, lighting, bridges, culverts, kerb and channel, local road drainage, pedestrian footpaths and cycleways (within the road reserve), on road cycleways, basic revegetation.
	Off-road pathways	• Cycleways and pedestrian pathways not within the road reserve

4.5.2 Plans for trunk infrastructure

(1) Plans identifying the existing and future trunk infrastructure, as well as the service catchments, for each infrastructure network are shown in Part 3 – Maps and Schedules of Works on the following maps:

- Map/s: XX to XX – Plans for trunk water supply infrastructure
- Map/s: XX to XX – Plans for trunk sewerage infrastructure
- Map/s: XX to XX – Plans for trunk stormwater infrastructure
- Map/s: XX to XX – Plans for trunk transport infrastructure
- Map/s: XX to XX – Plans for trunk public parks and land for community facilities infrastructure.

4.5.3 Trunk infrastructure networks not provided within the PIA

<This optional section will only be used if a local government can justify the inclusion of areas within the PIA that are not serviced by all trunk infrastructure networks.>

(1) Not all premises within the PIA will be serviced by all networks of trunk infrastructure. Those areas not serviced are shown on map / table/s XX in Part 3 – Maps and Schedules of Works.

4.5.4 Schedule of works

(1) Tables 4.5.4.1 to 4.5.4.X – Maps XX identify the existing and future trunk infrastructure items to service anticipated growth. The maps are supported by additional information shown in Schedules of Works.

(2) The included schedules of works for future assets identify the estimated cost of each asset, the service catchment(s) to which it relates and the assumed time of completion. These dates relate to the assumed timing of development. The location of these future assets are cross referenced and identified in the plans for trunk infrastructure.

(3) The full schedule of works, including details of existing and future trunk infrastructure, is provided as extrinsic material.

<The future trunk infrastructure items can be summarised (i.e. by project association) in the schedules of works provided they share common delivery timing. However, where a local government summarises items in its schedules of works, it should provide as much detailed as is available in the extrinsic material.>

Table 4.5.4.1 <Insert relevant network> schedule of works

(1) Table 4.5.4.1 identifies the future <insert relevant network> trunk infrastructure to service assumed growth.

(2) The schedule of works for future assets identifies the estimated cost of each asset, the service catchment(s) to which it relates and the assumed time of completion. The location of these future assets are cross referenced and identified in the plans for trunk infrastructure.

(3) The full schedule of works, including details of existing and future trunk infrastructure, is provided as extrinsic material.

<The future trunk infrastructure items can be summarised (i.e. by project association) in the schedules of works provided they share common delivery timing. However, where a local government summarises items in its schedules of works, it should still provide the detailed list (including costs) as extrinsic material.>

Table 4.5.4.1.2—<Insert relevant network> schedule of works for future infrastructure

Map no.	Item ID	Future infrastructure asset description	Total $	Estimated year of completion

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Appendix B

TNCS Part A Stages 1-2

B1 Stage 1 Base Network Review

Arup used GIS data, aerial photos and land use plans made available by MBRC to assess the existing condition of transport networks and to define places within the Council area. Attributes of the networks were used to define conditions so that gaps between the existing conditions and desired standards could be understood.

The conditions of the MBRC transport network were documented within the GIS database using ratings established in collaboration with MBRC staff. A simplified rating system was used to describe conditions associated with each network attribute. Each of the 1690 road segments in the Council area were coded for these conditions using the method shown in Table 20.

Table 20: Base Network Review Condition Criteria (Appendix B)

Condition Aspect	Criteria and Coding
Pathway availability and condition	0 – none available 1 – available – partially available 2 – available – available along whole length
Nature strip/highway verge condition	0 – none available 1 – available – limited opportunities for embellishment 2 – available - provides some opportunities for embellishment
Provision of shade tree planting	0 – none 1 – yes – average amount of plantings (more than 30 metres apart) 2 – yes – abundant plantings (12-15 metres apart)
Provision of marked on-street cycle lanes	0 – none 1 – yes – one side of the street only 2 – yes – both sides of the street
Central medians and intersections	0 – none 1 – has normal width central median 2 – has exceptionally wide central median
Shoulders	1 – none 2 – existing gravel or very poor condition 3 – existing sealed - on-street parking legally allowed 4 – existing sealed non parking (e.g., redundant, unnecessarily hatched)
Number of lanes	1S – one in each direction 1A – one lane (one way street) 2S – two lanes each direction 2A – two lanes in one direction, one lane in the other direction 3S – three lanes in each direction 3A – three lanes in one direction, two lanes in the other direction

	4S – four lanes in each direction 4A – four lanes in one direction, three lanes in the other direction
Intersections	Number of Signalised intersections per segment Number of Roundabouts per segment Number of priority intersections per segment (where link in question is the major movement) Number of priority intersections per segment (where link in question is the minor movement)
Pedestrian crossings	Signal crossing count Zebra crossing count Uncontrolled crossing count Refuge crossing count Side street crossing count
Freight routes	0 – No 1 - Yes

Methodology

The following generally outlines the process undertaken with regards to carrying out the base network review of the Region.

- Agreed initial appraisal criteria with MBRC 30 April 2012 – this included the addition of intersections, pedestrian crossings, and shoulders;
- A simplified coding was agreed that could be recorded using ArcGIS;
- A review of MBRC GIS files, in addition to aerial photography / video survey it was agreed that the "segmentation" of the network would be as per the current "segments" in the GIS network (for ease of transferring data, and usability with existing GIS layers);
- Reviewed each condition aspect for the network, and agreed those that could be undertaken by interrogating the GIS data, or manually (i.e. review of Aerial mapping or Video Survey) - refer to Table 21;
- The appraisal criterion that was not included in GIS info that would need to be viewed manually include:
  - number of lanes;
  - traffic light locations;
  - pedestrian crossings;
  - shoulders;
  - civil features; and
  - shade tree plantings.
- Received "streams" data from MBRC providing a list of all signalised intersections in the region (not digitised); and
- Undertook digitisation of this data for the region and included it as part of the GIS information for appraisal.

Table 21: Appraisal methodology (Appendix B)

Condition Aspect	Method / Notes
Pathway availability and condition	GIS processing
Nature strip/highway verge condition	GIS Processing.
Provision of shade tree planting	Subjective assessment Manually undertaken by reviewing the aerial photography.
Provision of marked on-street cycle lanes	GIS processing Plus manual checking
Central medians and intersections	GIS processing Plus manual checking
Shoulders	Manual processing
Number of lanes	Manual checking Due to the fact that the number of lanes may or may not be equal in each direction, the criteria included a note where it was symmetrical or asymmetrical. If asymmetrical then the greater number of lanes was to be recorded (e.g. 1 lane NB, 2 lanes SB – record 2A)
Intersections	GIS processing Any signal located on the end of a road segment has been included in the signal count for all segments that end with such a node.
Pedestrian crossings	Manual process.
Freight routes	GIS processing (review of available information online)

B2 Stage 2 Gap Analysis

Desirable standards were needed in order to define gaps between existing network conditions and desired conditions for the Region. Only link attribute standards were used to define gaps in Part A of the study.

Nodal attributes and nodal gaps were addressed in Part B of the study.

For each place type, six attributes were identified in order to establish desirable standards. Those attributes were:

- Pathways;
- Pedestrian crossings;
- Cycle provision;
- Verges/median width;
- Shading; and
- Capacity.

Desirable standards varied by place type and by road hierarchy and were established in collaboration with MBRC staff. The standards are shown in a series of inter-related tables (i.e. Table 23 and **Error! Reference source not found.** Tables A, A1, A2, A3, and B) following this section.

An identification system resembling traffic signal indications (green, amber and red) was used to highlight the severity of gaps on each network segment. Green represented opportunities for improvement (available space from extra-wide verges/median width used for the verge/median width and shading attributes only). Amber represented a moderate gap and red represented a significant gap.

Layers with these indications for the various attributes were incorporated into the Council GIS data base.

Gap descriptions

In order to use the GIS data and aerial photography to the greatest extent possible and keep the level of detail of the analysis relatively simple, gap analysis methodology assumptions had to be made for many attributes. The following paragraphs summarise assumptions that shaped the gap analysis.

Pathways

Gap determination for pathways considered shared or separate paths, path width, off-road versus adjacent locations and provision on one or both sides. Table A1 shows the desirable pathway standards for each road hierarchy classification and place type used to identify pathway gaps.

Pedestrian crossings

An average density of crossings was used to determine gaps. The number of crossings, regardless of type, was divided by the length of the road segment to determine the crossing density. Table A2 illustrates the spacings used to determine the desired density, which in turn was used to identify pedestrian crossing gaps.

Cycle provision

Any shared paths were included in the pathway analysis. Only exclusive cycle lanes were assessed as part of this network attribute. Table A3 outlines the criteria used to determine the desirable cycle provision standards that consider speed, parking, on-road versus off- road locations and contra flow.

Verges/median width

Average widths of verges and medians were calculated along the entire length of each segment.

Where the average width was greater than 3 metres, opportunities to construct additional infrastructure were considered very possible and given a green indication, where the average width was greater than zero, but less than 3 metres, the segment was given an amber indication.

For verge areas, an additional query was run to determine the percentage of the excess verge within 5 metres of the carriageway that has a slope between +/- 10 percent.

This gave an indication of locations where complex construction of a widening could occur, which will be an important factor in Part B of the study.

Shading

The average spacing between shade trees along a segment was used as the measure for this attribute. No plantings warranted a green indication representing a significant opportunity. An average of 30 or more metres between shade trees represented an average planting density and warranted an amber indication. An average of 12-15 metres between shade trees represented an abundant planting and warranted no enhancement.

Capacity

Volumes to capacity (V/C) ratios were used to determine capacity gaps. The V/C ratios were extracted from the current base year and recently developed 2021 travel demand model developed for MBRC. Any V/C value less than 0.85 was considered acceptable.

A value between 0.85 and 1.00 warranted an amber indication representing below standard conditions and a value over 1.00 warranted a red indication representing a significant gap. *Note: Part B of the study further refined the acceptable DSS for mid-block capacity for each place type.*

Area Analysis

After identifying gaps across the entire Council area, two additional analyses were conducted for the areas within one and five kilometres of activity centres, respectively. A separate set of gaps were identified for each of these catchment areas.

In addition, catchments for walking to schools, bus stations and rail stations were evaluated to identify potential accessibility gaps. In contrast to the activity centre gap analyses which were conducted within radii of the centre, this analysis evaluated the network in distances “as you walk”. This analysis used 400 metres

for a walking distance from bus stations and 800 metres for a walking distance from rail stations to identify active transport gaps.

Summary

Table 22 presents a summary of the actual network gaps in the Council area. The gaps are presented as a function of the number of segments.

Table 22: Identified Network Gaps (Appendix B)

	As Function of # of Segments		
Attribute	**Standard**	**Below Standard**	**Deficient**
Pathways	0%	2%	98%
Pedestrian Crossings	25%	17%	58%
Cycle provision	1%	3%	96%
Verges	95%	5%	N/A
Medians	12%	13%	N/A
Shade Trees	4%	29%	66%
Capacity	96%	3%	1%

Table 28 presents a summary for the data analysed in Part A of the study. Data is summarised as a function of the entire Council area, as a function of a five kilometre catchment around activity centres and as a function of a one kilometre catchment around activity centres.

The raw figures of each are also presented in percentages for comparison purposes.

The gaps noted in both Table 22 and Table 23 are indicative of the priority placed on roadway investment and the lack of active transport investment in recent history.

Table 23: Network Summaries (Appendix B)

		Whole LGA		Activity centre catchment (5km)		Activity centre catchment (1km)	
		Length	**%**	**Length**	**%**	**Length**	**%**
Total length of segments	State (km)	288.39	19.02%	80	18.00%	30	42.21%
	Arterial (km)	218.55	14.41%	60	13.47%	8	5.79%
	Sub-arterial (km)	206.85	13.64%	98	22.10%	31	21.92%
	Collector (km)	347.56	22.92%	78	17.62%	27	16.91%
	Bus collector (km)	96.68	6.38%	56	12.56%	14	8.39%
	Minor collector (km)	358.46	23.64%	72	16.25%	8	4.79%
	TOTAL (km)	**1,516.49**	**100.00%**	**445**	**100.00%**	**118**	**100.00%**
Pathways	Footpath absent (m)	897,102	59.16%	100,407	22.54%	68,339	31.66%
	Footpath only 1 side (m)	515,922	34.02%	272,502	61.17%	108,171	50.11%
	Footpath 2 sides (m)	103,275	6.81%	72,141	16.20%	39,367	18.24%
	TOTAL NETWORK LENGTH (m)	**1,516,490**		**445,450**		**215,877**	
	Footpath at target width (m)	113,937	14.98%	69,538	14.52%	39,308	17.19%
	Footpath not target width (m)	638,598	83.96%	402,122	83.99%	187,611	82.04%
	Shared path at target width (m)	4,129	0.54%	4,069	0.85%	840	0.37%
	Shared path not target width (m)	3,914	0.51%	3,034	0.63%	911	0.40%
	TOTAL FOOTPATH LENGTH (m)	**760,579**		**478,763**		**228,669**	
Pedestrian crossings	Signal crossings (count)	183	9.87%	150	13.55%	81	18.33%
	Zebra crossings (count)	29	1.56%	24	2.17%	16	3.62%
	Ramps crossing (count)	1,022	55.12%	602	54.38%	199	45.02%
	Ramps crossing with refuge (count)	620	33.44%	331	29.90%	146	33.03%
	TOTAL	**1,854**	**100.00%**	**1,107**	**100.00%**	**442**	**100.00%**
Cycle provision	Cycle lane (m)	88,376.00	2.91%	80,996	9.09%	52,470	12.15%
	State road cycle lanes (m)	15,070.87	2.61%	9,127	5.69%	5,695	3.13%
	Arterial road cycle lanes (m)	7,958.76	1.82%	7,958	6.63%	-	0.00%
	Sub arterial road cycle lanes (m)	42,898.98	10.37%	42,308	21.49%	33,486	35.39%
	Collector road cycle lanes (m)	13,107.07	1.89%	12,762	8.13%	10,203	13.97%
	Bus collector road cycle lanes (m)	7,976.64	4.13%	7,976	7.13%	3,086	8.52%
	Minor collector road cycle lanes (m)	1,363.89	0.19%	865	0.60%	-	0.00%
Verges	Average width (m)	7.62	na	7	na	7	na
	Slope < 10% within 5m of road (area %)	76.08	na	85	na	88	na
Medians	Segments with medians (count)	434	na	237	na	104	na
	Average median width(m)	6.05	na	2	na	2	na
Shade trees	No shade trees (count)	1,120	66.27%	562	73.46%	156	71.56%
	Average shade tree planting (count)	496	29.35%	185	24.18%	59	27.06%
	Abundant shade tree planting (count)	74	4.38%	18	2.35%	3	1.38%
	TOTAL	**1,690**	**100.00%**	**765**	**100.00%**	**218**	**100.00%**
Capacity	V/C > 1	3.00	0.20%	3	0.64%	2	1.53%
	V/C 0.85 to 1 (km)	29.09	1.92%	20	4.42%	12	9.89%

Note - Figures in red reflect the percentage of each road hierarchy class that has cycle lanes. The formulas are linked to the total road lengths (highlighted in blue)

Table 24: Link and Place types for Gap analysis review (Appendix B)

	Place Type Status									
	Type 1	Type 2					Type 3			
	Activity Centres	Urban Neighbourhood	Next Generation Surburban Neighbourhood	Enterprise Employment Areas #	Rural Townships	Coastal Villages	Suburban Neighbourhood	Rural Residential	Mountain Ranges, Forests and waterways	Rural Areas
Place Type example	*Caboolture (Principal Regional Activity Centre), Strathpine (Major Regional Activity Centre), North Lakes (MRAC), Petrie District Centre, Redcliffe Town Centre (Major Regional Activity Centre)*	*Scarborough*	*Woorim*	*Brendale, Petrie, North Lakes, Clontarf, Narangba,*	*Dayboro, Samford, Wamuran, Woodford - D'Aguilar*	*Beachmere, Hays Inlet,*	*Warner*	*Elimbah*	*Belthorpe, Cononale Ranges, Mt Mee, Mt Glorious*	*Areas surrounding Samford, Wamuran, Pumicestone*
Link Status / Hierarchy (a) State Road	**Refer to Table A, plus Tables A1, A2, A3 and Table B for characteristics / desirable standards for each Place Type and Link Status.**									
(b) Arterial										
(c) Sub arterial										
(d) Collector										

Table A: Attributes by Hierarchy Class

Hierarchy Class	Users (priority)	Attributes: Pathways	Pedestrian Crossings	Cycle Provision	Verges / Medians	Shading	Capacity
State Road	Walk Cycle Public Transport **Freight** **Road/Traffic**	**Refer to Table A1** Provision relates to Place Type	**Refer to Table A2** Provision relates to Place Type Likely to be predominately "signal controlled/Green-man"	**Refer to Table A3** Provision relates to Place Type *data refers to % length across segment or just at intersections, one or both sides*	None Available (green) - if > 3 metres wide Available (Amber) - if < 3 metres wide	None Scope for additional plantings	V/C Ratio - midblock on key segments/Links 0.85 – 1 Amber, 1 and above Red
Arterial (Major Road)	Walk Cycle Public Transport **Freight** **Road/Traffic**	**Refer to Table A1** Provision relates to Place Type	**Refer to Table A2** Provision relates to Place Type Likely to be predominately "signal controlled/Green-man" Provision may be "zebra" or/and "refuge" where only two traffic lanes two way exist.	**Refer to Table A3** Provision relates to Place Type	None Available (green) - if > 3 metres wide Available (Amber) - if < 3 metres wide	None Scope for additional plantings	V/C Ratio - midblock on key 0.85 – 1 Amber, 1 and above Red
Sub Arterial	**Walk** **Cycle** **Public Transport** **Freight** **Road/Traffic**	**Refer to Table A1** Provision relates to Place Type	**Refer to Table A2** Provision relates to Place Type Likely to be predominately "signal controlled/Green-man" Provision may be "zebra" or/and "refuge" where only two traffic lanes two way exist.	**Refer to Table A3** Provision relates to Place Type	None Available (green) - if > 3 metres wide Available (Amber) - if < 3 metres wide	None Scope for additional plantings	V/C Ratio - midblock on key 0.85 – 1 Amber, 1 and above Red
Collector (Access Road / neighbourhood collector)	**Walk** **Cycle** **Public Transport** Freight Road/Traffic	**Refer to Table A1** Provision relates to Place Type	**Refer to Table A2** Provision relates to Place Type Likely to include "signalised controlled / green man", "zebra", and "refuge" type crossings. For Collector Roads/Streets and below the provision may also include "raised platforms" and "shared zones".	**Refer to Table A3** Provision relates to Place Type Likely to generally see shared use of road space - bicycle awareness zones.	None Available (green) - if > 3 metres wide Available (Amber) - if < 3 metres wide	None Scope for additional plantings	V/C Ratio - midblock on key 0.85 – 1 Amber, 1 and above Red
NOTES			Assessment takes into consideration the number of crossings per "segment" within the ranges given in Table A2. It does not accurately measure the individual distances (centres) between crossings provided.	Assessment primarily focuses on On-road/Street provision. *data refers to % length across segment or just at intersections, one or both sides*	This attribute presents an opportunity hence has been coded "green" and "amber"		This assessment will take into consideration the output from the current base year, and forecast year MBRC Models

Table A1: Pathways (Gap Analysis by width)

		Place Type Status		
		Type 1	**Type 2**	**Type 3**
LINK Status	(a) State Road	Off-Road (shared) 3.0m both sides (or greater)	Off-Road (shared) 3.0m both sides (or greater)	Off-Road (shared) 3.0m both sides (or greater)
		Off Road (Separated) 2.5m [see Table A3]	Off Road (Separated) 2.5m [see Table A3]	
	(b) Arterial	Off-Road (shared) 3.0m both sides (or greater)	Off-Road (shared) 3.0m both sides (or greater)	Off-Road (shared) 3.0m both sides (or greater)
		Off Road (Separated) 2.5m [see Table A3]	Off Road (Separated) 2.5m [see Table A3]	
	(c) Sub arterial	Off-Road (shared) 3.0m both sides (or greater)	Off-Road (shared) 3.0m both sides (or greater)	Off-Road (shared) 3.0m both sides (or greater)
		Off Road (Separated) 2.5m [see Table A3]	Off Road (Separated) 2.5m [see Table A3]	
	(d) Collector	Off-Road (shared) 2.0 to 2.5 both sides (or greater)	Off-Road (shared) 2.0 to 2.5 both sides (or greater)	Off-Road (shared) 2.0 to 2.5 both sides (or greater)

General note: GIS attributes include width of pathways, and material type for each pathway.

Table A2: Pedestrian Crossings (Gap analysis by provison per length)

		Place Type Status		
		Type 1	**Type 2**	**Type 3**
LINK Status	(a) State Road	>200m - <400m centres (amber) > 400m centres (red)	>400m - <600m centres (amber) > 600m centres (red)	>400m - <600m centres (amber) > 600m centres (red)
	(b) Arterial	>200m - <400m centres (amber) > 400m centres (red)	>400m - <600m centres (amber) > 600m centres (red)	>400m - <600m centres (amber) > 600m centres (red)
	(c) Sub arterial	>200m - <400m centres (amber) > 400m centres (red)	>400m - <600m centres (amber) > 600m centres (red)	>400m - <600m centres (amber) > 600m centres (red)
	(d) Collector	>200m - <400m centres (amber) > 400m centres (red)	>200m - <400m centres (amber) > 400m centres (red)	>200m - <400m centres (amber) > 400m centres (red)

General Note: On arterial and sub-arterial roads where two traffic lanes each way, pedestrian crossings may also include 'zebra' and refuge' type crossing.

For collector level or below, pedestrian crossings also include 'raised platforms' and 'shared zones'. 'Uncontrolled' crossing may be acceptable.

The analysis will take into consideration the number of crossing per segment as an average in the ranges presented.

Table A3: Cycle Provision (for the Gap assessment it is a "Yes" / "No" outcome)

		Place Type Status		
		Type 1	**Type 2**	**Type 3**
LINK Status	(a) State Road	**Yes / No**	**Yes / No**	**Yes / No**
		On-road 1.5 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph),	*On-road 1.5 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph),*	*On-road 1.5 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph),*
		Off-Road (shared) 3.0m both sides (or greater)	*Off-Road (shared) 3.0m both sides (or greater)*	*Off-Road (shared) 3.0m both sides (or greater)*
		Off Road (Separated) 2.0m	*Off Road (Separated) 2.0m*	
	(b) Arterial	**Yes / No**	**Yes / No**	**Yes / No**
		On-road 1.5 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph),	*On-road 1.5 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph),*	*On-road 1.5 60kph, 2.0m 80kph, 3.5m 100kph (4.0-4.5m with parking 60 - 80kph),*
		Off-Road (shared) 3.0m both sides (or greater)	*Off-Road (shared) 3.0m both sides (or greater)*	*Off-Road (shared) 3.0m both sides (or greater)*
		Off Road (Separated) 2.0m	*Off Road (Separated) 2.0m*	
	(c) Sub arterial	**Yes / No**	**Yes / No**	**Yes / No**
		On-road 1.5 60kph, 2.0m 80kph (4.0-4.5m with parking 60 - 80kph),	*On-road 1.5 60kph, 2.0m 80kph (4.0-4.5m with parking 60 - 80kph),*	*On-road 1.5 60kph, 2.0m 80kph (4.0-4.5m with parking 60 - 80kph),*
		Off-Road (shared) 3.0m both sides (or greater)	*Off-Road (shared) 3.0m both sides (or greater)*	*Off-Road (shared) 3.0m both sides (or greater)*
		Off Road (Separated) 2.0m	*Off Road (Separated) 2.0m*	
	(d) Collector	**Yes / No**	**Yes / No**	**Yes / No**
		On-road 1.5m (min) (1.8m contra flow for speeds 60kph or less where unavoidable)	*On-road 1.5m (min) (1.8m contra flow for speeds 60kph or less where unavoidable)*	*On-road 1.5m (min) (1.8m contra flow for speeds 60kph or less where unavoidable)*
		Off-Road (shared) 2.0m to 2.5m both sides (or greater)	*Off-Road (shared) 2.0m to 2.5m both sides (or greater)*	*Off-Road (shared) 2.0m to 2.5m both sides (or greater)*
		Bicycle awareness zones or shared zones	*Bicycle awareness zones or shared zones*	*Bicycle awareness zones or shared zones*

Note: Shaded information was identifying what the "detail provision" may look like if width information was available for detailed gap analysis.

General Note: Refer MBRC Table of Design Standards for Walking and Cycling Infrastructure for greater detail and Geometry

Table B: Assessment by Area - Availability of attribute (i.e. Gaps where there is none)

This table provides overaly information in addition to attributes identified in other tables

		Place Type Status		
		TYPE 1	**TYPE 2**	**Type 3**
Area	1 km (circle)	Walk - pathways		
	"on the ground distance"	yes / no		
	5 km (circle)	Walk - pathways		
		Cycle - pathways/provison		
	"on the ground distance"	yes / no		
	400m as you walk from a Bus stop / Bus interchange node **	walk - pathways and cycle provision	walk - pathways and cycle provision	walk - pathways and cycle provision
		How much of area is "covered" by the bus stop catchments - visually identify gaps. In addition, availability of paths.	How much of area is "covered" by the bus stop catchments - visually identify gaps. In addition, availability of paths.	How much of area is "covered" by the bus stop catchments - visually identify gaps. In addition, availability of paths.
	800 m as you walk from a Rail node	walk - pathways and cycle provision	walk - pathways and cycle provision	walk - pathways and cycle provision
	2.5km from primary school *#or district Centre (for Type 1)*	Yes / No - availability of a path (minimum - on one side)	Yes / No - availability of a path (minimum - on one side)	Yes / No - availability of a path (minimum - on one side)
	5.0 km *from major activity centre (for Type 1)* or high school #	Yes / No - availability of a path (minimum - on one side) (for highschool only as major centre is covered above)	Yes / No - availability of a path (minimum - on one side)	Yes / No - availability of a path (minimum - on one side)

Radius (circle) distances refer to as the crow flies - as you walk refers to distances calculated on the ground.

Review of the output from this analysis may identify additional width requirements over and above the assessment based on Table A1, and A3.

*** These maps illustrate the "coverage" of the bus / rail network and potential accessibility gaps to Public Transport*

 # We will need to identify "features" that relate to primary and high schools to undertake this task.

B3 Planning Policy Paper

Moreton Bay Regional Council

Transport Networks and Corridors Strategy

Planning and Policy Context Paper

Final | 25 June 2012

Job number 224390-00

Ove Arup & Partners Ltd

ARUP

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Summary of Case Studies

1 Introduction

This planning and policy review paper is part of a larger project that will develop a *Transport Networks and Corridors Strategy* for Moreton Bay Regional Council (MBRC). The overall study will provide a framework to guide the development of transport networks and corridors across all transport modes. This project will inform part of Council's planning framework in developing a new planning scheme for the region.

This paper forms part of the initial stage of this project. The objectives of this paper are to:

- Identify the policy and planning context of regional transport; including transport priorities;
- Assist in identification of existing and future transport links, where these are noted in regulatory and policy documents. The current and future regional transport networks have been comprehensively mapped as part of the initial stage of this project.
- Identify key principles and best practice of transport hierarchy for the MBRC project team to consider in establishing an appropriate transport hierarchy,

PART 1- Legislation, policy and planning

The first half of this paper is comprised of section headings 2 and 3 which address state and local planning context. This section of this paper reviews applicable State and local planning and policy to identify the region's transport intentions. In doing so, it identifies terminology, functions and the relationships used to describe different elements of the transport network and how these have been prioritised within policy and plans. This section also highlights relevant requirements and implications that may require consideration in the development of the Moreton Bay Regional Transport Networks and Corridors Strategy.

PART 2- Principles, typologies and examples.

The second half of this paper is comprised of sections 4: typologies and principles; and 5: case studies. These chapters identify principles, typologies and case studies where best practice has been applied to transport networks and corridors. Case studies have been selected based upon relevance of geography, similar situations faced by other Councils and authorities and known best practice. As such a number of case studies are from neighbouring Councils, Queensland and New South Wales. These examples themselves are varied in approach and more so in the application of the blend of principles and functional hierarchies employed for ensuring relevant network corridors and links are achieved. This section seeks to provide the MBRC project team with examples and guidance to inform the development of a network that will promote sustainable mobility, support the integrated land use and transport objectives for the region, and facilitate a resilient regional transport network that meet the needs of the community for years to come.

Interpretation and limitations

For the purposes of this paper Moreton Bay Regional Council refers primarily to Council's project team involved with this study, and here with is referred to as MBRC project team. The MBRC area refers to the Local Government Area (LGA) that is governed by Moreton Bay Regional Council. Council refers to Moreton Bay Regional Council.

The scope of this study is recognised as being limited at this stage to a desk top review of available information provided from Council and other sources. A list of documents reviewed can be found in **Appendix A**.

PART 1: Legislative and Regulatory Context

This part comprising of section 2-State Planning and section 3-Local Planning identifies the regulatory and policy context of the Moreton Bay regional transport network.

2 State Planning

This section reviews relevant State policy and documents. It highlights how these documents are relevant to the development of a transport networks and corridors strategy in the Moreton Bay Region, and State interests that must be taken into account.

2.1 South East Queensland Regional Plan

The *South East Queensland Regional Plan (SEQRP) 2009-2031* is the guiding State document for managing growth of the south east region and protecting its lifestyle and environment. Key policies that support integrated transport planning are:

- Develop interconnected and coordinated public transport links and overall network;
- Provide a multi-modal transport network to connect established urban areas to new broad hectare and employment areas;
- Support walking, cycling and public transport in the planning and development of urban areas;
- Support transit oriented communities and regional activity centres that give priority to public transport networks and services, cycling and walking routes; and
- Plan new public transport routes, facilities and high-frequency services including priority transit corridors, and support the interrelationship between land use and transport.

The SEQRP states that a key transport challenge for Moreton Bay is to acquire capital investment to meet the demand driven by growth and change. This refers to both established areas and proposed development, such as the Caboolture West Identified Growth Area. Therefore the focus for infrastructure provision is on linking major regional activity centres to proposed areas of residential growth, and providing additional capacity to service new development areas. This will be primarily achieved by increasing road capacity and providing public transport infrastructure and services along key routes.

2.2 Queensland Infrastructure Plan

The *Queensland Infrastructure Plan (QIP) 2011*, guides the state's infrastructure priorities for the next two decades encompassing nearly 1000 projects and programs. This plan replaced the previous *South East Queensland Infrastructure Plan and Program 2010-2031*. The QIP provides a platform for planning, prioritising and sequencing infrastructure. It includes a 20 year transport infrastructure program.

The QIP uses a trigger based approach to determine the priority of a project. Such triggers include expected population growth, catchment areas, traffic movements, crime rates, population age and economic growth.

Through the QIP, infrastructure investment and decision making is guided by five core principles which underpin the development of a whole-of-government approach to prioritisation of infrastructure. These principles are:

- Make smarter use of existing infrastructure;
- Focus on whole-of network solutions which support long-term planning;
- Manage the impacts of climate change and achieve sustainability;
- Make bold, large-scale infrastructure investment decisions based on sound evidence; and
- Strengthen partnerships.

These principles will guide the State's approach to:

- Maximising the value of existing infrastructure networks;
- Planning and prioritising new growth related infrastructure investment decisions;
- Partnering with other levels of government and the private sector; and
- Positioning Queensland to prosper in a future carbon-constrained global economy.

In terms of transport investment, one of the key themes of the QIP is inter-regional accessibility including the provision of local public transport. It states that investment in transport will aim to develop sustainable, efficient and affordable mass transit, including expanding existing rail networks.

The key directions for individual transport mode networks with the QIP are as follows.

- **Maintain an effective freight network** through the upgrading of arterial and motorways to support access to port facilities and ensure reliability along key freight routes;
- **Safer and more efficient highway travel**. Investment will focus on improving traffic and congestion management, increasing traffic capacity and improving road safety and efficiency (along Bruce Highway);
- **Integrated public transport solutions**. Investment will aim to develop an integrated transport network that is sustainable, efficient and affordable; and
- Transport investment will aim to develop **sustainable, efficient and affordable mass transit**, including the expansion of existing bus and rail networks. The Moreton Bay Rail Link is a key priority to ensure 'fast and reliable journeys' and 'reduce congestion on roads'. The Local Government Network priorities for Moreton Bay include the upgrading of several roads.

2.3 Connecting South East Queensland

The State Government's *Connecting SEQ 2031: An Integrated Regional Transport Plan for South East Queensland (CSEQ)* sets out the transport blueprint for the next 20 years. It works in conjunction with SEQRP and QIP, and as such strongly underpins the transport and transit components of SEQRP.

Relevant to the Moreton Bay region:

- Key bus enhancements - services for areas of North Lakes and Kallangur for the first time; seven new bus routes; six bus routes enhanced with additional services; additional services to connect with the new train timetable from June 2011.
- Key train enhancements – new timetables for the Caboolture line; simplified stopping patterns; additional morning and afternoon peak services added to the Caboolture line.
- Better infrastructure – new park n ride facilities at Bribie Island; additional park 'n' ride facilities in Morayfield.

Trends and policies that support improving the efficiency and safety of the transport system are listed in the following paragraphs.

Investment will be focused on achieving inter-connected communities across the region. Similarly, priority for capacity enhancement projects will be given to public transport, active transport and freight networks.

Rail will be the backbone of the future passenger transport system, so that the region is connected by efficient and high frequency transit.

Road network. CSEQ promotes planning and management of the road network as 'one network' regardless of ownership. It recommends having an agreed hierarchy of strategic and local roads across the region, and across levels of government. The development of the road network will complete a connected and managed strategic road network, supported by multimodal arterial roads for local travel.

Multi-modal urban arterial corridors. A State Planning Program will ensure new urban arterial roads are provided in growth corridors to avoid over-reliance on the strategic motorway and highway network by supporting intra-urban movements. Multimodal urban arterials will include facilities for cyclists and pedestrians, whilst also providing strategic corridors for buses. These will be access controlled. Where possible, intersections will be at-grade. Where arterials comprise part of the principal cycle network, these may also encompass high capacity, segregated veloway style facilities, or on-road cycle lanes on lower-demand sections.

TransitWays will be implemented that give bus and/or active transport facilities priority on roads that are regularly affected by congestion, particularly where new, alternative traffic routes and infrastructure are provided.

Road user priority will be assigned to public transport and freight vehicles on congested parts of the network. CSEQ states that roads need to be managed to encourage people to use public transport or share rides. Prioritisation of high capacity freight traffic may be necessary in areas close to major freight terminals and industrial zones.

Connectivity and permeability initiatives are recommended that encourage walking and cycling. These could include grade separation to allow access across a motorway, green links and bus short-cuts, or elimination of open level crossings such as Todds Road in Lawnton.

Freight. a new inter-modal freight terminal may be investigated north of the Brisbane River and south of Beerburrum on the North Coast rail line. This will better service the Moreton Bay and Sunshine Coast areas and freight from northern Queensland.

Moreton Bay integrated transport network will be required to adhere to these transport network policy priorities. These are further addressed in the Moreton Bay Integrated Transport Strategy in section 3.3.

2.4 TransLink Transit Authority Network Plan

The overarching goal of the *TransLink Network Plan (TNP)* is to simplify the network so that public transport is easier to use across the whole of journey for customers. The TNP reflects on TransLink's achievements of the last year, identifies public transport trends and challenges and sets out a plan and program of upcoming service and infrastructure investment for the following year.

For 2011-12, the TNP identifies regional infrastructure improvements including; a new bus station at Peninsula Fair; new bicycle facilities generally across the network; and new buses

on the network. In addition, the Moreton Bay Rail Link project is noted as one that will significantly improve the accessibility for residents of the region.

2.5 South East Queensland Place Model

Council has resolved to utilise the SEQ Place Model described in the *Next Generation* Planning 2011 in the preparation of the new planning scheme for MBRC area. This signals Council's intention to plan for a series of places, each with common characteristics, similar land use mixes and intensities of development.

The Model describes 'best practice' places of the future, rather than existing places. Each of the place types which are applicable to the MBRC area will form the basis of the settlement pattern which Council identifies as part of its strategic framework providing 'big picture' policy direction for the local government area.

Relevance to this Study

Council's implementation of the new planning scheme will have considerable outcomes on the movement of people and goods throughout the Moreton Bay Regional Council area. Council's direction to pursue the development of mixed use centres and transit oriented development along public transport corridors are policy directions to reduce private vehicle mode share, enhance the efficiency of services and encourage behaviour change towards making active transport the first choice for travel by residents and visitors alike.

2.6 Preferred Code Provisions for Movement Networks in Planning Schemes

This State model code represents Queensland Transport's preferred approach to addressing movement networks. This approach is generally consistent with the relevant *Integrated Planning Act Guideline 1/02*. The street and road provisions in this code relate to local government and street and road networks only, noting that each local government may use a different road hierarchy. However any differences in terminology and hierarchy must ensure the provisions are still properly applied. This code applies to master plans and structure plans, subdivisions, strata subdivision and development for new urban and rural development.

The purpose of the code is to provide a movement network that:

- Has a highly-interconnected street network that clearly distinguishes between elements of the various transport network hierarchies;
- Establishes good internal and external access for community;
- Encourages walking and cycling and supports public transport;
- Minimises the impact of through traffic; and
- Improves use of land and the efficient provision of public transport infrastructure and services to maximise community benefit.

The code addresses the following elements

- Street network design;
- Public transport;
- Cycle movement network; and
- Pedestrian movement network.

Hierarchy and Function

The code is based on the road hierarchy shown in Table 1. This includes function, role and management.

TIER 1: KEY FUNCTION	
Roads	*Streets*
• To carry through traffic	• To provide local property access • To collect local traffic

TIER 2: ROLE			
Arterial Roads	*Sub-Arterial Roads*	*Collector Streets*	*Local Streets*
• through traffic movements across town; • longer distance strategic traffic movements; • primary connection between suburbs and employment, economic, education or entertainment centres; • line haul public transport task; • primary freight and dangerous goods routes; • regional cycle movements.	• connections between local areas and arterial roads • connections for through traffic between arterial roads • access to public transport • through movement for public transport • regional-local cycle movements • pedestrian movements • access to developments	• carry traffic having a trip end within the local area • direct access to properties • access to public transport • pedestrian movements • local cycle movements	• direct access to properties • pedestrian movements • local cycle movements

TIER 3: MANAGEMENT								
Highway	*Arterial*	*Arterial Main Street*	*Traffic Distributor*	*Controlled Distributor*	*Major Collector*	*Minor Collector*	*Access Street*	*Access Lane*
• longer distance traffic movements between towns; • regionally and nationally significant movements.	• longer distance traffic movements between suburbs and other centres. *Treatment may involve preservation of aspects of local amenity in balance with traffic operation.*	• longer distance traffic movements; • access to commercial properties; • car parking; • pedestrian movements. *Treatment may involve preservation of aspects of local amenity in balance with traffic operation.*	• connection of local areas to arterial roads; • through movements between arterial roads. *Treatment may involve preservation of aspects of local amenity in balance with traffic operation.*	• connection of local areas to arterial roads; • access to properties (certain cases). *Treatment may control some aspects of traffic operation to ameliorate impacts.*	• connection of residential streets with traffic carrying roads • access to grouped properties	• connection of residential streets with traffic carrying roads • access to individual adjacent properties	• access to individual adjacent properties • access to local area	• access to individual adjacent properties

Table 1: Road Hierarchy Elements and their Objectives. (Source: Preferred Code provisions for Movement Networks in Planning Schemes, QTIPS 4).

Annex 2 of the code details the connectivity index which can be used to quantify how well a network connects destinations, and an accessibility index which can be calculated by dividing direct travel distances by actual travel distances. The code also includes examples of lane way design and pedshed analysis, the walkable catchment technique which maps the actual area with a five-minute walking distance from any centre, or ten minute walk from any major transport stop such as a railway station.

Relevance to this study

This code takes a predominantly traffic engineering approach to road hierarchy and function. The Department of Transport and Main Roads, through its participation in the state interest review process as part of the overall local planning scheme preparation by Council under the *Sustainable Planning Act 2009*, will be required to adequately address matters of State interest nominated by the Department. In this context, the specific outcomes of this code, and the terminology and hierarchy adopted by Council, is a state interest. Council will need to ensure therefore that its new planning scheme does not conflict with the requirements of this code.

3 Local Planning

This section reviews relevant planning schemes and documents that highlight Council's position and objectives regarding both current and future transport networks, streetscapes and land use. These directions and objectives, and proposed development provide guidance on how a future transport network should be shaped to respond to the region's requirements and intents.

3.1 Planning Schemes

Council is currently preparing the *Moreton Bay Regional Council Planning Scheme* expected to be adopted in late 2014. Until this time, the MBRC area has three separate planning schemes being, *Caboolture Shire Plan 2005, Pine Rivers Plan 2006 and Redcliffe City Planning Scheme 2005*, along with the *Mango Hill Infrastructure Development Control Plan (North Lakes)*. How their broader strategic intent for development within these plans is detailed below, with particular attention given to how the plans approach connectivity, transport priorities, and integrated land use and transport.

Caboolture Shire Plan, 2005

The *Caboolture Shire Plan's* strategic framework generally promotes an increase in residential areas through infill development within existing boundaries; and the promotion of increased densities and mixed use within/in proximity to centres and major public transport nodes. It outlines the establishment of transit oriented development in appropriate locations. The plan advocates centres that offer mixed use development that is provided in an integrated, cohesive and human scale manner. It aims to focus higher order commercial and community facilities growth around the Caboolture –Morayfield Centre as the principal activity centre for the Brisbane north metropolitan region.

The overall outcomes for the Development Code for Traffic, Access and Parking seek to maximise the safety efficiency and convenience of traffic movement, access and parking. Development should not result in unacceptable impacts on the external road network. The code gives guidance on preferable access for different levels of road. The scheme also includes Caboolture Shire's bicycle and pedestrian network.

Pine Rivers Plan, 2006

The land use and transport planning outcomes sought through the *Pine Rivers Planning Scheme* aims to consolidate urban uses and development within centres and near railway stations that are interconnected and form urban corridors. These corridors are to facilitate appropriate transport connections to improve access and mobility between and through urban areas. Within centres in particular, medium density and mixed-use is encouraged coupled with a high level of public transport accessibility, and walking and cycling provision.

Development should maintain and protect the efficiency and effectiveness of existing and future transport corridors and linkages. It adopts the purposes of roads for community purposes as defined in Schedule 1 of the *Land Act 1994*, which has been updated since.

Redcliffe City Planning Scheme, 2005

The *Redcliffe City Planning Scheme's* desired localities for urban development and uses are within the six urban villages in Redcliff. Urban development outside of these localities is strongly discouraged. Land is to be zoned and controlled accordingly to support public transport patronage, walking and cycling. In regards to the road network, the scheme defines this as comprising of two separate categories, being the trunk roads network and the pathways network. For the trunk road network, Redcliffe Council adopted the following desired standards of service:-

- Provision of a functional urban road hierarchy that supports settlement patterns, commercial and economic activities, freight movement and public transport; and
- The road network should be designed and constructed in compliance with relevant standards.

As the Redcliffe Planning Scheme guides the land use planning for this part of the MBRC area, until superseded, the proposed network corridor strategy needs to consider land use and transport outcomes put forward in the planning scheme.

Mango Hill Infrastructure Development Control Plan (North Lakes)

The *Mango Hill Infrastructure DCP* forms part of the *Pine Rivers Shire Council Planning Scheme*. Its overall vision is to provide an attractive, safe, convenient, efficient and sustainable town integrated and comprehensive master planning. The DCP seeks to enable high quality connections to the regional road and public transport networks to maximise accessibility to other locations within the Brisbane metropolitan area and the northern corridor.

In terms of roads the Infrastructure DCP, distinguishes between external and internal roads. External Roads are of a higher order such as the national highway network (Bruce Highway) and Anzac Avenue which is the primary connection to the regional road transport network.

The internal road network reflects a clear hierarchy of the following elements

- **Arterial roads** are to accommodate two lanes in each direction, which cater for high volumes of traffic as well as pedestrians and cyclists in separate carriageways and thoroughfares. Provision for a separate busway would be acceptable. Arterial roads are not intended to provide direct access to sites.
- **Major roads** are to collect and distribute traffic from land uses. These roads are intended to carry traffic and local bus services on a single carriageway.
- **Local streets** include collector roads, access streets and access places. These streets are intended to accept circulating traffic and pedestrian traffic in safe conditions that discourage through traffic.
- **Laneways** are to provide rear access to some residential allotments.

The path network is intended for recreational pedestrians and cyclists. Commuter cycle routes are considered separately and are to be provided for within the road reserve. These networks are integrated with the road network and public transport network.

3.2 MBRC Draft Strategic Framework

The MBRC *draft Strategic Framework 2012* sets the policy direction for the proposed MBRC LGA planning scheme. It will address a 20 year planning horizon and will provide for the realisation of the principles and policies of the *SEQRP2031* relevant to the MBRC area along with the Council's vision and aspirations for the future. Thus, the draft strategic framework reflects the integration of State interests and Council's planning intentions.

Through the implementation of the strategic framework, Council is intending to guide the development of the region towards:

- protection of significant environmental values;
- greater levels of self-containment in terms of jobs, services and facilities;
- better integrated transport system, emphasising walkable communities focussed on activity centres and mixed use urban nodes; and
- diversity in housing choice, employment and educational opportunities.

To increase the level of self-containment, the draft strategic framework identifies that Council will consolidate development, and increase the density of people and jobs in central locations. Activity centres will support a greater mix of activities and will have improved connectivity within and between the centres. This will provide existing and future residents with *a greater range of convenient travel choices in more walkable communities*.

The draft settlement pattern has been developed through the application of the SEQ Place Model to the region (see Section 2.5). Council has expanded the concept of place types identified in the model to suit the local character and variety of places that are reflected in the region. In this regard, the functional places types, which the Council has used in its MBRC Place Model is the basis for the future pattern of development, are:

- Mountain Ranges, Forests and Waterways Place Type;
- Rural Areas Place Type;
- Rural Townships Place Type;
- Key Resource Areas Place Type;
- Special Areas Place Type;
- Rural Residential Place Type;
- Suburban Neighbourhood Place Type;
- Next Generation Suburban Neighbourhood Place Type;
- Urban Neighbourhood Place Type;
- Activity Centres Place Type;
- Enterprise and Employment Areas Place Type;
- Coastal Villages Place Type; and
- Coast and Riverlands Place Type.

Analysis of the MBRC Place Model in regard to its relevance to the development of an integrated transport network across the region is detailed in Table 1 (**Appendix B**).

3.3 Emerging Master Plans and Local Plans

Master Plans are currently being prepared for the following three localities within the LGA, and will be incorporated into the MBRC Planning Scheme.

Caboolture-Morayfield Principal Activity Centre

This Principal Activity Centre serves as the primary regional centre. The master plan is expected to be completed late 2012. Integrated public transport is a key strategy guiding the development of the master plan. The master plan will improve public transport and cycle and pedestrian paths by enhancing connections between residential areas, key services, shopping and employment opportunities.

Strathpine Major Activity Centre

The *Strathpine Master Plan* applies to the area surrounding Bray Park Station and Strathpine Station. Key features of the master plan include an urban boulevard along Gympie Road to enhance the walking and cycling, development of Strathpine TOD and strong pedestrian links complemented by green space links. Updates to the master plan should be reviewed for further details on transport priorities.

Clontarf Woody Point Master Plan

The foreshore will provide improved parklands, picnic areas and spaces for recreation and gatherings. The master plan includes improvements to the existing pedestrian and cycle network and improvements to vehicle circulation and car parking.

Emerging Local Plans

It is also noted that a number of local area plans at various stages, are currently being prepared. These will also inform the preparation of the new planning scheme. These plans and projects include Redcliffe Seaside Village Rejuvenation Project, Narangba East Local Development Area Plan, Morayfiled- Burpengary Local Planning Area Investigation, Burpengary East Local Planning investigation. A number of local area plans are being developed for MBRL station localities. These localities are Kinsella, Kippa-Ring, Mango Hill and Rothwell, Murrumba Downs and Kallangur. Whilst full details for each of these local plans were not available at the time of this study, it s expected that a number of plans will emphasise the principles of TOD by providing opportunities for medium density residential and commercial near existing and proposed transport stations.

Relevance to this Study

In developing a network corridor and strategy, MBRC project team will need to consider the language and priorities adopted by each of the three former councils, as these have most likely shaped the transport elements and network of their relevant areas. As these schemes were developed in a similar period and hence adhere to similar Integrated Planning Act versions, they are fundamentally similar in terms of transport requirements, differing structurally in how this is presented.

Emerging master plans and local plans are most likely to demonstrate an improvement of transport priorities and functions. These plans, their goals and strategies will need to be considered in the development of the regional wide transport network.

3.4 Moreton Bay Integrated Transport Strategy

The *Moreton Bay Integrated Transport Strategy (MITS) 2012* refines goals, assumptions and recommendations put forward by CSEQ for the MBRC area. MITS is an outcome of a previous study undertaken in 2010-2012, which identified issues, set a vision and objectives, and assessed strategic options. This study along with the SEQ Strategic Transport Model-Multi-Modal (SEQSTM-MM) was used to evaluate strategy options to adopt a preferred strategy. MITS is the plan for implementing the preferred strategy. The vision of MITS is *to promote an integrated, efficient and accessible transport system that supports well connected, sustainable communities and reduce the social, economic and environmental cost of transport*. All transport modes and land use planning system will contribute to the MIT strategy.

MITS states that the following transport challenges (critical performance issues) are faced by MBRC area. All are highly relevant to this review.

1. High level of car dependence;
2. Limited public transport access away from rail line;
3. Limited transport connectivity between centres;
4. Deficiency in the road network capacity and hierarchy;
5. Incomplete active transport network; and
6. Congestion impacts on freight efficiency.

As such transport challenges are due primarily to network and hierarchy deficiencies, which in turn impacts capacity and modal efficiency. For example limitations of the arterial network, results in local trips being made on the Bruce Highway. This affects the efficiency of other transport modes such as freight being highly reliant on this highway.

In addressing these critical performance issues and CSEQ priorities, MITS has seven desired transport outcomes (DTOs). These are to:

1. Improve network connectivity and cohesion;
2. Improve transport network performance;
3. Support the role of activity centres;
4. Improve transport choice for communities with limited travel options;
5. Improve function of the freight network;
6. Improve public and active transport mode share and decrease car dependence; and
7. Improve coverage, safety and security of the active transport network.

Assessment showed that implementing only committed projects from QIP and CSEQ is not sufficient to meet the goals of CSEQ and MITS. Therefore further

investment and commitment is required in infrastructure projects, major upgrades to public transport services, and extra effort in the provision of active transport if the goals of CSEQ and MITS are to be met. These projects are identified within MITS and have been incorporated into Arup's GIS review of the existing and proposed transport modal hierarchies and networks.

Within the strategic framework, detailed strategies have been developed for each network and the land use system. Of these strategies there are 10[1] priorities. These are to:

1. **Increase passenger transport mode share** by building new rail lines (Moreton Bay rail and North West transport corridor), introduce UrbanLink bus service between major centres, employment and community destinations. Restructure local services to connect to rail corridor, activity centres etc, anddevelop North Lakes Green Link for buses and active transport between Mango Hill Station and Deception Bay via North Lakes.
2. Protect functionality and efficiency of the **Bruce and D'Aguilar Highways** for long distance travel and freight movement by developing alternative multi-modal arterial routes that serve localised and inter-urban travel.
3. Facilitate economic development of Strathpine, Caboolture/Morayfield, Redcliffe and Narangba town centres by developing by-passes/alternative routes for through traffic, including opportunities for buses, cyclists and pedestrians through **community boulevards**.
4. Complete **network of safe active transport priority routes** within 5km of designated activity centres and railway stations.
5. Eliminate **level crossings**, possibly at Buchanan Road Morayfield, South Pine Road and Mackie Road.
6. Improve **road freight connections** to Brendale, by upgrading Linkfield Road and Telegraph Road.
7. Develop an **intermodal freight terminal at Beerburrum South** and relocate train stabling and servicing facilities away from principal and major activity centres.
8. Prepare a **master plan for Caboolture West**
9. Identify and **preserve transport corridors**, especially those that will service Caboolture West, employment hubs around Bruce Highway and may provide additional connectivity to Brisbane.

Relevance to this Study

MITS sets out a list of priorities and possible infrastructure projects that have been incorporated into the GIS component of the network review. Importantly for this review, deficiencies in various modal networks have been listed as a critical performance issue, usually having knock on effects to other modes and regional mobility overall. MITS is a comprehensive strategy for which this study has incorporated in mapping future priorities noted in MITS, as part of this review.

[1] Only nine priorities were identified as per list below.

3.5 Moreton Bay Rail Link (draft) Vision Statement

The *draft Moreton Bay Rail Link (draft) Community Integration 20 year Vision Statement* outlines a broad vision to provide a transit oriented corridor along the MBRL line of the six stations which include: Kallangur (full TOD opportunity); Murrumba Downs (180 degree TOD / Park 'n' Ride); Mango Hill (full TOD opportunity); Kinsellas Road (180 degree TOD / Park 'n' Ride); Rothwell (full Park n Ride opportunity); and Kippa-Ring (full TOD opportunity).

Relevance to this Study

This study needs to recognise the vision at each of these locations in terms of ensuring appropriate connectivity and users are catered for, particularly with respect to the TOD aspirations at the designated stations. The principles behind the vision statement are also relevant to the integration of transport and land uses throughout the MBRC area.

3.6 Urban Design Charter

The *Urban Design Charter* sets out nine Council endorsed values to achieve quality places and guide growth and development in an appropriate and sustainable manner. These principles for place are:

- **Distinctive, creative** and **vital** places- the transport network should enhance the identity and uniqueness of places in the MBRC area. Transport should support mixed use activities, enhance the quality of life and support the functioning of places including social, economic and environmental aspects;
- **Safe** and **secure** places- transport should encourage healthy lifestyles most notably through walkability. CPTED principles can foster safety of transport users. User comfort ability and ease also need to be considered in the design of a transport network and associated places;
- **Responsive** and **adaptable** places- streets should be designed to a human scale. The transport network should be responsive to climate change, resource depletion and be able to adapt and absorb changing needs and context; and.
- **Connected** and **accessible** places- the transport network should contribute towards creating places that are logical, easily understood, well organised with a clear and distinct network of paths and spaces. It should provide frequent points of interconnection between paths and modes to increase choice. Places should be permeable, legible and walkable.

Relevance to this study

The nine values outlined aim to guide development and growth in a manner that positively contributes to public spaces and the urban realm in Moreton Bay. Good urban design can greatly enhance the legibility, safety, connectivity and layout of a place. Development of the transport networks and corridors strategy needs to consider how transport can contribute towards enhancing public space and urban design.

3.7 Street, Place, and Movement Framework

This document provides a framework for the quality of streetscapes in the Moreton Bay region. It emphasises the importance of streets as social places rather than just being movement corridors, and hence the need to design, develop and manage streets well. The framework considers streets as places, the function and design of the street, various users and their needs, and embellishments. In doing so, it provides principles and goals for the physical and visual quality expected of streets as they change and develop which aims to establish a decision making philosophy in relation to the development or refurbishment of the public realm within the MBRC region. Important lessons from the framework are that the design of streets must acknowledge the variety of context and purposes, and the varying interfaces between users. The document emphasises streets as people places, it recognises that most streets support some form of vehicular traffic, but that there also needs to be a rebalance towards the inclusion of other users too.

Relevance to this study

Along with Council's *Urban Design Charter*, the principles within this framework outline Council's approach and desire for the development of the region's streetscapes. It emphasises streets as places as well as being movement corridors. This guide should be consulted early in the process of designing and creating streets and in monitoring the regional street network. The principles of this framework should be incorporated into the development of the transport hierarchy.

PART 2: Principles, Typologies and Examples

The following offers a summary of known best practice examples and guidelines, with the view of providing a higher level understanding of a suitable approach to assist MBRC project team in establishing a transport hierarchy for the region. The review aims to provide direction preparing the overall Transport Networks and Corridors Strategy and Plan with approaches towards achieving a connected network.

In doing so, the review of guidelines and case studies (section 5) sought to specifically address the following: what hierarchy/terminology is employed; what is this terminology based upon; how aspects of the network are defined i.e. roads, pathways, cycle transit ways; and what level of service or standards are employed. Not all of these points of enquiry were able to be identified within all reviews.

4 Typologies and Principles

4.1 Walk 21 – International Charter for Walking

Council has adopted the International Charter for Walking, which aims to raise awareness and commitment towards encouraging a culture where people choose to walk. This is sought through nine strategic principles:

1. Increased inclusive mobility;
2. Well designed and managed spaces and places for people;
3. Improved integration of networks;
4. Supporting land-use and spatial planning;
5. Reduced road danger;
6. Less crime and fear of crime;
7. More supportive authorities; and
8. A culture of walking.

Relevance to this Study

Of particular note to this study is ensuring streets are designed for people not just cars, ensuring legibility, building and maintaining high-quality networks of connected functional and safe walking routes, providing integrated and extensive well equipped public transport services and the need to improve the integration of sub-networks. Council's adoption of the charter will help drive the direction and output of the strategy and plan by ensuring the identification of deficiencies, and solutions for these address the region's need for high quality walking networks.

4.2 Sustainable Street Network Principles

Through the *Sustainable Street Network Principles 2012*, the Congress for New Urbanism (CNU) advocates for a greater understanding of the role and function of streets contribute to the economic, social and environmental vitality of places.

Central to this premise, is the return to streets where walking and the human scale are the starting point of street design.

This premise is embedded within the following principles which seek to guide public policy, development practice, urban design, transport planning and engineering.

Principles for a sustainable network are:

- Create a street network that supports communities and places to fulfil a basic need of human society through the movement of people, goods, ideas and wealth;
- Create a street network that attracts and sustains economic activity;
- Maximise transportation choice;
- Integrate the street network with natural systems at all scales;
- Respect the existing natural and built environment;
- Emphasise walking as the fundamental unit of the street network; and
- Create harmony with other transportation networks.

Key characteristics that define sustainable streets are:

- A web of streets and travel modes that maximise connectivity;
- Desirable places where multiple networks overlap;
- Inherently complex;
- Major streets designed and spaced properly;
- All streets safe and walkable; and
- Wide variety of street types, each with a role in the network.

Relevance to this Study

The principles outlined by CNU generally correlated with those advocated by Council in its *Urban Design Charter* and *Street, Place, and Movement Framework*.

4.3 Building on Buchanan

This paper, *Building on Buchanan- Evolving Road Hierarchy for Today's Streets Oriented Design Agenda* reviews the traditional principles of road hierarchy put forward by Collin Buchanan in *Traffic and Town*, published in 1963. The paper does so to explore how these principles are adapted to better meet today's needs of sustainable transport, streets-oriented urban design and principles of new urbanism.

The traditional road hierarchy principles put forward in Traffic and Towns are premised on the functional separation of movement efficiency, and access/environmental amenity, so that a road functions as either a movement road, or an access road. These principles have influenced the layout of urban areas associated with car-oriented urban sprawl for the last 40 years. This has often

been criticised for resulting in dull or dysfunctional places that are dominated by roads.

Marshall however, argues that we should not simply disregard hierarchy as a redundant generic and prescriptive tool, but that hierarchy can prove to be a robust and flexible tool that can be adaptable to an array of situations. In doing so, he revisits the reasons for hierarchy stating that hierarchy is simply a way of governing how different kinds of roads should relate to each other, surrounding buildings and urban form. All classification recognises that there is some conflict between uses and users. Hierarchy is therefore a strategic tool for prioritising use and responsibilities for different routes in a network. The alternative, if there was no hierarchy, is that all streets would attempt to carry out the same functions and meet the needs of all users, and most definitely result in no roads meeting any needs satisfactorily.

A review provided of various transport hierarchies illustrates that the terminology used may differ, but that all examples follow the same basic priority ranking of major roads through to local roads. Marshall asserts that this form of ranking is based on geographic scale of significance, i.e. national to local significance, rather than the misconception of being based on 'traffic engineering' principles. Therefore, there is value in retaining hierarchy.

Marshall does however critique the current 'fixed' use of hierarchy where street types and their function are fixed to an idealised spectrum in which mobility function is inversely related to access function. This treats streets as having either/or functions that are in contrast. This limits the types of roads and streets. Marshall proposes the Link and Place hierarchy (described in section 4.2.4 below) that recognises that mobility and access are separate, but not necessarily incompatible. This type of hierarchy is based upon firstly decoupling the conventional fixed relationship between mobility and access functions; to enable streets to have any combination of both as independent variables in their own right. Therefore, the objective of this new classification is to identify an appropriate functional role of a particular street or street section in regards to the whole system. This guides decision making on the trade-off between different users of street space.

Relevance to this Study

This paper provides insightful learning to the relevance and application of hierarchy. A key lesson is that transport hierarchy should be seen as a scale of geographical significance, rather than traffic function. In pursuit of developing a hierarchy and network that responds to the particulars of the MBRC area, this paper suggests that the MBRC project team should avoid replicating the inverse mobility/access relationship so commonly employed, but rather decouple this inverse relationship and develop a classification based upon street functional role.

4.4 Link & Place: A Guide to Street Planning and Design

As noted previously, there is growing recognition that streets contribute in many ways to economic, environmental and social life, aspects that have often been neglected. The *Link and Place* hierarchy is based upon two variants being streets as movement conduits (links), and destinations in their own right (places).

The place value of streets may include sidewalk cafes, places to sit and gather, shop, public performances and parking. Therefore, the design objective is to spend time along the street. The value of the place may be determined by national, city or local significance. Based on catchment sizes and significance, places form a spatial scatter across the urban landscape.

The link value of a street refers to its ability to support efficient movement of private cars, public transport, cyclists, pedestrians and freight. The design objective is to save time. The level of link status may be informed by a spectrum of types from strategic to local. It is similar to the traditional road hierarchy.

The link and place approach has a number of benefits. It is, gives due weight to both movement and non-movement functions of a street and results in site-sensitive design, instead of a uniform solution along a corridor.

A matrix, such as that shown in Figure 1 assists in identifying a set of street types in each cell, with each cell having a unique combination of link and place functions. Further division of link/place status may occur based on land use and mode priorities. Design standards differ by cell for example; performance standards, design requirements and speed limits. Link/place status is not fixed; a particular street may change its cell by time of day, day of week or time of year.

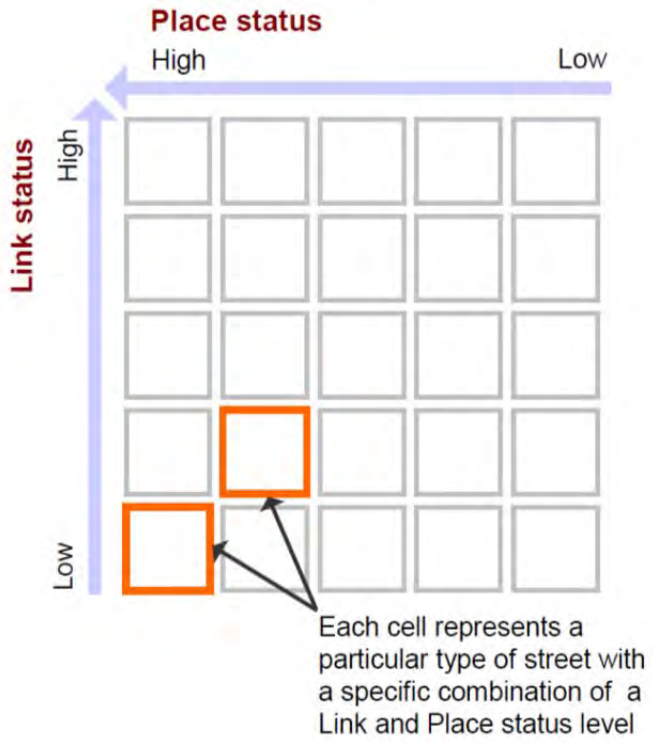

Figure 1: A street can be thought of as a particular combination of a thoroughfare and a destination as demonstrated in the matrix. (Source: Link & Place: A guide to street planning and design, 2007)

Relevance to this Study

This guideline offers an approach which is compatible with the place type planning Council is moving towards, and the associated links between different place types. For example consideration of the place value of activity centres or transit oriented nodes, would informs the type of links to other places, priorities given to different users and street allocations.

Taking this approach is demonstrated in the summary of the place types undertaken for the region, given in Appendix B – with a response to the type of movements likely to be related to the places.

4.5 Complete Streets. Guidelines for Urban Street Design

Complete Streets 2010 is a technical guide for urban street design. It replaces the previous *Queensland Streets*, for which the road hierarchy and street design was based on traffic volumes. It detours from this previous way of thinking towards a new hierarchy that serves the people using the street, be it for walking, talking, playing or socialising. In so doing, the thinking behind the guide pays the most attention to the most vulnerable users being pedestrians. This prioritisation is a move towards creating a mobility system in the future that will create more equitable access for all, provide mobility and choice and won't discriminate against those who choose not to drive to their destination.

The guide emphasises the difference between roads and streets. Roads, it notes have higher link status whereas the guide treats streets as places for doing things and carrying out activities such as shopping and meeting. This is in contrast to current hierarchical practice which treats streets as mini roads. The guide aims to rectify this and instead recognises the importance of streets in our social, communication and economic structures.

The guide divides streets into six types which are as follows.

1. **Main streets** are intended to support economic development of an area. They may have an important link function but this should not be to the detriment of the street a high place function. Residential amenity is not a high priority.
2. **Mixed-use streets** mainly differ from main streets in that they support residential uses along with retail, employment and so forth. Mixed-use streets therefore must have some degree of residential amenity.
3. **Streets for living** mainly support residential uses, but may also contain a corner store, home based business etc. These streets have a high level of amenity and are places to live and be.
4. **Industrial streets** support mainly industrial activities, with minimal presence of other uses. This typology is further divided into three industrial streets types relating to the presence of light, medium or large industries.
5. **Roads with street frontages** refers to streets that have existing character and access functions that should be retained, even though their current or future link purpose may be a higher priority. Design of these streets tends to on an individual basis, borrowing principles from the guide as appropriate.
6. **Rural residential streets** refers to rural areas with allotments smaller than 4,000m^2. They generally have a higher reliance on motor vehicles for mobility. Some provision for other modes should be considered. If areas are

more rural, road design manuals may be more appropriate than these guidelines.

Relevance to this Study

Complete Streets shows another application of link and place methodology applied within the Queensland context. Its move towards a hierarchy that promotes mobility equality, choice and recognition of the local context is highly appropriate to inform this review and later stage of developing a hierarchy that will respond to the changing transport needs of the MBRC area. Complete Streets offers a neat typology of streets based on place that the MBRC project team should find quite appropriate for its adoption of place based planning. This guide should go far in stimulating thoughts on how streets and roads may be classified and the level of amenity intended for each.

4.6 Centre Design Guidelines (draft)

The New South Wales Department of Planning's *draft Centre Design Guidelines 2011* provides design principles to guide the urban renewal of existing centres and the design of new centres. The guidelines were developed to ensure centres are well designed, functional and liveable and can meet the needs and accommodate additional population and activities within walking catchments.

The guidelines discuss transport, connectivity and mobility in the context of centre functionality, meeting growth and change. The guidelines adopt the centres hierarchy endorsed within the *Metropolitan Plan for Sydney 2036*. The Metropolitan Plan sets a guide for walking and cycling catchment sizes for each centre type, which corresponds to the NSW framework for defining the function and importance of different centres within the wider regional network of centres, similar to that employed within the *SEQRP 2031*. The centre's hierarchy provides a common language and understanding about centres and their roles. The hierarchy does not restrict the character of the centres from changing and is not part of the statutory planning system. Table 2 below shows preferred walking and cycling catchments for various centres.

Centre Typology	Preferred catchments	
	Walking	Cycling
Major centres and specialised centres	1km	3km
Town centres	800m	2.4km
Villages	600m	1.8km
Neighbourhood centres	200m	600m

Table 2: Preferred walking and cycling catchments for centres in NSW. (Adapted from: Centre Design Guidelines, 2011).

Hierarchy and functions

The following describes the recommended functioning and key relevant principles for constructing a Transport Networks and Corridors Strategy.

Walkable centres enable local trips for common needs and services to be reached by walking an achievable distance. Relevant principles include optimising opportunities to improve connectivity to, from and within centres; and encouraging a variety of path types such as lanes, arcades, share ways or promenades.

Street connectivity is a measure of the permeability and ease of access for all users. It is based on catchment size and time taken to reach key destinations. The street network should have clear and identifiable routes for pedestrian, cyclists and vehicles to improve connectivity. When designing streets, a balance should be sought between the priorities and needs of pedestrians, cyclists, public transport users, service vehicles and other motor vehicles. When reconfiguring the existing street network. It is recommended to restore route directness, avoid dead ends and reduce walking/cycling distances, where possible.

Major roads. The guidelines describe major roads as busy roads, with small clusters of shops and facilities that serve passing motorists on highways and major arterial roads, either on linear corridors or at major intersections. They do not provide the level of amenity or range of services usually found in other centre types. Their function is to carry regional traffic through, to, from, and around centres. Land uses are typically large format retail/commercial or light industrial uses. Key recommendations include diverting heavy vehicle traffic from more civic areas such as shopping streets, to ensure high levels of comfort and safety for pedestrians, and connecting local street directly to major roads to make it easy for pedestrians to navigate and move around neighbourhoods.

Main streets are usually the 'shopping street' supporting a row of commerce. Main streets are usually located along a recognised major thoroughfare that can also be a significant public transport route. Key principles include creating a lively main street (or streets) with a range of uses and activities and a pleasant pedestrian experience.

Local streets are mainly residential streets with less traffic movements, allowing for cycle lanes, on-street parking, and place for people to meet.

Lanes typically provide service access and loading areas and can support the pedestrian network, adding to the richness of the urban fabric.

Street element guidelines cover universal design, traffic calming, footpath widths, pavement materials and street furniture.

Relevance to this Study

This guideline provides useful guidance in terms of the "thinking" around network element function and importance in relation to achieving walkable catchments. The design principles generally mirror some of those in other guidelines although it offers good principles for the urban environment with respect to responding to the environment, good design guidance with respect to street elements, which may be useful when considering solutions for this study.

4.7 RTA Bicycle Guidelines

The NSW Roads and Traffic Authority's (RTA) *Bicycle Guidelines 2008*, provides guidance on how bicycle network facilities should be developed as part

of the wider transportation network. It is NSW Government policy to make appropriate provision for cyclists on all new major roads constructed. On arterial roads where major work is being carried out, provision should be made for bicycle facilities whether on or off road, or both.

The guideline summarises the five key principles that guide the provision of a bicycle network, namely: coherence; directness; safety; attractiveness and comfort. It further outlines how these relate to the different design / route conditions such as regional, local and mixed traffic routes.

Hierarchy and function

The guidelines define key words and terms associated with a bicycle network. It puts forward a three-tiered hierarchy within the cycle network detailed below.

Regional routes provide the quickest and most direct means of travelling between regional centres. This is equivalent to a state road within the road hierarchy. These routes offer the highest priority bicycle travel through an area with few delays and a high level of consistency and quality of construction.

Local routes link regional routes to local mixed traffic streets and provide a collector distributor function in the network. These routes also provide radial access to major sub-regional centres and parallel alternative access to regional routes.

Mixed traffic streets provide door to door access to places where people live. They are usually residential low-volume, low-speed streets where bicycles operate within the traffic stream and dictate the traffic flow.

Relevance to this Study

There is a desire as part of the identification of gaps and deficiencies in the region's network to ensure sufficient cycle provision along not only Council links, but also State road links. As such, the best practice principles may assist with identifying at later stages key methods/approaches for ensuring a provision that is applicable to these links.

5 Case Studies of Application

The following highlights examples of how various types of hierarchy and network strategies have been applied.

5.1 Sunshine Coast Council Sustainable Transport Strategy; and Sunshine Coast Active Transport Plan

The *Sunshine Coast Sustainable Transport Strategy 2011-2031* outlines the emerging priorities and key strategies that council will pursue to deliver a sustainable transport system. The strategy presents a policy framework and action plan for servicing the region to 2031 and beyond.

The *Sunshine Coast Active Transport Plan 2011-2031* which sits under the Sustainable Transport Strategy sets out the strategic planning for walking and cycling on the Sunshine Coast. The plan's policies and actions are grouped into seven priority areas which are: integrated planning; networks and infrastructure; safety; inform education and encourage; funding active transport; engage and partner; and monitor and report.

Approach

The strategy and plan have adopted a 'whole of journey' approach, which focuses on walking and cycling networks that connect to public transport stops, stations and interchanges. The act of defining all movement networks is guided by three transport concepts which are discussed as follows.

1. **Link and Place** as discussed in section 4.4 of this paper, the Sunshine Coast has generally adopted this approach to transport management which integrates land use, urban design and all transport modes in a coordinated manner. It assigns link and place status to each corridor and node. As such the Sunshine Coast in defining a corridor and node, considers a road's immediate attributes and street section (including physical form and demand for use), plus the streets role with respect to the wider street and urban system
2. The **user hierarchy** assigns priority in design and management of a corridor to pedestrians first, followed by consideration of other user modes in order to ensure that all modes that may be present are served in a balanced way (see Table 3: user hierarchy). This view emphasises that all users are important and the vulnerability of pedestrians and cyclists requires that their needs are considered early in any design or management decision. This does not imply that all modes should be catered for in all corridor sections and does not mean that pedestrians will always have a higher priority than other modes.

Consideration	User/mode
Consider first	• Pedestrians • Cyclists • Public transport users • Freight and specialist service vehicles
Consider last	• Other motor traffic

Table 3: Hierarchy is based on prioritisation of users that considers pedestrians first then cyclists, public transport users, specialist service vehicles and other general motor transport in that order. (Source: Sunshine Coast Active Transport Plan 2011-2031).

3. **Level of Service** (LoS) is a recognised way of describing operating performance. The level of service for an individual mode measures the service provided to negotiate the trade-offs between the various demands. Whilst the Council has yet to define how LoS will be measured at this stage, the Sunshine Coast's policy direction for levels of service applied to various mobility modes aim to:

    - Increase level of service for active transport (walking and cycling); and
    - Reduce the level of service for private motor vehicles. This is a passive action that will occur as the road network reaches peak capacity with time.

Hierarchy and functions

The three transport concepts above inform the Sunshine Coast's strategic transport hierarchy. The Sunshine Coast has mapped the proposed hierarchy and function of the region's transport corridors (Refer to Map 1: Corridor Reference Table, *in* Sunshine Coast Sustainable Transport Strategy 2011-2031, p 25.). This strategic hierarchy map also aims to guide the region's planning and implementation to achieve their sustainable transport vision.

The strategic hierarchy map takes into account the following:

- Regional activity centres including major tourist nodes and enterprise areas (as identified by SEQRP2031);
- Public transport hubs including regional, sub-regional, district hubs and intra-regional hubs servicing local and district centres; and dedicated public transport corridor stations as identified in CSEQ;
- Existing and proposed road interchanges (by 2031) along the Bruce Highway;
- Priority transit corridors and transit corridors as identified by CSEQ; and
- Ferry services represent existing and future opportunities for such services.

As this is a strategic map, pedestrian links are not shown due to scale limitations. These users do however remain the first consideration for giving priority in the region's transport network as stated in the user hierarchy table (see Table 3). Defining and mapping of pedestrian movement networks and locations of pedestrian priority activity primarily within activity centres will be undertaken as part of the Transport Management Plan, discussed below.

The hierarchy is comprised of different combinations of categories of each mode (public transport, cycling, road hierarchy and freight) as described in the modal description table.

Mode	Mode Detail	Mode notes
Public Transport	• Dedicated public transport • Public transport priority • Public transport advantage • Other public transport • Limited public transport	No notes
Cycle	• Principle Cycle • Non-principle cycle	Generally highlights those corridors where cycling is appropriate. This applies to most corridors, as most provide some form of cyclist facilities' whether on-road or off-road.
Corridor Hierarchy	• Arterial • Sub-arterial • Public Transport	The class of corridor is highlighted as 'road corridor' or 'dedicated public transport corridor'. If classed as a road, this is further sub-classified as either arterial or sub-arterial road. All existing and future arterial and sub-arterial corridors are assigned a reference based on the type of public transport, cycling, road hierarchy and freight they will support.
Freight	• Inter-regional freight (rail) • Inter-regional priority one freight (road)* • Intra-regional freight (road) • Intraregional priority two freight (road)* • Limited freight	Priority inter-regional and priority intra-regional freight routes are those as identified by SEQRP2031. Other intra-regional freight routes are those identified by Council as providing primarily for freight movement between activity centres and enterprise areas in the region.

Table 4: Modified Mode description table. *denotes mode details assigned by SEQRP2031 (Source: Sunshine Coast Sustainable Transport Strategy 2011-2031).

A corridor reference table expands upon the modal description table (Table 4 is a modified version) and describes the modal attributes of each corridor referred to in the strategic transport hierarchy map. There are 20 corridor types ('labelled 'A' to 'T'). Refer to Map 1: Corridor Reference Table in Sunshine Coast Sustainable Transport Strategy 2011-2031, p 25.

Transport Management Plan

The Sunshine Coast will develop a transport management plan that will support Council's Sustainable Transport Strategy and Active Transport Plan, by providing further detail and actions to drive implementation. Detailed place and street mapping will be conducted as part of the Transport Management Plan. The Transport Management Plan may also further articulate levels of services for each mode.

Relevance to this Study

Discussions with Sunshine Coast Council highlighted that it has made a vested decision to focus on the 'function' it wanted to achieve above all other considerations. This has been informed by overlaying all users across the network. Having identified appropriate functions, Council is only now considering the effect of these on the cross section of links (e.g. recognising that some links may have the same function, but a different cross section).

5.2 Brisbane City Council – Transport Network Development

Brisbane City Council (BCC) is currently developing a series of integrated transport networks in conjunction with developing a planning scheme for the local government area. BCC's approach is guided by the following Council policies of sustainable management of the city's transport system, reducing traffic congestion and increasing the uptake of public and active transport. BCC have undertaken extensive assessment and detailed planning of each network separately. It is now integrating these networks, which are:

- Freight;
- Public Transport;
- Private motor vehicles;
- Cycling; and
- Walking.

As such the approach taken by Council has been to look at each transport network separately and develop a hierarchy based on user needs. For example for cycling, the detailed assessment that informs how the cycle network should develop into the future, has undertaken the following steps:

- Reviewing factors that affect people's decisions to cycle;
- Identifying opportunities for increasing trips (trips under 5km and 10km);
- Identifying target trip type and trip locations (*feeders*- residential areas, future development areas; and *attractors*- employment areas, schools, centres, cultural and social facilities, recreation and sports areas);
- Identifying areas of the city that are easy to cycle (slope and topography); and
- Identifying areas of the city subject to traffic congestion.

In essence, BCC has identified where further development of the cycle network can have the greatest impact on supporting mode shift towards cycling in support of Council's policies noted above.

Relevance to this Study

In liaising with BCC, it was clear that it had a very well developed approach for completing their planning for a new Brisbane Bicycle Infrastructure Plan which will comprise of primary, secondary and local links (as outlined in their *Draft Brisbane Active Transport Strategy 2012-2026*).

BCC also recognised during their review the importance of reviewing their network within the boundary hierarchy classifications given in AustRoads and as outlined by TMR.

5.3 Thames Valley Multi Modal Study (UK)

The *Thames Valley Multi-Modal Study 2003* puts forward a multi-facetted transport and land use strategy for meeting the future transport needs of a fast growing area. The overall aim of the study was to identify transport problems and opportunities within the study area and to develop an integrated transportation strategy to address these. The study utilises an integrated, multi-modal, hub and spoke model based around eight major hub sites (Figure 2). These hubs are to be linked by high quality rail which will form the backbone of the system. Where corridors between these hubs cannot be served by rail, inter-urban bus services, mass transit and demand responsive transport will be promoted. Lower capacity access modes such as cars, cycle, bus and demand responsive transport will serve convenient interchanges that channel demand into key corridors.

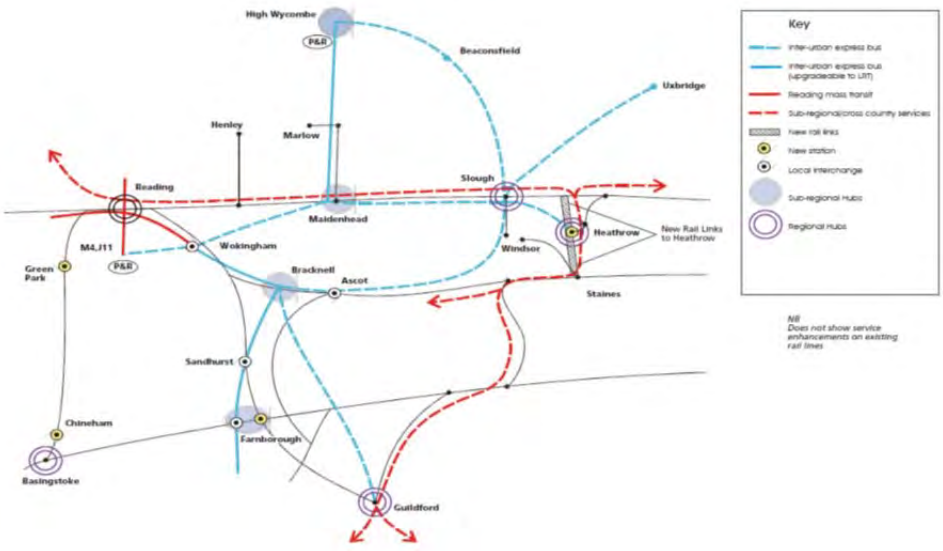

Figure 2: Thames Valley Public Transport Strategy.

Relevance to this Study

The Thames Valley Study provides a notable example of commitment to implementing a multi-faceted hub and spoke model. The planning of this study is focused on implementation, charging analysis and funding, which may be of interest to the MBRC project team at later stages of the transport network planning and implementation.

5.4 Liveable Arterials Plan (NZ)

The Auckland City Council's *Liveable Arterials Plan 2008*, guides the future use, management and development of Auckland City's street network. It aims to balance different needs and demands that different users place on and along arterials. The plan applies to all regional and district arterial streets and higher order collector streets.

Hierarchy and function

The arterial network is defined according to Auckland City's *Connecting People and Places*. In conjunction, this plan utilises four types of arterials that each have a different emphasis, namely:

- Freight emphasis;
- Passenger Transport emphasis;
- General vehicle emphasis; and
- Community emphasis.

Throughout, people are the top priority in defining and planning for street roles, functionality, and design. Detailed guidance of the type of outcomes envisaged for particular arterial corridors and parts of corridors is demonstrated in the plan to show how this can be achieved.

The plan recognises that different places are best supported by different approaches. In this regard, it seeks a place-based balance between many measures. This approach also requires better understanding of how the city works - in addition to transport issues this also includes the dynamics of population and economic growth, environmental issues, open spaces and heritage, community infrastructure and social issues. All of which are considered across the scales from regional, city-wide to local impacts.

Relevance to this Study

The approach taken by Auckland City Council focuses on arterial roads. The approach is flexible, allowing for different outcomes appropriate to different places, it recognises that to be sustainable, more than just the street function and traffic movement needs to be considered. As such, land use, social and cultural factors, and encouraging more sustainable mode share are also determining factors.

5.5 RTA Network and Corridor Planning Notes

This RTA *Network and Corridor Planning Notes 2008*, provides a process for enhancing the RTA's capacity to manage the road network, and forms part of a wider policy and organisational framework.

Integrated network and corridor planning processes are noted as a critical input to working towards the RTA's vision of *a safe, sustainable and efficient road transport system*. As such RTA's approach focuses on safety and efficient movement of people and goods. The RTA whilst primarily concerned with the road network also acknowledges this network is an integral part of the total transport system and its support for economic development and social functioning.

Hierarchy and function

The RTA has adopted the National Guidelines for Transport System Management in Australia which is based on a hierarchy of transport system elements (Australian Transport Council, 2006). This framework outlines the process and hierarchical elements. This framework begins at the strategic level of broad network and corridor planning, progressing through to the route and project levels, as shown in Figure 5.

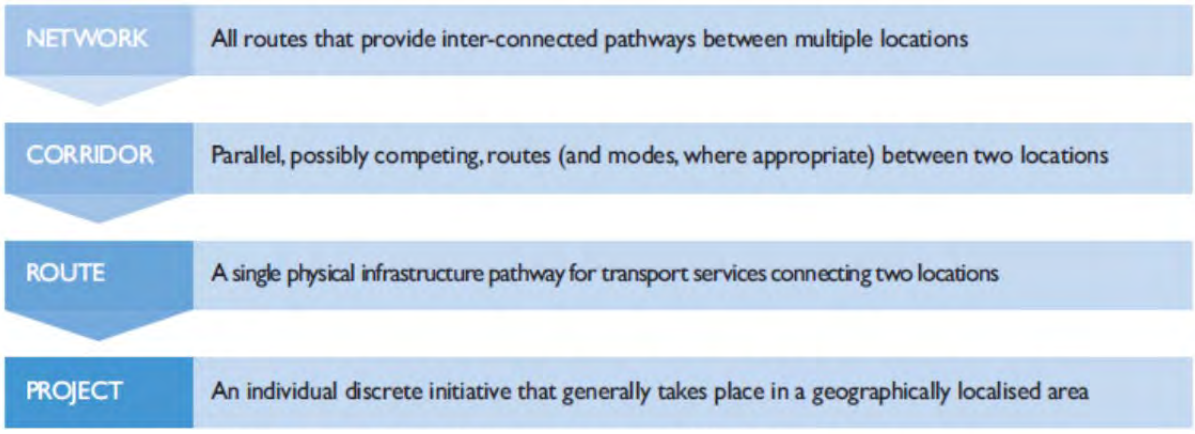

Figure 5: RTA Road Transport System Planning Levels (*Source: RTA Network and Corridor Planning Notes)*

The functional hierarchy and road classification system employed by the RTA, recognises the needs of different road users, and seeks to achieve an appropriate balance between the transport and non-transport functions of roads. It defines the transport function as *mobility* being, the movement of people and goods; and the non-transport function through *access* being, the ability to enter/exit land use adjacent to the road. These determining functions are mainly driven by the relationship between road network and the land use it serves.

Road classification

RTA utilises two main road classification systems, which are the administrative and the functional classification systems. The administrative class is based on a legal definition and responsibility, while the functional class is based on usage

and provides a basis for policy and management. The relationship between functional classification, role and network management principles is shown in Table 6 below. The functional class of a road may change over time in response to changes in its intended role.

Administrative System	Functional System
State Roads	Freeways, motorways and arterial roads
Regional Roads	Sub-arterial roads
Local Roads	Collector and local roads

Table 6: Administrative and functional systems are used to classify roads. (Source: RTA Network and Corridor Planning Notes, 2008).

The **road network management hierarchy** organises the network into logical groupings so that state roads can be managed according to their relative importance. It divides the State road network into 12 classes being Urban Network Class 1U-6U and Rural Network Class 1R-6R. This is based upon a combination of traffic volumes, heavy vehicle volumes, posted speed zoning, and strategic factors such as inclusion in the AusLink National Network or the Strategic Bus Corridor Network. This classification also broadly corresponds to the functional and administrative classification systems. The road management hierarchy articulates for each of the 12 classes an appropriate average annual daily traffic and heavy vehicles, and speed limit.

Relevance to this study

These planning notes provide a succinct definition of typical functional road hierarchy elements particularly with respect to the likely users and access opportunities. The description of the functional road hierarchy and operational service levels may also offer good practice input for future discussions with regards to agreeing on any likely changes or approaches to establishing a revised hierarchy typology for the region.

6 Summary

6.1 Regulatory and policy context

This review has established the planning context for the network strategy and plan. This will enable further stages of this study to appropriately consider and incorporate regional and local intentions for the transport network and regional development. Significantly, this context emphasises a desire to transition to place based planning following the SEQ Place Model.

The review has further identified the strategic transport intentions and land use patterns as set out within SEQRP, mode targets and goals set by CSEQ which have been refined and localised through MITS. A review of current and proposed local planning schemes and master plans has highlighted Council's intentions for settlement patterns and transport. Council's guides such as Urban Design Charter and Street, Place and Movement Framework highlight Council's existing approach to streets as places. It is crucial that the subsequent steps of this study acknowledge and build upon these existing studies and approaches to maximise the appropriateness of recommendations made at later stages of this study.

6.2 Typologies and case studies

The review of case studies has highlighted the current shift in thinking from prescriptive, inflexible road hierarchies based upon traffic volumes and conduit functions; to hierarchies that are more flexible, guiding rather than standardised, and are place responsive to support the surrounding land uses. These hierarchies importantly also recognise the economic, social and environmental functions of streets. Appendix C summarises the hierarchy employed and key lessons of each case study.

Whilst the case studies illustrate the multitude of ways in which places and authorities have applied hierarchies to enable more sustainable settlement patterns and transport options, a number of key factors were evident throughout. These were

- **Designing streets for people** usually entails a user hierarchy that gives highest priority to pedestrians, then active transport, public transport, and lastly motor vehicles. Within the *Link and Place* methodology, identification of user priority informs appropriate movement and place functions. *Complete Streets* importantly emphasises the need to restore equity of travel modes and users;
- Marshall in his analysis *(Building on Buchanan*) of multiple hierarchies and terminologies demonstrated that whilst there is a wide variety of terms used to describe different road types, all are based on a **geographic scale of significance.** This displaces the misconception that the function and importance of a road based on principles of traffic engineering alone. Link and Place follows through showing a methodology that also incorporates the geographic significance of place and how the street design could respond.
- Recognising not just the mobility functions of streets and road network, but also the **economic**, **social** and **environmental functions** they support. The *Congress for New Urbanism* strongly advocates that design recognises the

multifunctional roles of streets to support sustainable communities and regional development;

- **Balancing mobility and access**, processes that are accountable in how they consider different user needs. The *Auckland Liveable Arterial Project*, *Link and Place,* and *Sunshine Coast Strategy and Plan* provide sound working methods for doing so;
- Hierarchies are usually well integrated into a **wider policy framework** that addresses sustainable transport and regional transport and land use intentions. This review has highlighted the importance of a network hierarchy that closely aligns with the policy and planning context; and
- Hierarchies should be **intuitive, flexible** and **transparent** in how the needs of different users have been considered or addressed in street designation, space allocation and embellishment. This enables users to have a say over how their streets should be designed, taking into account street allocation requirements. *Link and Place* provides a good example of stakeholder exercises. *Complete Streets* offers another example of detailing appropriate responses, but giving enough flexibility for street design to respond to the local context. *Sunshine Coast Council's hierarchy* also illustrates flexibility in being able to accommodate a myriad of situations whilst remaining user friendly and comprehensible.

Appendix A

Background documentation

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Appendix B

MBRC Area Place Types

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Mountain Ranges, Forests and Waterways Place Type	Place dominated by the natural environment. Protection of ecological assets and biodiversity, access to natural settings. Covers the mountains, forests and waterways associated with the D'Aguilar, Blackall and Conondale Ranges and hamlets of Mt Nebo, Mt Glorious and Mt Mee.	Low-key, low-intensity, outdoor recreational, educational and environmental character and function. Diverse range of active and passive outdoor recreational activities. Dispersed dwellings and farm buildings on large rural allotments. Employment opportunities include: • low-key, low-impact tourist facilities and accommodation; • agricultural, forest practices, animal husbandry and rural support activities; • existing small-scale shops and tourist facilities at Mt Nebo, Mt Glorious and Mt Mee; and • home-based businesses.	Roads provide for local trips, visitor traffic and safe evacuation routes during bushfire events. Likely vehicle types using roads in this place include private motor cars, motorcycles, small delivery vehicles, tourist buses, Council trucks, farm vehicles and bicycles. Sealed roads intended to have adequate width to include line-marked shoulders to accommodate cyclists, especially on hilly sections.	Specific areas to be included: • D'Aguilar National Park • Brisbane Forest Park • Bunyaville Forest Reserve • North Lakes Environmental Park • Clear Mountain State Forest Land which is included in the Catchment Locality which is included in the: • Conservation Zone • Open Space Zone • Special Facilities (SF1 and SF3) Zone Land which is included in the Mountain Summit and Forests Locality which is included in the: • Rural Zone	Specific areas to be included: • Hays Inlet Conservation Park • Nathan Road wetlands reserve Land which is included in the: • Natural Values Zone	Specific areas to be included: • Freshwater National Park • Sheep Station Creek Conservation Park • Beerburrum State Forest • Bribie Island National Park • Buckleys Hole Conservation Park • Glass House Mountains National Park	Home-Based Work: • Private Motor Vehicle or Motor Bike Home-Based Education: • Private Motor Vehicle or Motor Bike • School Bus • Bicycle Home-Based Shopping: • Private Motor Vehicle or Motor Bike Home-Based Other: • Private Motor Vehicle or Motor Bike • Bicycle Work-Based Work: • Private Motor Vehicle or Motor Bike • Farm Machinery • Small Delivery Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Tourist Buses • Bicycle	• Rural Townships • Activity Centres

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Rural Areas Place Type	Place mostly used for rural production (from low intensity grazing to intensive cropping/animal husbandry). Rural living is secondary to rural production. Focussed in rural areas surrounding Samford, Dayboro, Woodford, Bellthorpe, Wamuran, Elimbah and Pumicestone.	Areas of GQAL limited to uses that are allied to / compatible with ongoing sustainable productive use of land. Dispersed dwellings and associated outbuildings on large rural allotments. Some small discrete clusters of housing. Employment opportunities include: • agricultural, cultivation, grazing, forestry and horticulture • rural service industries; • low-key, low-impact, small-scale tourist and recreation facilities • low-key, low-impact, short-stay tourist accommodation; • activities complementary to Woodfordia; and • home-based businesses and cottage industries.	Roads provide for local trips, visitor traffic and safe evacuation routes during bushfire events. Likely vehicle types using roads in this place include private motor cars, motorcycles, small delivery vehicles, tourist buses, Council trucks, farm vehicles and bicycles. Sealed roads intended to have adequate width to include line-marked shoulders to accommodate cyclists, especially on hilly sections.	Land which is included in the Catchment Locality which is included in the: • Rural Zone • Rural Residential Zone • Special Residential Zone Land which is included in the Rural Living Locality which is included in the: • Rural Zone • Rural Residential Zone Land which is included in the Coast and River Lands Locality which is included in the: • Rural Zone Land which is included in the Mountain Summit and Forests Locality which is included in the: • Rural Zone		Land which is included in the: • Rural Zone • Rural Residential Zone – where located outside the Urban Footprint defined in the SEQRP	Home-Based Work: • Private Motor Vehicle or Motor Bike Home-Based Education: • Private Motor Vehicle or Motor Bike • School Bus • Bicycle Home-Based Shopping: • Private Motor Vehicle or Motor Bike Home-Based Other: • Private Motor Vehicle or Motor Bike • Bicycle Work-Based Work: • Private Motor Vehicle or Motor Bike • Farm Machinery • Small Delivery Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Tourist Buses • Bicycle	• Rural Townships • Rural Residential • Activity Centres • Enterprise and Employment Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Rural Townships Place Type	Townships centre on a mixed use, low-rise main street with eclectic mix of uses surrounded by detached housing on larger lots. Most have a range of local community facilities and services and rely upon larger centres for higher order uses such as employment, major health, higher education and cultural needs.	Mixed-use, low-scale main street, usually with traditional design elements such as supported awnings over footpaths. Schools, pre-schools, child care centres, places of worship and community health services located within townships. Active and passive local civic spaces, open space, sport and recreation area including showgrounds located within townships. Residential development is predominantly low-density detached dwellings in traditional subdivision layout. Some small-scale service/tourist/day-tripper activities. Industrial uses (small-scale local service trades, transport and farm machinery).	Well-connected network of streets and pathways within township area for all vehicle types, cyclists and pedestrians. Likely vehicle types using roads in this place include private motor cars, motorcycles, small delivery vehicles, tourist buses, Council trucks, farm vehicles and bicycles. Interconnected open space corridors and roadways provide for horse trails, walkways and cycle tracks.	• Samford • Dayboro		• Wamuran • Woodford-D'Aguilar	Home-Based Work: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian Home-Based Education: • Private Motor Vehicle or Motor Bike • School Bus • Bicycle • Pedestrian Home-Based Shopping: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian Home-Based Other: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian Work-Based Work: • Private Motor Vehicle or Motor Bike • Small and Large Delivery Vehicles • Farm Machinery Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Tourist Buses • Bicycle • Pedestrian	• Mountain Ranges, Forests and Waterways • Rural Areas • Rural Residential • Activity Centres • Enterprise and Employment Areas • Special Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Key Resource Areas Place Type	Areas set aside to facilitate long-term resource extraction.	Extractive resource operations and processes and activities that is allied to and compatible with these activities.	Nominated transport routes and dedicated haulage corridors are protected for the transportation of extracted material. Likely vehicle types using roads in this place heavy trucks (articulated and rigid). Existing and new haul roads are constructed, upgraded and maintained to adequate standard for haulage purposes. Adequate linkages to the regional freight network to accommodate heavy vehicle movements.	• Whiteside KRA • Pine Rivers North KRA • Pine Rivers South KRA		• Bracalba KRA • Meldale/ Donnybrook KRA • Narangba KRA • Ningi KRA,	Work-Based Work: • Private Motor Vehicle or Motor Bike • Heavy Rigid and Articulated Trucks	• Enterprise and Employment Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Special Areas Place Type	Large scale, single use or focus place.	Cater for special land uses and temporary events	Areas used for special events have unique parking and access arrangements addressed through specific event management strategies.	• Lakeside Motor Sport Complex • South Pine Sporting Complex • North Pine Country Park • Brendale WWTP • Dayboro WWTP • Murrumba Downs WWTP • Murrenbong Scout Campsite • Baden Powell Park • Proposed Samford Valley CSIRO Parklands	• Scarborough boat harbour • Redcliffe aerodrome • Redcliffe WWTP	• Woodfordia • Abbey Museum • Caboolture Aerodrome • Caboolture Historical Village • Queensland State Equestrian Centre • Shaftsbury Citizenship Campus • Caboolture Regional Sports Park • Woodford Correctional Centre • Bribie Island WWTP • Burpengary East WWTP • South Caboolture WWTP • Woodford WWTP	Work-Based Work: • Private Motor Vehicle or Motor Bike • Small and Large Delivery or Maintenance Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Tourist Buses • Bicycle • Pedestrian	• Rural Townships • Rural Residential • Suburban Neighbourhood • Next Generation Suburban Neighbourhood

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Rural Residential Place Type	Rural living on large allotments with some infrastructure.	Single detached houses on allotments ranging from 3000m^2 to 2 hectares. May also contain second dwelling unit and often large outbuildings. Limited opportunities for local employment: • Home-based businesses, including some owner-operated service trades businesses operated out of rural residential premises • Horticulture, restricted agriculture and non-intensive animal husbandry • Small to medium scale recreation and tourism uses	Passenger transport is poor/non-existent. Therefore, there is general reliance on private motor vehicle for access. Recreational trails provide connections to rural townships. Access to convenience shopping/essential services in nearby areas via sealed roads. Interconnected open space corridors and roadways provide for horse trails, walkways and cycle tracks. Sealed roads intended to have adequate width to include line-marked shoulders to accommodate cyclists, especially on hilly sections	Land which is included in the Rural Living Locality which is included in the: • Rural Zone • Rural Residential Zone • Special Residential Zone • Special Facilities Zone (some instances) Land which is included in the Semi Urban Locality which is included in the: • Park Residential Zone • Special Facilities Zone (some instances) Land which is included in the Catchment Locality which is included in the: • Park Residential Zone		Rural Residential Zone – some of the area located within the Urban Footprint defined in the SEQRP	Home-Based Work: • Private Motor Vehicle or Motor Bike Home-Based Education: • Private Motor Vehicle or Motor Bike • School Bus Home-Based Shopping: • Private Motor Vehicle or Motor Bike Home-Based Other: • Private Motor Vehicle or Motor Bike • Bicycle Work-Based Work: • Private Motor Vehicle or Motor Bike • Small and Large Delivery Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Bicycle	• Rural Townships • Activity Centres • Enterprise and Employment Areas • Special Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Suburban Neighbourhood Place Type	Areas that have developed over the past 60 years for predominantly residential development. Capacity and capability for land use change in foreseeable future is limited.	Mostly detached houses on a range of allotment sizes. New infill development will comprise mix of lot sizes, including small lot, zero lot line, and rear lane housing. Some dual occupancy, low-rise multiple dwellings, housing for older persons may occur adjacent to local centres/ bus stops on main thoroughfares. Local centres provide day-to-day convenience retail, local services, local/neighbourhood parks, primary schools and community facilities.	Generally not well serviced by public passenger transport. Main through streets provide access to schools, local centres, neighbourhood and district sports and recreation facilities and are the main bus routes through the place. Active transport linkages provide mainly for school and recreational trips. Roads of collector or higher order include linemarked shoulders to accommodate cyclists.	Land which is included in the Urban Locality which is included in the: • Residential A Zone • Local Business Zone • Neighbourhood Facilities Zone • Parks & Open Space Zone • Special Purposes Zone • Special Facilities Zone (some instances)	Some of the land included in the: • Low Density Residential Zone • Mixed Residential Zone • Open Space and Recreation Zone • Community Purposes Zone	Some of the land included in the: • Residential A Zone • Rural Residential Zone • Rural Zone • Local Centre Zone • Open Space Zone • Special Use Zone	Home-Based Work: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Home-Based Education: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Home-Based Shopping: • Private Motor Vehicle or Motor Bike • Bus • Bicycle • Pedestrian Home-Based Other: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Work-Based Work: • Private Motor Vehicle or Motor Bike • Small and Large Delivery Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian	• Activity Centres • Enterprise and Employment Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Next Generation Suburban Neighbourhood Place Type	Applies to targeted existing suburban areas, new greenfield and rural residential transitional areas that have capacity and capability to change in the foreseeable future to accommodate new residential development and related local services.	Mix of housing types including detached houses on smaller lots, duplexes, attached houses and some shop-top housing. Local centres provide day-to-day convenience retail, local services, local/neighbourhood parks, primary schools and community facilities. Intended to include more local employment opportunities within walking distance of dwellings than the Suburban Neighbourhood Place Type. Local employment generally in the form of home-based businesses.	Place intended to be developed at a density that will support passenger and active transport. Streets generally provide for cars, bikes and pedestrian movement. Intended to be developed as walkable neighbourhoods. Access to frequent short distance public passenger transport services to nearby activity centres, transport nodes and urban neighbourhoods.	Land which is included in the Urban Locality which is included in the: • Residential A Zone • Residential B Zone • Park Residential Zone (some) • Local Business Zone • Neighbourhood Facilities Zone • Parks & Open Space Zone • Special Purposes Zone	Some of the land included in the: • Low Density Residential Zone • Mixed Residential Zone • Open Space and Recreation Zone • Community Purposes Zone	Some of the land included in the: • Residential A Zone • Residential B Zone • Rural Residential Zone • Rural Zone • Local Centre Zone • Open Space Zone • Special Use Zone	Home-Based Work: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Home-Based Education: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Home-Based Shopping: • Private Motor Vehicle or Motor Bike • Bus • Bicycle • Pedestrian Home-Based Other: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Work-Based Work: • Private Motor Vehicle or Motor Bike • Small and Large Delivery Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian	• Activity Centres • Enterprise and Employment Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Urban Neighbourhood Place Type	Selected formerly suburban areas adjoining activity centres and/or existing railway stations intended to be targeted for infill and redevelopment associated with public investment in passenger transport infrastructure. Areas possess the attributes and capacity to change over time to more walkable, compact and sustainable community form. Have an underlying structure that will allow change to occur, including a permeable and legible street network (or potential for one to be developed) and subdivision pattern and lot sizes that will support redevelopment to higher densities.	Focus of neighbourhood is a local mixed use business centre which is easily accessed and located on main through street and is public passenger transport node. Where area includes a railway station, development is focussed in 5-10 minute walking distance (400m to 800m) with denser development within the 400m core. Local mixed use business centre contains full range of services and facilities to meet day-to-day convenience needs of local residents and businesses. Environment is vibrant with attractive streetscapes, active frontages, public town centre parkland/space, civic facilities and architecturally designed buildings. Centre is supported by complementary uses which may include higher density residential, commercial premises, low impact service industries, primary and secondary schools and child care facilities. Diversity of housing types, tenures and sizes is provided, with a bias towards attached and multi-unit dwellings. Significant local employment	Streets are grid based and connected to enhance legibility and support redevelopment and change over time. Main through streets provides access to schools, local shops, districts sports and recreation facilities and are the main bus routes. Convenient, safe and legible active transport pathway network. Each resident is located within walking distance of public passenger transport which provides short trips to nearby activity centre and integrated transport hub (creation of 10 minute neighbourhoods). Full or 180 degree transit oriented development at key rail nodes, including walkable catchments with fully integrated pathways, roads and streets that facilitate walkable communities and safe and accessible cycling.	Land which is included in the Urban Locality which is included in the: • Residential A Zone • Residential B Zone • Commercial Zone (some) • Future Urban Zone • Parks & Open Space Zone • Sport & Recreation Zone • Special Purposes Zone • Special Facilities Zone (some)	Some of the land included in the: • Low Density Residential Zone • Mixed Residential Zone • Open Space and Recreation Zone • Community Purposes Zone • Retail Core Zone • Health Services Zone	Some of the land included in the: • Residential A Zone • Residential B Zone • Rural Residential Zone • Local Centre Zone • Open Space Zone • Special Use Zone	Home-Based Work: • Bus/Rail • Bicycle • Pedestrian Home-Based Education: • Bus/Rail • Bicycle • Pedestrian Home-Based Shopping: • Bus • Bicycle • Pedestrian Home-Based Other: • Private Motor Vehicle or Motor Bike • Bus/Rail • Bicycle • Pedestrian Work-Based Work: • Bus/Rail • Bicycle • Pedestrian • Small and Large Delivery Vehicles Other Non-Home-Based: • Bicycle • Pedestrian	• Activity Centres • Enterprise and Employment Areas

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Activity Centres Place Type	Range of different scales of activity centres – District, Major Regional and Principal Regional. Diverse mix of uses with concentration of retail, business, commercial, employment, health services, education, administrative, community, cultural, recreation and entertainment.	Predominantly non-residential uses and key employment areas. Combination of uses spans primary urban land use categories including retail, office employment, community and civic and multi-unit residential. Housing is usually in the form of apartments in multi-storey buildings, with little or no single detached houses. Man-made environment is dominant with public spaces and urban parks providing gathering points and meeting places. Transit Oriented Development at major transport nodes.	Focus of public transport networks and hub for pedestrian and bicycle networks. Major and Principal Regional centres are major transport hubs that serve catchments of sub-regional and regional significance. Streets are lined with mature trees, constructed footpaths for pedestrians and roads shared by vehicles and bikes. Full or 180 degree transit oriented development at key rail nodes, including walkable catchments with fully integrated pathways, roads and streets that facilitate walkable communities and safe and accessible cycling.	• Strathpine Major Regional Activity Centre • North Lakes Major Regional Activity Centre • Petrie District Centre • Kallangur District Centre • Warner District Centre • Albany Creek District Centre • Arana Hills District Centre	• Redcliffe-Kippa Ring Major Regional Activity Centre • Margate District Centre	• Caboolture-Morayfield Principal Regional Activity Centre • Bellara District Centre • Burpengary District Centre • Deception Bay District Centre • Narangba District Centre	Home-Based Work: • Bus/Rail • Bicycle • Pedestrian Home-Based Education: • Bus/Rail • Bicycle • Pedestrian Home-Based Shopping: • Bus • Bicycle • Pedestrian Home-Based Other: • Bus/Rail • Bicycle • Pedestrian Work-Based Work: • Bus/Rail • Bicycle • Pedestrian • Small and Large Delivery Vehicles Other Non-Home-Based: • Bus/Rail • Bicycle • Pedestrian	• Rural Residential • Suburban Neighbourhood • Next Generation Suburban Neighbourhood • Urban Neighbourhood

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Enterprise and Employment Areas Place Type	Major locations for industrial activity and associated business activity critical to the future growth of employment activities.	Place type primarily intended for manufacturing, engineering, transport, logistics and warehousing activities and associated business activities.	High level of accessibility to regional freight network. Areas have safe, legible and convenient walking, cycling and passenger transport access from dominant workforce and customer catchments. Likely vehicle types using roads in this place include private motor cars, motorcycles, articulated vehicles, large rigid vehicles, small delivery vehicles and bicycles.	• Brendale • Petrie • North Lakes	• Clontarf	• Narangba • Burpengary • Morayfield • Caboolture • Elimbah East (future) • Northeast Business Park (future)	Work-Based Work: • Private Motor Vehicle or Motor Bike • Small and Large Delivery Vehicles	• Activity Centres • Rural Townships

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Coastal Villages Place Type	Small village settlements bordering Pumicestone Passage and Deception Bay that caters for bayside living and retirement lifestyles.	Limited residential development within the coastal village – infill and redevelopment for low-density detached housing. Employment opportunities include: • Small-scale retail uses to serve the convenience needs of local residents and visitors; • Home-based businesses; • Small-scale uses to serve day trippers.	Roads provide for local trips, visitor traffic and safe evacuation routes. Likely vehicle types using roads in this place include private motor cars, motorcycles, small delivery vehicles, tourist buses, Council trucks, cars towing private recreational boats and bicycles. Boating facilities provide safe access to waterways. Create "15 minute neighbourhood" within the coastal village.	• Dohles Rocks.		• Toorbul • Donnybrook • Ningi • Beachmere.	Home-Based Work: • Private Motor Vehicle or Motor Bike • Pedestrian Home-Based Education: • Private Motor Vehicle or Motor Bike • School Bus • Bicycle • Pedestrian Home-Based Shopping: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian Home-Based Other: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian Work-Based Work: • Private Motor Vehicle or Motor Bike • Small Delivery Vehicles Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Bicycle • Pedestrian	• Suburban Neighbourhood

Place Type	Description	Land Use and Development	Integrated Transport	Pine Rivers District	Redcliffe District	Caboolture District	Key Trip Purposes and Modes	Key Connections and Links to Other Place Types
Coast and Riverlands Place Type	Place is dominated by the natural environment with areas particularly exposed to coastal hazards and flooding. Areas perform essential ecological, hydraulic and landscape functions.	No intensification of existing uses. Low-key, dispersed water based and waterfront recreational and open space uses. Low-key, low impact recreational and tourism activities.	Adequate road access for visitors to provide for safe movement in areas susceptible to flooding. Sealed roads intended to have adequate width to include line-marked shoulders to accommodate cyclists	• Pine River estuary	• Hays Inlet	• Caboolture River estuary • Pumicestone Passage are a • Bribie Island	Other Non-Home-Based: • Private Motor Vehicle or Motor Bike • Bicycle • Tourist Buses	• Suburban Neighbourhood • Coastal Villages

Table 1 Analysis of the MBRC Place Model

Appendix C

Summary of Case Studies

Guideline or Case Study	Link and Place	Complete Streets	Centre Design Guidelines	RTA Bicycle Routes	Sunshine Coast	Brisbane City Council	Liveable Arterials Plan	RTA
Locality	*UK*	*Queensland*	*NSW*	*NSW*	*Queensland*	*Queensland*	*Auckland, NZ*	*NSW*
Approach	Combines the importance of place and mobility.	Applies Link and Place to Queensland context	Looks at how transport links can best support activity centres.	Applies to bicycles routes.	Guided by Link and Place; User Hierarchy and Level of Service. Similar context to MBRC hierarchy development.	Developed hierarchy for each mode separately, and then integrating modes to inform street priorities and design.	Applies to arterial roads. People are first priority for all arterials.	Applies to State roads. Informed by operational and administrative functions.
Hierarchy	Matrix based on each cell representing a particular type of street with a specific combination of a Link and Place status level.	1. Main streets 2. Mixed-use streets 3. Streets for living 4. Industrial streets 5. Roads with street frontages Rural residential streets	1. Major roads 2. Main streets 3. Local streets 4. Lanes	1. Regional routes 2. Local routes 3. Mixed traffic streets	20 corridor types 'A' to 'T' that combines route priority mode, user and geographic scale ie regional route.	Each mode has its own hierarchy. Under development.	Four types of arterials 1. Freight emphasis; 2. Passenger Transport emphasis; 3. General vehicle emphasis; and 4. Community emphasis.	1. Network 2. Corridor 3. Route 4. Project
Key lessons that are relevant to this study	• Could be adapted to respond to SEQ place types and preferred links, LoS between places. • This method has influenced Complete Streets, and the Sunshine Coast's hierarchy.	• Hierarchy should promote mobility equality, choice and recognition of the local context. • Street typology based on Queensland street places. • Provides guidance on appropriate street design and cross sections for street and place types.	• Provides walkable catchments around activity centres. • Consider network element function in relation to achieving walkable catchments. • Offers good design guidance with respect to street elements, which may be useful when considering solutions for this study.	Best practice principles may assist with identifying at later stages key methods/approaches for ensuring a provision that is applicable to these links.	• Focus first on what function should be achieved. Then consider cross sections. • Hierarchy has been led by 1. User hierarchy 2. Link and Place 3. Level of Service	BCC recognised during their review the importance of reviewing their network within the boundary hierarchy classifications given in AustRoads and as outlined by TMR.	• Approach is flexible, allows for different outcomes that reflect different places. • Recognises that to be sustainable, more than just street function and traffic movements need to be considered. Land use, social and cultural factors inform street. • Sustainable mode shares are encouraged through design and space allocation.	This hierarchy applies to State roads, which is outside the scope of MBRC's jurisdiction and this study. It is considered to serve different purposes to those primarily being pursued by MBRC.

Appendix C

Opportunity Methodology and Non-Capacity Solution Identification

C1 Opportunity Analysis

C1.1 General

This paper outlines the general methodology behind the GIS analysis of deficiencies that were identified in Part A, Stage 2 of the Network and Corridor Strategy. It outlines the approach take to identify possible opportunities for inclusion as "projects" / "schemes for future works/upgrades in the Region.

C1.2 Active Transport Network – Opportunities

Three areas of opportunity generally exist that can be identified through the use of the condition assessment and gap analysis outcomes from Part A, Stage 2 of the TNCS study. Namely, pathway gaps and upgrades; cycle lane gaps; and pedestrian crossing gaps and upgrades. In addition to this, there is the opportunity to improve upon shading provision where it is below average of deficient – and as such enhance the walking and cycling environment.

The identification of opportunities is highlighted in the following sections.

C1.3 Pedestrians

C1.3.1 Pathways

Aim

- To improve the walkability of the region and reduce dependence on private motor car for travel;
- Create a more connected and complete network;
- Facilitate ease of access to "place" types or specific activity destination, and public transport services for residents and visitors to the region; and
- Provide shading alongside the provision of pathways to enhance the choice for this mode of travel.

Opportunity Analysis Methodology

Opportunity - Short to Medium Term

- Deficient path = was scored in *TNCS Part A, Stage 1* 0 – none, or 1 – partially available
- Good path = was scored in *TNCS Part A, Stage 1* 2 – available along whole length
- Deficient shading = was scored in *TNCS Part A, Stage 1*. 0 none or 1 average
- Good Shading = was scored in *TNCS Part A, Stage 1*. 2 abundant
- Good Verge width > 3 metres – providing opportunity for addressing gaps, and deficiencies.

	Pathway	Shading	Verge width	Description
(a)	Deficient	Deficient	3 metres	Needs a pathway, plus shading

(b)	Deficient	Good	3 metres	Needs a pathway only.
(c)	Good	Deficient	3 metres	Needs shading treatment / planting
(d)	Good	Good	3 metres	Likely to require no upgrade or embellishment

Opportunity – Medium to Longer term

- Deficient path = was scored in *TNCS Part A, Stage 1* - 0 – none, or 1 – partially available
- Good path = was scored in *TNCS Part A, Stage 1* 2 – available along whole length
- Deficient shading = was scored in *TNCS Part A, Stage 1* - 0 none or 1 average
- Good Shading = was scored in *TNCS Part A, Stage 1* - 2 abundant
- Deficient Verge width < 3 metres – providing limited scope for addressing gaps, and deficiencies. May require other opportunities (e.g. road diets) to address.

	Pathway	Shading	Verge width	Description
(e)	Deficient	Deficient	< 3 metres	Needs shading/planting plus upgrade to pathway
(f)	Deficient	Good	< 3 metres	Needs an upgrade to pathway only.
(g)	Good	Deficient	< 3 metres	May need to look at other opportunities to improve environment for walking.

C1.3.2 Crossings

Aim

- Create a more connected and complete network;
- Improve accessibility across the transport network corridor and activate "place" types where the "link" in the network also forms a "place" type function;
- Enable both formal and informal crossing opportunities that are safe and address desire-lines for users (e.g. to public transport services);
- Enable upgrade of existing crossings appropriate to "place" type and road hierarchy; and
- Consideration of all users, pedestrians and cyclists at crossing points.

Opportunity Analysis Methodology

Opportunity – Short to Medium Term

- Crossing deficiency (with reference to desired density agreed with MBRC – Table A2, see **Error! Reference source not found.**) – relates to the density of crossing provision along the link length
- Deficient shading = was scored in *TNCS Part A, Stage 1*. 0 none or 1 average

- Good Shading = was scored in *TNCS Part A, Stage 1*. 2 abundant
- No. Of Lanes – consideration of need to provide a median break/refuge to enable safe crossing
- Available median – to support the provision of crossings for carriageway widths greater than 4 lanes wide.

	Crossing Density	Shading	No of Lanes	Median	Description
(a)	Good	Deficient	n/a	n/a	Planting/embellishment around / near crossing
(b)	Deficient	Good	Narrow	n/a	Require crossing on narrow road
(c)	Deficient	Deficient	Narrow	n/a	Require crossing and shading/embellishment on narrow road
(d)	Deficient	Good	Wide	Yes	Require crossing on wide road with median
(e)	Deficient	Deficient	Wide	yes	Require crossing on wide road with median plus shading/embellishment

Note: Narrow - assumes 3 lanes or less Wide - assumes 4 lanes or greater

Opportunity – Medium to Longer term

- Crossing deficiency (with reference to desired density agreed with MBRC – Table A2, see **Error! Reference source not found.**) – relates to the density of crossing provision along the link length
- Deficient shading = was scored in *TNCS Part A, Stage 1*. 0 none or 1 average
- Good Shading = was scored in *TNCS Part A, Stage 1*. 2 abundant
- No. Of Lanes – consideration of need to provide a median break/refuge with crossing
- Available median – to support the provision of crossings for carriageway widths greater than 4 lanes wide.

	Crossing Density	Shading	No of Lanes	Median	Description
(f)	Deficient	Good (abundant)	Wide	No	Need to introduce a median to facilitate a crossing. May require other opportunities to address deficiency
(g)	Deficient	Deficient (none or average)	Wide	No	Need to introduce a median to facilitate a crossing plus shading. May require other opportunities to address deficiency

Opportunity – No upgrade required

- Crossing density = good/adequate and shade trees abundant

C1.4 Cycling

C1.4.1 Cycle Lanes

Aim

- Improve accessibility across the road/network corridor and create a more connected and complete network;
- To improve the cycling take up across the region and help reduce dependence on private motor car for travel; and
- Facilitate ease of access to "place" types or specific activity destination.

Opportunity Analysis Methodology

Opportunity – Short to Medium Term

- Cycle lane deficiency (with reference to desired density agreed with MBRC – Table A2, see **Error! Reference source not found.**) – relates to the availability of a cycle lane "yes or no".
- Good Shoulder - scored in *TNCS Part A, Stage 1. 3* existing sealed (on street parking), or 4 sealed (no on street parking)
- No specific analysis undertaken to differentiate a sealed should with or without on street parking

	Cycle lane	Shoulder	Description
(a)	Deficient	Good (sealed)	Possible upgrade available within available shoulder space (e.g. line marking). Management of conflict with on street parking to be considered.

Opportunity – Medium to Longer term

- Cycle lane deficiency (with reference to desired density agreed with MBRC – Table A2, see **Error! Reference source not found.**) – relates to the availability of a cycle lane "yes or no".
- Deficient Shoulder – scored in *TNCS Part A, Stage 1*. 1 none, or 2 existing gravel poor condition

	Cycle lane	Shoulder	Description
(a)	Deficient	Deficient (None or poor condition)	Requires review of link to enable implementation of cycle lanes

Opportunity – No upgrade required

- If bike lane is available along whole length, and shoulder is sealed on both sides = no upgrade likely to be required

C1.5 Summary of Opportunity Analysis Findings

The findings of the above analysis of opportunities in the region's transport network are given below for pathways, crossings and cycle lanes:

Paths

- Short to medium term – 1596 segments (95%)
- Longer term – 92 segments (5%)

Crossings:

- Short to medium term – 1660 segments (98%)
- Longer term – 15 segments (1%)
- Upgrade not needed – 13 segments (1%)

Cycle Lanes:

- Short to medium term – 1438 segments (85%)
- Longer term – 203 segments (12%)
- Upgrade not needed – 47 segments (3%)

The preliminary results illustrate that the vast majority of road segments offer a short to medium term opportunity for the three categories assessed.

Hence there is good potential to address gaps in the network, or upgrade existing provision to realise a high benefit for potential low cost outlay.

C2 Mapping

The following graphically illustrates the GIS output of the opportunities analysis for the Region.

Appendix D

Non Capacity Projects

D1 Priority Areas

D2 Schedule of Non Capacity Projects

Priority Areas	Land Use Category	Road Length (m)	Pop Total 2011	Pop Total 2021	Pop Diff. 2011 - 2021	Pop Total 2031	Pop Diff. 2021 - 2031	Pop Diff. 2011 - 2031	Emp Total 2011	Emp Total 2021	Emp Diff. 2011 - 2021	Emp Total 2031	Emp Diff. 2021 - 2031	Emp Diff. 2011 - 2031
			Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count
Albany Creek	Excluded		208.00	204.59	-3.41	201.18	-3.41	-6.82	11.53	12.46	0.93	13.28	0.83	1.76
	Type 1	2,473.41	-	-	-	-	-	-	387.96	456.52	68.56	524.91	68.39	136.95
	Type 2	2,923.15	2,480.28	2,863.22	382.95	3,246.17	382.95	765.90	476.08	555.98	79.90	605.86	49.89	129.79
	Type 3	36,375.69	12,587.78	12,633.71	45.93	12,679.64	45.93	91.86	1,437.38	1,608.78	171.40	1,761.40	152.62	324.02
Bribie Island	Excluded		4.04	3.02	-1.02	2.00	-1.02	-2.04	294.83	253.33	-41.50	212.31	-41.02	-82.52
	Type 1	3,943.90	1,344.34	1,348.52	4.18	1,352.70	4.18	8.37	911.72	1,019.76	108.03	1,125.02	105.27	213.30
	Type 2	23,467.30	8,758.87	8,996.30	237.43	9,233.74	237.43	474.87	2,601.37	2,916.61	315.24	3,212.25	295.64	610.88
	Type 3	20,695.01	7,416.43	7,588.02	171.59	7,759.61	171.59	343.17	955.65	1,085.55	129.89	1,169.65	84.10	213.99
Burpengary-Narangba	Type 1	3,560.78	-	-	-	-	-	-	697.10	1,263.22	566.12	1,826.21	562.98	1,129.10
	Type 2	27,975.77	8,091.26	14,925.58	6,834.33	21,759.91	6,834.33	13,668.65	3,288.85	4,739.46	1,450.61	6,559.58	1,820.12	3,270.73
	Type 3	58,936.94	17,937.84	20,839.67	2,901.84	23,741.51	2,901.84	5,803.68	2,069.27	2,669.63	600.36	3,391.27	721.65	1,322.01
Caboolture Central 1	Excluded	3,763.22	63.17	63.01	-0.17	62.84	-0.17	-0.33	8.49	9.31	0.83	9.94	0.63	1.45
	Type 1	10,801.76	5,525.95	7,460.41	1,934.46	9,394.87	1,934.46	3,868.92	4,849.46	7,082.73	2,233.27	9,431.48	2,348.75	4,582.02
	Type 2	27,686.72	1,535.25	5,282.38	3,747.14	9,029.52	3,747.14	7,494.27	1,697.21	2,021.64	324.43	2,230.47	208.83	533.27
	Type 3	67,894.26	18,236.38	19,604.31	1,367.93	20,972.24	1,367.93	2,735.87	2,005.97	2,363.13	357.15	2,623.33	260.21	617.36
Caboolture Central 2	Excluded	10,859.49	78.30	75.64	-2.66	72.98	-2.66	-5.32	129.13	957.53	828.41	1,780.66	823.13	1,651.54
	Type 2	2,830.00	-	-	-	-	-	-	-	321.54	321.54	641.01	319.48	641.01
	Type 3	2,317.74	367.20	370.11	2.91	373.02	2.91	5.82	53.96	92.93	38.97	133.00	40.07	79.03
Caboolture East	Excluded	32,295.39	1,527.55	1,514.48	-13.07	1,501.41	-13.07	-26.14	446.68	430.21	-16.47	412.87	-17.35	-33.82
	Type 2	18,429.89	5,388.31	5,323.74	-64.57	5,259.17	-64.57	-129.14	1,985.29	3,142.13	1,156.84	4,292.84	1,150.72	2,307.55
	Type 3	53,084.41	11,350.30	11,616.34	266.03	11,882.37	266.03	532.07	991.69	1,554.15	562.47	2,078.29	524.14	1,086.61
Caboolture Hinterland	Excluded	145,152.60	2,682.12	3,151.26	469.14	3,620.40	469.14	938.28	1,480.78	1,398.57	-82.22	1,309.79	-88.78	-171.00
	Type 2	8,133.64	2,447.14	2,894.55	447.41	3,341.96	447.41	894.83	744.61	972.96	228.35	1,199.48	226.52	454.87
	Type 3	26,420.93	615.44	698.50	83.06	781.56	83.06	166.12	61.06	67.77	6.71	77.71	9.94	16.65
Caboolture Midwest 1	Excluded	29,671.77	747.69	717.53	-30.16	687.36	-30.16	-60.32	403.46	1,319.17	915.70	2,228.75	909.59	1,825.29
	Type 2	1,645.71	175.65	202.76	27.11	229.87	27.11	54.22	90.46	133.86	43.40	179.18	45.32	88.72
	Type 3	37,988.29	2,917.92	2,855.41	-62.52	2,792.89	-62.52	-125.03	170.03	183.51	13.48	195.49	11.98	25.46
Caboolture Midwest 2	Excluded	75,104.07	1,721.11	1,687.66	-33.45	1,654.20	-33.45	-66.91	519.37	532.18	12.80	543.81	11.63	24.43
	Type 2	410.19	116.11	115.04	-1.07	113.97	-1.07	-2.13	105.58	164.00	58.42	222.06	58.06	116.48
	Type 3	40,139.95	3,868.25	3,944.81	76.56	4,021.37	76.56	153.11	400.15	675.51	275.37	930.46	254.94	530.31
Caboolture Midwest 3	Excluded	17,145.48	1,704.02	1,686.71	-17.31	1,669.40	-17.31	-34.62	260.29	259.49	-0.80	258.51	-0.98	-1.78
	Type 2	6,819.83	545.20	4,546.20	4,001.01	8,547.21	4,001.01	8,002.01	32.32	98.86	66.55	350.50	251.63	318.18
	Type 3	23,672.58	3,622.64	3,643.52	20.87	3,664.39	20.87	41.75	267.83	315.54	47.71	361.78	46.23	93.95
Central Pine West	Excluded	17,417.16	544.78	588.67	43.89	632.56	43.89	87.78	136.69	95.30	-41.39	52.39	-42.91	-84.30
	Type 1	791.97	5.80	5.70	-0.10	5.60	-0.10	-0.20	371.36	1,156.18	784.82	1,936.23	780.05	1,564.87
	Type 2	11,839.82	692.40	3,046.95	2,354.55	5,401.49	2,354.55	4,709.09	52.93	412.01	359.08	731.55	319.54	678.62
	Type 3	59,306.65	22,398.91	26,492.18	4,093.27	30,585.45	4,093.27	8,186.54	1,622.77	2,151.93	529.16	2,638.52	486.59	1,015.75
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	-	-	-	71.41	74.74	3.32	78.09	3.35	6.68
	Type 1	7,639.19	615.62	809.78	194.16	1,003.94	194.16	388.32	681.87	891.80	209.93	1,118.37	226.57	436.50
	Type 2	18,255.29	5,338.77	10,470.04	5,131.27	15,601.31	5,131.27	10,262.54	962.12	2,154.42	1,192.30	3,283.84	1,129.42	2,321.72
	Type 3	39,343.16	24,409.63	24,955.24	545.61	25,500.86	545.61	1,091.23	3,060.60	3,712.79	652.18	4,340.85	628.06	1,280.24
Deception Bay	Excluded	1,364.50	321.70	316.35	-5.36	310.99	-5.36	-10.71	69.93	79.78	9.85	89.43	9.65	19.50
	Type 1	3,643.07	10.49	10.33	-0.16	10.17	-0.16	-0.32	381.11	542.83	161.72	703.78	160.95	322.67
	Type 2	21,447.81	3,400.70	6,694.47	3,293.76	9,988.23	3,293.76	6,587.53	1,761.69	2,228.37	466.68	2,646.47	418.10	884.78
	Type 3	38,759.76	18,180.20	18,795.79	615.60	19,411.39	615.60	1,231.19	1,844.71	2,131.67	286.96	2,387.04	255.38	542.34
Griffin-Mango Hill	Excluded		121.07	106.80	-14.27	92.52	-14.27	-28.55	30.57	119.94	89.37	209.70	89.75	179.12
	Type 1	6,798.69	473.56	650.01	176.46	826.47	176.46	352.91	5,362.48	10,496.96	5,134.48	15,602.00	5,105.04	10,239.52
	Type 2	10,369.34	4,035.71	17,438.51	13,402.80	30,841.31	13,402.80	26,805.59	1,135.13	2,521.65	1,386.52	3,479.80	958.15	2,344.68
	Type 3	17,428.07	17,069.97	18,467.14	1,397.16	19,864.30	1,397.16	2,794.33	1,480.40	1,772.77	292.37	1,926.14	153.38	445.75
Hills District	Excluded	136.26	74.55	73.23	-1.32	71.91	-1.32	-2.64	4.55	5.03	0.49	5.48	0.45	0.94
	Type 1	2,268.83	-	-	-	-	-	-	368.81	426.54	57.73	484.16	57.62	115.35
	Type 2	12,725.70	5,717.12	6,482.38	765.27	7,247.65	765.27	1,530.53	1,210.60	1,502.57	291.97	1,801.79	299.22	591.20
	Type 3	39,420.51	15,104.87	15,443.30	338.43	15,781.73	338.43	676.86	1,678.25	1,853.82	175.58	1,999.66	145.84	321.41
Morayfield	Excluded		5.77	4.75	-1.02	3.73	-1.02	-2.03	15.38	15.95	0.57	16.50	0.54	1.11
	Type 1	17,404.93	2,180.09	2,156.38	-23.71	2,132.67	-23.71	-47.42	7,888.58	12,500.18	4,611.60	17,087.41	4,587.23	9,198.83
	Type 2	31,514.31	15,405.09	22,224.01	6,818.93	29,042.94	6,818.93	13,637.85	1,653.24	2,608.74	955.49	3,531.74	923.00	1,878.49
	Type 3	14,890.00	6,169.83	6,347.21	177.38	6,524.59	177.38	354.76	776.14	1,005.01	228.87	1,223.95	218.94	447.80
Moreton Bay (R) Bal 1	Excluded	130,482.01	3,389.39	3,322.20	-67.19	3,255.01	-67.19	-134.38	862.21	883.54	21.32	903.09	19.55	40.88
	Type 2	11,417.62	1,795.26	1,856.30	61.04	1,917.35	61.04	122.09	545.54	681.85	136.31	817.44	135.59	271.91
	Type 3	6,257.52	2,191.37	2,220.49	29.12	2,249.60	29.12	58.23	247.89	258.20	10.31	274.79	16.59	26.90
Moreton Bay (R) Bal 2	Excluded	28,594.33	824.90	816.24	-8.66	807.59	-8.66	-17.31	146.98	159.72	12.75	172.63	12.90	25.65
	Type 2	6,079.08	1,519.58	1,548.29	28.71	1,577.00	28.71	57.42	838.86	1,121.84	282.98	1,401.00	279.16	562.14
	Type 3	74,340.32	10,536.90	10,659.66	122.76	10,782.41	122.76	245.51	745.30	812.50	67.20	888.83	76.33	143.53
Petrie	Excluded	1,725.05	66.70	67.72	1.02	68.75	1.02	2.05	4.43	4.85	0.42	5.42	0.57	0.99
	Type 1	17,644.20	66.24	71.98	5.74	77.72	5.74	11.48	316.02	399.87	83.85	482.66	82.78	166.63
	Type 2	907.60	937.88	1,638.58	700.70	2,339.27	700.70	1,401.39	754.51	904.45	149.94	1,087.12	182.67	332.61
	Type 3	15,905.83	7,987.36	8,010.31	22.95	8,033.26	22.95	45.90	783.20	827.61	44.41	874.39	46.78	91.19
Redcliffe	Excluded		233.36	237.62	4.26	241.88	4.26	8.53	25.75	22.06	-3.69	19.42	-2.64	-6.33
	Type 1	38,956.89	6,741.68	8,042.47	1,300.79	9,343.26	1,300.79	2,601.58	7,443.42	8,747.27	1,303.85	10,177.75	1,430.48	2,734.33
	Type 2	53,121.75	24,026.17	26,779.78	2,753.62	29,533.40	2,753.62	5,507.24	7,686.01	9,098.50	1,412.50	10,828.20	1,729.70	3,142.20
	Type 3	20,754.01	26,074.07	26,794.65	720.57	27,515.22	720.57	1,441.14	3,703.74	3,880.80	177.06	4,046.19	165.39	342.45
Strathpine	Excluded	2,345.57	46.59	317.85	271.26	589.10	271.26	542.51	206.15	231.19	25.04	251.39	20.19	45.23
	Type 1	10,732.68	433.61	624.66	191.05	815.71	191.05	382.10	5,059.33	6,856.47	1,797.14	8,664.51	1,808.04	3,605.18
	Type 2	38,906.42	8,416.82	10,860.90	2,444.09	13,304.99	2,444.09	4,888.17	9,647.13	12,020.69	2,373.57	14,446.47	2,425.78	4,799.34
	Type 3	29,164.40	18,198.52	18,797.60	599.07	19,396.67	599.07	1,198.15	1,901.33	2,132.21	230.88	2,381.26	249.05	479.93

Notes:

The calculations for the three land use types (i.e. Place types) will not exactly match the extents of roads in the Region that pass through those land uses areas.
Each road segment was given an appropriate land use category based on the land uses it interacted with. Many of the road segments in the Region pass through multiple land use categories and this needs to be considered with reviewing the findings presented.

Priority Areas	Land Use Category	Road Length (m)	Dwelling Total 2011	Dwelling Total 2021	Dwelling Diff. 2011 - 2021	Dwelling Total 2031	Dwelling Diff. 2031 - 2021	Dwelling Diff. 2031 - 2021	Total Combined Pop. And Emp. 2011	Total Pop. And Emp. Combined Growth
			Count	Count	Count	Count	Count	Count		
Albany Creek	Excluded		65	65	-	65	-	-	220	- 5.06
	Type 1	2,473.41	-	-	-	-	-	-	388	136.95
	Type 2	2,923.15	958	1,245	287	1,301	56	343	2,956	895.68
	Type 3	36,375.69	4,329	4,464	135	4,509	45	180	14,025	415.88
Bribie Island	Excluded		2	2	-	3	1	1	299	- 84.56
	Type 1	3,943.90	799	800	1	789	- 11	- 10	2,256	221.67
	Type 2	23,467.30	5,478	5,592	114	5,620	28	142	11,360	1,085.75
	Type 3	20,695.01	3,576	3,932	356	3,961	29	385	8,372	557.17
Burpengary-Narangba	Type 1	3,560.78	-	-	-	-	-	-	697	1,129.10
	Type 2	27,975.77	2,920	4,589	1,669	9,540	4,951	6,620	11,380	16,939.38
	Type 3	58,936.94	5,885	6,679	794	8,441	1,762	2,556	20,007	7,125.68
Caboolture Central 1	Excluded	3,763.22	21	22	1	22	- 0	1	72	1.12
	Type 1	10,801.76	2,406	2,666	260	4,038	1,372	1,632	10,375	8,450.94
	Type 2	27,686.72	584	2,368	1,784	3,187	819	2,603	3,232	8,027.54
	Type 3	67,894.26	6,719	7,937	1,218	8,470	533	1,751	20,242	3,353.23
Caboolture Central 2	Excluded	10,859.49	29	29	-	29	-	-	207	1,646.22
	Type 2	2,830.00	-	-	-	-	-	-	-	641.01
	Type 3	2,317.74	136	136	-	149	13	13	421	84.85
Caboolture East	Excluded	32,295.39	625	625	-	625	-	-	1,974	- 59.96
	Type 2	18,429.89	2,661	2,695	34	2,766	71	105	7,374	2,178.42
	Type 3	53,084.41	4,293	4,658	365	4,793	135	500	12,342	1,618.67
Caboolture Hinterland	Excluded	145,152.60	790	971	181	1,110	139	320	4,163	767.28
	Type 2	8,133.64	955	1,152	197	1,361	209	406	3,192	1,349.69
	Type 3	26,420.93	222	237	15	283	46	61	677	182.77
Caboolture Midwest 1	Excluded	29,671.77	265	264	- 1	265	1	-	1,151	1,764.97
	Type 2	1,645.71	63	65	2	86	21	23	266	142.94
	Type 3	37,988.29	955	955	-	955	-	-	3,088	- 99.58
Caboolture Midwest 2	Excluded	75,104.07	556	556	-	556	-	-	2,240	- 42.47
	Type 2	410.19	41	41	-	41	-	-	222	114.35
	Type 3	40,139.95	1,461	1,631	170	1,666	35	205	4,268	683.42
Caboolture Midwest 3	Excluded	17,145.48	561	561	-	567	6	6	1,964	- 36.40
	Type 2	6,819.83	182	714	532	2,837	2,123	2,655	578	8,320.20
	Type 3	23,672.58	1,161	1,191	30	1,226	35	65	3,890	135.70
Central Pine West	Excluded	17,417.16	184	197	13	197	-	13	681	3.48
	Type 1	791.97	2	2	-	2	-	-	377	1,564.67
	Type 2	11,839.82	274	1,397	1,123	2,242	845	1,968	745	5,387.71
	Type 3	59,306.65	7,251	8,982	1,731	10,523	1,541	3,272	24,022	9,202.29
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	-	-	-	71	6.68
	Type 1	7,639.19	281	289	8	450	161	169	1,297	824.82
	Type 2	18,255.29	2,162	4,758	2,596	6,989	2,231	4,827	6,301	12,584.25
	Type 3	39,343.16	9,425	9,973	548	10,479	506	1,054	27,470	2,371.47
Deception Bay	Excluded	1,364.50	104	104	-	104	-	-	392	8.79
	Type 1	3,643.07	4	4	-	4	-	-	392	322.35
	Type 2	21,447.81	1,525	2,965	1,440	4,073	1,108	2,548	5,162	7,472.31
	Type 3	38,759.76	6,789	7,232	443	7,518	286	729	20,025	1,773.53
Griffin-Mango Hill	Excluded		41	41	-	50	9	9	152	150.57
	Type 1	6,798.69	417	435	18	457	22	40	5,836	10,592.43
	Type 2	10,369.34	1,353	8,456	7,103	12,232	3,776	10,879	5,171	29,150.27
	Type 3	17,428.07	6,412	7,579	1,167	7,698	119	1,286	18,550	3,240.07
Hills District	Excluded	136.26	22	22	-	22	-	-	79	- 1.70
	Type 1	2,268.83	-	-	-	-	-	-	369	115.35
	Type 2	12,725.70	2,160	2,475	315	2,899	424	739	6,928	2,121.73
	Type 3	39,420.51	5,619	5,924	305	6,063	139	444	16,783	998.27
Morayfield	Excluded		2	2	-	2	-	-	21	- 0.92
	Type 1	17,404.93	947	958	11	979	21	32	10,069	9,151.41
	Type 2	31,514.31	5,954	9,262	3,308	12,442	3,180	6,488	17,058	15,516.34
	Type 3	14,890.00	2,188	2,330	142	2,427	97	239	6,946	802.57
Moreton Bay (R) Bal 1	Excluded	130,482.01	1,125	1,125	-	1,127	2	2	4,252	- 93.51
	Type 2	11,417.62	616	650	34	692	42	76	2,341	394.00
	Type 3	6,257.52	567	567	-	631	64	64	2,439	85.13
Moreton Bay (R) Bal 2	Excluded	28,594.33	372	372	-	378	6	6	972	8.34
	Type 2	6,079.08	517	546	29	561	15	44	2,358	619.56
	Type 3	74,340.32	3,382	3,440	58	3,623	183	241	11,282	389.05
Petrie	Excluded	1,725.05	23	23	-	25	2	2	71	3.04
	Type 1	17,644.20	26	32	6	32	0	6	382	178.12
	Type 2	907.60	372	529	157	977	448	605	1,692	1,734.00
	Type 3	15,905.83	2,812	2,843	31	2,931	88	119	8,771	137.09
Redcliffe	Excluded		78	78	-	88	10	10	259	2.20
	Type 1	38,956.89	3,896	4,044	148	5,350	1,306	1,454	14,185	5,335.91
	Type 2	53,121.75	11,532	11,690	158	14,728	3,038	3,196	31,712	8,649.43
	Type 3	20,754.01	10,925	11,405	480	11,938	533	1,013	29,778	1,783.59
Strathpine	Excluded	2,345.57	9	134	125	218	84	209	253	587.75
	Type 1	10,732.68	233	242	9	415	173	182	5,493	3,987.28
	Type 2	38,906.42	3,699	4,143	444	5,361	1,218	1,662	18,064	9,687.52
	Type 3	29,164.40	6,482	6,728	246	7,228	500	746	20,100	1,678.07

Notes:

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Priority Areas	Land Use Category	Road Length (m)	Sparse/ No Shade Trees	Average shade Trees	Abundant Shade Trees	Road Length % with Average or Better tree Planting
			Road CL length (m)	Road CL length (m)	Road CL length (m)	
Albany Creek	Excluded		-	-	-	0.00%
	Type 1	2,473.41	2,334.02	139.39	-	5.64%
	Type 2	2,923.15	2,008.93	914.22	-	31.28%
	Type 3	36,375.69	19,832.20	16,543.49	-	45.48%
Bribie Island	Excluded		-	-	-	0.00%
	Type 1	3,943.90	3,943.90	-	-	0.00%
	Type 2	23,467.30	15,311.30	7,934.87	221.13	34.75%
	Type 3	20,695.01	15,671.57	5,023.44	-	24.27%
Burpengary-Narangba	Type 1	3,560.78	3,437.63	123.15	-	3.46%
	Type 2	27,975.77	18,135.83	9,098.23	741.71	35.17%
	Type 3	58,936.94	48,394.96	8,950.78	1,591.20	17.89%
Caboolture Central 1	Excluded	3,763.22	3,763.22	-	-	0.00%
	Type 1	10,801.76	5,805.39	4,698.55	297.82	46.26%
	Type 2	27,686.72	15,605.31	1,406.02	1,774.34	11.49%
	Type 3	67,894.26	43,894.18	4,782.66	779.99	8.19%
Caboolture Central 2	Excluded	10,859.49	10,859.49	-	-	0.00%
	Type 2	2,830.00	2,830.00	-	-	0.00%
	Type 3	2,317.74	2,317.74	-	-	0.00%
Caboolture East	Excluded	32,295.39	30,673.63	1,448.69	173.07	5.02%
	Type 2	18,429.89	11,063.27	7,366.62	-	39.97%
	Type 3	53,084.41	44,716.43	7,485.61	882.37	15.76%
Caboolture Hinterland	Excluded	145,152.60	63,934.88	45,623.57	8,661.99	37.40%
	Type 2	8,133.64	7,808.24	325.40	-	4.00%
	Type 3	26,420.93	9,481.04	579.91	-	2.19%
Caboolture Midwest 1	Excluded	29,671.77	18,369.80	8,051.06	3,250.91	38.09%
	Type 2	1,645.71	-	1,541.59	104.13	100.00%
	Type 3	37,988.29	27,129.94	2,050.05	4,151.86	16.33%
Caboolture Midwest 2	Excluded	75,104.07	12,527.14	36,471.97	-	48.56%
	Type 2	410.19	410.19	-	-	0.00%
	Type 3	40,139.95	18,816.63	4,438.69	-	11.06%
Caboolture Midwest 3	Excluded	17,145.48	6,765.37	9,255.97	1,124.14	60.54%
	Type 2	6,819.83	1,962.51	4,857.32	-	71.22%
	Type 3	23,672.58	19,109.16	4,563.42	-	19.28%
Central Pine West	Excluded	17,417.16	783.08	16,634.09	-	95.50%
	Type 1	791.97	791.97	-	-	0.00%
	Type 2	11,839.82	5,460.29	3,552.08	2,827.45	53.88%
	Type 3	59,306.65	20,043.93	34,150.27	5,112.45	66.20%
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	0.00%
	Type 1	7,639.19	6,266.80	1,372.39	-	17.97%
	Type 2	18,255.29	5,802.41	10,479.03	1,973.85	68.22%
	Type 3	39,343.16	29,295.59	9,356.50	691.07	25.54%
Deception Bay	Excluded	1,364.50	-	1,364.50	-	100.00%
	Type 1	3,643.07	3,643.07	-	-	0.00%
	Type 2	21,447.81	17,716.44	2,876.63	854.74	17.40%
	Type 3	38,759.76	37,693.75	1,066.01	-	2.75%
Griffin-Mango Hill	Excluded		-	-	-	0.00%
	Type 1	6,798.69	1,852.24	4,946.46	-	72.76%
	Type 2	10,369.34	7,440.95	2,490.89	437.49	28.24%
	Type 3	17,428.07	5,306.85	11,846.94	274.28	69.55%
Hills District	Excluded	136.26	136.26	-	-	0.00%
	Type 1	2,268.83	2,268.83	-	-	0.00%
	Type 2	12,725.70	7,001.19	5,724.51	-	44.98%
	Type 3	39,420.51	15,889.76	23,133.21	397.54	59.69%
Morayfield	Excluded		-	-	-	0.00%
	Type 1	17,404.93	16,566.22	838.70	-	4.82%
	Type 2	31,514.31	24,199.60	4,982.51	2,332.20	23.21%
	Type 3	14,890.00	10,243.45	4,646.55	-	31.21%
Moreton Bay (R) Bal 1	Excluded	130,482.01	19,125.00	63,711.77	26,870.19	69.42%
	Type 2	11,417.62	6,112.63	5,304.99	-	46.46%
	Type 3	6,257.52	-	4,139.24	2,118.29	100.00%
Moreton Bay (R) Bal 2	Excluded	28,594.33	-	2,949.96	25,644.37	100.00%
	Type 2	6,079.08	2,174.75	3,904.33	-	64.23%
	Type 3	74,340.32	12,201.65	54,005.37	8,133.30	83.59%
Petrie	Excluded	1,725.05	-	795.26	929.78	100.00%
	Type 1	17,644.20	77.76	2,349.71	-	13.32%
	Type 2	907.60	651.40	256.20	-	28.23%
	Type 3	15,905.83	8,201.57	7,265.08	439.18	48.44%
Redcliffe	Excluded		-	-	-	0.00%
	Type 1	38,956.89	20,997.87	5,235.19	571.83	14.91%
	Type 2	53,121.75	31,612.60	21,509.15	-	40.49%
	Type 3	20,754.01	14,039.93	6,714.08	-	32.35%
Strathpine	Excluded	2,345.57	2,345.57	-	-	0.00%
	Type 1	10,732.68	9,842.32	890.37	-	8.30%
	Type 2	38,906.42	34,936.52	3,969.90	-	10.20%
	Type 3	29,164.40	21,466.27	7,698.12	-	26.40%

Notes:

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Priority Areas	Land Use Category	Road Length (m)	Pathway Missing Both Sides (arterial, sub-arterial) - Wide Verge	Pathway Missing 1 Side (arterial, sub-arterial) - Wide Verge	Pathway Missing Both Sides (arterial, sub-arterial) - Narrow Verge	Pathway Missing 1 Side (arterial, sub-arterial) - Narrow Verge	Pathway Missing Both Sides (collector) - Wide Verge	Pathway Missing 1 Side (collector) - Wide Verge	Pathway Missing Both Sides (collector) - Narrow Verge	Pathway Missing 1 Side (collector) - Narrow Verge	Pathway too narrow <= 2.4m (arterial, sub-arterial) - wide verge
			Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)	Footpath CL length (m)
Albany Creek	Excluded		-	-	-	-	-	-	-	-	-
	Type 1	2,473.41	-	-	-	-	0.00	163.32	-	-	-
	Type 2	2,923.15	-	-	-	-	632.41	1,722.17	-	-	-
	Type 3	36,375.69	347.70	1,008.75	0.00	14.83	2,643.10	15,099.83	0.00	113.58	3,912.01
Bribie Island	Excluded		-	-	-	-	-	-	-	-	-
	Type 1	3,943.90	17.23	3,153.71	-	-	0.00	719.07	-	-	3,871.84
	Type 2	23,467.30	54.44	3,288.11	-	-	7,916.00	9,384.26	-	-	4,850.32
	Type 3	20,695.01	0.00	2,625.31	-	-	8,303.35	9,285.35	-	-	3,558.04
Burpengary-Narangba	Type 1	3,560.78	0.00	499.22	-	-	0.00	130.79	-	-	4,523.13
	Type 2	27,975.77	10,375.87	9,825.14	576.61	791.12	2,619.61	605.65	-	-	11,868.72
	Type 3	58,936.94	4,830.18	17,061.39	-	-	16,685.24	16,847.02	39.52	148.32	16,483.69
Caboolture Central 1	Excluded	3,763.22	1,869.51	-	-	-	1,893.71	-	-	-	-
	Type 1	10,801.76	183.33	1,678.39	18.00	33.51	395.85	2,978.42	50.02	213.02	5,667.00
	Type 2	27,686.72	3,292.37	5,801.78	207.74	-	133.76	3,600.46	0.00	94.61	2,421.65
	Type 3	67,894.26	5,764.49	6,955.17	546.48	19.64	11,055.43	10,054.84	132.80	17.76	10,299.18
Caboolture Central 2	Excluded	10,859.49	3,961.54	-	-	-	-	-	-	-	-
	Type 2	2,830.00	2,830.00	-	-	-	-	-	-	-	-
	Type 3	2,317.74	-	-	-	-	2,317.74	-	-	-	-
Caboolture East	Excluded	32,295.39	5,163.18	-	-	-	10,850.34	117.73	-	-	-
	Type 2	18,429.89	1,596.43	269.24	-	-	6,146.11	8,376.79	-	-	5.79
	Type 3	53,084.41	3,129.23	4,704.77	-	-	18,729.36	6,409.66	-	-	4,144.46
Caboolture Hinterland	Excluded	145,152.60	-	-	-	-	74,312.39	1,135.89	-	-	-
	Type 2	8,133.64	-	-	-	-	5,572.52	854.83	-	-	-
	Type 3	26,420.93	-	-	-	-	579.91	-	-	-	-
Caboolture Midwest 1	Excluded	29,671.77	12,289.19	-	-	-	14,848.08	-	-	-	-
	Type 2	1,645.71	-	-	312.47	-	898.86	330.25	0.00	104.13	-
	Type 3	37,988.29	6,499.16	-	-	-	16,403.99	1,294.01	195.67	37.97	-
Caboolture Midwest 2	Excluded	75,104.07	11,555.72	-	-	-	26,647.38	491.34	-	-	-
	Type 2	410.19	-	-	-	-	317.77	-	40.76	51.67	-
	Type 3	40,139.95	1,505.99	2,640.42	-	-	7,104.57	2,851.88	-	-	361.85
Caboolture Midwest 3	Excluded	17,145.48	3,126.09	-	-	-	14,019.39	-	-	-	-
	Type 2	6,819.83	724.11	1,389.94	-	-	3,509.22	1,196.56	-	-	1,194.60
	Type 3	23,672.58	3,909.67	5,205.68	-	-	11,578.18	2,979.05	-	-	4,517.16
Central Pine West	Excluded	17,417.16	12,443.32	346.43	-	-	3,573.98	1,053.43	-	-	125.10
	Type 1	791.97	583.79	208.18	-	-	-	-	-	-	1,166.56
	Type 2	11,839.82	4,218.13	2,555.23	329.74	-	1,833.41	2,455.82	-	-	3,099.12
	Type 3	59,306.65	11,728.92	2,412.32	-	-	21,601.17	20,460.60	35.73	351.42	3,394.20
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	-	-	-	-	-	-
	Type 1	7,639.19	272.63	952.91	0.00	340.90	0.00	703.49	0.00	201.15	1,999.57
	Type 2	18,255.29	2,005.28	8,038.90	-	-	1,890.22	4,512.47	0.00	517.52	10,708.21
	Type 3	39,343.16	4,194.83	7,140.27	0.00	130.35	2,828.36	16,492.42	136.79	26.61	17,339.95
Deception Bay	Excluded	1,364.50	-	-	-	-	1,364.50	-	-	-	-
	Type 1	3,643.07	0.00	437.40	-	-	996.82	1,710.80	-	-	1,154.78
	Type 2	21,447.81	5,697.83	4,068.11	92.27	54.03	8,222.23	2,598.38	261.92	80.21	4,170.66
	Type 3	38,759.76	2,702.11	820.41	-	-	13,631.07	12,576.52	56.53	350.00	1,432.46
Griffin-Mango Hill	Excluded		-	-	-	-	-	-	-	-	-
	Type 1	6,798.69	1,635.78	2,047.34	-	-	489.23	1,645.73	-	-	7,066.62
	Type 2	10,369.34	3,176.67	1,315.91	-	-	2,244.11	2,974.15	-	-	2,206.02
	Type 3	17,428.07	2,628.27	2,745.71	-	-	3,220.77	7,387.02	18.16	65.66	11,821.09
Hills District	Excluded	136.26	-	-	-	-	0.00	136.26	-	-	-
	Type 1	2,268.83	16.35	754.16	-	-	0.00	506.54	-	-	2,668.21
	Type 2	12,725.70	200.28	2,219.41	-	-	2,059.19	6,224.51	168.56	218.33	3,997.98
	Type 3	39,420.51	1,631.40	6,648.98	9.09	540.33	2,623.88	15,215.72	77.35	21.03	20,085.08
Morayfield	Excluded		-	-	-	-	-	-	-	-	-
	Type 1	17,404.93	24.83	2,788.39	-	-	542.78	3,577.83	0.00	129.57	6,090.24
	Type 2	31,514.31	9,109.97	10,235.20	-	-	3,985.83	5,207.25	60.97	18.27	14,439.46
	Type 3	14,890.00	1,305.38	3,444.96	-	-	3,137.73	5,584.62	-	-	4,467.41
Moreton Bay (R) Bal 1	Excluded	130,482.01	20,057.55	1,119.96	497.68	-	55,509.14	-	-	-	632.91
	Type 2	11,417.62	3,227.97	279.41	-	-	6,907.78	27.18	-	-	292.57
	Type 3	6,257.52	2,118.29	-	-	-	4,139.24	-	-	-	-
Moreton Bay (R) Bal 2	Excluded	28,594.33	17,167.53	5,195.28	184.85	-	6,046.66	-	-	-	3,368.30
	Type 2	6,079.08	-	-	-	-	2,227.80	878.04	-	-	-
	Type 3	74,340.32	12,827.63	1,689.33	744.10	241.03	42,813.94	368.03	-	-	509.76
Petrie	Excluded	1,725.05	837.54	887.51	-	-	-	-	-	-	1,115.82
	Type 1	17,644.20	-	-	-	-	-	-	17.86	33.72	-
	Type 2	907.60	-	-	-	-	172.42	229.49	-	-	-
	Type 3	15,905.83	422.88	1,109.44	5.65	87.73	1,298.03	10,262.55	-	-	2,073.58
Redcliffe	Excluded		-	-	-	-	-	-	-	-	-
	Type 1	38,956.89	441.71	1,852.34	-	-	0.00	1,738.82	28.48	2,272.46	7,173.99
	Type 2	53,121.75	4,198.09	8,704.10	-	-	9,217.42	16,955.33	1,626.69	2,215.67	24,618.47
	Type 3	20,754.01	1,440.77	2,941.12	-	-	4,455.98	10,114.01	493.29	-	6,274.67
Strathpine	Excluded	2,345.57	1,257.07	344.21	-	-	-	-	-	-	33.60
	Type 1	10,732.68	868.89	192.00	0.00	105.81	151.01	2,126.82	140.32	148.74	483.72
	Type 2	38,906.42	1,870.02	6,704.35	19.85	710.72	3,512.56	10,783.85	0.00	50.95	16,328.14
	Type 3	29,164.40	280.58	4,056.01	548.36	2,229.39	4,161.35	12,058.16	84.26	123.26	11,909.30

Notes:

The calculations for the three land use types (i.e. Place types) will not exactly match the extents of roads in the Region that pass through those land uses areas.
Each road segment was given an appropriate land use category based on the land uses it interacted with. Many of the road segments in the Region pass through multiple land use categories and this needs to be considered with reviewing the findings presented.

Priority Areas	Land Use Category	Road Length (m)	Pathway adequate width > 2.4m (arterial, sub-arterial) - wide verge	Pathway too narrow <= 2.4m (arterial, sub-arterial) - narrow verge	Pathway adequate width > 2.4m (arterial, sub-arterial) - narrow verge	Pathway too narrow <= 2m (collector roads) - wide verge	Pathway adequate width > 2m (collector roads) - wide verge	Pathway too narrow <= 2m (collector roads) - narrow verge	Pathway adequate width > 2m (collector roads) - narrow verge	Road Length % with Footpaths (any width) on Both Sides
			Footpath CL length (m)	Footpath CL length (m)	Footpath CL length (m)	Footpath CL length (m)	Footpath CL length (m)	Footpath CL length (m)	Footpath CL length (m)	
Albany Creek	Excluded		-	-	-	-	-	-	-	-
	Type 1	2,473.41	-	-	-	961.14	5.53	-	-	0.52
	Type 2	2,923.15	-	-	-	2,375.36	12.88	-	-	0.19
	Type 3	36,375.69	-	46.04	-	15,767.53	2,052.32	79.80	-	0.09
Bribie Island	Excluded		-	-	-	-	-	-	-	-
	Type 1	3,943.90	14.66	-	-	676.57	60.09	-	-	0.01
	Type 2	23,467.30	429.62	-	-	12,833.32	3,002.32	-	-	0.12
	Type 3	20,695.01	107.53	-	-	8,339.43	430.86	228.68	-	0.02
Burpengary-Narangba	Type 1	3,560.78	-	-	-	1,248.13	-	35.88	-	0.69
	Type 2	27,975.77	148.24	464.40	-	611.47	-	22.58	8.92	0.04
	Type 3	58,936.94	51.02	-	-	16,334.75	1,261.06	-	-	0.05
Caboolture Central 1	Excluded	3,763.22	-	-	-	-	-	-	-	-
	Type 1	10,801.76	84.04	96.75	-	4,913.52	817.39	-	-	0.34
	Type 2	27,686.72	-	-	-	5,959.55	101.64	24.49	-	0.06
	Type 3	67,894.26	-	44.87	-	9,595.23	238.84	12.46	-	0.06
Caboolture Central 2	Excluded	10,859.49	-	-	-	-	-	-	-	-
	Type 2	2,830.00	-	-	-	-	-	34.20	-	-
	Type 3	2,317.74	-	-	-	-	-	-	-	-
Caboolture East	Excluded	32,295.39	-	-	-	225.74	-	-	-	0.01
	Type 2	18,429.89	-	-	-	12,192.46	92.69	-	-	0.11
	Type 3	53,084.41	-	-	-	7,158.00	26.66	-	-	0.02
Caboolture Hinterland	Excluded	145,152.60	-	-	-	272.51	-	-	-	0.00
	Type 2	8,133.64	-	-	-	761.81	-	-	-	0.08
	Type 3	26,420.93	-	-	-	-	-	-	-	0.00
Caboolture Midwest 1	Excluded	29,671.77	-	-	-	-	-	-	-	-
	Type 2	1,645.71	-	-	-	275.86	-	-	-	0.00
	Type 3	37,988.29	-	-	-	924.18	-	-	-	0.02
Caboolture Midwest 2	Excluded	75,104.07	-	-	-	69.30	-	-	-	-
	Type 2	410.19	-	-	-	1.71	-	-	-	0.00
	Type 3	40,139.95	-	-	-	2,867.40	7.93	-	-	0.00
Caboolture Midwest 3	Excluded	17,145.48	-	-	-	-	-	-	-	-
	Type 2	6,819.83	-	-	-	1,074.85	-	-	-	0.00
	Type 3	23,672.58	-	-	-	2,354.21	-	-	-	0.00
Central Pine West	Excluded	17,417.16	-	-	-	646.13	-	-	-	-
	Type 1	791.97	-	-	-	-	-	-	-	-
	Type 2	11,839.82	1,632.22	-	-	2,189.48	79.29	-	-	0.04
	Type 3	59,306.65	12.27	-	-	22,933.62	1,180.95	304.96	80.87	0.05
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	-	-	-	-	-
	Type 1	7,639.19	-	1,887.81	-	777.92	-	988.61	-	0.48
	Type 2	18,255.29	111.16	-	-	4,257.45	422.16	-	67.23	0.07
	Type 3	39,343.16	4.61	342.56	-	24,708.12	126.43	-	-	0.18
Deception Bay	Excluded	1,364.50	-	-	-	-	-	-	-	-
	Type 1	3,643.07	-	-	-	2,004.74	-	-	-	0.14
	Type 2	21,447.81	-	-	-	2,082.35	208.56	373.46	-	0.02
	Type 3	38,759.76	-	-	-	11,698.03	22.21	184.18	-	0.03
Griffin-Mango Hill	Excluded		-	-	-	-	-	-	-	-
	Type 1	6,798.69	423.64	-	-	3,947.13	1,394.09	-	-	0.14
	Type 2	10,369.34	-	-	-	3,282.51	25.04	-	-	0.06
	Type 3	17,428.07	87.51	-	-	9,814.70	327.61	16.54	-	0.08
Hills District	Excluded	136.26	-	-	-	101.59	-	-	-	- 0.00
	Type 1	2,268.83	20.30	-	-	996.90	19.47	-	-	0.44
	Type 2	12,725.70	59.32	-	-	6,658.36	3.24	-	-	0.11
	Type 3	39,420.51	-	375.14	-	16,419.82	88.27	-	-	0.15
Morayfield	Excluded		-	-	-	-	-	-	-	-
	Type 1	17,404.93	70.87	-	-	4,121.36	608.85	-	-	0.15
	Type 2	31,514.31	257.13	-	-	4,713.12	7.84	-	-	0.07
	Type 3	14,890.00	-	-	-	7,830.91	7.59	-	-	0.10
Moreton Bay (R) Bal 1	Excluded	130,482.01	-	-	-	-	-	-	-	0.01
	Type 2	11,417.62	-	-	-	-	-	-	-	0.00
	Type 3	6,257.52	-	-	-	-	-	-	-	-
Moreton Bay (R) Bal 2	Excluded	28,594.33	-	-	-	-	-	-	-	0.00
	Type 2	6,079.08	-	-	-	596.48	-	-	-	0.04
	Type 3	74,340.32	16.55	71.77	-	28.99	-	-	-	0.00
Petrie	Excluded	1,725.05	-	-	-	-	-	-	- -	0.00
	Type 1	17,644.20	-	-	-	-	-	51.08	-	0.07
	Type 2	907.60	-	-	-	1,408.58	189.36	-	-	0.56
	Type 3	15,905.83	-	26.49	-	15,187.38	36.49	-	-	0.17
Redcliffe	Excluded		-	-	-	-	-	-	-	-
	Type 1	38,956.89	201.85	-	-	4,701.20	105.06	1,457.97	872.11	0.44
	Type 2	53,121.75	253.50	-	-	20,550.95	2,375.53	1,642.86	208.94	0.10
	Type 3	20,754.01	1.96	-	-	14,174.77	430.69	-	-	0.06
Strathpine	Excluded	2,345.57	-	-	-	-	-	-	-	0.00
	Type 1	10,732.68	3.74	139.47	2.22	4,709.67	-	129.12	9.43	0.32
	Type 2	38,906.42	1,142.87	857.30	-	14,961.02	495.75	42.78	-	0.20
	Type 3	29,164.40	260.31	2,468.34	-	15,814.61	254.84	127.83	-	0.19

Notes:

The calculations for the three land use types (i.e. Place types) will not exactly match the extents of roads in the Region that pass through those land uses areas.
Each road segment was given an appropriate land use category based on the land uses it interacted with. Many of the road segments in the Region pass through multiple land use categories and this needs to be considered with reviewing the findings presented.

Priority Areas	Land Use Category	Road Length (m)	Arterial Road Crossings				Collector Road Crossings				Existing Crossings as a % of Target Based on Road Length
			Existing Crossings Count	Dist (m)	Ave Dist (m)	Extra Crossings Needed	Count	Dist (m)	Ave Dist (m)	Extra Crossings Needed	
Albany Creek	Excluded		-	-	-	-	-	-	-		0.00%
	Type 1	2,473.41	-	-	-	-	5.00	646.73	129.35	-	56.60%
	Type 2	2,923.15	-	-	-	-	5.00	2,923.15	584.63	2.31	164.21%
	Type 3	36,375.69	10	2209.790667	220.98	-	61.00	19,579.06	320.97	-	35.74%
Bribie Island	Excluded		-	-	-	-	-	-	-		0.00%
	Type 1	3,943.90	7	3170.937331	452.99	9	4.00	772.96	193.24	-	55.78%
	Type 2	23,467.30	4	3828.981107	957.25	6	46.00	19,638.32	426.92	3.10	42.61%
	Type 3	20,695.01	4	2669.16895	667.29	3	39.00	18,025.84	462.20	6.06	41.56%
Burpengary-Narangba	Type 1	3,560.78	8	2435.801262	304.48	4	2.00	668.49	334.24	1.34	56.17%
	Type 2	27,975.77	28	22652.05266	809.00	29	1.00	3,225.26	3,225.26	7.06	21.45%
	Type 3	58,936.94	27	23287.18725	862.49	31	84.00	35,015.44	416.85	3.54	37.67%
Caboolture Central 1	Excluded	3,763.22	0	1869.505699	-	-	-	1,893.71	-		0.00%
	Type 1	10,801.76	18	3506.284974	194.79	-	25.00	5,010.43	200.42	0.05	81.47%
	Type 2	27,686.72	6	9358.00688	1,559.67	17	16.00	4,771.23	298.20	-	24.56%
	Type 3	67,894.26	19	14335.29212	754.49	17	51.00	21,734.85	426.17	3.34	24.16%
Caboolture Central 2	Excluded	10,859.49	0	3961.541949	-	-	-	-	-		0.00%
	Type 2	2,830.00	0	2830.003459	-	7	-	-	-	-	106.01%
	Type 3	2,317.74	-	-	-	-	-	2,317.74	-	5.79	69.03%
Caboolture East	Excluded	32,295.39	0	5163.180303	-	-	-	10,968.07	-		1.24%
	Type 2	18,429.89	0	1865.671224	-	5	31.00	16,328.58	526.73	9.82	20.62%
	Type 3	53,084.41	5	7833.890424	1,566.78	15	27.00	26,060.52	965.20	38.15	10.93%
Caboolture Hinterland	Excluded	145,152.60	-	-	-	-	-	75,448.29	-		0.14%
	Type 2	8,133.64	-	-	-	-	2.00	6,440.43	3,220.22	14.10	14.75%
	Type 3	26,420.93	-	-	-	-	-	579.91	-	1.45	2.27%
Caboolture Midwest 1	Excluded	29,671.77	0	12289.18552	-	-	-	14,848.08	-		0.00%
	Type 2	1,645.71	0	312.473391	-	1	1.00	1,333.24	1,333.24	2.33	12.15%
	Type 3	37,988.29	0	6499.156951	-	16	1.00	17,931.65	17,931.65	43.83	6.84%
Caboolture Midwest 2	Excluded	75,104.07	0	11555.71845	-	-	-	27,138.72			0.27%
	Type 2	410.19	0	0	-	-	2.00	410.19	205.10	-	97.52%
	Type 3	40,139.95	1	4219.653445	4,219.65	10	11.00	10,079.27	916.30	14.20	7.47%
Caboolture Midwest 3	Excluded	17,145.48	0	3126.091375	-	-	-	14,019.39	-		0.00%
	Type 2	6,819.83	0	2114.0481	-	5	1.00	4,705.78	4,705.78	10.76	2.93%
	Type 3	23,672.58	2	9115.35569	4,557.68	21	8.00	14,557.23	1,819.65	28.39	8.45%
Central Pine West	Excluded	17,417.16	0	12789.75247	-	-	-	4,627.41	-		0.00%
	Type 1	791.97	3	791.974522	263.99	1	-	-	-	-	75.76%
	Type 2	11,839.82	10	7523.302705	752.33	9	9.00	4,316.52	479.61	1.79	32.10%
	Type 3	59,306.65	6	14920.29458	2,486.72	31	92.00	44,386.32	482.46	18.97	33.05%
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	-	-	-	-		0.00%
	Type 1	7,639.19	8	2805.188727	350.65	6	6.00	1,663.68	277.28	2.32	52.36%
	Type 2	18,255.29	11	11335.08674	1,030.46	17	17.00	6,920.21	407.07	0.30	30.68%
	Type 3	39,343.16	29	14314.88629	493.62	7	84.00	22,569.69	268.69	-	59.99%
Deception Bay	Excluded	1,364.50	-	-	-	-	-	1,364.50	-		0.00%
	Type 1	3,643.07	3	729.769956	243.26	1	13.00	2,913.30	224.10	1.57	87.84%
	Type 2	21,447.81	5	10026.29812	2,005.26	20	17.00	11,421.51	671.85	11.55	20.51%
	Type 3	38,759.76	4	4063.718513	1,015.93	6	69.00	26,852.11	389.16	-	42.31%
Griffin-Mango Hill	Excluded		-	-	-	-	-	-	-		0.00%
	Type 1	6,798.69	22	3817.339692	173.52	-	16.00	2,981.35	186.33	-	111.79%
	Type 2	10,369.34	13	4975.794234	382.75	-	10.00	5,393.54	539.35	3.48	44.36%
	Type 3	17,428.07	36	5945.400527	165.15	-	69.00	11,482.67	166.42	-	120.50%
Hills District	Excluded	136.26	-	-	-	-	1.00	136.26	136.26		146.78%
	Type 1	2,268.83	5	1543.420412	308.68	3	5.00	725.41	145.08	-	88.15%
	Type 2	12,725.70	12	3216.710098	268.06	-	29.00	9,325.44	321.57	-	64.44%
	Type 3	39,420.51	29	14275.69753	492.27	7	63.00	18,544.58	294.36	-	47.18%
Morayfield	Excluded		-	-	-	-	-	-	-		0.00%
	Type 1	17,404.93	13	4194.469416	322.65	8	18.00	4,483.89	249.10	4.42	52.86%
	Type 2	31,514.31	21	21542.48945	1,025.83	33	20.00	9,288.44	464.42	3.22	26.02%
	Type 3	14,890.00	4	5009.086275	1,252.27	9	18.00	9,880.92	548.94	6.70	29.55%
Moreton Bay (R) Bal 1	Excluded	130,482.01	0	21675.18988	-	-	-	55,509.14	-		0.77%
	Type 2	11,417.62	2	3507.387342	1,753.69	7	1.00	6,934.96	6,934.96	16.34	5.26%
	Type 3	6,257.52	0	2118.288678	-	5	-	4,139.24	-	10.35	0.00%
Moreton Bay (R) Bal 2	Excluded	28,594.33	0	22547.66488	-	-	-	6,046.66	-		0.00%
	Type 2	6,079.08	0	0	-	-	2.00	3,105.84	1,552.92	5.76	26.32%
	Type 3	74,340.32	3	15524.27822	5,174.76	36	1.00	43,181.97	43,181.97	106.95	0.54%
Petrie	Excluded	1,725.05	1	1725.046009	1,725.05	-	-	-	-		11.59%
	Type 1	17,644.20	0	0	-	-	1.00	77.76	77.76	-	5.67%
	Type 2	907.60	-	-	-	-	5.00	907.60	181.52	-	110.18%
	Type 3	15,905.83	5	2031.576556	406.32	0	41.00	13,874.25	338.40	-	57.84%
Redcliffe	Excluded		-	-	-	-	-	-	-		0.00%
	Type 1	38,956.89	14	4634.792167	331.06	9	33.00	5,434.60	164.68	-	54.42%
	Type 2	53,121.75	42	15166.61677	361.11	-	123.00	31,633.33	257.18	-	66.64%
	Type 3	20,754.01	10	4774.250096	477.43	2	62.00	15,979.76	257.74	-	69.38%
Strathpine	Excluded	2,345.57	0	1601.284499	-	-	-	-	-		0.00%
	Type 1	10,732.68	4	1243.030454	310.76	2	20.00	4,041.14	202.06	0.21	65.22%
	Type 2	38,906.42	32	14240.33762	445.01	4	59.00	16,707.60	283.18	-	52.95%
	Type 3	29,164.40	28	10580.91351	377.89	-	66.00	18,583.48	281.57	-	64.46%

Notes:

The calculations for the three land use types (i.e. Place types) will not exactly match the extents of roads in the Region that pass through those land uses areas.
Each road segment was given an appropriate land use category based on the land uses it interacted with. Many of the road segments in the Region pass through multiple land use categories and this needs to be considered with reviewing the findings presented.

Priority Areas	Land Use Category	Road Length (m)	Cycle Lane Missing Both Sides (sealed shoulder)	Cycle Lane Missing Both Sides (unsealed shoulder)	Intermittent Cycle Lane Provision (sealed shoulder)	Intermittent Cycle Lane Provision (unsealed shoulder)	Full Cycle Lane Provision (both sides of road)	Road Length % with Full Cycle lane Provision	Road Space Reallocation Potential	Average Active Transport Provision %
			Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)	Road CL length (m)		Road CL length (m)	
Albany Creek	Excluded		-	-	-	-	-	0.00%	-	0.00%
	Type 1	2,473.41	2,473.41	-	-	-	-	0.00%	1,007.09	28.61%
	Type 2	2,923.15	1,251.14	1,672.00	-	-	-	0.00%	1,138.66	53.73%
	Type 3	36,375.69	21,301.16	-	15,074.53	-	-	0.00%	915.07	22.47%
Bribie Island	Excluded		-	-	-	-	-	0.00%	348.73	0.00%
	Type 1	3,943.90	3,943.90	-	-	-	-	0.00%	620.98	14.29%
	Type 2	23,467.30	20,987.17	3,551.37	2,480.14	-	-	0.00%	133.05	22.35%
	Type 3	20,695.01	20,695.01	6,468.33	-	-	-	0.00%	-	17.04%
Burpengary-Narangba	Type 1	3,560.78	3,560.78	1,194.92	-	-	-	0.00%	494.20	32.28%
	Type 2	27,975.77	24,424.39	15,562.24	-	-	-	0.00%	682.18	15.12%
	Type 3	58,936.94	52,468.61	1,139.53	-	-	-	0.00%	748.80	15.03%
Caboolture Central 1	Excluded	3,763.22	2,568.30	-	-	-	-	0.00%	517.73	0.00%
	Type 1	10,801.76	7,184.03	-	3,617.73	-	-	0.00%	2,533.99	40.40%
	Type 2	27,686.72	11,900.06	2,830.00	224.42	-	-	0.00%	1,307.42	10.45%
	Type 3	67,894.26	66,754.73	2,317.74	-	-	-	0.00%	3,720.62	9.69%
Caboolture Central 2	Excluded	10,859.49	10,859.49	4,990.50	-	-	-	0.00%	235.09	0.00%
	Type 2	2,830.00	-	283.99	-	-	-	0.00%	-	26.50%
	Type 3	2,317.74	-	805.02	-	-	-	0.00%	-	17.26%
Caboolture East	Excluded	32,295.39	18,296.29	-	9,008.60	-	-	0.00%	4,139.31	1.74%
	Type 2	18,429.89	18,145.90	-	-	-	-	0.00%	1,377.95	17.86%
	Type 3	53,084.41	33,243.46	-	19,035.93	-	-	0.00%	6,837.62	7.11%
Caboolture Hinterland	Excluded	145,152.60	83,517.05	61,635.55	-	-	-	0.00%	-	9.38%
	Type 2	8,133.64	8,133.64	-	-	-	-	0.00%	-	6.78%
	Type 3	26,420.93	26,420.93	-	-	-	-	0.00%	-	1.12%
Caboolture Midwest 1	Excluded	29,671.77	9,663.77	20,008.00	-	-	-	0.00%	-	9.52%
	Type 2	1,645.71	1,333.24	312.47	-	-	-	0.00%	-	28.04%
	Type 3	37,988.29	17,943.63	20,044.66	-	-	-	0.00%	-	6.18%
Caboolture Midwest 2	Excluded	75,104.07	70,919.56	4,184.51	-	-	-	0.00%	-	12.21%
	Type 2	410.19	410.19	-	-	-	-	0.00%	-	24.38%
	Type 3	40,139.95	39,196.33	943.62	-	-	-	0.00%	-	4.76%
Caboolture Midwest 3	Excluded	17,145.48	14,740.03	2,405.45	-	-	-	0.00%	-	15.14%
	Type 2	6,819.83	5,557.38	1,262.44	-	-	-	0.00%	-	18.54%
	Type 3	23,672.58	23,268.51	404.08	-	-	-	0.00%	-	6.93%
Central Pine West	Excluded	17,417.16	2,030.98	15,386.18	-	-	-	0.00%	612.32	23.88%
	Type 1	791.97	136.03	-	655.95	-	-	0.00%	489.20	18.94%
	Type 2	11,839.82	2,176.79	2,580.91	4,254.68	2,827.45	-	0.00%	2,075.45	22.44%
	Type 3	59,306.65	39,049.53	19,701.63	-	-	555.49	0.94%	-	26.19%
Dakabin-Kallangur-M. Downs	Excluded		-	-	-	-	-	0.00%	-	0.00%
	Type 1	7,639.19	6,883.35	-	755.83	-	-	0.00%	998.65	29.69%
	Type 2	18,255.29	14,054.02	4,201.27	-	-	-	0.00%	3,902.64	26.49%
	Type 3	39,343.16	33,262.07	468.67	5,189.54	-	422.89	1.07%	3,032.53	26.27%
Deception Bay	Excluded	1,364.50	1,364.50	-	-	-	-	0.00%	1,503.95	25.00%
	Type 1	3,643.07	3,643.07	-	-	-	-	0.00%	1,453.36	25.38%
	Type 2	21,447.81	21,447.81	-	-	-	-	0.00%	1,578.53	9.91%
	Type 3	38,759.76	38,604.61	155.15	-	-	-	0.00%	1,122.13	12.04%
Griffin-Mango Hill	Excluded		-	-	-	-	-	0.00%	1,907.99	0.00%
	Type 1	6,798.69	1,276.08	-	1,705.27	-	3,817.34	56.15%	4,914.22	63.78%
	Type 2	10,369.34	3,955.76	6,413.58	-	-	-	0.00%	11,134.83	19.74%
	Type 3	17,428.07	8,307.04	1,468.06	1,489.87	-	6,163.11	35.36%	1,576.46	58.31%
Hills District	Excluded	136.26	136.26	-	-	-	-	0.00%	-	36.70%
	Type 1	2,268.83	2,268.83	-	-	-	-	0.00%	381.98	32.97%
	Type 2	12,725.70	12,335.21	390.48	-	-	-	0.00%	921.48	30.21%
	Type 3	39,420.51	39,420.51	-	-	-	-	0.00%	1,205.44	30.56%
Morayfield	Excluded		-	-	-	-	-	0.00%	813.87	0.00%
	Type 1	17,404.93	17,175.22	229.70	-	-	-	0.00%	1,877.63	18.19%
	Type 2	31,514.31	29,880.61	1,633.70	-	-	-	0.00%	3,081.71	14.06%
	Type 3	14,890.00	14,890.00	-	-	-	-	0.00%	1,614.40	17.57%
Moreton Bay (R) Bal 1	Excluded	130,482.01	94,502.47	35,979.54	-	-	-	0.00%	-	17.76%
	Type 2	11,417.62	9,251.01	2,166.61	-	-	-	0.00%	-	12.93%
	Type 3	6,257.52	-	6,257.52	-	-	-	0.00%	-	25.00%
Moreton Bay (R) Bal 2	Excluded	28,594.33	3,000.84	25,593.49	-	-	-	0.00%	-	25.00%
	Type 2	6,079.08	2,973.24	3,105.84	-	-	-	0.00%	-	23.52%
	Type 3	74,340.32	41,221.61	33,118.71	-	-	-	0.00%	-	21.08%
Petrie	Excluded	1,725.05	795.26	929.78	-	-	-	0.00%	-	27.90%
	Type 1	17,644.20	17,644.20	-	-	-	-	0.00%	15.63	6.39%
	Type 2	907.60	907.60	-	-	-	-	0.00%	-	48.53%
	Type 3	15,905.83	14,852.53	1,053.30	-	-	-	0.00%	-	30.84%
Redcliffe	Excluded		-	-	-	-	-	0.00%	14.64	0.00%
	Type 1	38,956.89	12,275.57	-	26,681.32	-	-	0.00%	5,793.68	28.32%
	Type 2	53,121.75	33,344.93	-	9,732.02	-	10,044.80	18.91%	10,363.18	33.90%
	Type 3	20,754.01	12,833.40	-	5,541.88	-	2,378.73	11.46%	2,238.33	29.88%
Strathpine	Excluded	2,345.57	744.29	1,601.28	-	-	-	0.00%	629.15	0.00%
	Type 1	10,732.68	10,732.68	-	-	-	-	0.00%	2,087.71	26.45%
	Type 2	38,906.42	26,595.23	1,734.92	10,011.95	564.31	-	0.00%	6,233.07	20.74%
	Type 3	29,164.40	28,134.31	1,030.08	-	-	-	0.00%	1,123.85	27.53%

Notes:

The calculations for the three land use types (i.e. Place types) will not exactly match the extents of roads in the Region that pass through those land uses areas.
Each road segment was given an appropriate land use category based on the land uses it interacted with. Many of the road segments in the Region pass through multiple land use categories and this needs to be considered with reviewing the findings presented.

Appendix E

Transport Model Technical Report

Moreton Bay Region Council

Transport Networks and Corridors Strategy

Transport Model Technical Report

Issue | 21 May 2013

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1 Introduction

Arup was commissioned by Moreton Bay Regional Council (MBRC) to develop a 2021 and 2031 strategic transport model which would support Councils' emerging planning scheme and regional infrastructure strategy.

The scope for this study also included updating of the existing 2006 Moreton Bay Region Strategic Transport Model (MBRSTM-MM) base year model to a 2010 base.

1.1 Background

The Moreton Bay Regional Council (MBRC) emerged after the March 2008 local government elections, amalgamating the previous Local Government Authorities of Caboolture Shire Council (CSC), Pine Rivers Shire Council (PRSC) and Redcliffe City Council (RCC).

MBRC is currently developing a new Planning Scheme which will be based on the next generation planning 'Place Types' concept. As this will be the first Planning Scheme developed by MBRC as a combined entity, this provides MBRC with the opportunity to provide a fresh direction with regards to the long-term urban development patterns and transport requirements for the region.

Sustainable transport forms a key part of the Planning Scheme. Council has identified the following desired outcomes:

- Reduced trip generation rates;
- Increased mode share of walking, cycling and public transport;
- Increased self-containment of trips within the region, combined with shorter trip lengths; and
- More efficient use of the existing transport infrastructure.

1.2 Study scope

To assist in the development of the Planning Scheme, MBRC required a strategic transport model to be developed for the region to predict future travel demand as a basis to evaluate various road and public transport infrastructure requirements. The model will be used to inform the development of emerging planning scheme policies and regional infrastructure strategies, to support transport strategies and network operations and to assess the transport impacts of new developments.

The model requirements were that it uses the EMME/3 platform and represents a 2010 base year and two future year scenarios of 2021 and 2031 for the 24 hour and AM & PM peak periods. The models were developed using the latest available land use assumptions provided by MBRC (as of September 2012).

For the 2031 future year model, two mode split scenarios were considered. The first, referred to as the 'trend' based scenario, uses the model's inherent mode share results. The second scenario, termed as the 'policy' based scenario, applied external adjustments to the model's mode split results to reduce car mode share and increase public transport and active transport mode shares. This was a target

based approach used to investigate outcomes if mode share targets are achieved, recognising that a change to current travel behaviour would be required in the future.

The future year models were used to analyse the future road network capacity deficiencies and likely solutions for input to the Transport Infrastructure component of the Moreton Bay Regional Council Priority Infrastructure Plan (PIP) and the MBRC Transport Networks and Corridors Strategy (TNCS).

1.3 Report Overview

This report summarises the development of the base and future year Moreton Bay Region Strategic Transport Model – Multi Modal (MBRSTM-MM) and the model results used as inputs to the MBRC TNCS.

The report structure is as follows:

- Section 2 gives an overview of the strategic model;
- Section 3 outlines the development, calibration and validation of the base year model;
- Section 4 discusses the development of the forecast year models, including mode shift assumptions for a policy based scenario;
- Section 5 describes the assessment of road capacity deficiencies;
- Section 6 discusses the analysis of road space reallocation opportunities; and
- Section 7 provides an overall summary.

2 Overview of the MBRSTM-MM

2.1 Previous Traffic Models

The Moreton Bay Regional Strategic Transport Model (MBRSTM-MM) is a multi-modal model based on an EMME/3 platform. A 2006 base year model was developed by Halcrow in 2010 and the development and validation of that model was documented in a series of working papers[1]. The 2006 base year model has been updated and recalibrated to a 2010 base year as part of this study.

The MBRSTM-MM was adapted from the South-East Queensland Strategic Transport Model (SEQSTM-MM) and as such, it follows processes and methodologies contained within the SEQSTM-MM and the Brisbane Strategic Transport Model (BSTM-MM). The traffic zones and model assumptions were refined to more accurately represent the road network and land use in the Moreton Bay region.

2.2 Traffic Model Software

EMME is a widely used transport modelling software platform developed and maintained by Inro and it's the software platform for TMR's BSTM-MM and SEQSTM-MM models.

EMME/3 has the capability to include all steps of a four-step model and as such incorporates the following key processes within each model run:

- Trip generation;
- Trip distribution;
- Mode choice; and
- Route assignment.

The mode split and distribution models implemented in MBRSTM-MM uses the same structure as BSTM-MM (and the SEQSTM-MM). Generally the parameters used in BSTM-MM were used as a starting point, and new parameters estimated using observed data. Distribution adjustment factors, known as k factors, were applied during the model validation process. This approach is documented in the technical working papers produced by Halcrow.

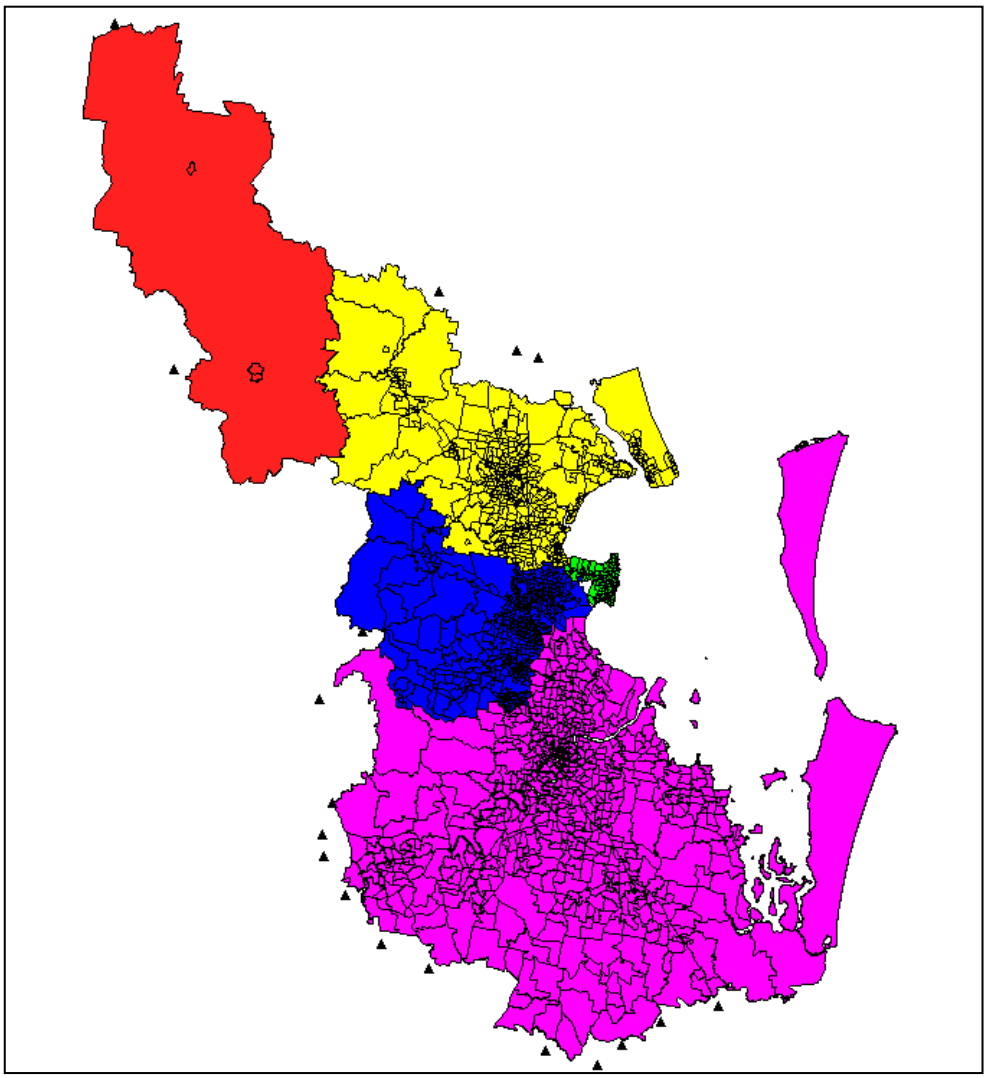
Highway and transit networks are coded using MapInfo software and are subsequently converted to EMME/3 format using an automated process. The magnitude of trip demand and travel patterns is derived within each model run and is primarily based on land use data input into the model traffic zones.

The current version at the time, Version 3, of EMME/3 has been used to develop MBRSTM-MM. We note that Inro has subsequently released Version 4 of the software, which includes various improvements. Whilst not critical for this project, a future consideration will be the need to upgrade the model to the new version of this software.

[1] MBRC Strategic Transport Model Update, Working Paper, Halcrow, 9 November 2010

2.3 Study Area and Zone System

The modelled geographic area of MBRSTM-MM and BSTM-MM are similar, except that MBRSTM-MM has been extended to include the Kilcoy Shire area in the north-western part of the study area. MBRSTM-MM includes a refinement of the BSTM-MM zone system in the Moreton Bay region with larger zones covering the remainder of greater Brisbane. Figure 1 shows the modelled area of MBRSTM-MM and the zone numbering system categorised by local government areas.



Area	Zone Number	Number of Zones
Former Pine Rivers Shire Council	1 – 979	590
Former Caboolture Shire Council	2,001 – 2,541	541
Former Redcliffe City Council	4,001 – 4,140	137
Former Kilcoy Shire Council	6,001 – 6,004	4
Remainder of Brisbane Statistical Division	7,001 – 8,926	698
External Zones	9,001 – 9,018	18

Figure 1: Zone system for MBRSTM-MM

Around the periphery of the model area, external zones allow traffic to enter and exit the modelled area. In total there are 18 external zones and 1,970 internal zones, of which 1,272 are located within the Council area.

2.4 Modelled Time Periods

The MBRSTM-MM represents travel demand over a 24 hour period of an average weekday in 2010, with the following time periods represented:

- AM peak period (07:00 to 09:00);
- Day time off-peak period (09:00 to 16:00);
- PM peak period (16:00 to 18:00); and
- Night time off-peak (18:00 to 07:00).

2.5 Modelled User Classes

The MBRSTM-MM disaggregates private travel demand following the distribution and mode split process into the following user classes:

- Car driver;
- Car passenger;
- Public transport passenger;
- Park & Ride;
- Kiss & Ride;
- Walk; and
- Cycle.

In addition to the above, commercial vehicle trips are split into separate demand matrices for medium commercial vehicles (MCV) and heavy commercial vehicles (HCV).

The assigned traffic volumes are stored in link attributes for each link of the network as follows:

- Private vehicles (PV)
- MCVs; and
- HCVs.

It is noted that validation of traffic volumes has been undertaken only for total volumes.

Public transport passenger demand is also stored in a link attribute for the purposes of extracting data used in the validation of bus and rail trips.

2.6 Trip Purposes

The trip purposes represented within MBRSTM-MM are the same as in the preceding SEQSTM-MM and BSTM-MM models.

Modelled trip purposes are:

- Home Based Work – Blue Collar (HBWB);
- Home Based Work – White Collar (HBWW);
- Home Based Education – Primary and Secondary only (HBE);
- Home Based Education – Tertiary only (HBET);
- Home Based Shopping & Personal Business (HBS);
- Home Based Other (HBO);
- Work Based Work (WBW);
- Other Non-Home Based – Excluding WBW (ONHB);
- Medium Commercial Vehicles (MCV); and
- Medium Commercial Vehicles (HCV).

3 Base Year Model Development

The following steps were taken in the development of the updated 2010 base year model from the existing 2006 base year model:

- Development of 2010 road and public transport network;
- Development of 2010 public transport services;
- Development of 2010 land use inputs;
- Calibration of the model assignment results; and
- Validation of the model against traffic count and public transport survey data.

This section of the report summarises the steps listed above. The model development report, *MBRSTM – 2010 Base Model Development Report*, March 2013 describes in detail the model development process and validation results and should be read in conjunction with this report if a full understanding of the model calibration and validation is required.

3.1 Network

The 2006 network used in the previous base model was taken as the starting point for the creation of the 2010 base model network. The following steps were undertaken in developing the 2010 road and public transport network:

- Inclusion of projects constructed between 2006 and 2010 based on projects coded in the BSTM-MM and SEQSTM-MM schemes. The status of projects was reviewed using aerial photography and in consultation with Council officers;
- Review of initial 2010 road network against the latest available aerial photography to identify other completed road projects;
- Inclusion of various existing pedestrian and cycle routes within the MBRC area that were not previously coded into the model;
- Changes to road hierarchy across the MBRC area;
- Inclusion of turn penalties for rail level crossings in MBRC area; and
- Localised revision of network coding in selected areas where discrepancies in the network coding were found during the network calibration process.

3.2 Public Transport Services

TransLink provided the 2010 public transport service data (transit lines) based on the 2010 road and public transport network. The public transport service data was based on the timetable in place on Wednesday 4 August 2010. Modelled routes and service frequencies were reviewed and updated where applicable.

3.3 Land Use Inputs

Land use data was provided by MBRC in September 2013. This dataset contained employment and population figures for years 2011, 2021 and 2031.

A number of checks were undertaken in order to ensure that the land use data used in the MBRSTM-MM was robust. These included the identification and correction of zones with:

- missing population data where households were present;
- missing household data where population was listed;
- a population per household ratio of greater than 5; and
- a large change in the population per household ratio in 2021 compared to 2011 and 2031.

Land use data for year 2010 was then derived based on an extrapolation using the growth rate derived from the 2011 and 2021 datasets.

Data on education enrolments and job categories was derived using information from the SEQSTM-MM, which was based on RPC 3 and 4 information developed by DTMR.

Table 1 shows a summary of the assumed demographic data for the Moreton Bay region.

Table 1: Demographic forecasts in the MBRC region

Year	Population (Persons)	Change	Employment (Jobs)	Change
2011	382,704	-	98,513	-
2021	454,381	19% (1.7% pa)	133,959	36% (3.1% pa)
2031	526,054	16% (1.5% pa)	169,100	26% (2.4% pa)

3.4 Model Calibration

In consultation with MBRC various adjustments were made to the model as part of the calibration process in order to improve model validation. Calibration changes included a review and update of the following input data:

- Road network attributes such as hierarchy and impedance;
- Coded number of lanes or posted speeds (if original coding was incorrect);
- Trip generation adjustment factors;
- Trip distribution adjustment factors;
- Time of day adjustment factors; and
- External volumes entering and exiting the modelled study area.

With regards to changes to the model network coding, adjustments were only made if they were considered to provide an improved representation of the actual network or if an error was detected. It should be noted that a high level review of the network coding was undertaken, with a detailed review only undertaken in areas where traffic flow irregularities were observed.

3.5 Model Validation

The 2010 model formed the basis of the forecast models that were used to determine the form of MBRC's future transport network, including intersection upgrade requirements. As such, validation of the peak period flows to a considerably stringent set of criteria was adopted.

Model validation has been based on criteria from a number of sources. UK transport modelling guidance sets out its acceptability guidelines in the *Design Manual for Roads and Bridges* (DMRB). Further guidance has also been taken from *Land Transport NZ's Economic Evaluation Manual – Volume 1* and DTMR's draft *Criteria and Guidelines for Transport Modelling (version 0.1).*

The above guidance documents were referred to due to their comprehensive description of the statistical analysis required for strategic traffic model validation.

The following criteria have been used for the validation of the 2010 base year traffic volumes:

- Scatter plots and coefficient of determination (R^2 analysis);
- Absolute differences in link volumes;
- GEH statistic; and
- Percentage root-mean-square-error (RMSE).

3.5.1 Screenline Locations

Screenlines are defined in models to represent travel between one area of the model to another. The screenline locations used in the MBRSTM-MM in the Moreton Bay region have been used to maintain consistency with the SEQSTM-MM. The screenline spreadsheets for the SEQSTM-MM were supplied by DTMR. An additional screenline was added to assist in monitoring traffic movements across the North Pine River with crossing points through Houghton Highway, Bruce Highway, Gympie Road and Youngs Crossing Road.

The following screenlines were included in model validation:

- Screenline SEQ 9 – North of Caboolture;
- Screenline SEQ 10 – Bruce Highway (Caboolture);
- Screenline SEQ CS – Caboolture River / Wararba Creek;
- Screenline SEQ 11 – Pine Rivers / Caboolture Border;
- Screenline SEQ 12 – Redcliffe / Caboolture/ Pine Rivers Border;
- Screenline SEQ 13 – Brisbane / Pine Rivers Border; and
- Screenline SEQ 13b (adapted screenline not originally in SEQ model) – North Pine River.

These locations are detailed in Figure 2.

The screenline validation process compares the observed traffic volume and the estimated model traffic flows. The results of the comparison between the observed

traffic counts and the estimated model volumes within the Moreton Bay Region are presented in the following sections.

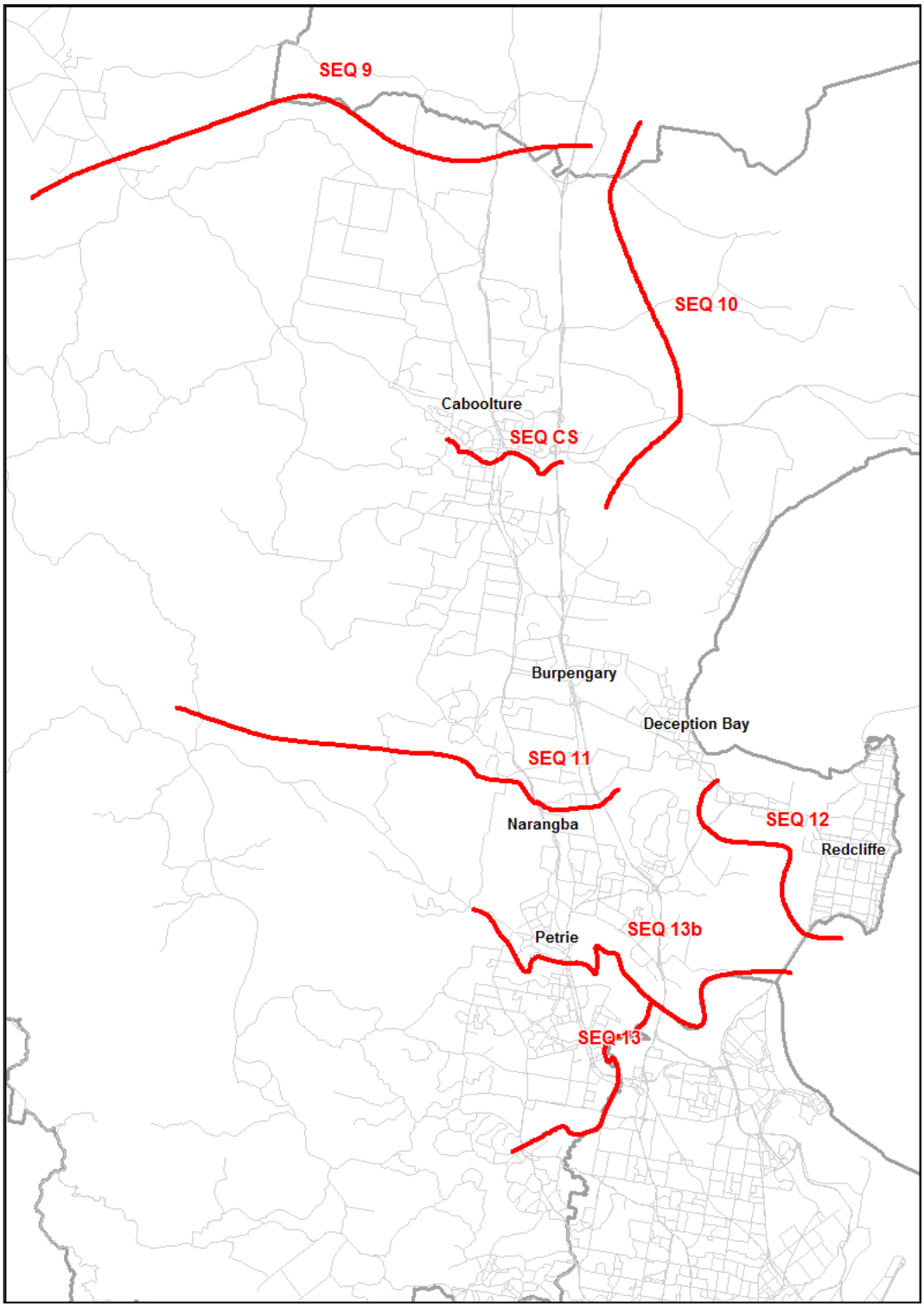


Figure 2: MBRSTM-MM screenlines used for traffic flow validation

3.5.2 Regression Analysis

Scatter plots have been prepared for all individual links and individual screenline totals. These are shown in the following sections.

Scatter plots are produced to compare the observed traffic counts to the estimated model volumes. The coefficient of determination (R^2) should be greater than 0.85 overall and greater than 0.95 in the vicinity of any infrastructure upgrade schemes that are to be analysed using the model.

The R^2 statistic is a number between 0 and 1, used to describe how well a regression line fits a set of data. An R^2 value close to 1 indicates that a regression line fits the data well, while an R^2 closer to 0 indicates a regression line does not fit the data very well.

All values for the 2010 model exceed the recommended value of 0.85 overall.

3.5.2.1 All Individual Links

The following figures present the correlation between the observed traffic volumes and the estimated model traffic flows for the 56 count sites across the seven screenlines. The comparison has been undertaken for the 24hr period, the AM peak period and the PM peak period.

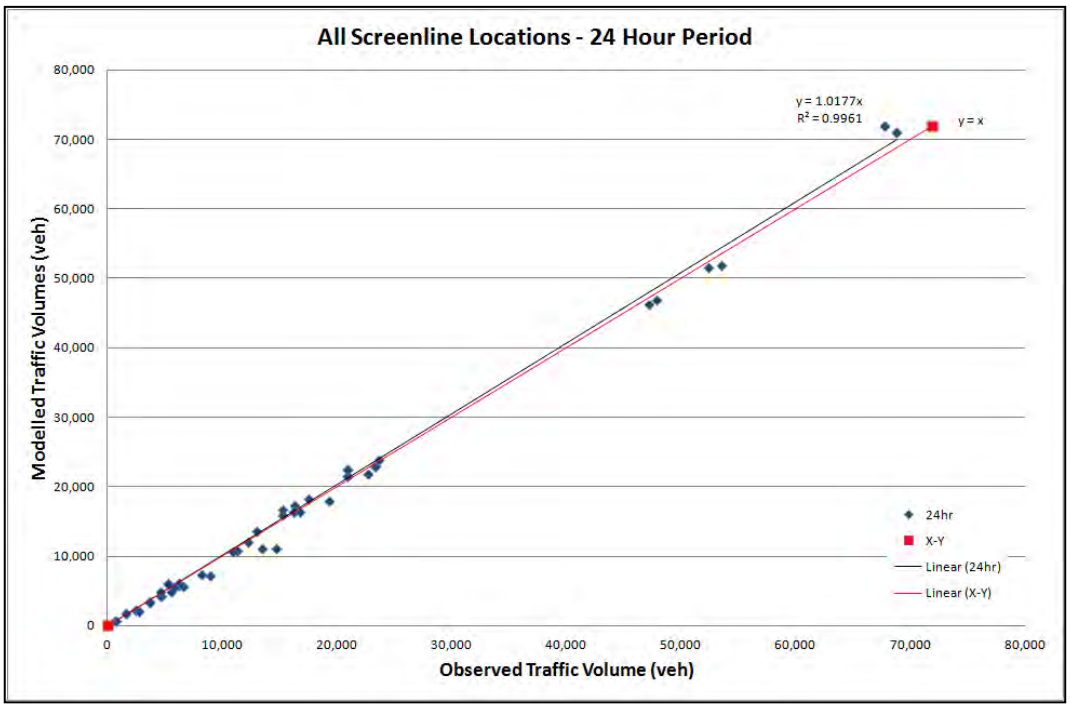


Figure 3: Scatter plot for 24hr period – all individual links

Figure 3 shows that the estimated model flows are well matched to the observed traffic volumes over the 24 hour period with an R^2 value of 0.9961.

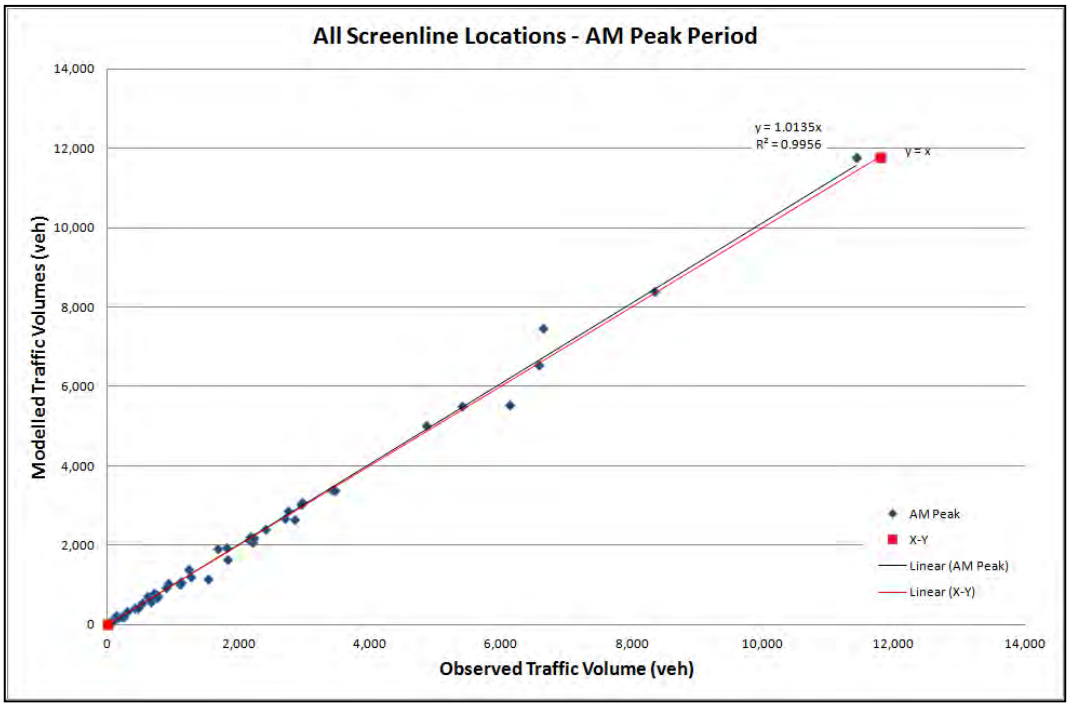


Figure 4: Scatter plot for AM peak period – all individual links

Figure 4 shows the estimated model flows are well matched to the observed traffic volumes over the AM peak period with an R^2 value of 0.9956.

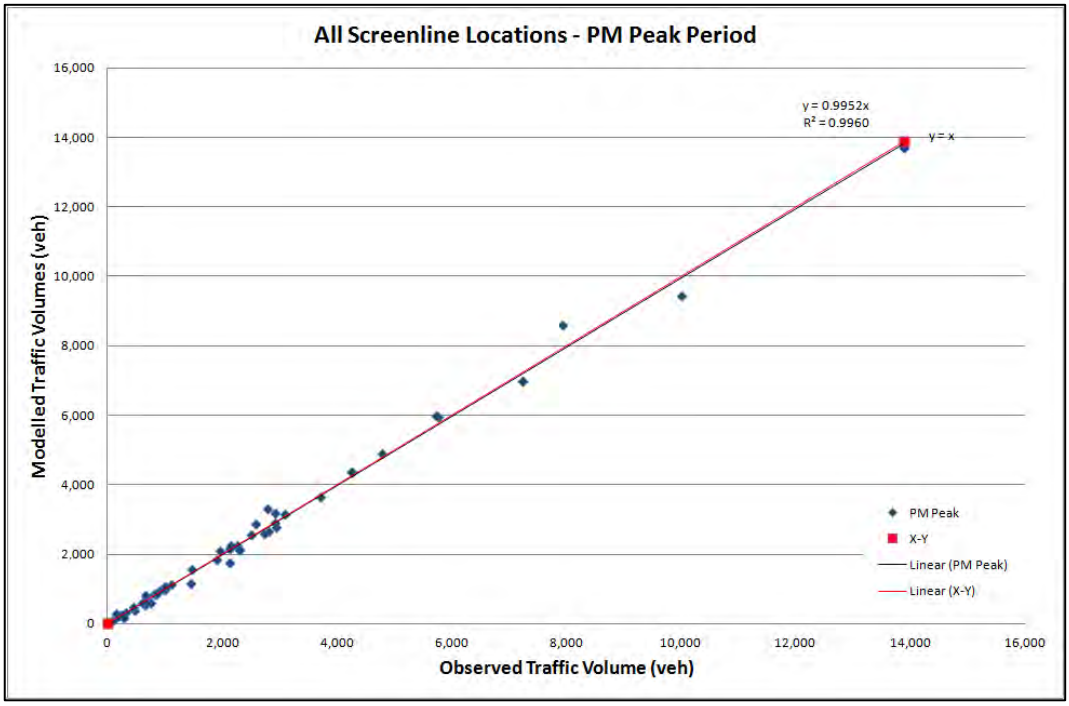


Figure 5: Scatter plot for PM peak period – all individual links

Figure 5 shows the estimated model flows are well matched to the observed traffic volumes over the PM peak period with an R^2 value of 0.9960.

3.5.2.2 Screenlines

The following figures present the correlation between the observed traffic volumes and the estimated model traffic flows for each direction of the seven screenlines. The comparison has been undertaken for the 24hr period, the AM peak period and the PM peak period.

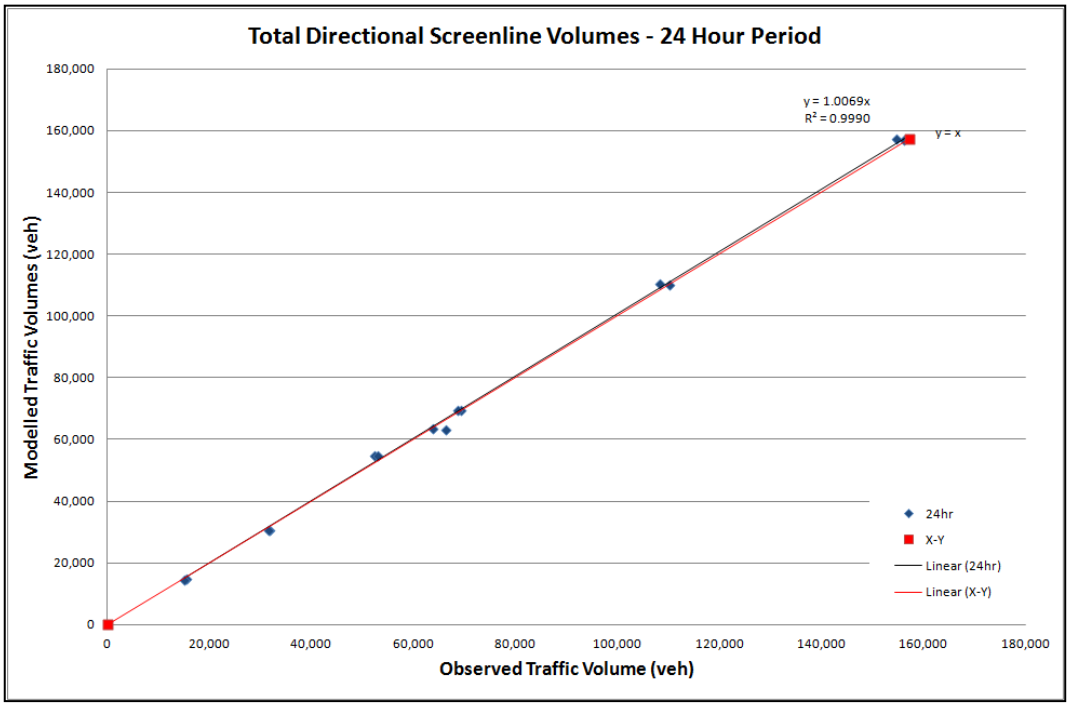


Figure 6: Scatter plot for 24hr period – directional screenline totals

Figure 6 shows the estimated model flows are well matched to the observed traffic volumes over the 24 hour peak period with an R-square value of 0.9990.

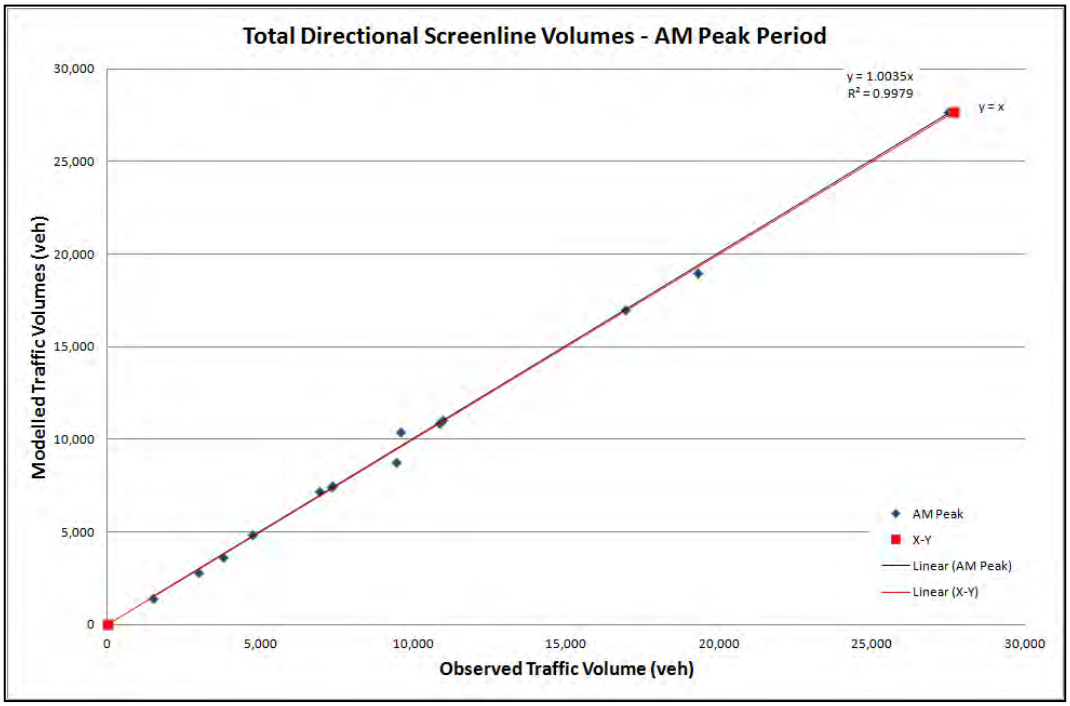


Figure 7: Scatter plot for the AM peak period – directional screenline totals

Figure 7 shows the estimated model flows are well matched to the observed traffic volumes over the AM peak period with an R-square value of 0.9979.

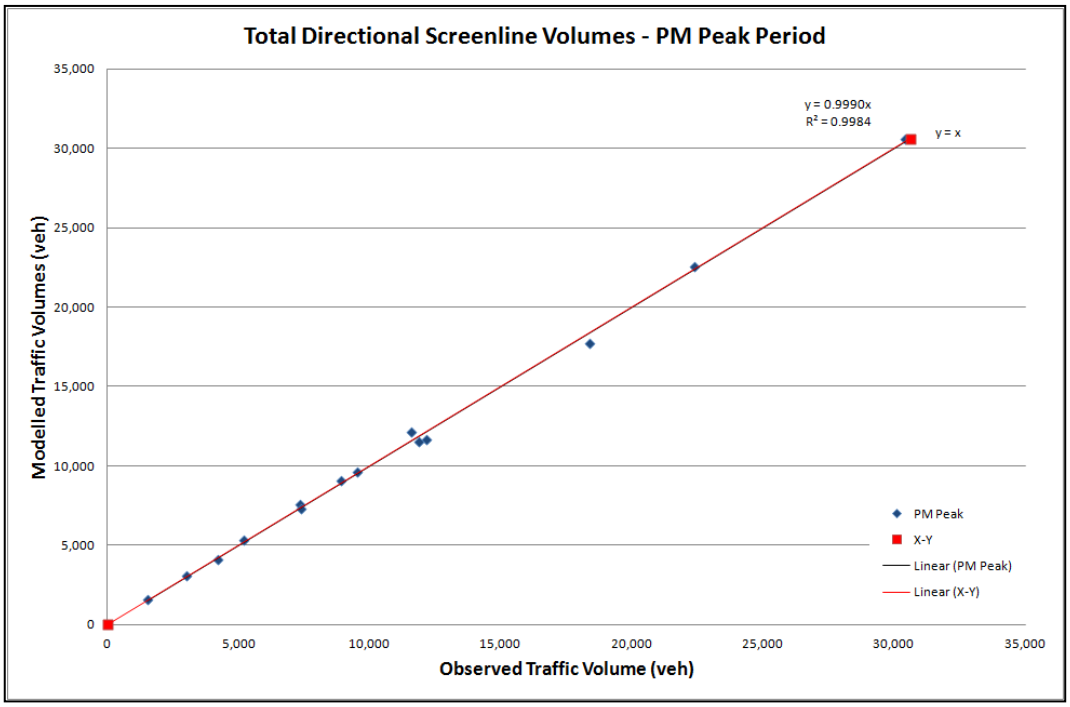


Figure 8: Scatter plot for the PM peak period – directional screenline totals

Figure 8 shows the estimated model flows are well matched to the observed traffic volumes over the AM peak period with an R-square value of 0.9990.

3.5.3 Traffic Volume Comparison

The validation of link volumes has been assessed using validation criteria set by DMRB[2], which stipulates that 85% of individual link flows must be:

- within 100 vehicles per hour (vph) of observed volumes for flows less than 700 vph;
- within 15% of observed volumes for flows between 700 vph and 2,700 vph; and
- within 400 vph of observed volumes for flows greater than 2,700 vph.

Total screenline volumes should also be within 5% of the observed volumes for all or nearly all screenlines. Arup's interpretation of the DMRB guidance is that 90% of all screenlines are required to pass this criterion for the purposes of this model validation analysis.

Link flows have also been tested against DTMR's draft Criteria and Guidelines for Transport Modelling (version 0.1). The guidance stipulates that link flows must be:

- within 10% or 50 to 300 vph of observed volumes for flows between 120 vph and 3,000 vph;
- within 9% or 300 to 400 vph of observed volumes for flows between 3,001 vph and 4,500 vph;
- within 400 vph of observed volumes for flows between 4,500 vph.

It should be noted that it would not be realistic to expect 100% of all individual link flow to pass the above DTMR flow criteria. Arup's interpretation of the DTMR guidance is that 85% of all individual links are required to pass the above criteria for the purposes of this model validation analysis.

3.5.3.1 Individual Links

The results of all individual links for the 24 hour, AM and PM peak period are summarised in Table 2, Table 3 and Table 4 respectively. The analysis highlights that the 24 hour model and the peak period models all have a pass rate of 95% and above and therefore pass the validation criteria for traffic volumes.

Table 2: Summary of DMRB flow validation for links – 24 hour period

Description	Links by Traffic Flow			All Links
Link Flow	< 700 veh	700-2700 veh	> 2700 veh	-
Acceptability Criterion (Modelled vs Observed Flow)	< 100 veh	< 15%	< 400 veh	-
Total Number of Links	35	17	4	56
Number of Passing Links	33	17	4	54
Actual % Passing Links	94%	100%	100%	96%
Target % of Passing Links	≥ 85%	≥ 85%	≥ 85%	≥ 85%
Verdict	PASS	PASS	PASS	PASS

[2] Design Manual for Roads and Bridges: Volume 12 Traffic Appraisal of Roads Schemes

Table 3: Summary of DMRB flow validation for links – AM peak period

Description	Links by Traffic Flow			All Links
Link Flow	< 700 veh	700-2700 veh	> 2700 veh	-
Acceptability Criterion (Modelled vs Observed Flow)	< 100 veh	< 15%	< 400 veh	-
Total Number of Links	24	24	8	56
Number of Passing Links	24	23	7	54
Actual % Passing Links	100%	96%	88%	96%
Target % of Passing Links	≥ 85%	≥ 85%	≥ 85%	≥ 85%
Verdict	PASS	PASS	PASS	PASS

Table 4: Summary of DMRB flow validation for links – PM peak period

Description	Links by Traffic Flow			All Links
Link Flow	< 700 veh	700-2700 veh	> 2700 veh	-
Acceptability Criterion (Modelled vs Observed Flow)	< 100 veh	< 15%	< 400 veh	-
Total Number of Links	23	25	8	56
Number of Passing Links	23	22	8	53
Actual % Passing Links	100%	88%	100%	95%
Target % of Passing Links	≥ 85%	≥ 85%	≥ 85%	≥ 85%
Verdict	PASS	PASS	PASS	PASS

3.5.3.2 Screenlines

A comparison of difference between the total observed and modelled flows for all screenlines in both directions is summarised in Table 5. The analysis included each screenline by direction as well as the combined two-way total.

Table 5: Summary of flow validation for screenlines

Description	24 Hour	AM Peak	PM Peak
Acceptability Criterion (Modelled vs Observed Flow)	< 5%	< 5%	< 5%
Total Number of Screenlines	21	21	21
Number of Passing Screenlines	21	19	21
Actual % Passing Screenlines	100%	90%	100%
Target % of Passing Screenlines	≥ 85%	≥ 85%	≥ 85%
Verdict	PASS	PASS	PASS

3.5.4 GEH Analysis

The GEH calculation is a chi-squared statistic which accounts for the magnitude of the difference between the observed and modelled values together with the

magnitude of the observed value. It is commonly used in traffic model validation and should be undertaken for individual link flows and also for screenline totals.

Guidance documents generally stipulate the following acceptability criteria apply when analysing link flows using the GEH statistic.

Individual link volumes must have a GEH value of:

- less than 5 for more than 85% of cases;
- less than 10 for more than 95% of cases; and
- less than 12 for 100% of cases.

For screenline totals the GEH value should be less than 4.

3.5.4.1 Individual Links

The results of the GEH analysis for individual links over a 24 hour period are summarised in Table 6.

The results indicate that only one link had a GEH value of greater than 5 for the 24 hour period and no links had a GEH value exceeding 10. This indicates that the modelled traffic volumes compared very well to observed volumes at a 24 hour level.

Table 6: Summary of GEH statistic for individual links – 24 hour period

Description	Links by GEH		
Acceptability Criterion (GEH)	< 5	< 10	< 12
Total Number of Links	56	56	56
Number of Passing Links	55	56	56
Actual % Passing Links	98%	100%	100%
Target % of Passing Links	≥ 85%	≥ 95%	100%
Verdict	PASS	PASS	PASS

Table 7 shows the results of the GEH analysis for individual links in the AM peak period. The results indicate that only three links had a GEH value of greater than 5 and no links had a GEH value exceeding 10.

Given that 95% of links had a GEH value within acceptable limits this indicates that the modelled traffic volumes compared very well to observed volumes in the AM peak period.

Table 7: Summary of GEH statistic for individual links – AM peak period

Description	Links by GEH		
Acceptability Criterion (GEH)	< 5	< 10	< 12
Total Number of Links	56	56	56
Number of Passing Links	53	56	56
Actual % Passing Links	95%	100%	100%
Target % of Passing Links	≥ 85%	≥ 95%	100%
Verdict	PASS	PASS	PASS

Table 8 shows the results of the GEH analysis for individual links in the PM peak period. The results indicate that six links had a GEH value of greater than 5 and no links had a GEH value exceeding 10.

Given that 89% of links have a GEH within acceptable limits this indicates that the modelled traffic volumes compared well to observed volumes in the PM peak period.

Table 8: Summary of GEH statistic for individual links – PM peak period

Description	Links by GEH		
Acceptability Criterion (GEH)	< 5	< 10	< 12
Total Number of Links	56	56	56
Number of Passing Links	50	56	56
Actual % Passing Links	89%	100%	100%
Target % of Passing Links	≥ 85%	≥ 95%	100%
Verdict	PASS	PASS	PASS

3.5.4.2 Screenlines

The results of the GEH analysis for screenline crossings over a 24 hour period, AM peak and PM peak period are contained in Table 9. Given that at least 90% of screenlines had a GEH of less than 4 in the AM peak period and all screenlines had a GEH of less than 4 in the PM and 24hr time periods indicates that the modelled traffic volumes compared well to observed volumes.

An examination of the individual screenline results showed that the Caboolture screenline (SEQ CS) has a slight tidal imbalance, with the model estimating low traffic volumes on Bruce Highway at this location in the northbound and high traffic volumes in the southbound direction in the AM peak.

Table 9: Summary of GEH statistic by screenline

Description	24 Hour	AM Peak	PM Peak
Acceptability Criterion (GEH)	< 4	< 4	< 4
Total Number of Screenlines	21	21	21
Number of Passing Screenlines	19	21	21
Actual % Passing Screenlines	90%	100%	100%
Target % of Passing Screenlines	≥ 90%	≥ 90%	≥ 90%
Verdict	PASS	PASS	PASS

3.5.5 Route-Mean-Square Error

The route-mean-square error of the 24 hour, AM peak and PM peak period are shown in Table 10. The route-mean-square error for all links is 7% in all time periods. These values are well below the acceptance limit of 30%.

Table 10: Summary of route-mean-square error

Description	24 Hour	AM Peak	PM Peak
Actual RMSE	7%	7%	7%
Target RMSE	< 30%	< 30%	< 30%
Verdict	PASS	PASS	PASS

3.5.6 Public Transport Patronage

A comparison of the public transport patronage has been undertaken by comparing the model estimates against public transport ticketing data.

The results of this comparison are contained in Table 11. The results show a good correlation between public transport patronage and the observed ticketing data over 24 hours and in the AM peak. The PM peak model overestimates public transport mode share by some 23%, however the number of trip boardings in the Moreton Bay region during the PM peak is significantly lower than in the AM peak due to the direction of journey to work trips from central Brisbane in the PM. Therefore the overall validation of public transport assignment appears reasonable.

Table 11: Public transport patronage – boarding only

Year	Public Transport Passenger Boarding Data		
	24 Hour	AM Peak	PM Peak
Modelled Passengers	40,057	15,798	4,111
Observed Passengers	37,381	16,131	3,345
Difference: Modelled - Observed	2,676	-333	767
Difference (%)	7%	-2%	23%

3.5.7 Model Validation Conclusion

Traffic volumes have been validated against five separate traffic flow validation guidelines. The results of the analysis indicate that the model exceeds the passing criteria for traffic flow validation for the 24 hour period, AM peak period and PM peak period.

A comparison of modelled public transport demand versus observed ticketing data has also illustrated a good representation of bus and rail trips within the model.

The model validation of the 2010 MBRSTM-MM has been significantly improved compared to the 2006 model, particularly for the AM and PM peak periods. Based on accepted standards it was considered that the model provides a suitable tool to inform planning of future transport requirements in the Moreton Bay Region.

4 Forecast Year Model Development

4.1 Model Scenarios

The 2010 validated base model was taken as the starting point for the creation of two forecast year models, 2021 and 2031.

For the 2031 forecast year, two scenarios were developed. The 'trend' based scenario refers to the case where the level of public transport provision coded into the model is in line with current planning expectations and the model predicts the mode share. The 'policy' based scenario refers to the case where a higher level of public transport provision has been assumed and the modelled mode share is adjusted externally to match targets set by MBRC.

The forecast model scenarios that were developed were:

- 2021;
- 2031 Trend; and
- 2031 Policy.

4.2 Road Network

The following steps were undertaken in developing the forecast year road networks:

- Inclusion of projects assumed to be constructed in 2011, 2012, 2016, 2021, 2026 and 2031. These were based on a combination of projects identified from the SEQSTM-MM, BSTM-MM and determined in consultation with Council; and
- Inclusion of various pedestrian and cycle routes within the MBRC area as advised by Council.

A summary of network changes within MBRC and surrounding areas that were included in the forecast MBSTM-MM models are shown in Appendix A.

Whilst the above changes were undertaken to create a model which reflects the expected base case of future infrastructure improvements, the following assumed road upgrades in MBRC are subject to confirmation through future local area planning:

- Station Road (Joyce Street to Progress Road) – upgrade to 4 lanes divided; and
- Caboolture River Road (Grant Road to Morayfield Road) – upgrade to 4 lanes divided.

4.3 Public Transport Services

Modelled public transport routes were generally based on the Connecting SEQ 2013 (CSEQ) public transport service data (transit lines) from the SEQSTM-MM.

For 2021, specific public transport service data was unavailable for the project. Therefore, a 2021 transit lines file was produced by:

- Using existing routes from the 2010 transit lines file and reducing the service headways by applying a growth rate; and
- Adding new services from the 2031 transit lines file and increasing the service headways by applying a growth rate.

The growth rate that was applied was extracted from the SEQSTM-MM. This rate was 8.3% per annum, which is the medium growth for bus headways in the outer areas of SEQ.

Additional bus routes to those contained within the SEQSTM-MM were also added to the 2021 and 2031 models. These routes are assumed to operate in conjunction with Moreton Bay Rail Line and were based on supplied information from MBRC as follows:

- Kippa-Ring to Redcliffe;
- North Lakes south to North Lakes north;
- Redcliffe to Peninsula Fair;
- Clontarf to Peninsula Fair;
- Dakabin Station to North Lakes;
- North Lakes to Petrie Station;
- North Lakes Station to Mango Hill;
- Rothwell to Sandgate Station;
- Deception Bay to North Lakes;
- Strathpine to Redcliffe;
- Caboolture to Redcliffe;
- Murrumba Downs to Petrie Station;
- Kinsellas – Mango Hill Loop;
- Rothwell to Deception Bay; and
- Redcliffe Loop Service.

Further public transport services were also added to the 2031 models based recommendations identified in the Moreton Bay Integrated Transport Study (MITS) model and advice received from MBRC's transport planners.

Table 12 summarises the additional public transport services added in the 2021, and 2031 Trend and Policy models.

Table 12: Future Year Public Transport Services

2031 Public Transport Project	2021 Trend	2031 Trend	2031 Policy
Moreton Bay Rail Line bus services	✓	✓	✓
North West Transport Corridor (NWTC)	×	×	✓
Caboolture North Rail Station	×	✓	✓
CSEQ bus routes from MITS model	×	✓	✓
Alderley-North Lakes bus route	×	✓	×
Northern Busway (Chermside to Bald Hills)	×	×	✓
Kippa-Ring to Redcliffe High Frequency bus route	×	×	✓
MITS bus routes	×	×	✓
Caboolture to Wamuran Green Corridor	×	×	✓

4.4 Mode Share Targets for Policy Model

The mode share targets that were adopted for the policy based model are shown in Table 13. These targets were determined by MBRC, following a review of existing mode share splits in the region, and a comparison with other Region's and local authorities approach to responding to CSEQ targets and growth.

The table also shows the mode share as predicted by the 2010 and 2031 trend based MBRSTM-MM. It can be seen that the model forecasts a mode shift from car travel to public transport between 2010 and 2031 on a trend basis. This is likely to be due to the increased level of public transport provided in the 2031 trend model.

In 2031, to achieve MBRC's policy mode share targets, car mode share would need to reduce by approximately 7.8%, public transport mode share would need to increase by 1.7% and active transport would need to increase by 6 %.

Table 13: Modelled and Target Mode Share

	Car	Public Transport	Active Transport
2010 Modelled Mode Share	87.0%	5.0%	8.0%
2031 Modelled Mode Share (Trend)	82.8%	9.3%	8.0%
2031 Mode Share Target (for Policy Model)	75%	11%	14%

As a comparison, the CSEQ targets for Moreton Bay Region were 70% car, 11% public transport and 19% active transport.

The mode share between private vehicle trips, public transport trips and active transport trips from the 2031 trend based model was analysed by trip purpose and place type to identify where increased mode shift could be realised in the policy based model. Table 14 summarises the results of this analysis and shows how mode share would need to change in each of the place types in order to meet the overall regional targets. The table shows that the largest mode shift away from

private car travel is targeted in Activity Centres, Urban and Next Generation Suburban place types.

Table 14: Comparison Trend and Policy Mode Shares by Place Type

	2031 Trend Based Model			2031 Policy Based Model		
Place Type	**Car**	**Public Transport**	**Active Transport**	**Car**	**Public Transport**	**Active Transport**
Activity Centre	75%	7%	18%	65%	10%	25%
Enterprise/Employment	87%	9%	5%	85%	9%	6%
Urban	81%	11%	8%	67%	14%	19%
Next Gen Suburban	84%	9%	7%	74%	11%	14%
Suburban	83%	11%	6%	78%	12%	10%
Special Area	91%	7%	2%	91%	7%	2%
Key Resource Area	93%	6%	1%	93%	6%	1%
Rural / Coastal	90%	6%	4%	90%	6%	4%
Total	82.8%	9.3%	8.0%	75.6%	10.8%	13.6%

4.5 Model Results

The model results are presented as a series of 24hr volume plots shown in Appendix B for the 2021 and 2031 trend based models and the 2031 policy based model. AM and PM two-hour peak period volume forecasts have also been produced as outputs from the model, but have been not specifically provided as volume plots in this report.

The following sections discuss in detail the changes to road based traffic flows, public transport trips and active transport trips between each of the scenarios. The following comparisons have been made:

- 2010 to 2021;
- 2021 to 2031 Trend; and
- 2031 Trend to 2031 Policy,

4.5.1 Growth between 2010 and 2021

4.5.1.1 Car and Commercial Vehicle Trips

Table 15 shows the growth in highway based travel demand between years 2010 and 2021 as estimated by MBRSTM-MM. The growth in car travel is forecast to be between 21% and 26% in the peak periods, or approximately 2% per annum. Growth in commercial vehicle trips is slightly higher than car trips, reflecting that employment is predicted to grow proportionately higher in the region than population.

Table 15: Growth in car and commercial vehicle trips between 2010 and 2021

Time Period	Travel Mode	Trip Totals (PCUs)		Total Growth	Annual Growth
		2010	2021		
AM	Car	137,000	164,600	21%	1.8%
	HCV	2,800	3,500	29%	2.3%
	MCV	4,000	5,400	33%	2.6%
PM	Car	127,000	160,000	26%	2.1%
	HCV	1,600	2,000	29%	2.3%
	MCV	2,300	3,000	33%	2.6%
24 Hour	**All**	**828,200**	**1,039,900**	**26%**	**2.1%**

4.5.1.2 Public and Active Transport Trips

Table 16 shows the growth in public and active transport trip demand predicted by the model between 2010 and 2021. Overall, the growth in public transport and active transport modes is forecast to be higher than private vehicle growth in percentage terms, though it should be noted that these trips are starting from a much lower base.

Public transport trips were forecast to experience a relatively high growth rate of around 6% per annum in the peak periods. This is likely to be due to the introduction of the Moreton Bay Rail Link, which is expected to open around 2016.

The active transport modes were forecast to have annual growth rates of 0.8 to 2.2% per annum in the peak periods, which is approximately in-line with the rate of growth in private vehicle trips.

Table 16: Growth in public and active transport trips between 2010 and 2021

Time Period	Travel Mode	Total Person Trips		Total Growth	Annual Growth
		2010	2021		
AM	PT	10,700	20,400	91%	6.0%
	Walk	17,700	19,300	9%	0.8%
	Cycle	4,000	4,400	10%	0.9%
PM	PT	6,400	11,900	86%	5.8%
	Walk	10,700	13,600	27%	2.2%
	Cycle	1,500	1,900	25%	2.0%
24 Hour	**All**	**132,700**	**186,700**	**41%**	**3.2%**

4.5.1.3 Growth Across Screenlines

Table 17 shows a summary of the forecast growth in traffic demand between 2010 and 2021 across screenlines for the 24 hour, AM peak and PM peak periods respectively. Appendix C contains detailed tables showing the forecast growth for individual screenline crossing points.

Table 17: 2010 to 2021 growth in road volumes across screenlines

Screenline	Direction	24 Hour	AM Peak	PM Peak
Screenline SEQ 9:	Northbound	2.5%	2.3%	2.1%
North of Caboolture	Southbound	2.5%	2.7%	2.8%
Screenline SEQ 10:	Westbound	0.7%	0.5%	1.4%
Bruce Highway (Caboolture)	Eastbound	0.7%	1.4%	0.3%
Screenline SEQ CS:	Northbound	2.4%	2.8%	0.9%
Caboolture River	Southbound	2.4%	2.0%	3.1%
Screenline SEQ 11:	Northbound	2.0%	1.9%	2.2%
Pine/Caboolture Border	Southbound	2.0%	1.8%	2.4%
Screenline SEQ 12:	Westbound	1.8%	0.7%	2.5%
Redcliffe/Caboolture/Pine Border	Eastbound	1.8%	1.8%	1.9%
Screenline SEQ 13:	Northbound	1.6%	1.1%	2.3%
Brisbane/Pine Border	Southbound	1.6%	1.7%	1.0%
Screenline SEQ 13b:	Northbound	1.5%	0.7%	2.4%
North Pine River	Southbound	1.5%	2.2%	1.1%

The key conclusions from this analysis were:

- Growth across screenlines SEQ 9 and SEQ CS is above the region wide average growth rate of 2.1% per annum. This reflects the relatively strong growth in employment expected in the Caboolture and Morayfield areas;
- The growth in trip demand across screenline SEQ 10 (trips to and from Bribie Island) was forecast to be significantly lower than growth in region as a whole. This is related to the low population growth in Bribie Island and nearby zones. Analysis of the population in Bribie Island in 2010 and 2021 shows an annual growth rate of only 0.2% compared to 1.7% in the Moreton Bay region overall.

Analysis of growth in peak periods also shows that growth occurs predominantly in the counter-peak direction at screenline SEQ 13, which is located along South Pine River on the border of Brisbane and the Moreton Bay region. Two factors that may contribute to this are:

- Growth in employment within Moreton Bay attracting a larger proportion of trips from both within and external to the Moreton Bay region;
- Growth in the peak direction is limited by available highway capacity.

4.5.1.4 Difference Plots

Figure 9 shows the change in travel demand over a 24 hour period in the Moreton Bay Region between 2010 and 2021. The displayed bandwidths are proportional to the absolute change in travel demand. Red bandwidths indicate an increase in demand and green travel bands indicate a decrease. The most significant increases in travel demand in absolute terms throughout the Moreton Bay region occur on the Bruce Highway.

Figure 9: Change in travel demand between 2010 and 2021 in the Moreton Bay region (24 hour)

Plots in Appendix D show the predicted 24-hour traffic volume changes on the road network from 2010 to 2021 in the areas of Caboolture/Morayfield, Burpengary, North Lakes/ Redcliffe and Strathpine.

Caboolture/Morayfield

In the Caboolture/Morayfield area the increase in traffic volumes (apart from the Bruce Highway) is most significant on Morayfield Road. Other roads with substantial increases in traffic volumes in the area are Oakey Flat Road, Buchanan Road, Lindsay Road and Beerburrum Road.

The difference plot also shows that the model predicted a change in the way traffic accesses Buchanan Road from Morayfield, with traffic using Dickson Road instead of Leda Boulevard.

It is recommended that refinement of the model in this local area would be required to improve localised route choice if traffic investigations are required in this area.

Burpengary

Traffic volumes in the Burpengary area are forecast to increase most significantly on O'Brien Road and Uhlmann Road, reflecting increased travel demand to/from Cabooltue/Morayfield.

North Lakes and Redcliffe

Within the North Lakes area, many of the changes in traffic volumes reflect the inclusion of new road links between 2010 and 2021. Anzac Avenue is forecast to experience high level of growth north of North Lakes.

In the Redcliffe area changes in traffic volumes between 2010 and 2021 are not significant apart from on Anzac Avenue. It is noted that traffic volumes on Anzac Avenue increase significantly more than traffic volumes on the Houghton Highway. This may indicate that growth in travel demand to destinations within the Moreton Bay region is forecast to be stronger than growth in travel to Brisbane.

Strathpine

In the Strathpine area the most significant forecast change in travel volumes is on Gympie Road. A large change is shown on Francis Road, which is a new connection over the rail line.

4.5.2 Growth Between 2021 and 2031 Trend Based Model

Table 18 shows the growth in road based travel demand between 2021 and 2031 as estimated by MBRSTM-MM with the overall growth in car travel demand forecast to be approximately 1.6% per annum. A notable trend is that the annual growth rate of cars and commercial vehicles between 2021 and 2031 is two-thirds of the growth rate between 2010 and 2021.

Table 18: Growth in car and commercial vehicle trips between 2021 and 2031 trend based model

Time Period	Travel Mode	Trip Totals (PCUs)		Total Growth	Annual Growth
		2021	2031		
AM	Car	164,600	188,800	15%	1.4%
	HCV	3,500	4,000	14%	1.3%
	MCV	5,400	6,200	15%	1.5%
PM	Car	160,000	189,300	18%	1.7%
	HCV	2,000	2,300	15%	1.2%
	MCV	3,000	3,500	17%	1.4%
24 Hour	**All**	**1,039,300**	**1,215,500**	**17%**	**1.6%**

Table 19 shows the forecast growth in public and active transport trip demand between 2021 and 2031. Forecast growth in public transport use is relatively high at over 3%, which is likely to be due to the increased level of bus services provision coded into the model.

Table 19: Growth in public and active transport trips between 2021 and 2031 trend based model

Time Period	Travel Mode	Total Person Trips		Total Growth	Annual Growth
		2021	2031		
AM	PT	20,400	27,700	36%	3.1%
	Walk	19,300	21,600	12%	1.1%
	Cycle	4,400	4,800	9%	0.8%
PM	PT	11,900	16,500	39%	3.4%
	Walk	13,600	16,800	24%	2.1%
	Cycle	1,900	2,300	21%	1.8%
24 Hour	**All**	**186,700**	**235,800**	**26%**	**3.4%**

4.5.2.1 Growth Across Screenlines

Table 20 shows a summary of the forecast growth in traffic demand between 2021 and 2031 (Trend scenario) across screenlines for the 24 hour, AM peak and PM peak periods respectively. Appendix C contains detailed tables showing the forecast growth for individual screenline crossing points.

Table 20: 2021 to 2031 Trend growth in road volumes across screenlines

Screenline	Direction	24 Hour	AM Peak	PM Peak
Screenline SEQ 9:	Northbound	6.4%	7.9%	5.7%
North of Caboolture	Southbound	6.5%	5.6%	8.2%
Screenline SEQ 10:	Westbound	0.7%	-0.4%	4.4%
Bruce Highway (Caboolture)	Eastbound	0.2%	0.8%	-0.4%
Screenline SEQ CS:	Northbound	3.7%	4.2%	2.6%
Caboolture River	Southbound	3.6%	2.9%	4.7%
Screenline SEQ 11:	Northbound	2.9%	4.3%	1.3%
Pine/Caboolture Border	Southbound	3.0%	1.9%	4.8%
Screenline SEQ 12:	Westbound	1.5%	1.6%	2.0%
Redcliffe/Caboolture/Pine Border	Eastbound	1.5%	1.5%	1.9%
Screenline SEQ 13:	Northbound	1.5%	0.8%	2.6%
Brisbane/Pine Border	Southbound	1.5%	2.2%	0.6%
Screenline SEQ 13b:	Northbound	1.8%	1.1%	3.3%
North Pine River	Southbound	1.7%	2.7%	0.7%

The key conclusions from this analysis were:

- Growth in trip demand across screenline SEQ 10 (trips to and from Bribie Island) is significantly lower than growth in the model as a whole. This is related to the low population growth in Bribie Island and nearby zones. Analysis of the population in Bribie Island in 2021 and 2031 shows an annual growth rate of only 0.2% compared to 1.5% in the Moreton Bay region overall.
- Forecast growth across screenlines SEQ 9 and SEQ CS and SEQ 10 is well above the region wide growth rate and growth across all other screenlines is broadly in line with the rest of the Moreton Bay region as a whole. This suggests that growth in demographic data is more concentrated in the northern part of the study area between 2021 and 2031.

An analysis of individual screenline crossing points highlights that forecast traffic growth on Bruce Highway across screenline SEQ 9 is particularly high in comparison to the rest of the model area. Traffic volumes assigned to the model at this location are controlled by external volumes entering the model directly onto Bruce Highway. External entry and exit volumes were cordoned from the SEQ model and are input directly to MBRSTM-MM using an input file that controls traffic volumes at the model boundary.

Analysis of the forecast growth in peak periods also shows that, as for 2021, growth occurs predominantly in the counter-peak direction at screenline SEQ 13, which is located along South Pine River on the border of Brisbane and the Moreton Bay region.

4.5.2.2 Difference Plots

Plots in Appendix D show the predicted traffic volume changes from 2021 to 2031 (Policy scenario) on the road network in the areas of Caboolture/Morayfield, Burpengary, North Lakes/ Redcliffe and Strathpine.

Caboolture/Morayfield

In the Caboolture/Morayfield area the increase in traffic volumes (apart from the Bruce Highway) is most significant on Morayfield Road. Other roads with notable increases in traffic volumes in the area are Oakey Flat Road and Beerburrum Road.

Burpengary

Traffic volumes in the Burpengary area are forecast to increase most significantly on O'Brien Road. It is notable that there are some local access routing changes, with volumes reducing on New Settlement Road and the Uhlmann Road/Bruce Highway interchange. This is likely to be a result of localised congestion affect route choice.

North Lakes and Redcliffe

Traffic growth in the North Lakes/Redcliffe area is concentrated along Anzac Avenue and the North South Urban Arterial. It is notable that volumes are forecast to decrease on the Houghton Highway.

Strathpine

In the Strathpine area the most significant forecast change in traffic volumes is on Gympie Road and South Pine Road. Other changes on the road network are relatively small.

4.5.3 Comparison Between 2031 Trend and Policy Based Models

A comparison of trips in the 2031 Trend and Policy models is shown in Table 21 and Table 22. These results clearly demonstrate the mode share change form car based trips to public transport, walk and cycle trips. It is notable that cycle trips experience the highest percentage increase, due to the relatively low starting value for this mode type.

Table 21: Change in car and commercial vehicle trips between trend and policy based models

Time Period	Travel Mode	Trip Totals (PCUs)		Change
		2031 Trend	2031 Policy	
AM	Car	188,800	169,300	-10.3%
	HCV	4,000	4,000	0%
	MCV	6,200	6,200	0%
PM	Car	189,300	176,400	-6.8%
	HCV	2,300	2,300	0%
	MCV	3,500	3,500	0.0%
24 Hour	**All**	**1,215,500**	**1,121,500**	**-7.7%**

Table 22: Change in public and active transport trips between trend and policy based model

Time Period	Travel Mode	Total Person Trips		Change
		2031 Trend	2031 Policy	
AM	PT	27,700	42,400	52.8%
	Walk	21,600	40,500	87.3%
	Cycle	4,800	10,900	130.3%
PM	PT	16,500	24,300	47.3%
	Walk	16,800	23,800	41.3%
	Cycle	2,300	4,300	88.1%
24 Hour	**All**	**235,800**	**373,000**	**58.2%**

4.5.3.1 Difference Plots

Plots in Appendix D show detailed predicted traffic volume changes on the road network in the areas of Caboolture/Morayfield, Burpengary, North Lakes/

Redcliffe and Strathpine. These plots show how road traffic volumes are predicted to decrease across the entire road network as a result of the targeted reduction in car based travel in the 2031 Policy scenario. Traffic volume decreases on the Bruce Highway are predicted to be relatively modest with the most significant changes predicted on the arterial road network, including on Morayfield Road, Anzac Avenue and Gympie Road.

5 Assessment of Road Capacity Deficiencies

5.1 Desired Standard of Service

Council has defined a desired standard of service (DSS) to identify capacity deficiencies in the road network. The identified deficiencies will be used as an input to determine Council's 10 year priority infrastructure plan (PIP) and the longer term 20 year transport strategy.

A DSS has been defined separately for each place type using place type groupings as summarised below.

- Place Type Grouping 1: activity centres;
- Place Type Grouping 2: urban neighbourhoods, next generation suburban neighbourhoods, *suburban neighbourhoods*, enterprise employment areas, rural townships, coastal villages; and
- Place Type Grouping 3: rural residential, rural areas.

Noted: it was agreed with Council that it would be more appropriate for the Suburban Neighbourhoods place type to be grouped in Place Type 2 for the assessment of road capacity DSS, rather than in Place Type 3 which was used for other planning considerations.

It was agreed with Council that is the proposed DSS to identify capacity deficiencies in the road network would be based on an upper limit level of service (LOS) applicable during peak travel periods, as defined for each place type grouping. The LOS has been defined using degree of saturation (DOS), which is a measure how close the road network is to capacity. The DOS for links and intersections was calculated using outputs from the Strategic Model.

Table 23: Desired Standard of Service for Road Capacity

		Place Type Grouping		
		1	2	3
Desired Standard of Service (Level of Service)		D/E*	D	C
Road Link DOS	Arterial	0.95	0.85	0.65
	Sub-Arterial	0.95	0.85	0.65
	Collector	0.90	0.80	0.60
Intersection DOS	Signalised	0.95	0.95	0.90
	Roundabout	0.95	0.95	0.85
	Priority	0.90	0.90	0.80

** LOS E for Place Type Grouping 1(Activity Centres) relates to the level of service on links. Network capacity in Activity Centres is most likely to be determined through intersection capacity, which has an upper limit of LOS D.*

MBRC's Strategic Framework and current policies aim to ensure future infrastructure provision does not see an over provision of inappropriate capacity enhancements. The proposed DSS recognise the different expectations for acceptable peak period traffic conditions across the different place types. For

example, in built-up areas such activity centres, a lower level of service is tolerated compared to rural areas.

Council seeks to encourage a wider mode choice particularly in activity centres, and hence the DSS has been targeted at D/E.

This aligns with Council's objectives for creating more sustainable transport outcomes such as an increased mode share of walking, cycling and public transport.

5.2 Methodology

Road network deficiencies were determined by calculating the degree of saturation of links and intersections using modelled AM and PM peak hour flows output from the 2021 and 2031 Policy strategic models and compared against the thresholds shown in Table 23.

An analysis of traffic counts in different locations in the region showed that, on average, a conversion factor of 0.6 for the AM peak and 0.5 for the PM peak applied when converting modelled peak 2-hour flows to peak 1-hour flows.

5.2.1 Links

Link deficiencies were assessed to determine if additional mid-block lanes would be required for a link. For example, upgrade of a two-lane road to a four lane road. A link was defined as being deficient when the degree of saturation for the link was predicted to exceed the thresholds shown in Table 23.

The degree of saturation of road links was calculated using an assumed lane saturation flow, taken to range from 1,850 to 2,100 pcu/lane, depending on the link's hierarchy classification. This lane saturation flow was intended to only be the carrying capacity of a link, excluding the influence of intersections on the capacity of the links. It is different to the mid-block link capacity parameters used in the model assignment, which takes into account the influence of intersections.

5.2.2 Intersections

The intersection deficiencies were determined using SIDRA analysis, using peak hour traffic volumes predicted by the strategic model. An intersection was identified as being deficient if the degree of saturation of any traffic movement exceeded the thresholds shown in Table 23.

As the MBRSTM-MM is a strategic model that does not explicitly model intersection delay or capacity, a process to 'flag' potentially deficient intersections using the modelled volumes on links was used to select candidate intersection for analysis in SIDRA.

The process to select intersections for SIDRA analysis used the modelled mid-block link capacity parameter to calculate a volume to capacity ratio (v/c) of the approaches (links) to intersections. Intersections were then selected for SIDRA analysis if:

- At least 1 leg exceeded a v/c of 0.8; or
- At least 2 legs exceeded a v/c of 0.64; or

- At least 3 legs exceeded a v/c of 0.48.

The results of the selection process are shown in Appendix E. These results show the intersections that were selected for SIDRA analysis and those that were subsequently identified as being deficient.

5.3 Deficiencies and Solutions

The link deficiency analysis for 2021 and 2031 did not identify any links on MBRC's road network that would require additional mid-block capacity.

The intersection deficiency analysis identified 15 intersections in 2021 and 40 intersections in 2031 that would not meet the level of service criteria. These intersections are shown in Table 24 and Table 25 respectively, along with proposed solutions to address the deficiencies. In some cases, intersections have been grouped together as a corridor upgrade.

The results of the deficiency analysis are also shown on network plots contained in Appendix F. These plots show the location of all intersections that were flagged using the selection process discussed in Section 5.2.2, including intersections on the State controlled road network which are discussed in further detail in Section 5.4, and the intersections on MBRC's network that were subsequently identified as being deficient.

It should be noted that the identified solutions are based on SIDRA intersection analysis using traffic volumes output from the MBRSTM-MM. This assessment should be supplemented by a detailed analysis of the upgrade requirements using design volumes derived using project specific traffic forecasting.

Table 24: 2021 Road Capacity Deficiencies and Solutions

Deficiency ID	Location	Identified Deficiency	Proposed Solution
2-1	Youngs Crossing Road/Oxford Street, Joyner	Existing priority controlled intersection exceeds DSS	Signalisation of intersection and upgrade of Young's Crossing Road to 4 lanes between Oxford Road and Francis Road. Design for 2031 volumes.
2-2	Samsonvale Road/Lavarack Road, Bray Park	Existing signalised intersection exceeds DSS	Upgrade intersection by: • Increasing capacity of the southern approach by lengthening the right turn lane.
2-3	Kremzow Road/Leitchs Road, Brendale	Existing signalised intersection exceeds DSS	Upgrade intersection by: • Increasing capacity of the southern approach by increasing the length of 2-lane section.
2-4	South Pine Road/Camelia Avenue, Everton Hills	Existing signalised intersection exceeds DSS	Upgrade intersection by: • Increasing capacity of the westbound movements by adding a third through lane on the westbound approach and departure.
2-5	South Pine Road/Plucks Road, Arana Hills	Existing signalised intersection exceeds DSS	Upgrade intersection by: • Increasing capacity northern approach.
2-6	Queens Road/Miller Parade, Everton Park	Existing priority controlled intersection exceeds DSS	No upgrade proposed as just over DSS of 0.9 and is not deficient under 2031 analysis.
3-1	Burpengary Road/New Settlement Road, Burpengary	Existing roundabout exceeds DSS	Signalise intersection and increase capacity through additional lanes on all approaches. This upgrade requires either widening of the rail crossing underpass or shifting the intersection 50m to the east, resulting in significant land requirements. Design for 2031 volumes.
4-1	Old Gympie Road/Hughes Road, Kallangur	Existing priority controlled intersection exceeds DSS	Signalisation of intersection. Upgrade to be consistent with future corridor improvements along Old Gympie Road.
4-2	Old Gympie Road/Macarthur Drive	Existing priority controlled intersection exceeds DSS	Signalisation of intersection. Upgrade to be consistent with future corridor improvements along Old Gympie Road.
4-3	Halpine Drive/Shop Access, Mango Hill	Priority controlled intersection exceeds DSS	Intersection will be upgraded as part of MBRL works
6-1	Oakey Flat Road, Morayfield	Several intersections exceed DSS: Oakey Flat Road/Clark Road Oakey Flat Road/Anderson Road Oakey Flat Road/Ridgegarden Drive Oakey Flat Road/Walkers Road	Corridor upgrade of Oakey Flat Road from Clark Road to Morayfield Road to address intersection capacity improvements, right-turn safety improvements and provision of active transport facilities. Intersection capacity improvements: • Oakey Flat Road/Clark Road – signalise. • Oakey Flat Road/Anderson Road – signalise.

Deficiency ID	Location	Identified Deficiency	Proposed Solution
			• Oakey Flat Road/Walkers Road – increase length of short lanes. Design of upgrade should take into account 2031 design requirements.
6-2	Anderson Road/Lindsay Road intersection, Morayfield	Existing priority controlled intersection exceeds DSS	Signalisation of intersection

Table 25: 2031 Road Capacity Deficiencies and Solutions

Deficiency ID	Location	Identified Deficiency	Proposed Solution
2-1	Youngs Crossing Road/Oxford Street, Joyner	Existing priority controlled intersection exceeds DSS	As per 2021 upgrade.
2-2	Samsonvale Road/Lavarack Road, Bray Park	Existing signalised intersection exceeds DSS	As per 2021 modifications.
2-3	Kremzow Road/Leitchs Road, Brendale	2021 upgrade solution exceeds DSS	Modify signalised intersection to include a slip lane from south approach
2-4	South Pine Road/Camelia Avenue, Everton Hills	Existing signalised intersection exceeds DSS	As per 2021 upgrade.
3-1	Burpengary Road/New Settlement Road, Burpengary	Existing roundabout exceeds DSS	As per 2021 upgrade.
3-2	Nerangba Road/ Alma Road	Existing priority controlled intersection exceeds DSS	Signalisation of intersection.
3-3	Boundary Road/Narangba Road	Existing priority controlled intersection exceeds DSS	Signalisation of intersection and provide a 2nd through lane on northern arm.
3-4	Burpengary Road/Pitt Road	Existing priority controlled intersection exceeds DSS	Signalisation of intersection.
3-5	Burpengary Road/Rosehill Drive	Existing priority controlled intersection exceeds DSS	No upgrade if Pitt Road signalised as alternative route available.
3-6	Burpengary Road/Fernando Street	Existing priority controlled intersection exceeds DSS	No upgrade if Pitt Road signalised as alternative route available.
4-3.1	Halpine Drive/Shop Access,	Priority controlled intersection	Intersection will be upgraded as part of MBRL works

Deficiency ID	Location	Identified Deficiency	Proposed Solution
	Mango Hill	exceeds DSS	
4-3.2	Halpine Drive/Mango Hill Ring Road, Mango Hill	Priority controlled intersection exceeds DSS	Intersection will be signalised as part of the Mango Hill Ring Road works
4-4	Old Gympie Road,	Several intersections exceed DSS: Old Gympie Rd/ Brickworks Rd Old Gympie Rd/Ann St Old Gympie Rd/Alma Rd/Kerr Rd West Old Gympie Rd/Boundary Rd	Corridor upgrade of Old Gympie Road from Anzac Avenue to Boundary Road to address intersection capacity improvements, right-turn safety improvements and provision of active transport facilities. Intersections of Hughes Road and Macarthur Drive upgraded in 2021.
4-5	Dohles Rocks Road, Kallangur	Several intersections exceed DSS.	Intersections will be upgraded as part of MBRL works
6-1	Oakey Flat Road, Morayfield	Several intersections exceed DSS: Oakey Flat Rd/Clark Rd Oakey Flat Rd/Anderson Rd Oakey Flat Rd/Ridgegarden Dr Oakey Flat Rd/Walkers Rd Oakey Flat Rd/ Lakeview Rd Oakey Flat Rd/ Ashbrook Dr Oakey Flat Rd/ Burbury Rd	Corridor upgrade as per 2021.
6-2	Anderson Road/Lindsay Road intersection, Morayfield	2021 upgrade solution exceeds DSS	Increase capacity on western arm and northern turn pocket.
6-3.1	Lindsay Road/O'Brien Road intersection, Burpengary	Existing priority controlled intersection exceeds DSS	Signalisation of intersection with priority of movements changed to Lindsay-O'Brien.
6-3.4	Lindsay Road/Hunt Road, Burpengary	Existing priority controlled intersection exceeds DSS	Signalisation of intersection.
6-3.2	Station Road/ Jill Street, Burpengary	Existing priority controlled intersection exceeds DSS	Signalisation of intersection.
6-3.3	Station Road/O'Brien Road, Burpengary	Existing signalised intersection exceeds DSS	Provide greater capacity for west-south movements. Increase turn lane storage on all arms.
6-4	Grant Road, Caboolture South	Several deficient intersections: Grant Road/Torrens Road	Reduce "rat-running" volumes on Grant Road by providing the Cundoot Creek Crossing.

Deficiency ID	Location	Identified Deficiency	Proposed Solution
		Grant Road Caboolture River Road Grant Road/Michael Avenue Grant Road/Beacon Street	
6-4.1	Caboolture River Road/Grant Road, Caboolture South	Existing signalised intersection exceeds DSS.	Upgrade not required as Cundoot Creek Crossing results in lower volumes on Grant Road.
6-5	Buchanan Road/ Graham Road/ Weier Road, Morayfield	Existing roundabout exceeds DSS	Signalisation of intersection.
6-6	Lindsay Road/Clark Road, Morayfield	Existing signalised intersection exceeds DSS (with Cundoot Creek Crossing scenario).	Signalisation of intersection.
6-7	Cundoot Creek Crossing	New link to increase network connectivity and capacity.	Cundoot Creek Crossing (extension of Graham Road to Lower King Street).
6-8	Brown Street	New link to increase network connectivity and capacity.	Brown Street link (connection between Pettigrew Street and Pumicstone Road (via Ardrossan Road).

5.4 State Road Network Deficiencies

The deficiency analysis has also identified link deficiencies on the State road network within Moreton Bay region. These link deficiencies are summarised in Table 26 below.

Table 26: 2021 and 2031 State Link Deficiencies

Deficient Link	2021	2031
Samford Road between Ancaster Road and Camp Mountain Road	✓	✓
Samford Road westbound between Samford Creek and Camp Mountain Road		✓
South Pine Road southbound between Eatons Crossing Road and Albany Creek Road	✓	✓
Linkfield Road westbound between South Pine River and Coes Lane	✓	✓
Bruce Highway between south of Boundary Road Interchange and Pine River	✓	✓
Bruce Highway southbound between south of Deception Bay Road interchange and north of Boundary Road Interchange	✓	✓
Bruce Highway between south of Uhlmann Road interchange and north of Deception Bay Road interchange	✓	✓
Bruce Highway southbound between south of Caboolture Bribie Island Road interchange and north of Buchanan Road interchange	✓	✓
Bruce Highway southbound between south of Beerburrum-Donnybrook Way interchange and north of Pumicestone Road interchange	✓	✓
Bruce Highway between Pine River and Steve Irwin Way interchange		✓

Intersection deficiencies on the State road network have not been identified to the same level as the MBRC intersections due to the level of SIDRA analysis that would be required. However, the flagging process discussed in Section 5.2.2 has been used to identify intersection that may be deficient in 2021 and 2031 (subject to confirmation using detailed capacity analysis).

These intersections are summarised below in Table 27 and shown on network plots in Appendix F along with the State link deficiencies summarised above.

Table 27: 2021 and 2031 State Intersection Flagged for Deficiencies

Deficient Link	2021	2031
Intersections on Samford Road between Owarra Avenue West and Main Street	✓	✓
Intersection of Mount Glorious Road (Pei Road) / School Road	✓	✓
Intersections on Old Northern Road between Albany Creek Road and Chinook Street	✓	✓
Intersections on South Pine Road between Old North Road and Albany Road	✓	✓
Intersections on Eatons Crossing Road between South Pine Road and Eden Drive	✓	✓
Intersections on Gympie Road between Anzac Avenue and South Pine Road	✓	✓
Intersections on Dayboro Road between Youngs Crossing Road and Anzac Avenue	✓	✓
Intersections on Anzac Avenue between Gympie Road and Dohles Rocks Road	✓	✓
Merge point of Bruce Highway southbound with on-ramp from Dohles Rocks Road	✓	✓
Intersection of Bruce Highway southbound on-ramp / Dohles Rocks Road /	✓	✓

Deficient Link	2021	2031
Goodrich Road East		
Intersection of Bruce Highway northbound off-ramp / Dohles Rocks Road	✓	✓
Intersection of Dohles Rocks Road / Narangba Road / Anzac Avenue	✓	
Merge point of Bruce Highway southbound with on-ramp from Anzac Avenue	✓	✓
Intersection of Anzac Avenue / Brays Road	✓	✓
Intersection of Anzac Avenue / Bruce Highway southbound off-ramp / on-ramp	✓	✓
Merge point of Bruce Highway northbound with on-ramp from Anzac Avenue		✓
Intersection of Anzac Avenue / Discovery Drive / Halpine Drive	✓	✓
Intersections on Anzac Avenue between McGahey Street and Klingner Road	✓	✓
Intersection of Hornibrook Esplanade / Haysmouth Parade	✓	
Intersection of Deception Bay Road / Morris Road		✓
Merge point of Bruce Highway southbound with on-ramp from Boundary Road	✓	✓
Merge point of Bruce Highway northbound with on-ramp from Boundary Road		✓
Merge point of Bruce Highway southbound with on-ramp from Deception Bay Road		✓
Intersection of Deception Bay Road / Bruce Highway southbound o-ramp / off-ramp	✓	
Intersection of Deception Bay Road / New Settlement Road / Bruce Highway northbound on-ramp / off-ramp	✓	✓
Intersection of New Settlement Road / Old Gympie Road	✓	✓
Merge point of Bruce Highway northbound with on-ramp from New Settlement Road	✓	✓
Merge point of Bruce Highway southbound with on-ramp from Uhlmann Road	✓	✓
Merge point of Bruce Highway northbound with on-ramp from Uhlmann Road		✓
Intersection of Uhlmann Road / Bruce Highway southbound on-ramp / off-ramp	✓	
Intersection of Uhlmann Road / Bruce Highway northbound on-ramp	✓	✓
Intersection of Uhlmann Road / Bruce Highway northbound off-ramp	✓	✓
Intersection of Uhlmann Road / Bruce Highway northbound on-ramp / off-ramp	✓	
Intersections on Morayfield Road from Uhlmann Road to Lower King Street	✓	✓
Merge point of Bruce Highway southbound with on-ramp from Buchanan Road	✓	✓
Merge point of Bruce Highway northbound with on-ramp from Buchanan Road		✓
Intersections on Lower King Street between Mewett Street and Morayfield Road	✓	✓
Intersection of Beerburrum Road / Hasking Street	✓	✓
Intersection of Beerburrum Road / Bertha Street		✓
Intersection of King Street / Smiths Road	✓	
Merge point of Bruce Highway southbound with on-ramp from Caboolture Bribie Island Road	✓	✓
Merge point of Bruce Highway southbound with on-ramp from D'Aguilar Highway		✓
Intersection of Caboolture Bribie Island Road / Pasturage Road	✓	✓
Intersection of Caboolture Bribie Island Road / Hickey Road	✓	
Intersection of Caboolture Bribie Island Road / Old Toorbul Point Road	✓	
Intersection of Caboolture Bribie Island Road / Saint Road	✓	
Intersection of Caboolture Bribie Island Road / Bestmann Road	✓	
Merge point of Bruce Highway southbound off-ramp with D'Aguiler Highway		✓
Merge and diverge point of D'Aguiler Highway and Bruce Highway ramps		✓
Merge point of D'Aguiler Highway with ramps from Pumicestone Road		✓

Deficient Link	2021	2031
Intersection of Pumicestone Road / D'Aguiler Highway eastbound on-ramp		✓
Intersection of Pumicestone Road / Old Gympie Road		✓
Merge and diverge point of D'Aguiler Highway and Old Gympie Road ramps		✓
Merge point of Bruce Highway northbound with on-ramp from D'Aguiler Highway		✓
Intersections on Beerburrum Road between McDougall Road and Tuckeroo Drive		✓
Merge point of Bruce Highway southbound with on-ramp from Pumicestone Road		✓
Merge point of Bruce Highway northbound with on-ramp from Pumicestone Road		✓
Merge point of Bruce Highway southbound with on-ramp from Steve Irwin Way		✓
Intersection of Steve Irwin Way / Beerburrum-Donnybrook Road		✓
Intersection of Beerburrum-Donnybrook Way / Bruce Highway southbound off-ramp		✓
Intersections on D'Aguiler Highway between King Street and Bleakley Street		✓
Intersections on D'Aguiler Highway between King Street and Atwood Street	✓	

6 Opportunities for Reallocation of Road Space

6.1 Methodology

The model results have been used to identify locations where opportunities might exist to reallocate road space. This refers to cases where road capacity is reduced (by removing general traffic lanes) in order to facilitate the inclusion or enhancement of facilities for other transport users other than general traffic (for example, bus priority lanes, cycle lanes or wider footpaths).

The identification of these opportunities was achieved by using link volume forecasts from the 2031 Policy model and analysing the degree of saturation of multi-lane links assuming a reduction of one-lane of capacity in each direction.

6.2 Identified Opportunities

The location of potential road space reallocation projects is shown on the plots in Appendix G. The plots show links that would still meet the DSS thresholds with a reduction of one lane in each direction. The plots also show links that 'almost' meet the DSS thresholds (i.e. within 10% of the thresholds) with a reduction of one lane in each direction. These indicate locations that may still have road space reallocation projects implemented if supporting works are implemented to provide additional capacity elsewhere on the network.

These identified locations should only be viewed as potential locations where road capacity could be reduced. The analysis only considered mid-block link capacity and did not take into account the potential impact to intersection capacity. Further detailed analysis would be required at each potential location to confirm whether or not a reallocation of road space would be feasible.

7 Summary and Conclusions

Model Development

The MBRSTM-MM is a multi-modal model that can be used to predict future transport movements and to evaluate various road and public transport infrastructure requirements.

The existing 2006 base year model has been updated to a 2010 base year and validated for the 24hr period and AM and PM peak periods.

From the base year model two future year scenarios of 2021 and 2031 were then developed. The models were developed using the latest available land use dataset provided by MBRC and reflect the expected growth in population and employment within the Moreton Bay Region.

For the 2031 future year model, two mode share scenarios were considered. The first, referred to as the 'trend' based scenario, uses the model's predicted mode share results. The second scenario, termed as the 'policy' based scenario, used a target based approach to reduce car mode share and increase public transport and active transport mode shares. This approach recognises that mode share change will not only be a response to increased infrastructure, but will also require a change in travel behaviour, which could be influenced through government policy measures such as public education programs and travel management programs.

The mode share in the base year and in the 2031 trend based and policy based models are summarised in Table 28.

Table 28: Modelled and Target Mode Share

	Car	Public Transport	Active Transport
2010 Modelled Mode Share	87.0%	5.0%	8.0%
2031 Modelled Mode Share (for Trend Model)	82.8%	9.3%	8.0%
2031 Mode Share Target (for Policy Model)	75%	11%	14%

The 2031 targets were determined by MBRC, following a review of existing mode share splits in the region, and a comparison with other Region's and local authorities approach to responding to CSEQ targets and growth. As a comparison, the CSEQ targets for Moreton Bay Region were 70% car, 11% public transport and 19% active transport.

Growth in Travel Demand

The model predicted that growth in private vehicle travel in the region would be approximately 26% between 2010 and 2021 and 17% from 2021 to 2031 on a trend basis. The difference between the trend and policy scenarios was then predicted to be a reduction in private vehicle travel of 7.7%.

Hence, the growth in private car travel between 2010 and the 2031 Policy scenario was predicted to be 35%, or an increase of approximately 300,000 daily trips. For this same comparison, the growth in public transport and active transport travel was predicted to be 180%, or an increase of approximately 240,000 daily trips.

Deficiency Analysis

The 2021 and 2031Policy models were used to analyse the capacity of the future road network to identify deficiencies and likely solutions for input to the transport infrastructure component of the MBRC PIP and the MBRC TNCS.

This analysis did not result in any MBRC road links being identified as needing to be upgraded with additional mid-block capacity (for example, an upgrade of a two-lane road to a four lane road).

The intersection deficiency analysis identified 15 intersections in 2021 and 40 intersections in 2031 that would not meet the level of service criteria adopted for this study. These intersections are shown in Table 24 and Table 25 respectively, along with proposed solutions to address the deficiencies. In some cases, intersections have been grouped together as a corridor upgrade.

For information, the output of the deficiency analysis also identified State controlled roads that were forecast to become deficient in 2021 and 2031 using the deficiency criteria assumed for this study. A list of potentially deficient intersections has also been generated, which would require further capacity analysis to confirm.

The results of the deficiency analysis for the MBRC controlled road network have been used as an input to the TNCS, where the list of deficiency solutions have been costed and prioritised.

Appendix A

Future Network Assumptions

A1 Future Year Network Schemes

Scheme Name	Year	Location	Description	2021 Trend	2031 Trend	2031 Policy
DMR_334G	2011	Houghton Highway	Upgrade to 6 lanes divided	✓	✓	✓
BCC_443_MB	2011	Bridgeman Road (Albany Creek Road to Millar Road)	Upgrade to 4 lanes divided	✓	✓	✓
DMR_017_with705	2011	Airport Drive (Lomandra Drive to Domestic Terminal)	Upgrade to 6 lanes divided	✓	✓	✓
DMR_321b	2011	Gateway Motorway (Port of Brisbane to Wynnum Road)	Upgrade to 8 lanes divided	✓	✓	✓
DMR_321c	2011	Gateway Motorway (Wynnum Road to Old Cleveland Road)	Upgrade to 8 lanes divided	✓	✓	✓
DMR_321c	2011	Gateway Motorway (Old Cleveland Road to Mt Gravatt-Capalaba Road)	Upgrade to 6 lanes divided	✓	✓	✓
DMR_322	2011	Gateway Motorway Bridge Duplication	Upgrade existing bridge to 12 lanes divided	✓	✓	✓
PnR_2011	2011	2011 Park'n'Ride modifications	Modifications to park'n'ride nodes including updates to car parking spaces	✓	✓	✓
Dohles2011	2011	Dohles Rocks Road (Northlakes Drive to Ogg Road)	Modified from 4 lanes to 2 lanes as per existing geometry	✓	✓	✓
AL_1173	2012	Airport Link	Sandgate Road interchange	✓	✓	✓
AL_1198_MB	2012	Airport Link Ancillary Works	Northern Busway Staging	✓	✓	✓
AL_1200	2012	Aiport Link	Clem7 and Aiport Link connections	✓	✓	✓
AL_1202	2012	Aiport Link	Gympie Road / Stafford Road interchange	✓	✓	✓
EW_3008	2012	Kingsford Smith Drive / Gateway Bridge Duplication Ramps		✓	✓	✓
EW_3009	2012	Gateway Access (Doomben ramps)	Ramp access to/from ATC North from Gateway Motorway	✓	✓	✓

Scheme Name	Year	Location	Description	2021 Trend	2031 Trend	2031 Policy
EW_3039	2012	Gateway Motorway lane removal	Remove auxiliary lanes between Kingsford Smith Drive and Airport Drive due to Doomben ramps	✓	✓	✓
N_bwy_2b	2012	Stage 2 Northern Busway	Busway between Windsor and Kedron	✓	✓	✓
EWAG_12	2012	Airport Roundabout Upgrade Project	New flyover with ramp modifications	✓	✓	✓
NLakes_003	2012	North Lakes / Boundary Road Connection	Connection of Aurora Boulevard and Bounty Boulevard	✓	✓	✓
BCC_450	2016	Hanford Road (Depot Road to Gympie Road)	Upgrade to 4 lanes	✓	✓	✓
DMR_323	2016	Gateway Motorway (Mt Gravatt-Capalaba Road to Pacific Motorway	Upgrade to 6 lanes	✓	✓	✓
DMR_335a	2016	Port of Brisbane Motorway – Stage 2a (Gateway Motorway to Lytton Road)	Upgrade to 4 lanes	✓	✓	✓
NL_2130	2016	Northern Link Preliminary Assessment Option A	Connection between Western Freeway to Kelvin Grove Road	✓	✓	✓
PnR_2016_2	2016	2016 Park'n'Ride modifications	Modifications to park'n'ride nodes including updates to car parking spaces	✓	✓	✓
DMR_014	2016	Nudgee Interchange Upgrade	Between Gateway Motorway to Queens Road	✓	✓	✓
DMR_335c	2016	Port of Brisbane Motorway – Stage 2b (Lytton Road to Pritchard Road)	New 4 lane motorway	✓	✓	✓
Francis_Rd	2016	Francis Road Overpass	New overpass connecting into Gympie Road	✓	✓	✓
KerrOverpass	2016	Kerr Road Overpass	New overpass across Bruce Highway	✓	✓	✓
BCC_427	2016	Telegraph Road	Upgrade to 4 lanes divided	✓	✓	✓
N_bwy_A	2016	Northern Busway	Interim HOV lanes Kedron to Chermside	✓	✓	✓
NBAM_013	2016	Station Road, Burpengary (Joyce Road to Progress Road)	Upgrade to 4 lanes divided	✓	✓	✓
BCC_438	2021	Beams Road (Gympie Road to Sandgate Road)	Upgrade to 4 lanes	✓	✓	✓

Scheme Name	Year	Location	Description	2021 Trend	2031 Trend	2031 Policy
BCC_445	2021	Pickering Street / Sicklefield Street	Grade separation of rail and upgrade to divided between Enoggera Road and Pickering Street	✓	✓	✓
BCC_456	2021	Beams Road (Bridgeman Road to Gympie Road)	Upgrade to 4 lanes	✓	✓	✓
BCC_478	2021	Trouts Road	New 2 lane undivided between northern and southern sections of Trouts Road	✓	✓	✓
DMR_015	2021	Gateway Motorway (Queens Road to Deagon Deviation Road)	Upgrade to 6 lanes	✓	✓	✓
DMR_4511	2021	Deception Bay Road (Bruce Highway to Lipscombe Road)	Upgrade to 4 lanes divided	✓	✓	✓
PnR_2021_edit_2	2021	2021 Park'n'Ride modifications	Modifications to park'n'ride nodes including updates to car parking spaces	✓	✓	✓
Brown_Ped	2021	Brown Street Pedestrian Path (Elof Road to Brown Street)	1.5 km walking/cycling route	✓	✓	✓
GF_MB_21	2021	Moreton Bay Greenfill Sites Network	Road network changes around greenfield sites (North Lakes and Caboolture). North Lakes in preparation for North South Urban Arterial	✓	✓	✓
St_BB2_102_MB	2021	Inner City Rail Stage 1 (Fairfield-Exhibition Loop to Bowen Hills_	New rail	✓	✓	✓
P2K_Rail	2021	Moreton Bay Rail (Petrie to Kippa-Ring)	New rail corridor including 6 stations	✓	✓	✓
NSUAnth	2021	North South Urban Arterial (Anzac Avenue to Boundary Road)	Upgrade to 4 lanes divided	✓	✓	✓
NSUAnth_1L	2021	North South Urban Arterial (Dohles Rocks Road to Anzac Avenue)	Update hierarchy	✓	✓	✓
N_Bwy_B	2021	Northern Busway (Aspley to Carseldine)	Interim HOV lanes	✓	✓	✓
N_Bwy_C	2021	Northern Busway (Carseldine to Bracken Ridge)	Interim HOV lanes	✓	✓	✓

Scheme Name	Year	Location	Description	2021 Trend	2031 Trend	2031 Policy
NBAM_042	2021	South Pine Road (Queens Road to Lily Street)	Upgrade to 4 lanes undivided	✓	✓	✓
KAL_001	2021	Moreton Bay Rail road network	Area surrounding Kallangur Station – changes as per Parsons Brinkerhoff local plan	✓	✓	✓
KIN_001	2021	Moreton Bay Rail road network	Area surrounding Kinsellas Road Station – changes as per Parsons Brinkerhoff local plan	✓	✓	✓
KPR_001	2021	Moreton Bay Rail road network	Area surrounding Kippa-Ring Station – changes as per Parsons Brinkerhoff local plan	✓	✓	✓
MRD_001	2021	Moreton Bay Rail road network	Area surrounding Murrumba Downs Station – changes as per Parsons Brinkerhoff local plan	✓	✓	✓
RTH_001	2021	Moreton Bay Rail road network	Area surrounding Rothwell Station – changes as per Parsons Brinkerhoff local plan	✓	✓	✓
NBAM_014	2021	Buchanan Road (entire length)	Upgrade to 4 lanes divided	✓	✓	✓
NBAM_015	2021	Caboolture River Road (Grant Road to Morayfield Road)	Upgrade to 4 lanes divided	✓	✓	✓
SouthPineRd_4L	2021	South Pine Road (Queens Road to Camelia Avenue)	Upgrade to 4 lanes undivided	✓	✓	✓
Gy_BL_rem	2026	Gympie Road bus lanes	Removal of bus lanes from N_Bwy_A		✓	✓
DMR_016	2026	Gateway Motorway (Deagon Deviation to Bruce Highway)	Upgrade to 6 lanes divided		✓	✓
NBAM_050	2026	South Pine Road (Plucks Road to Bunya Road)	Upgrade to 4 lanes undivided		✓	✓
N_bwy_3	2026	Northern Busway – Stage 3 (Bryden Street to Bowen Street)	Driven tunnel on Lutwyche Road for busway		✓	✓
N_bwy_4	2026	Northern Busway (Kedron to Chermside)	New busway		✓	✓
PnR_2026_edit_2	2026	2026 Park'n'Ride modifications	Modifications to park'n'ride nodes including updates to car parking spaces		✓	✓

Scheme Name	Year	Location	Description	2021 Trend	2031 Trend	2031 Policy
NSUA2GympAr	2026	North South Urban Arterial (Dohles Rocks Road to Gympie Arterial)	New 4 lane arterial		✓	✓
NSUAsth	2026	North South Urban Arterial (southern section)	New 4 lane arterial		✓	✓
NBAM_043	2026	Port of Brisbane Motorway (Pritchard Street to Boat Passage)	Upgrade to 4 lanes		✓	✓
CabNRail_2	2031	Caboolture North Rail Station	New rail station at Caboolture North		✓	✓
Cab2Wam	2031	Caboolture to Wamuran Green Corridor	New green corridor (bus, pedestrian and cycle) from the existing Caboolture Rail Station to Wamuran			✓
NW_Rail_2	2031	North-West Rail	New rail corridor between Alderley and Strathpine Rail Stations			✓
N_Bwy_5_2	2031	Northern Busway (Chermside to Bald Hills)	New busway			✓

Appendix B

24-Hour Flow Plots

Appendix C

Scenario Comparisons - Screenline Flow

C1 Comparison of 2010 and 2021 Results

Title: 24 Hour Traffic Volume Growth Analysis (by Site/Screenline and direction)

Project: 220403-11 **Version:** *v1.6 (2021_002)*

Author: Philip Thiele **Date:** *7-Jan-13*

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Moreton Bay Regional Council

Road Name / Screenline	Direction	Link ID	A Node	B Node	2010 Volume (Veh)	2021 Volume (Veh)	Growth in Demand (Veh)	Annual Growth in Demand (%)
Screenline SEQ 9 - North of Caboolture								
Bruce Highway	Northbound	22857-24412	22857	24412	22963	29998	7035	2.5%
Bruce Highway	Southbound	24447-22889	24447	22889	22986	30001	7015	2.5%
Glasshouse Mountains Road	Northbound	21740-20605	21740	20605	3458	4172	715	1.7%
Glasshouse Mountains Road	Southbound	20605-21740	20605	21740	3382	4097	715	1.8%
Caboolture - Kilcoy Road	Northbound	15106-15065	15106	15065	4277	6234	1958	3.5%
Caboolture - Kilcoy Road	Southbound	15065-15106	15065	15106	4282	6248	1966	3.5%
SEQ9 - Northbound Total	Northbound				30697	40405	9708	2.5%
SEQ9 - Southbound Total	Southbound				30650	40345	9696	2.5%
SEQ9 - Combined Total	Combined				61347	80750	19403	2.5%
Screenline SEQ 10 - Bruce Highway (Caboolture)								
Pumicestone Road	Westbound	30601-22661	30601	22661	1721	1792	71	0.4%
Pumicestone Road	Eastbound	22661-30601	22661	30601	1693	1761	68	0.4%
Caboolture - Bribie Island Rd	Westbound	28982-28590	28982	28590	10728	11740	1012	0.8%
Caboolture - Bribie Island Rd	Eastbound	28590-28982	28590	28982	10602	11618	1016	0.8%
Caboolture - Beachmere Road	Westbound	25631-24839	25631	24839	2265	2397	132	0.5%
Caboolture - Beachmere Road	Eastbound	24839-25631	24839	25631	2237	2373	135	0.5%
SEQ10 - Westbound Total	Westbound				14714	15929	1216	0.7%
SEQ10 - Eastbound Total	Eastbound				14533	15752	1220	0.7%
SEQ10 - Combined Total	Combined				29246	31682	2435	0.7%
Screenline SEQ_CS - Caboolture River								
Bruce Highway	Northbound	22183-200210	22183	200210	46951	58500	11549	2.0%
Bruce Highway	Southbound	200209-22221	200209	22221	46310	58064	11754	2.1%
Burpengary - Caboolture Road	Northbound	19498-19589	19498	19589	16427	24462	8035	3.7%
Burpengary - Caboolture Road	Southbound	19599-19517	19599	19517	17334	25094	7760	3.4%
Bellmere Road	Northbound	17969-18265	17969	18265	6063	7464	1401	1.9%
Bellmere Road	Southbound	18265-17969	18265	17969	5948	7338	1390	1.9%
SEQ_CS - Northbound Total	Northbound				69441	90426	20984	2.4%
SEQ_CS - Southbound Total	Southbound				69592	90497	20905	2.4%
SEQ_CS - Combined Total	Combined				139034	180923	41889	2.4%
Screenline SEQ 11 - Pine/Caboolture Border								
Bruce Highway	Northbound	26643-24419	26643	24419	51555	62700	11145	1.8%
Bruce Highway	Southbound	24407-27053	24407	27053	51825	62729	10905	1.8%
Old Gympie Rd	Northbound	105132-80229	105132	80229	6147	8362	2215	2.8%
Old Gympie Rd	Southbound	80229-105132	80229	105132	5714	8067	2352	3.2%
Narangba Rd	Northbound	21436-21178	21436	21178	4934	6610	1676	2.7%
Narangba Rd	Southbound	21178-21436	21178	21436	4858	6617	1759	2.8%
Brisbane-Woodford Rd	Northbound	15498-15488	15498	15488	746	767	22	0.3%
Brisbane-Woodford Rd	Southbound	15488-15498	15488	15498	734	763	29	0.4%
SEQ11 - Northbound Total	Northbound				63381	78440	15059	2.0%
SEQ11 - Southbound Total	Southbound				63131	78176	15045	2.0%
SEQ11 - Combined Total	Combined				126512	156616	30104	2.0%
Screenline SEQ 12 - Redcliffe/Caboolture/Pine Border								
Deception Bay Rd	Westbound	31084-30887	31084	30887	16424	18473	2049	1.1%
Deception Bay Rd	Eastbound	105158-31109	105158	31109	16425	19075	2650	1.4%
Redcliffe Rd	Westbound	30572-30029	30572	30029	16656	24641	7985	3.6%
Redcliffe Rd	Eastbound	29630-30559	29630	30559	15935	23258	7323	3.5%
Brighton-Redcliffe Rd	Southbound	36010-34829	36010	34829	21564	23142	1577	0.6%
Brighton-Redcliffe Rd	Northbound	34829-36010	34829	36010	22498	24065	1567	0.6%
SEQ12 - Westbound Total	Westbound				54645	66256	11611	1.8%
SEQ12 - Eastbound Total	Eastbound				54858	66398	11540	1.8%
SEQ12 - Combined Total	Combined				109503	132654	23151	1.8%
Screenline SEQ 13 - Brisbane/Pine Border								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	21564	23142	1577	0.6%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	22498	24065	1567	0.6%
Bruce Highway	Southbound	27449-27114	27449	27114	71857	85640	13783	1.6%
Bruce Highway	Northbound	27159-27426	27159	27426	71069	84326	13257	1.6%
Gympie Road	Southbound	25071-25359	25071	25359	18003	22772	4769	2.2%
Gympie Road	Northbound	25358-25067	25358	25067	18197	21186	2988	1.4%
Linkfield Road	Eastbound	24492-25092	24492	25092	11960	16137	4177	2.8%
Linkfield Road	Westbound	25092-24492	25092	24492	13589	22230	8641	4.6%
South Pine Road	Southbound	20508-25032	20508	25032	23814	27533	3718	1.3%
South Pine Road	Northbound	25031-20499	25031	20499	21784	23539	1755	0.7%
Bunya Road	Eastbound	17399-17885	17399	17885	600	693	93	1.3%
Bunya Road	Westbound	17885-17399	17885	17399	725	746	21	0.3%
Strathpine-Samford Road	Southbound	16634-16691	16634	16691	7214	8271	1057	1.3%
Strathpine-Samford Road	Northbound	16691-16634	16691	16634	7380	8309	929	1.1%
Samford - Mount Glorious Road	Eastbound	15707-15906	15707	15906	2096	2626	530	2.1%
Samford - Mount Glorious Road	Westbound	15906-15707	15906	15707	2072	2626	554	2.2%
SEQ13 - Southbound Total	Southbound				157108	186814	29705	1.6%
SEQ13 - Northbound Total	Northbound				157314	187027	29713	1.6%
SEQ13 - Combined Total	Combined				314423	373841	59418	1.6%
Screenline SEQ 13b - North Pine River								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	21564	23142	1577	0.6%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	22498	24065	1567	0.6%
Bruce Highway	Southbound	27449-27114	27449	27114	71857	85640	13783	1.6%
Bruce Highway	Northbound	27159-27426	27159	27426	71069	84326	13257	1.6%
Gympie Road	Southbound	22956-22980	22956	22980	11060	14137	3078	2.3%
Gympie Road	Northbound	22966-22947	22966	22947	11031	14445	3415	2.5%
Youngs Crossing Road	Southbound	20176-19743	20176	19743	5774	6381	608	0.9%
Youngs Crossing Road	Northbound	19743-20176	19743	20176	5540	6408	867	1.3%
SEQ13b - Southbound Total	Southbound				110255	129301	19046	1.5%
SEQ13b - Northbound Total	Northbound				110137	129243	19106	1.5%
SEQ13b - Combined Total	Combined				220392	258544	38152	1.5%

Title: AM Traffic Volume Growth Analysis (by Site/Screenline and direction)

Project: 220403-11 **Version: *v1.6 (2021_002)***

Author: Philip Thiele **Date: *7-Jan-13***

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Moreton Bay Regional Council

Road Name / Screenline	Direction	Link ID	A Node	B Node	2010 Volume (Veh)	2021 Volume (Veh)	Growth in Demand (Veh)	Annual Growth in Demand (%)
Screenline SEQ 9 - North of Caboolture								
Bruce Highway	Northbound	22857-24412	22857	24412	2674	3451	776	2.3%
Bruce Highway	Southbound	24447-22889	24447	22889	3375	4404	1029	2.4%
Glasshouse Mountains Road	Northbound	21740-20605	21740	20605	416	496	80	1.6%
Glasshouse Mountains Road	Southbound	20605-21740	20605	21740	715	855	140	1.6%
Caboolture - Kilcoy Road	Northbound	15106-15065	15106	15065	573	753	180	2.5%
Caboolture - Kilcoy Road	Southbound	15065-15106	15065	15106	799	1265	465	4.3%
SEQ9 - Northbound Total	Northbound				3663	4699	1036	2.3%
SEQ9 - Southbound Total	Southbound				4890	6523	1634	2.7%
SEQ9 - Combined Total	Combined				8553	11223	2670	2.5%
Screenline SEQ 10 - Bruce Highway (Caboolture)								
Pumicestone Road	Westbound	30601-22661	30601	22661	340	347	7	0.2%
Pumicestone Road	Eastbound	22661-30601	22661	30601	213	220	6	0.3%
Caboolture - Bribie Island Rd	Westbound	28982-28590	28982	28590	2090	2224	134	0.6%
Caboolture - Bribie Island Rd	Eastbound	28590-28982	28590	28982	1020	1196	176	1.5%
Caboolture - Beachmere Road	Westbound	25631-24839	25631	24839	415	438	24	0.5%
Caboolture - Beachmere Road	Eastbound	24839-25631	24839	25631	202	252	50	2.0%
SEQ10 - Westbound Total	Westbound				2845	3009	164	0.5%
SEQ10 - Eastbound Total	Eastbound				1435	1667	233	1.4%
SEQ10 - Combined Total	Combined				4280	4677	397	0.8%
Screenline SEQ_CS - Caboolture River								
Bruce Highway	Northbound	22183-200210	22183	200210	5549	7446	1897	2.7%
Bruce Highway	Southbound	200209-22221	200209	22221	7474	9017	1543	1.7%
Burpengary - Caboolture Road	Northbound	19498-19589	19498	19589	2122	3157	1035	3.7%
Burpengary - Caboolture Road	Southbound	19599-19517	19599	19517	2160	2960	800	2.9%
Bellmere Road	Northbound	17969-18265	17969	18265	1075	1267	191	1.5%
Bellmere Road	Southbound	18265-17969	18265	17969	754	996	242	2.6%
SEQ_CS - Northbound Total	Northbound				8746	11870	3124	2.8%
SEQ_CS - Southbound Total	Southbound				10388	12972	2585	2.0%
SEQ_CS - Combined Total	Combined				19133	24842	5709	2.4%
Screenline SEQ 11 - Pine/Caboolture Border								
Bruce Highway	Northbound	26643-24419	26643	24419	5514	6783	1269	1.9%
Bruce Highway	Southbound	24407-27053	24407	27053	8400	9970	1570	1.6%
Old Gympie Rd	Northbound	105132-80229	105132	80229	1037	1272	235	1.9%
Old Gympie Rd	Southbound	80229-105132	80229	105132	1067	1551	484	3.5%
Narangba Rd	Northbound	21436-21178	21436	21178	543	718	175	2.6%
Narangba Rd	Southbound	21178-21436	21178	21436	1203	1495	293	2.0%
Brisbane-Woodford Rd	Northbound	15498-15488	15498	15488	87	88	1	0.1%
Brisbane-Woodford Rd	Southbound	15488-15498	15488	15498	223	232	9	0.3%
SEQ11 - Northbound Total	Northbound				7181	8861	1680	1.9%
SEQ11 - Southbound Total	Southbound				10892	13248	2356	1.8%
SEQ11 - Combined Total	Combined				18073	22109	4036	1.8%
Screenline SEQ 12 - Redcliffe/Caboolture/Pine Border								
Deception Bay Rd	Westbound	31084-30887	31084	30887	1909	2183	274	1.2%
Deception Bay Rd	Eastbound	105158-31109	105158	31109	3087	3368	281	0.8%
Redcliffe Rd	Westbound	30572-30029	30572	30029	2139	2886	747	2.8%
Redcliffe Rd	Eastbound	29630-30559	29630	30559	2222	3308	1086	3.7%
Brighton-Redcliffe Rd	Southbound	36010-34829	36010	34829	3397	2996	-401	-1.1%
Brighton-Redcliffe Rd	Northbound	34829-36010	34829	36010	2190	2498	308	1.2%
SEQ12 - Westbound Total	Westbound				7445	8064	619	0.7%
SEQ12 - Eastbound Total	Eastbound				7499	9174	1675	1.8%
SEQ12 - Combined Total	Combined				14944	17238	2294	1.3%
Screenline SEQ 13 - Brisbane/Pine Border								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	3397	2996	-401	-1.1%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	2190	2498	308	1.2%
Bruce Highway	Southbound	27449-27114	27449	27114	11780	13380	1600	1.2%
Bruce Highway	Northbound	27159-27426	27159	27426	6540	8621	2081	2.5%
Gympie Road	Southbound	25071-25359	25071	25359	2877	3781	904	2.5%
Gympie Road	Northbound	25358-25067	25358	25067	3043	3086	43	0.1%
Linkfield Road	Eastbound	24492-25092	24492	25092	1639	2384	744	3.5%
Linkfield Road	Westbound	25092-24492	25092	24492	1932	2866	934	3.7%
South Pine Road	Southbound	20508-25032	20508	25032	5028	5356	327	0.6%
South Pine Road	Northbound	25031-20499	25031	20499	2398	2294	-104	-0.4%
Bunya Road	Eastbound	17399-17885	17399	17885	162	251	89	4.0%
Bunya Road	Westbound	17885-17399	17885	17399	69	56	-13	-1.8%
Strathpine-Samford Road	Southbound	16634-16691	16634	16691	2086	2176	90	0.4%
Strathpine-Samford Road	Northbound	16691-16634	16691	16634	638	784	145	1.9%
Samford - Mount Glorious Road	Eastbound	15707-15906	15707	15906	679	756	77	1.0%
Samford - Mount Glorious Road	Westbound	15906-15707	15906	15707	199	249	50	2.0%
SEQ13 - Southbound Total	Southbound				27648	31079	3431	1.1%
SEQ13 - Northbound Total	Northbound				17009	20454	3444	1.7%
SEQ13 - Combined Total	Combined				44657	51533	6875	1.3%
Screenline SEQ 13b - North Pine River								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	3397	2996	-401	-1.1%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	2190	2498	308	1.2%
Bruce Highway	Southbound	27449-27114	27449	27114	11780	13380	1600	1.2%
Bruce Highway	Northbound	27159-27426	27159	27426	6540	8621	2081	2.5%
Gympie Road	Southbound	22956-22980	22956	22980	2662	2900	238	0.8%
Gympie Road	Northbound	22966-22947	22966	22947	1389	1824	435	2.5%
Youngs Crossing Road	Southbound	20176-19743	20176	19743	1157	1183	26	0.2%
Youngs Crossing Road	Northbound	19743-20176	19743	20176	929	1116	187	1.7%
SEQ13b - Southbound Total	Southbound				18995	20459	1464	0.7%
SEQ13b - Northbound Total	Northbound				11048	14059	3010	2.2%
SEQ13b - Combined Total	Combined				30044	34518	4474	1.3%

Title: PM Traffic Volume Growth Analysis (by Site/Screenline and direction)

Project: 220403-11 **Version: *v1.6 (2021_002)***

Author: Philip Thiele **Date: *7-Jan-13***

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Moreton Bay

Road Name / Screenline	Direction	Link ID	A Node	B Node	2010 Volume (Veh)	2021 Volume (Veh)	Growth in Demand (Veh)	Annual Growth in Demand (%)
Screenline SEQ 9 - North of Caboolture								
Bruce Highway	Northbound	22857-24412	22857	24412	3639	4473	834	1.9%
Bruce Highway	Southbound	24447-22889	24447	22889	3147	4308	1161	2.9%
Glasshouse Mountains Road	Northbound	21740-20605	21740	20605	816	917	100	1.1%
Glasshouse Mountains Road	Southbound	20605-21740	20605	21740	393	491	98	2.0%
Caboolture - Kilcoy Road	Northbound	15106-15065	15106	15065	858	1285	426	3.7%
Caboolture - Kilcoy Road	Southbound	15065-15106	15065	15106	549	754	205	2.9%
SEQ9 - Northbound Total	Northbound				5313	6674	1361	2.1%
SEQ9 - Southbound Total	Southbound				4089	5552	1464	2.8%
SEQ9 - Combined Total	Combined				9402	12226	2825	2.4%
Screenline SEQ 10 - Bruce Highway (Caboolture)								
Pumicestone Road	Westbound	30601-22661	30601	22661	194	212	18	0.8%
Pumicestone Road	Eastbound	22661-30601	22661	30601	324	329	5	0.1%
Caboolture - Bribie Island Rd	Westbound	28982-28590	28982	28590	1131	1332	201	1.5%
Caboolture - Bribie Island Rd	Eastbound	28590-28982	28590	28982	2240	2335	94	0.4%
Caboolture - Beachmere Road	Westbound	25631-24839	25631	24839	249	284	35	1.2%
Caboolture - Beachmere Road	Eastbound	24839-25631	24839	25631	488	488	-1	0.0%
SEQ10 - Westbound Total	Westbound				1574	1828	253	1.4%
SEQ10 - Eastbound Total	Eastbound				3053	3151	98	0.3%
SEQ10 - Combined Total	Combined				4627	4978	351	0.7%
Screenline SEQ_CS - Caboolture River								
Bruce Highway	Northbound	22183-200210	22183	200210	8609	9635	1026	1.0%
Bruce Highway	Southbound	200209-22221	200209	22221	5943	8464	2521	3.3%
Burpengary - Caboolture Road	Northbound	19498-19589	19498	19589	2670	2932	262	0.9%
Burpengary - Caboolture Road	Southbound	19599-19517	19599	19517	2600	3734	1134	3.3%
Bellmere Road	Northbound	17969-18265	17969	18265	851	869	18	0.2%
Bellmere Road	Southbound	18265-17969	18265	17969	1045	1277	232	1.8%
SEQ_CS - Northbound Total	Northbound				12131	13436	1305	0.9%
SEQ_CS - Southbound Total	Southbound				9587	13474	3887	3.1%
SEQ_CS - Combined Total	Combined				21718	26910	5193	2.0%
Screenline SEQ 11 - Pine/Caboolture Border								
Bruce Highway	Northbound	26643-24419	26643	24419	9429	10982	1554	1.4%
Bruce Highway	Southbound	24407-27053	24407	27053	5970	7507	1537	2.1%
Old Gympie Rd	Northbound	105132-80229	105132	80229	989	1756	768	5.4%
Old Gympie Rd	Southbound	80229-105132	80229	105132	952	1404	452	3.6%
Narangba Rd	Northbound	21436-21178	21436	21178	1074	1845	771	5.0%
Narangba Rd	Southbound	21178-21436	21178	21436	600	842	242	3.1%
Brisbane-Woodford Rd	Northbound	15498-15488	15498	15488	185	201	15	0.7%
Brisbane-Woodford Rd	Southbound	15488-15498	15488	15498	67	74	7	0.9%
SEQ11 - Northbound Total	Northbound				11677	14785	3107	2.2%
SEQ11 - Southbound Total	Southbound				7589	9827	2238	2.4%
SEQ11 - Combined Total	Combined				19266	24611	5345	2.3%
Screenline SEQ 12 - Redcliffe/Caboolture/Pine Border								
Deception Bay Rd	Westbound	31084-30887	31084	30887	2917	3380	463	1.3%
Deception Bay Rd	Eastbound	105158-31109	105158	31109	2149	2685	536	2.0%
Redcliffe Rd	Westbound	30572-30029	30572	30029	2243	3517	1274	4.2%
Redcliffe Rd	Eastbound	29630-30559	29630	30559	2577	3811	1234	3.6%
Brighton-Redcliffe Rd	Southbound	36010-34829	36010	34829	2123	2629	506	2.0%
Brighton-Redcliffe Rd	Northbound	34829-36010	34829	36010	4370	4637	267	0.5%
SEQ12 - Westbound Total	Westbound				7282	9525	2243	2.5%
SEQ12 - Eastbound Total	Eastbound				9095	11133	2037	1.9%
SEQ12 - Combined Total	Combined				16378	20658	4280	2.1%
Screenline SEQ 13 - Brisbane/Pine Border								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	2123	2629	506	2.0%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	4370	4637	267	0.5%
Bruce Highway	Southbound	27449-27114	27449	27114	6971	9355	2384	2.7%
Bruce Highway	Northbound	27159-27426	27159	27426	13715	14971	1256	0.8%
Gympie Road	Southbound	25071-25359	25071	25359	3176	4038	862	2.2%
Gympie Road	Northbound	25358-25067	25358	25067	2877	3194	317	1.0%
Linkfield Road	Eastbound	24492-25092	24492	25092	1856	2338	482	2.1%
Linkfield Road	Westbound	25092-24492	25092	24492	1764	3324	1559	5.9%
South Pine Road	Southbound	20508-25032	20508	25032	2768	3338	570	1.7%
South Pine Road	Northbound	25031-20499	25031	20499	4893	4851	-42	-0.1%
Bunya Road	Eastbound	17399-17885	17399	17885	79	79	0	0.0%
Bunya Road	Westbound	17885-17399	17885	17399	299	310	11	0.3%
Strathpine-Samford Road	Southbound	16634-16691	16634	16691	594	753	160	2.2%
Strathpine-Samford Road	Northbound	16691-16634	16691	16634	2090	2153	63	0.3%
Samford - Mount Glorious Road	Eastbound	15707-15906	15707	15906	170	225	55	2.6%
Samford - Mount Glorious Road	Westbound	15906-15707	15906	15707	595	701	106	1.5%
SEQ13 - Southbound Total	Southbound				17738	22755	5017	2.3%
SEQ13 - Northbound Total	Northbound				30603	34140	3537	1.0%
SEQ13 - Combined Total	Combined				48340	56894	8554	1.5%
Screenline SEQ 13b - North Pine River								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	2123	2629	506	2.0%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	4370	4637	267	0.5%
Bruce Highway	Southbound	27449-27114	27449	27114	6971	9355	2384	2.7%
Bruce Highway	Northbound	27159-27426	27159	27426	13715	14971	1256	0.8%
Gympie Road	Southbound	22956-22980	22956	22980	1556	2037	481	2.5%
Gympie Road	Northbound	22966-22947	22966	22947	3297	4488	1191	2.8%
Youngs Crossing Road	Southbound	20176-19743	20176	19743	881	1022	141	1.4%
Youngs Crossing Road	Northbound	19743-20176	19743	20176	1168	1354	186	1.4%
SEQ13b - Southbound Total	Southbound				11531	15043	3512	2.4%
SEQ13b - Northbound Total	Northbound				22550	25449	2899	1.1%
SEQ13b - Combined Total	Combined				34081	40493	6411	1.6%

C2 Comparison of 2021 and 2031Trend Results

Title: 24 Hour Traffic Volume Growth Analysis (by Site/Screenline and direction)

Project: 220403-11 **Version:** *v1.6 (2031T_002)*

Author: Philip Thiele **Date:** *11-Jan-13*

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Moreton Bay

Road Name / Screenline	Direction	Link ID	A Node	B Node	2021 Volume (Veh)	2031 Volume (Veh)	Growth in Demand (Veh)	Annual Growth in Demand (%)
Screenline SEQ 9 - North of Caboolture								
Bruce Highway	Northbound	22857-24412	22857	24412	29998	62488	32490	7.6%
Bruce Highway	Southbound	24447-22889	24447	22889	30001	62391	32390	7.6%
Glasshouse Mountains Road	Northbound	21740-20605	21740	20605	4172	4404	232	0.5%
Glasshouse Mountains Road	Southbound	20605-21740	20605	21740	4097	5106	1010	2.2%
Caboolture - Kilcoy Road	Northbound	15106-15065	15106	15065	6234	8024	1789	2.6%
Caboolture - Kilcoy Road	Southbound	15065-15106	15065	15106	6248	8016	1768	2.5%
SEQ9 - Northbound Total	Northbound				40405	74916	34511	6.4%
SEQ9 - Southbound Total	Southbound				40345	75513	35168	6.5%
SEQ9 - Combined Total	Combined				80750	150429	69679	6.4%
Screenline SEQ 10 - Bruce Highway (Caboolture)								
Pumicestone Road	Westbound	30601-22661	30601	22661	1792	2509	717	3.4%
Pumicestone Road	Eastbound	22661-30601	22661	30601	1761	1697	-64	-0.4%
Caboolture - Bribie Island Rd	Westbound	28982-28590	28982	28590	11740	12091	351	0.3%
Caboolture - Bribie Island Rd	Eastbound	28590-28982	28590	28982	11618	11913	294	0.3%
Caboolture - Beachmere Road	Westbound	25631-24839	25631	24839	2397	2426	28	0.1%
Caboolture - Beachmere Road	Eastbound	24839-25631	24839	25631	2373	2393	21	0.1%
SEQ10 - Westbound Total	Westbound				15929	17026	1097	0.7%
SEQ10 - Eastbound Total	Eastbound				15752	16003	251	0.2%
SEQ10 - Combined Total	Combined				31682	33029	1348	0.4%
Screenline SEQ_CS - Caboolture River								
Bruce Highway	Northbound	22183-200210	22183	200210	58500	85574	27074	3.9%
Bruce Highway	Southbound	200209-22221	200209	22221	58064	83420	25356	3.7%
Burpengary - Caboolture Road	Northbound	19498-19589	19498	19589	24462	33879	9417	3.3%
Burpengary - Caboolture Road	Southbound	19599-19517	19599	19517	25094	35290	10196	3.5%
Bellmere Road	Northbound	17969-18265	17969	18265	7464	9994	2530	3.0%
Bellmere Road	Southbound	18265-17969	18265	17969	7338	10197	2859	3.3%
SEQ_CS - Northbound Total	Northbound				90426	129447	39021	3.7%
SEQ_CS - Southbound Total	Southbound				90497	128907	38410	3.6%
SEQ_CS - Combined Total	Combined				180923	258354	77431	3.6%
Screenline SEQ 11 - Pine/Caboolture Border								
Bruce Highway	Northbound	26643-24419	26643	24419	62700	83237	20537	2.9%
Bruce Highway	Southbound	24407-27053	24407	27053	62729	82890	20161	2.8%
Old Gympie Rd	Northbound	105132-80229	105132	80229	8362	11495	3133	3.2%
Old Gympie Rd	Southbound	80229-105132	80229	105132	8067	11370	3304	3.5%
Narangba Rd	Northbound	21436-21178	21436	21178	6610	9261	2652	3.4%
Narangba Rd	Southbound	21178-21436	21178	21436	6617	9449	2832	3.6%
Brisbane-Woodford Rd	Northbound	15498-15488	15498	15488	767	890	123	1.5%
Brisbane-Woodford Rd	Southbound	15488-15498	15488	15498	763	1135	372	4.0%
SEQ11 - Northbound Total	Northbound				78440	104883	26444	2.9%
SEQ11 - Southbound Total	Southbound				78176	104845	26668	3.0%
SEQ11 - Combined Total	Combined				156616	209728	53112	3.0%
Screenline SEQ 12 - Redcliffe/Caboolture/Pine Border								
Deception Bay Rd	Westbound	31084-30887	31084	30887	18473	21812	3338	1.7%
Deception Bay Rd	Eastbound	105158-31109	105158	31109	19075	22697	3622	1.8%
Redcliffe Rd	Westbound	30572-30029	30572	30029	24641	30310	5669	2.1%
Redcliffe Rd	Eastbound	29630-30559	29630	30559	23258	28663	5405	2.1%
Brighton-Redcliffe Rd	Southbound	36010-34829	36010	34829	23142	24552	1410	0.6%
Brighton-Redcliffe Rd	Northbound	34829-36010	34829	36010	24065	25417	1352	0.5%
SEQ12 - Westbound Total	Westbound				66256	76673	10417	1.5%
SEQ12 - Eastbound Total	Eastbound				66398	76777	10379	1.5%
SEQ12 - Combined Total	Combined				132654	153450	20796	1.5%
Screenline SEQ 13 - Brisbane/Pine Border								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	23142	24552	1410	0.6%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	24065	25417	1352	0.5%
Bruce Highway	Southbound	27449-27114	27449	27114	85640	102581	16941	1.8%
Bruce Highway	Northbound	27159-27426	27159	27426	84326	101710	17384	1.9%
Gympie Road	Southbound	25071-25359	25071	25359	22772	25351	2579	1.1%
Gympie Road	Northbound	25358-25067	25358	25067	21186	23730	2544	1.1%
Linkfield Road	Eastbound	24492-25092	24492	25092	16137	18339	2202	1.3%
Linkfield Road	Westbound	25092-24492	25092	24492	22230	24521	2291	1.0%
South Pine Road	Southbound	20508-25032	20508	25032	27533	31806	4273	1.5%
South Pine Road	Northbound	25031-20499	25031	20499	23539	27140	3600	1.4%
Bunya Road	Eastbound	17399-17885	17399	17885	693	762	69	1.0%
Bunya Road	Westbound	17885-17399	17885	17399	746	877	132	1.6%
Strathpine-Samford Road	Southbound	16634-16691	16634	16691	8271	9543	1272	1.4%
Strathpine-Samford Road	Northbound	16691-16634	16691	16634	8309	9377	1068	1.2%
Samford - Mount Glorious Road	Eastbound	15707-15906	15707	15906	2626	4072	1446	4.5%
Samford - Mount Glorious Road	Westbound	15906-15707	15906	15707	2626	4018	1392	4.3%
SEQ13 - Southbound Total	Southbound				186814	217006	30192	1.5%
SEQ13 - Northbound Total	Northbound				187027	216791	29764	1.5%
SEQ13 - Combined Total	Combined				373841	433797	59956	1.5%
Screenline SEQ 13b - North Pine River								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	23142	24552	1410	0.6%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	24065	25417	1352	0.5%
Bruce Highway	Southbound	27449-27114	27449	27114	85640	102581	16941	1.8%
Bruce Highway	Northbound	27159-27426	27159	27426	84326	101710	17384	1.9%
Gympie Road	Southbound	22956-22980	22956	22980	14137	18455	4318	2.7%
Gympie Road	Northbound	22966-22947	22966	22947	14445	17896	3451	2.2%
Youngs Crossing Road	Southbound	20176-19743	20176	19743	6381	8290	1908	2.7%
Youngs Crossing Road	Northbound	19743-20176	19743	20176	6408	8496	2089	2.9%
SEQ13b - Southbound Total	Southbound				129301	153878	24577	1.8%
SEQ13b - Northbound Total	Northbound				129243	153519	24276	1.7%
SEQ13b - Combined Total	Combined				258544	307397	48853	1.7%

2031 Moreton Bay Region Strategic Transport Model Growth Analysis

Title: AM Traffic Volume Growth Analysis (by Site/Screenline and direction)

Project: 220403-11 **Version:** *v1.6 (2031T_002)*

Author: Philip Thiele **Date:** *11-Jan-13*

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Moreton Bay Regional Council

Road Name / Screenline	Direction	Link ID	A Node	B Node	2021 Volume (Veh)	2031 Volume (Veh)	Growth in Demand (Veh)	Annual Growth in Demand (%)
Screenline SEQ 9 - North of Caboolture								
Bruce Highway	Northbound	22857-24412	22857	24412	3451	8170	4719	9.0%
Bruce Highway	Southbound	24447-22889	24447	22889	4404	8676	4272	7.0%
Glasshouse Mountains Road	Northbound	21740-20605	21740	20605	496	937	441	6.6%
Glasshouse Mountains Road	Southbound	20605-21740	20605	21740	855	870	16	0.2%
Caboolture - Kilcoy Road	Northbound	15106-15065	15106	15065	753	954	201	2.4%
Caboolture - Kilcoy Road	Southbound	15065-15106	15065	15106	1265	1664	400	2.8%
SEQ9 - Northbound Total	Northbound				4699	10061	5361	7.9%
SEQ9 - Southbound Total	Southbound				6523	11211	4687	5.6%
SEQ9 - Combined Total	Combined				11223	21272	10049	6.6%
Screenline SEQ 10 - Bruce Highway (Caboolture)								
Pumicestone Road	Westbound	30601-22661	30601	22661	347	324	-23	-0.7%
Pumicestone Road	Eastbound	22661-30601	22661	30601	220	211	-9	-0.4%
Caboolture - Bribie Island Rd	Westbound	28982-28590	28982	28590	2224	2145	-79	-0.4%
Caboolture - Bribie Island Rd	Eastbound	28590-28982	28590	28982	1196	1320	124	1.0%
Caboolture - Beachmere Road	Westbound	25631-24839	25631	24839	438	427	-12	-0.3%
Caboolture - Beachmere Road	Eastbound	24839-25631	24839	25631	252	283	31	1.2%
SEQ10 - Westbound Total	Westbound				3009	2896	-113	-0.4%
SEQ10 - Eastbound Total	Eastbound				1667	1814	147	0.8%
SEQ10 - Combined Total	Combined				4677	4710	33	0.1%
Screenline SEQ_CS - Caboolture River								
Bruce Highway	Northbound	22183-200210	22183	200210	7446	11449	4003	4.4%
Bruce Highway	Southbound	200209-22221	200209	22221	9017	11162	2146	2.2%
Burpengary - Caboolture Road	Northbound	19498-19589	19498	19589	3157	4912	1755	4.5%
Burpengary - Caboolture Road	Southbound	19599-19517	19599	19517	2960	4915	1955	5.2%
Bellmere Road	Northbound	17969-18265	17969	18265	1267	1564	298	2.1%
Bellmere Road	Southbound	18265-17969	18265	17969	996	1246	250	2.3%
SEQ_CS - Northbound Total	Northbound				11870	17925	6056	4.2%
SEQ_CS - Southbound Total	Southbound				12972	17323	4351	2.9%
SEQ_CS - Combined Total	Combined				24842	35249	10407	3.6%
Screenline SEQ 11 - Pine/Caboolture Border								
Bruce Highway	Northbound	26643-24419	26643	24419	6783	10605	3822	4.6%
Bruce Highway	Southbound	24407-27053	24407	27053	9970	11340	1370	1.3%
Old Gympie Rd	Northbound	105132-80229	105132	80229	1272	1488	216	1.6%
Old Gympie Rd	Southbound	80229-105132	80229	105132	1551	2111	560	3.1%
Narangba Rd	Northbound	21436-21178	21436	21178	718	1263	546	5.8%
Narangba Rd	Southbound	21178-21436	21178	21436	1495	2190	694	3.9%
Brisbane-Woodford Rd	Northbound	15498-15488	15498	15488	88	119	31	3.0%
Brisbane-Woodford Rd	Southbound	15488-15498	15488	15498	232	296	64	2.5%
SEQ11 - Northbound Total	Northbound				8861	13476	4615	4.3%
SEQ11 - Southbound Total	Southbound				13248	15936	2689	1.9%
SEQ11 - Combined Total	Combined				22109	29412	7303	2.9%
Screenline SEQ 12 - Redcliffe/Caboolture/Pine Border								
Deception Bay Rd	Westbound	31084-30887	31084	30887	2183	2780	598	2.4%
Deception Bay Rd	Eastbound	105158-31109	105158	31109	3368	3961	593	1.6%
Redcliffe Rd	Westbound	30572-30029	30572	30029	2886	3368	482	1.6%
Redcliffe Rd	Eastbound	29630-30559	29630	30559	3308	4052	745	2.1%
Brighton-Redcliffe Rd	Southbound	36010-34829	36010	34829	2996	3314	317	1.0%
Brighton-Redcliffe Rd	Northbound	34829-36010	34829	36010	2498	2666	168	0.7%
SEQ12 - Westbound Total	Westbound				8064	9462	1397	1.6%
SEQ12 - Eastbound Total	Eastbound				9174	10680	1507	1.5%
SEQ12 - Combined Total	Combined				17238	20142	2904	1.6%
Screenline SEQ 13 - Brisbane/Pine Border								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	2996	3314	317	1.0%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	2498	2666	168	0.7%
Bruce Highway	Southbound	27449-27114	27449	27114	13380	14279	899	0.7%
Bruce Highway	Northbound	27159-27426	27159	27426	8621	11966	3345	3.3%
Gympie Road	Southbound	25071-25359	25071	25359	3781	4336	556	1.4%
Gympie Road	Northbound	25358-25067	25358	25067	3086	3433	348	1.1%
Linkfield Road	Eastbound	24492-25092	24492	25092	2384	2884	501	1.9%
Linkfield Road	Westbound	25092-24492	25092	24492	2866	3079	213	0.7%
South Pine Road	Southbound	20508-25032	20508	25032	5356	5504	149	0.3%
South Pine Road	Northbound	25031-20499	25031	20499	2294	2945	651	2.5%
Bunya Road	Eastbound	17399-17885	17399	17885	251	288	37	1.4%
Bunya Road	Westbound	17885-17399	17885	17399	56	65	9	1.4%
Strathpine-Samford Road	Southbound	16634-16691	16634	16691	2176	2264	87	0.4%
Strathpine-Samford Road	Northbound	16691-16634	16691	16634	784	955	171	2.0%
Samford - Mount Glorious Road	Eastbound	15707-15906	15707	15906	756	949	193	2.3%
Samford - Mount Glorious Road	Westbound	15906-15707	15906	15707	249	396	147	4.8%
SEQ13 - Southbound Total	Southbound				31079	33818	2739	0.8%
SEQ13 - Northbound Total	Northbound				20454	25506	5052	2.2%
SEQ13 - Combined Total	Combined				51533	59324	7791	1.4%
Screenline SEQ 13b - North Pine River								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	2996	3314	317	1.0%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	2498	2666	168	0.7%
Bruce Highway	Southbound	27449-27114	27449	27114	13380	14279	899	0.7%
Bruce Highway	Northbound	27159-27426	27159	27426	8621	11966	3345	3.3%
Gympie Road	Southbound	22956-22980	22956	22980	2900	3884	984	3.0%
Gympie Road	Northbound	22966-22947	22966	22947	1824	2290	467	2.3%
Youngs Crossing Road	Southbound	20176-19743	20176	19743	1183	1369	186	1.5%
Youngs Crossing Road	Northbound	19743-20176	19743	20176	1116	1431	315	2.5%
SEQ13b - Southbound Total	Southbound				20459	22847	2387	1.1%
SEQ13b - Northbound Total	Northbound				14059	18353	4295	2.7%
SEQ13b - Combined Total	Combined				34518	41200	6682	1.8%

2031 Moreton Bay Region Strategic Transport Model Growth Analysis

Title: PM Traffic Volume Growth Analysis (by Site/Screenline and direction)

Project: 220403-11 **Version:** *v1.6 (2031T_002)*

Author: Philip Thiele **Date:** *11-Jan-13*

ARUP

Moreton Bay Regional Council

Road Name / Screenline	Direction	Link ID	A Node	B Node	2021 Volume (Veh)	2031 Volume (Veh)	Growth in Demand (Veh)	Annual Growth in Demand (%)
Screenline SEQ 9 - North of Caboolture								
Bruce Highway	Northbound	22857-24412	22857	24412	4473	8327	3855	6.4%
Bruce Highway	Southbound	24447-22889	24447	22889	4308	10973	6665	9.8%
Glasshouse Mountains Road	Northbound	21740-20605	21740	20605	917	1628	711	5.9%
Glasshouse Mountains Road	Southbound	20605-21740	20605	21740	491	240	-250	-6.9%
Caboolture - Kilcoy Road	Northbound	15106-15065	15106	15065	1285	1660	375	2.6%
Caboolture - Kilcoy Road	Southbound	15065-15106	15065	15106	754	1017	263	3.0%
SEQ9 - Northbound Total	Northbound				6674	11615	4941	5.7%
SEQ9 - Southbound Total	Southbound				5552	12230	6677	8.2%
SEQ9 - Combined Total	Combined				12226	23844	11618	6.9%
Screenline SEQ 10 - Bruce Highway (Caboolture)								
Pumicestone Road	Westbound	30601-22661	30601	22661	212	1005	793	16.8%
Pumicestone Road	Eastbound	22661-30601	22661	30601	329	302	-27	-0.8%
Caboolture - Bribie Island Rd	Westbound	28982-28590	28982	28590	1332	1489	157	1.1%
Caboolture - Bribie Island Rd	Eastbound	28590-28982	28590	28982	2335	2258	-76	-0.3%
Caboolture - Beachmere Road	Westbound	25631-24839	25631	24839	284	309	25	0.8%
Caboolture - Beachmere Road	Eastbound	24839-25631	24839	25631	488	456	-31	-0.7%
SEQ10 - Westbound Total	Westbound				1828	2802	974	4.4%
SEQ10 - Eastbound Total	Eastbound				3151	3017	-134	-0.4%
SEQ10 - Combined Total	Combined				4978	5818	840	1.6%
Screenline SEQ_CS - Caboolture River								
Bruce Highway	Northbound	22183-200210	22183	200210	9635	11969	2335	2.2%
Bruce Highway	Southbound	200209-22221	200209	22221	8464	12931	4467	4.3%
Burpengary - Caboolture Road	Northbound	19498-19589	19498	19589	2932	4251	1318	3.8%
Burpengary - Caboolture Road	Southbound	19599-19517	19599	19517	3734	5973	2239	4.8%
Bellmere Road	Northbound	17969-18265	17969	18265	869	1087	218	2.3%
Bellmere Road	Southbound	18265-17969	18265	17969	1277	2416	1140	6.6%
SEQ_CS - Northbound Total	Northbound				13436	17306	3871	2.6%
SEQ_CS - Southbound Total	Southbound				13474	21320	7846	4.7%
SEQ_CS - Combined Total	Combined				26910	38627	11716	3.7%
Screenline SEQ 11 - Pine/Caboolture Border								
Bruce Highway	Northbound	26643-24419	26643	24419	10982	11945	962	0.8%
Bruce Highway	Southbound	24407-27053	24407	27053	7507	11602	4095	4.4%
Old Gympie Rd	Northbound	105132-80229	105132	80229	1756	2215	459	2.3%
Old Gympie Rd	Southbound	80229-105132	80229	105132	1404	1949	545	3.3%
Narangba Rd	Northbound	21436-21178	21436	21178	1845	2335	490	2.4%
Narangba Rd	Southbound	21178-21436	21178	21436	842	1758	916	7.6%
Brisbane-Woodford Rd	Northbound	15498-15488	15498	15488	201	252	51	2.3%
Brisbane-Woodford Rd	Southbound	15488-15498	15488	15498	74	353	279	16.9%
SEQ11 - Northbound Total	Northbound				14785	16747	1962	1.3%
SEQ11 - Southbound Total	Southbound				9827	15662	5835	4.8%
SEQ11 - Combined Total	Combined				24611	32409	7797	2.8%
Screenline SEQ 12 - Redcliffe/Caboolture/Pine Border								
Deception Bay Rd	Westbound	31084-30887	31084	30887	3380	4067	687	1.9%
Deception Bay Rd	Eastbound	105158-31109	105158	31109	2685	3669	984	3.2%
Redcliffe Rd	Westbound	30572-30029	30572	30029	3517	4563	1046	2.6%
Redcliffe Rd	Eastbound	29630-30559	29630	30559	3811	4735	924	2.2%
Brighton-Redcliffe Rd	Southbound	36010-34829	36010	34829	2629	2981	352	1.3%
Brighton-Redcliffe Rd	Northbound	34829-36010	34829	36010	4637	5060	423	0.9%
SEQ12 - Westbound Total	Westbound				9525	11611	2085	2.0%
SEQ12 - Eastbound Total	Eastbound				11133	13464	2331	1.9%
SEQ12 - Combined Total	Combined				20658	25075	4417	2.0%
Screenline SEQ 13 - Brisbane/Pine Border								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	2629	2981	352	1.3%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	4637	5060	423	0.9%
Bruce Highway	Southbound	27449-27114	27449	27114	9355	13287	3932	3.6%
Bruce Highway	Northbound	27159-27426	27159	27426	14971	15620	649	0.4%
Gympie Road	Southbound	25071-25359	25071	25359	4038	4433	395	0.9%
Gympie Road	Northbound	25358-25067	25358	25067	3194	3620	427	1.3%
Linkfield Road	Eastbound	24492-25092	24492	25092	2338	3050	712	2.7%
Linkfield Road	Westbound	25092-24492	25092	24492	3324	3307	-17	-0.1%
South Pine Road	Southbound	20508-25032	20508	25032	3338	4215	877	2.4%
South Pine Road	Northbound	25031-20499	25031	20499	4851	5032	181	0.4%
Bunya Road	Eastbound	17399-17885	17399	17885	79	88	9	1.1%
Bunya Road	Westbound	17885-17399	17885	17399	310	405	95	2.7%
Strathpine-Samford Road	Southbound	16634-16691	16634	16691	753	1091	338	3.8%
Strathpine-Samford Road	Northbound	16691-16634	16691	16634	2153	2256	103	0.5%
Samford - Mount Glorious Road	Eastbound	15707-15906	15707	15906	225	394	169	5.8%
Samford - Mount Glorious Road	Westbound	15906-15707	15906	15707	701	872	171	2.2%
SEQ13 - Southbound Total	Southbound				22755	29537	6783	2.6%
SEQ13 - Northbound Total	Northbound				34140	36172	2033	0.6%
SEQ13 - Combined Total	Combined				56894	65710	8815	1.5%
Screenline SEQ 13b - North Pine River								
Brighton-Redcliffe Rd	Southbound	34829-34149	34829	34149	2629	2981	352	1.3%
Brighton-Redcliffe Rd	Northbound	34149-34829	34149	34829	4637	5060	423	0.9%
Bruce Highway	Southbound	27449-27114	27449	27114	9355	13287	3932	3.6%
Bruce Highway	Northbound	27159-27426	27159	27426	14971	15620	649	0.4%
Gympie Road	Southbound	22956-22980	22956	22980	2037	2933	895	3.7%
Gympie Road	Northbound	22966-22947	22966	22947	4488	4824	336	0.7%
Youngs Crossing Road	Southbound	20176-19743	20176	19743	1022	1569	547	4.4%
Youngs Crossing Road	Northbound	19743-20176	19743	20176	1354	1867	513	3.3%
SEQ13b - Southbound Total	Southbound				15043	20769	5726	3.3%
SEQ13b - Northbound Total	Northbound				25449	27371	1922	0.7%
SEQ13b - Combined Total	Combined				40493	48140	7648	1.7%

Appendix D

Volume Difference Plots

Appendix E

Intersection Analysis Summary

E1 2021 Intersection Flagging and Capacity Analysis Summary

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Connector - Oakey Flat Road / Lakeview Road	18964	Priority	2	65%	OK	73%	OK
Oakey Flat Road / Anderson Road	18992	Priority	2	98%	Fail	220%	Fail
Connector - Oakey Flat Road / Sheoak Street	19007	Priority	2	59%	OK	57%	OK
Oakey Flat Road / Walkers Road	19325	Signalised	2	129%	Fail	100%	Fail
Bunya Road / The Jinker Track	19335	Priority	2	66%	OK	36%	OK
Youngs Crossing Road / Oxford Street	19666	Priority	2	292%	Fail	117%	Fail
Connector - Youngs Crossing Road / Genesis Christian College access	19712	Signalised	2	76%	OK	41%	OK
Burpengary Road / New Settlement Road	19812	Roundabout	2	101%	Fail	71%	OK
Patricks Road / Leslie Road	19986	Priority	1	59%	OK	51%	OK
Lindsay Road / Anderson Road	20084	Priority	2	118%	Fail	32%	OK
Patricks Road / Grove Avenue	20264	Signalised	1	85%	OK	84%	OK
Old North Road / Lavarack Road	20531	Signalised	2	83%	OK	46%	OK
South Pine Road / Dawson Parade	20641	Signalised	2	83%	OK	83%	OK
Old North Road / Kremzow Road	20791	Signalised	2	88%	OK	68%	OK
Old North Road / northbound ramp from South Pine Road	20818	Priority	2	45%	OK	59%	OK
Samsonvale Road / Sparkes Road	21200	Signalised	2	72%	OK	60%	OK
South Pine Road / Camelia Avenue	21328	Signalised	2	100%	Fail	100%	Fail
Connector - Camelia Ave / Grevillea Street	21615	Priority	2	58%	OK	43%	OK
Connector - Camelia Ave / Nymphaea Street	21772	Priority	2	57%	OK	45%	OK
Connector - Camelia Ave / Violet Street	22002	Priority	2	56%	OK	28%	OK
Queens Road / Timms Road	22292	Priority	2	70%	OK	55%	OK
Francis Road / Tarandi Street	22794	Priority	2	72%	OK	39%	OK
Old Gympie Road / Boundary Road	80229	Roundabout	2	71%	OK	93%	OK
South Pine Road / Queens Road	80238	Roundabout	2	89%	OK	90%	OK
Connector - Del Rosso Road / Tullawong State High School access	105057	Priority	2	22%	OK	11%	OK
Old North Road / Stanley Street	105129	Signalised	2	88%	OK	75%	OK
Connector - Oakey Flat Road / Ashbrook Drive	105198	Priority	2	62%	OK	53%	OK

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Queens Road / Miller Parade	23151	Priority	2	91%	Fail	23%	OK
Samsonvale Road / Schubert Street	23206	Priority	2	39%	OK	26%	OK
Halpine Drive / Mango Hill Shops and Tavern access	28454	Priority	2	141%	Fail	119%	Fail
Grant Road / Beacon Street	18407	Priority	2	58%	OK	33%	OK
Grant Road / Michael Avenue	18442	Priority	2	46%	OK	36%	OK
Connector - Grant Road / Gallipoli Court	18462	Priority	2	47%	OK	37%	OK
Oakey Flat Road / Clark Road	18794	Priority	2	140%	Fail	49%	OK
Oakey Flat Road / Ridgegarden Drive	18970	Priority	2	100%	Fail	46%	OK
Connector - Bunya Road / Blackwood Drive	19048	Priority	2	55%	OK	39%	OK
William Berry Drive / Leda Boulevard	19378	Priority	1	16%	OK	26%	OK
Youngs Crossing Road / Francis Road / Gordons Crossing Road East	19545	Signalised	2	84%	OK	79%	OK
Charles Street / Lee Street	20404	Priority	1	63%	OK	37%	OK
Narangba Road / School Street	20703	Priority	2	47%	OK	46%	OK
South Pine Road / Atrium Way	20720	Priority	2	56%	OK	44%	OK
Samsonvale Road / Evergreen Avenue	20852	Priority	2	53%	OK	19%	OK
Samsonvale Road / Lavarack Road	20918	Signalised	2	100%	Fail	65%	OK
South Pine Road / Henderson Road	20935	Priority	2	57%	OK	45%	OK
Collins Road / Peter Street North	21502	Priority	2	51%	OK	30%	OK
Narangba Road / Marsden Road	22921	Priority	2	52%	OK	31%	OK
Connector - Old Gympie Road / Hughes Road East	24000	Priority	2	179%	Fail	80%	OK
Old Gympie Road / Alma Road / Kerr Road West - Kerr Road gets realigned with Alma Road	24155	Signalised	2	90%	OK	90%	OK
Connector - Old Gympie Road / Roseann Street	24274	Priority	2	50%	OK	55%	OK
Connector - Old Gympie Road / Macarthur Drive	24385	Priority	2	180%	Fail	77%	OK
Brays Road / Moreton Street	26791	Priority	2	36%	OK	27%	OK
Grant Road / Torrens Road	80460	Roundabout	2	77%	OK	49%	OK
Smiths Road / Del Rosso Road	105052	Signalised	2	76%	OK	33%	OK
Old North Road / Russet Burbank Parade	105128	Roundabout	2	47%	OK	38%	OK
Grant Road / Beacon Street	18407	Priority	2	58%	OK	33%	OK
Grant Road / Michael Avenue	18442	Priority	2	46%	OK	36%	OK
Connector - Grant Road / Gallipoli Court	18462	Priority	2	47%	OK	37%	OK

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Oakey Flat Road / Clark Road	18794	Priority	2	140%	Fail	49%	OK
Oakey Flat Road / Ridgegarden Drive	18970	Priority	2	100%	Fail	46%	OK
Connector - Bunya Road / Blackwood Drive	19048	Priority	2	55%	OK	39%	OK
Youngs Crossing Road / Francis Road / Gordons Crossing Road East	19545	Signalised	2	84%	OK	79%	OK
Charles Street / Lee Street	20404	Priority	1	63%	OK	37%	OK
Narangba Road / School Street	20703	Priority	2	47%	OK	46%	OK
South Pine Road / Atrium Way	20720	Priority	2	56%	OK	44%	OK
Samsonvale Road / Evergreen Avenue	20852	Priority	2	53%	OK	19%	OK
Samsonvale Road / Lavarack Road	20918	Signalised	2	100%	Fail	65%	OK
South Pine Road / Henderson Road	20935	Priority	2	57%	OK	45%	OK
Collins Road / Peter Street North	21502	Priority	2	51%	OK	30%	OK
Narangba Road / Marsden Road	22921	Priority	2	52%	OK	31%	OK
Connector - Old Gympie Road / Hughes Road East	24000	Priority	2	179%	Fail	80%	OK
Old Gympie Road / Alma Road / Kerr Road West - Kerr Road gets realigned with Alma Road	24155	Signalised	2	90%	OK	90%	OK
Connector - Old Gympie Road / Roseann Street	24274	Priority	2	50%	OK	55%	OK
Connector - Old Gympie Road / Macarthur Drive	24385	Priority	2	180%	Fail	77%	OK
Brays Road / Moreton Street	26791	Priority	2	36%	OK	27%	OK
Grant Road / Torrens Road	80460	Roundabout	2	77%	OK	49%	OK
Smiths Road / Del Rosso Road	105052	Signalised	2	76%	OK	33%	OK
Old North Road / Russet Burbank Parade	105128	Roundabout	2	47%	OK	38%	OK
Narangba Road / Mumford Road / Main Street	20533	Signalised	2	79%	OK	87%	OK
Dawson Parade / Patricks Road / Pimelea Street	20547	Signalised	1	88%	OK	75%	OK
Kremzow Road / Leitchs Road	22929	Signalised	2	100%	Fail	80%	OK
South Pine Road / Plucks Road	20520	Signalised	2	100%	Fail	82%	OK
Patricks Road / Leslie Road	19986	Priority	2	59%	OK	51%	OK
South Pine Road / Atrium Way	20720	Priority	2	56%	OK	44%	OK

E2 2031 Intersection Flagging and Capacity Analysis Summary

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Connector - Oakey Flat Road / Lakeview Road	18964	Priority	2	150%	Fail	89%	OK
Oakey Flat Road / Anderson Road	18992	Priority	2	143%	Fail	268%	Fail
Connector - Oakey Flat Road / Sheoak Street	19007	Priority	2	89%	OK	74%	OK
Oakey Flat Road / Walkers Road	19325	Signalised	2	163%	Fail	138%	Fail
Bunya Road / The Jinker Track	19335	Priority	2	65%	OK	47%	OK
Youngs Crossing Road / Oxford Street	19666	Priority	2	386%	Fail	163%	Fail
Connector - Youngs Crossing Road / Genesis Christian College access	19712	Signalised	2	77%	OK	47%	OK
Burpengary Road / New Settlement Road	19812	Roundabout	2	107%	Fail	94%	OK
Lindsay Road / Anderson Road	20084	Priority	2	217%	Fail	158%	Fail
Patricks Road / Grove Avenue	20264	Signalised	1	68%	OK	79%	OK
Old North Road / Lavarack Road	20531	Signalised	2	86%	OK	56%	OK
South Pine Road / Dawson Parade	20641	Signalised	2	84%	OK	77%	OK
Old North Road / Kremzow Road	20791	Signalised	2	87%	OK	78%	OK
Old North Road / northbound ramp from South Pine Road	20818	Priority	2	54%	OK	59%	OK
Samsonvale Road / Sparkes Road	21200	Signalised	2	88%	OK	70%	OK
South Pine Road / Camelia Avenue	21328	Signalised	2	100%	Fail	106%	Fail
Connector - Camelia Ave / Grevillea Street	21615	Priority	2	54%	OK	49%	OK
Connector - Camelia Ave / Nymphaea Street	21772	Priority	2	57%	OK	50%	OK
Connector - Camelia Ave / Violet Street	22002	Priority	2	63%	OK	56%	OK
Queens Road / Timms Road	22292	Priority	2	69%	OK	51%	OK
Francis Road / Tarandi Street	22794	Priority	2	88%	OK	41%	OK
Old Gympie Road / Boundary Road	80229	Roundabout	2	105%	Fail	97%	Fail
South Pine Road / Queens Road	80238	Roundabout	2	89%	OK	60%	OK
Connector - Del Rosso Road / Tullawong State High School access	105057	Priority	2	36%	OK	11%	OK
Old North Road / Stanley Street	105129	Signalised	2	87%	OK	81%	OK
Connector - Oakey Flat Road / Ashbrook Drive	105198	Priority	2	99%	Fail	67%	OK

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Gympie Road / Kremzow Road	24504	Signalised	1	105%	Fail	97%	Fail
Gympie Road / Samsonvale Road	23803	Signalised	1	133%	Fail	111%	Fail
Morayfield Road / King Street	19626	Signalised	1	174%	Fail	151%	Fail
Queens Road / Miller Parade	23151	Priority	2	80%	OK	23%	OK
Samsonvale Road / Schubert Street	23206	Priority	2	45%	OK	44%	OK
Halpine Drive / Mango Hill Shops and Tavern access	28454	Priority	2	156%	Fail	118%	Fail
Grant Road / Beacon Street	18407	Priority	2	94%	Fail	54%	OK
Grant Road / Michael Avenue	18442	Priority	2	100%	Fail	119%	Fail
Connector - Grant Road / Gallipoli Court	18462	Priority	2	60%	OK	55%	OK
Oakey Flat Road / Clark Road	18794	Priority	2	478%	Fail	150%	Fail
Oakey Flat Road / Ridgegarden Drive	18970	Priority	2	220%	Fail	109%	Fail
Connector - Bunya Road / Blackwood Drive	19048	Priority	2	53%	OK	39%	OK
William Berry Drive / Leda Boulevard	19378	Priority	1	18%	OK	44%	OK
Youngs Crossing Road / Francis Road / Gordons Crossing Road East	19545	Signalised	2	88%	OK	87%	OK
Charles Street / Lee Street	20404	Priority	1	56%	OK	40%	OK
Narangba Road / School Street	20703	Priority	2	51%	OK	47%	OK
Samsonvale Road / Evergreen Avenue	20852	Priority	2	54%	OK	24%	OK
Samsonvale Road / Lavarack Road	20918	Signalised	2	100%	Fail	82%	OK
South Pine Road / Henderson Road	20935	Priority	2	54%	OK	42%	OK
Narangba Road / Marsden Road	22921	Priority	2	85%	OK	45%	OK
Connector - Old Gympie Road / Hughes Road East	24000	Priority	2	202%	Fail	139%	Fail
Old Gympie Road / Alma Road / Kerr Road West - Kerr Road gets realigned with Alma Road	24155	Signalised	2	118%	Fail	116%	Fail
Connector - Old Gympie Road / Roseann Street	24274	Priority	2	75%	OK	60%	OK
Connector - Old Gympie Road / Macarthur Drive	24385	Priority	2	208%	Fail	133%	Fail
Brays Road / Moreton Street	26791	Priority	2	38%	OK	31%	OK
Grant Road / Torrens Road	80460	Roundabout	2	97%	Fail	79%	OK
Old North Road / Russet Burbank Parade	105128	Roundabout	2	63%	OK	40%	OK
Narangba Road / Mumford Road / Main Street	20533	Signalised	2	86%	OK	80%	OK
Kremzow Road / Leitchs Road	22929	Signalised	2	100%	Fail	76%	OK
Dohles Rocks Road / Ogg Road	25605	Signalised	2	85%	OK	80%	OK
Old Gympie Road / Ann Street	80224	Roundabout	2	129%	Fail	124%	Fail

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Caboolture River Road / Grant Road	18380	Signalised	2	114%	Fail	100%	Fail
William Berry Drive / Buchanan Road	80549	Roundabout	1	48%	OK	83%	OK
South Pine Road / Plucks Road	20520	Signalised	2	94%	OK	82%	OK
Nairn Road / Excelsior Drive	17460	Priority	2	30%	OK	24%	OK
Nairn Road /J Dobson Road	17679	Priority	2	27%	OK	41%	OK
Bellmere Road / Piggott Road	17860	Priority	2	86%	OK	62%	OK
Connector - Bellmere Road / Xanadu Drive	17931	Priority	2	41%	OK	61%	OK
Connector - Bellmere Road / Ulster Drive	17969	Priority	2	43%	OK	64%	OK
Connector - Dorset Drive / Grant Road	18234	Priority	2	50%	OK	54%	OK
Connector - Oakey Flat Road / Burbury Road	18602	Priority	2	93%	Fail	45%	OK
Youngs Crossing Road / Todds Road	19416	Priority	2	54%	OK	51%	OK
Connector - Pumicestone Road / Cowie Street	19682	Priority	2	58%	OK	72%	OK
Connector - Burpengary Road / Rosehill Drive	19805	Priority	2	119%	Fail	56%	OK
Burpengary Road / Pitt Road	20060	Priority	2	212%	Fail	186%	Fail
Burpengary Road / Fernando Street	20107	Priority	2	100%	Fail	60%	OK
Connector - Burpengary Road / Crendon Street	20136	Priority	2	63%	OK	54%	OK
Connector - Main Street / Kelly Street	20218	Priority	2	50%	OK	50%	OK
Lindsay Road / Hunt Road	20272	Priority	2	205%	Fail	98%	Fail
Connector - Station Road / Jill Street	20278	Priority	2	133%	Fail	53%	OK
Connector - Lindsay Road / Clark Road	20283	Priority	2	87%	OK	54%	OK
Station Road / O'Brien Road	20319	Signalised	2	122%	Fail	108%	Fail
Lindsay Road / O'Brien Road / Adsett Road	20331	Priority	2	267%	Fail	194%	Fail
Lindsay Road / Blewers Road	20384	Priority	2	57%	OK	41%	OK
Boundary Road / Narangba Road	21178	Priority	2	230%	Fail	185%	Fail
Connector - Narangba Road / Cooper Road	21436	Priority	2	49%	OK	61%	OK
Samsonvale Road / Windrest Street	21655	Priority	2	47%	OK	40%	OK
Narangba Road / Torrens Road	21716	Priority	3	43%	OK	50%	OK
Narangba Road / Alma Road	21923	Priority	2	267%	Fail	349%	Fail
Narangba Road / Lyons Road	21963	Priority	2	41%	OK	50%	OK
Narangba Road / Lakeside Road	22143	Priority	2	54%	OK	50%	OK
Samsonvale Road / Kensington Way	22189	Signalised	2	77%	OK	78%	OK
Old Gympie Road / McPhail Road	23579	Roundabout	2	77%	OK	63%	OK

				AM Peak		PM Peak	
Intersection Name	Node	Intersection Type	Place Type	V/C	OK/Fail	V/C	OK/Fail
Connector - Old Gympie Road / Goodwin Road	23950	Priority	2	58%	OK	48%	OK
Dohles Rocks Road / School Road	24172	Priority	2	177%	Fail	89%	OK
Old Gympie Road / Brickworks Road	24261	Priority	2	133%	Fail	195%	Fail
Connector - Dohles Rocks Road / Clyde Street	24294	Priority	2	201%	Fail	95%	Fail
Dohles Rocks Road / Blatchford Drive	25159	Priority	2	63%	OK	54%	OK
Dohles Rocks Road / Elm Drive	25287	Priority	2	63%	OK	45%	OK
Endeavour Boulevard / Memorial Drive	27597	Roundabout	1	46%	OK	34%	OK
Halfpine Drive / Commercial precinct access	28581	Priority	2	1235%	Fail	510%	Fail
Old Gympie Road / Whitehorse Road / Butterfly Drive	80223	Roundabout	2	87%	OK	81%	OK
Buchanan Road / Graham Road / Weier Road	80242	Roundabout	2	94%	OK	107%	Fail
Burpengary Road / Station Road / Rowley Road / Henderson Road	80249	Roundabout	2	90%	OK	84%	OK
Bellmere Road / River Drive	80268	Roundabout	2	52%	OK	57%	OK
Dohles Rocks Road / Duffield Road extension?	100340	Priority	2	115%	Fail	59%	OK
Market Drive / Dickson Road	100555	Roundabout	1	75%	OK	81%	OK
Patricks Road / Leslie Road	19986	Priority	2	54%	OK	29%	OK
South Pine Road / Atrium Way	20720	Priority	2	53%	OK	41%	OK

Appendix F

Road Network Capacity Deficiency Plots

Appendix G

Road Space Reallocation Opportunity Plots

Background Paper Appendix C

Planning Profiles

Transport Networks and Corridors Strategy 2012 - 2031

Regional Planning Profile

Assessing the Transport Networks and Corridors Infrastructure Network

The Desired Standards of Service (DSS) have been applied to Council's existing transport infrastructure networks to identify capacity constraints and needs in provision and future requirements for transport network and corridor facilities.

Methodology

To complete a thorough assessment of the existing and future transport networks and corridors in the Moreton Bay Region, the following steps were undertaken:

1. Demographic analysis - A brief demographic analysis was used to identify the key attractors, the extent of growth and the spread of that growth across the districts in the region.
2. Determine corridor types - The corridors were classified by road hierarchy and category of place types through which they pass.
3. Performance standards - Determine appropriate "Desirable Standards of Service" (DSS)to provide benchmarks against which the performance of the network will be assessed.
4. Functional Analysis - The analysis of the role and function of the transport network and its constituent facilities was undertaken to identify potential shortfalls in the distribution of linkages and movement opportunities to serve the needs of users in accessing key attractors. The analysis identifies where the desired connectivity and functionality fall short of the desired strategic intent.
5. Capacity Analysis – The regional strategic model was used to project existing and anticipated traffic volumes and determine capacities required to meet the DSS.
6. Develop future infrastructure recommendations based on opportunities for shifts to more sustainable modes as well as growth assumptions, the desired standards of service, committed development, and principles of transport planning as identified in the Networks and Corridors Strategy.
7. Identify future programs and actions - A series of solution sets for each district were identified which demonstrated the desired standards of service. Of the total scope of new or upgraded facilities necessary to meet standards throughout the district, the most strategically important projects were selected as high priorities for implementation. These selected projects were subject of scoping and costing to inform the subsequent consideration for delivery.

The region has been divided into a series of district level catchments which reflect the district catchments identified in Council's Strategic Framework. The intent of the regional planning area profile is to identify the current and future transport infrastructure needs across our region and to identify elements that link the various geographical contexts.

The regional profile determines the future trunk requirements for higher-order transport linkages to major destinations, and between districts and sub-districts. The analysis considers the influence both local and regional destinations have on the demand for new and upgraded facilities. The profile will inform a program of infrastructure requirements over a twenty year planning horizon.

Profile Summary

The Moreton Bay Region regional catchment includes the entire Moreton Bay Regional Council area. The catchment is bounded by the Sunshine Coast Council area in the north, the Coral Sea and Moreton Bay in the east, Brisbane City in the south, and the Somerset Region in the west.

The Moreton Bay Region contains growing residential areas, with substantial rural, rural-residential, commercial and industrial areas. The region has a total land area of over 2,000 square kilometres, and includes mountain ranges, coastal wetlands, national parks, state forests, rural townships, coastal villages and urban centres.

Communities within the region vary considerably, from residential suburbs in the south and east to rural communities in the north and west, key activity centres at Redcliffe, Caboolture, Strathpine and North Lakes to coastal communities on the shores of Moreton Bay. The region has some of the fastest growing suburbs in Australia and new residential areas are emerging in previously rural residential communities. In some circumstances the growth has occurred so rapidly that infrastructure has failed to keep pace.

Strategic Planning Directions

Council's Strategic Framework states how Council intends to respond to growth and changing community trends across the region.

Growth is expected to occur predominantly along the region's urban corridor, in close proximity to activity centres and along existing and future rail lines. These existing and proposed places are clustered together to form neighbourhoods and districts. Some established places will remain largely unchanged in the foreseeable future, while other neighbourhoods such as those along the Moreton Bay Rail Link (MBRL) will be targeted for growth and change.

The rural areas together with their rural townships will also be encouraged to become more self-contained while retaining environmental and scenic landscape values.

Demographics

The population assumptions for the Moreton Bay Region planning area reflect the planning directions outlined in Council's Strategic Framework. The table below identifies that the Moreton Bay Region is projected to have an additional 147,119 residents by 2031.

Estimated Population Growth – MBRC Planning Assumptions			
Regional Planning Catchment	***2011***	***2031***	***Growth***
Moreton Bay Region	381,651	528,770	147,119

Moreton Bay Regional Planning Area Population Assumptions

Transport Networks and Corridors facilities assessment

The combination of these factors has been compiled and the results are illustrated at the district catchment level below.

Caboolture District Profile

Assessing the Transport Networks and Corridors Infrastructure

The Desired Standards of Service (DSS) have been applied to Council's existing transport infrastructure network to identify capacity constraints and needs in provision and future requirements for transport network and corridor facilities.

Catchment profiles

The region has been divided into a series of district level catchments which reflect those identified in Council's Strategic Framework. The intent of the district planning area profiles is to identify the current and future transport network and corridor infrastructure needs for parts of our region that share a similar geographical context.

The district area profiles determine the future trunk requirements for district level transport linkages to major destinations, and between districts and sub-districts. The analysis considers the influence both local and regional destinations have on the demand for new and upgraded facilities. The profile will inform a program of infrastructure requirements over a twenty year planning horizon.

Methodology

To complete a thorough assessment of the existing and future transport networks and corridors in the Caboolture district, the following steps were undertaken:

1. Demographic Analysis – A brief demographic analysis was used to identify the key attractors, the extent of growth and the spread of that growth across the districts in the region.
2. Corridor types – The corridors were classified by road hierarchy and category of place types through which they pass.
3. Performance standards - Appropriate "Desired Levels of Service" (DSS) were determined to provide benchmarks against which the performance of the network will be assessed.
4. Functional Analysis – The analysis of the function of transport network and its constituent facilities was undertaken to identify potential shortfalls in the distribution of linkages and movement opportunities to serve the needs of users in accessing key attractors. The analysis identifies where the desired connectivity and functionality fall short of the desired strategic intent.
5. Capacity Analysis – The strategic model was used to project existing and anticipated traffic volumes and determine capacities required to meet the DSS.
6. Future infrastructure - Recommendations were developed, based on opportunities for shifts to more sustainable modes, as well as growth assumptions, the desired standards of service, committed development, and principles of transport planning as identified in the Networks and Corridors Strategy.
7. Future programs and actions - A series of solution sets for each district were identified which demonstrated the desired standards of service. Of the total scope of new or upgraded facilities necessary to meet standards throughout the district, the most strategically important projects were selected as high priorities for implementation.

These selected projects were subject of scoping and costing to inform the subsequent consideration for delivery.

Profile Summary

The Caboolture district covers a large area, from Narangba in the south to Elimbah in the north and east to Deception Bay, all focused around the principal activity centre of Caboolture-Morayfield. The district includes a range of urban, suburban, rural and rural residential communities. The district includes key industry and employment opportunities along the Bruce Highway at Narangba, Caboolture and Elimbah.

Strategic Planning Directions

In the next 20 years considerable change will occur throughout this district as more people decide to live, work and play within and in close proximity to the Caboolture-Morayfield Activity Centre. New residents will be accommodated in a mix of higher density living close to Morayfield, Caboolture, and Burpengary and in new Next Generation residential neighbourhoods on the fringe of the urban areas.

Demographics

The population assumptions for the Caboolture district reflect the planning directions outlined in Council's Strategic Framework. The table below identifies that the district is projected to have an additional 40,992 residents up to 2031. This represents the second highest district growth in the region and 27% of the region's growth.

Estimated Population Growth – MBRC Planning Assumptions			
District Planning Catchment	***2011***	***2031***	***Growth***
Caboolture Planning Area	68901	109892	40992
Moreton Bay Region	381,651	528,770	147,119

Caboolture District Planning Area Population Assumptions

Based on trends, the majority of these new residents will be families moving into more affordable housing options on the urban fringe of the Brisbane metropolitan area.

Transport Networks and Corridors Assessment

Existing facilities within Caboolture are spread out, resulting in longer trip lengths and higher car usage. State Roads pass through the centres of Caboolture and Morayfield, facilitating north-south trips. Many roads serve multiple purposes, such as Morayfield Road carrying strategic trips as well as serving as an access road to low intensity retail and bulky-goods facilities.

Transport Networks and Corridors Planned Improvements

An Eastern Caboolture Orbital Road is planned from Pumicestone Road to Morayfield Road to allow local trips to circulate within the region without undue reliance on the State road network. Improved East-West connections of Caboolture River Road and Buchanans Road will create a stronger grid system in the catchment. Targeted capacity upgrades on Key north-south links such as Oakey Flat Road and Burpengary Road will strengthen connections between Caboolture and Southern Catchments.

Transport Networks and Corridors Solutions

The transport networks and corridors recommendations are identified in the District and Local catchment maps which can be accessed from the links and key map on the Council website.

Table 1 identifies priority road corridor and intersection projects necessary to meet a full range of user needs, and the recommended sequence for implementation.

Table 2 identifies priority active transport projects necessary to meet active transport user needs in accessing major destinations within 15 minutes walking or cycling distance, together with critical linkages to connect otherwise separate communities. The table also identifies the recommended sequence for implementation.

Table 3 identifies the State-controlled road corridor projects necessary to connect the various localities across Moreton Bay and to provide external linkages. This table identifies broad timeframes to indicate when the projects would be required.

The following tables identifies priority transport infrastructure required for Caboolture to service anticipated growth for the next 20 years.

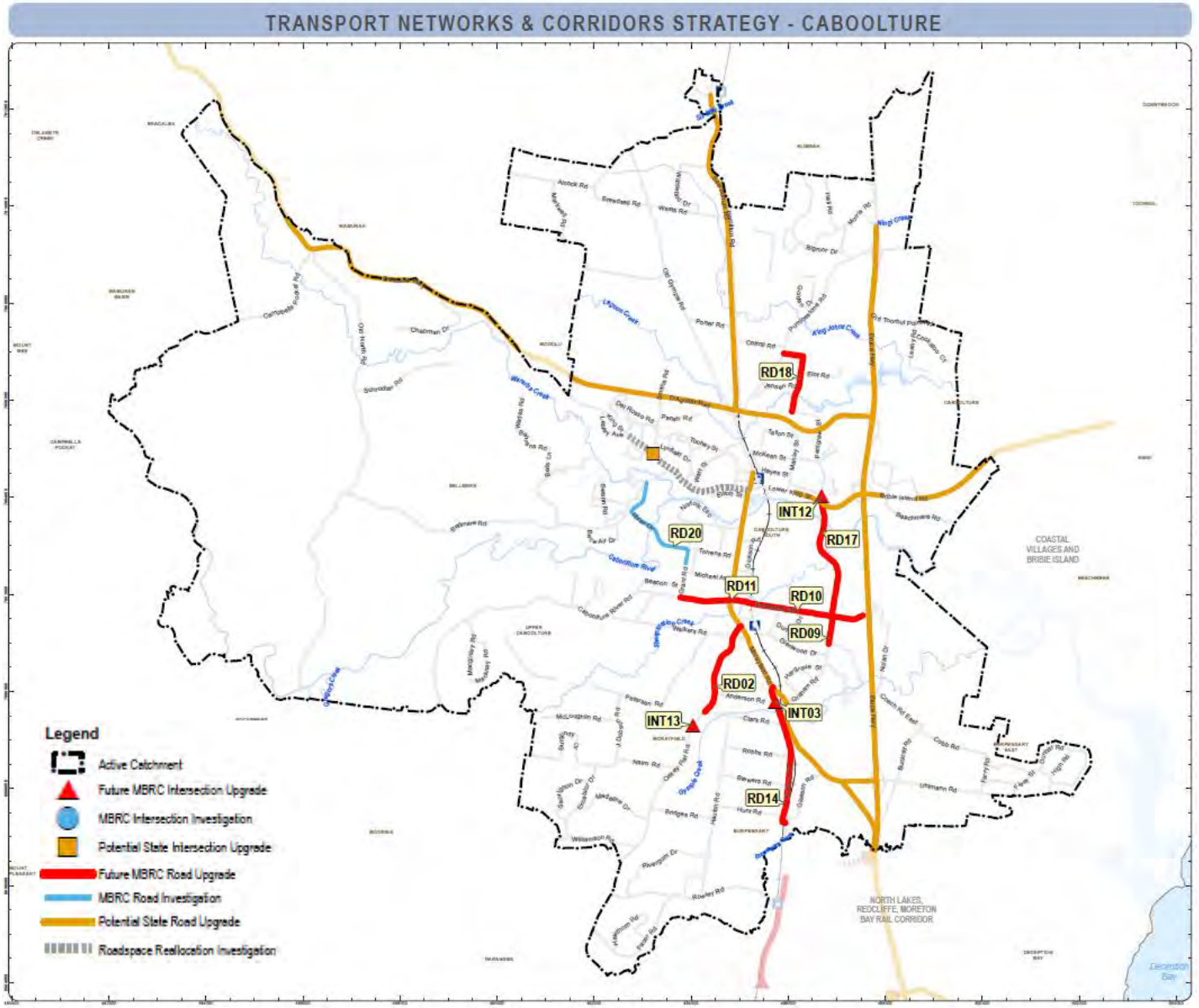
Table 1 - Caboolture - Road Capacity Upgrades						
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**	**Local catchment**
Oakey Flat Road, Morayfield - Intersection and Corridor Upgrade	RD02	2016	Capacity upgrade	MBRC	Morayfield Road to Clark Road intersection upgrade and localised widening	Caboolture South / Morayfield
Anderson Road/Lindsay Road, Morayfield - Intersection	INT03	2016	Capacity upgrade	MBRC	Signalisation	Caboolture South / Morayfield
Graham Rd, Morayfield - Road Upgrade	RD09	2021	Capacity upgrade	MBRC	Lomandra Drive to Buchanan Road Duplication	Caboolture South / Morayfield
Buchanan Road , Morayfield - Intersection and Corridor Upgrade	RD10	2021	Facilitate Development	MBRC	Morayfield to Bruce Highway intersection upgrade and localised widening, including new rail bridge	Caboolture South / Morayfield
Caboolture River Rd , Morayfield/Upper Caboolture - Intersection and Corridor Upgrade	RD11	2021	Capacity upgrade	MBRC	Grant Road to Morayfield Road intersection upgrade and localised widening	Caboolture South / Morayfield
Lindsay Rd, Morayfield - Intersection and Corridor Upgrade	RD14	2026	Capacity upgrade	MBRC	Morayfield Rd to O'Brien Road intersection upgrade and localised widening	Caboolture South / Morayfield
Cundoot Creek, South Caboolture - New Road	RD17	2031	Capacity upgrade	DTMR/MBRC	New 2 lane arterial road between Buchanan Road and Lower King Street	Caboolture Central
Brown Street, Caboolture - New Road	RD18	2031	Capacity upgrade	DTMR/MBRC	New 2 Lane Sub-Arterial Road between Ardrossan Rd and Pettigrew Street	Caboolture North
Mewett St/Lee St/Summerfields Drive, Caboolture - Intersection	INT12	2031	Capacity upgrade	MBRC	Signalisation	Caboolture Central
Oakey Flat Road/Burbury Road, Morayfield - Intersection	INT13	2031	Capacity upgrade	MBRC	Signalisation	Caboolture South / Morayfield
Bellmere Road, Bellmere - Intersection and Corridor Upgrade	RD20	Beyond 2031	Capacity upgrade	MBRC	River Drive to Ulster Drive	Caboolture Central

Table 2 - Caboolture - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
Pumicestone Road, Caboolture North - Path & Bike Lane Upgrade	CN2(b)	2016	Active Transport	MBRC	D'Aguilar Highway to Silica Street, as part of planned road improvements. Includes on-road bike lanes
Dances Road, Caboolture North - New Path & Bike Lanes	CN1 (a)	2016	Active Transport	TMR/MBRC	D'Aguilar Highway to Cottrill Road. Includes on-road bike lanes
Pumicestone Road Old Gympie Road intersection, Caboolture North - Path Upgrade	CN1 (b)	2016	Active Transport	TMR/MBRC	Upgrade Pumicestone Road/Old Gympie Road intersection, including active transport priority and crossings
Rowe and Bury Streets, Caboolture - New Path	Cab2 (a)	2016	Active Transport	MBRC	Rowe Street Upgrade connecting McKean St and Hayes St. Provide path along Bury Street drain
McKean Street, Caboolture - Path & Bike Lane Upgrade	Cab2 (b)	2016	Active Transport	MBRC	Beerburrum Rd to Manley St. Path widening and on-street bike lanes
Matthew Terrace, Caboolture - Path upgrade	Cab3	2016	Active transport	MBRC	Associated with station precinct re-development
James Street, Caboolture - Path Upgrade	Cab4	2016	Active Transport	MBRC	Associated with James St precinct re-development
Hasking St/George Street, Caboolture - Path & Bike Lane Upgrade	Cab5(a)	2016	Active Transport	MBRC	Hasking St George Street (between Hasking St and King St). Includes on street bike lanes
Hasking Street to East Street, Caboolture - New Path	Cab5(c)	2016	Active Transport	MBRC	New midblock connection through post office site
King Street*, Caboolture - Path Upgrade	Cab6	2016	Active Transport	TMR/MBRC	Boulevard treatment between George Street and Beerburum Road. Including mid-block connection between King St and Elliott St
Elliott Street*, Caboolture - Path Upgrade	Cab7	2016	Active Transport	TMR/MBRC	Elliott Street and Morayfield Rd between King Street and Caboolture River
Morayfield Road, Morayfield - Path & Bike Lane Upgrade	CabS1(a)	2016	Active Transport	TMR/MBRC	Caboolture River to Market Drive. Includes on-road bike lanes
Morayfield Road, Morayfield - Path Upgrade	CabS1(b)	2016	Active Transport	TMR/MBRC	Caboolture River Road to Station Road
Market Drive/Dickson Rd/William Berry Drive, Morayfield - New Path & Bike Lanes	CabS2(a)	2016	Active Transport	MBRC	New path and on-road bike lanes. Includes rail crossing, Visentin Road (to Morayfield Station) and Buchanan Rd to Kirkcaldy St
George Street, Caboolture - Path & Bike Lane Upgrade	Cab5(b)	2016	Active Transport	MBRC	George Street between Hasking St and Bertha St. Includes on street bike lanes

Table 2 - Caboolture - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
Burnett Road/Lower King Street, Caboolture - Intersection	INT09	2016	Active Transport	TMR/MBRC	Signalisation of intersection to facilitate pedestrian crossing on Lower King Street
Bury Street, Caboolture - New Path	Cab2 (c)	2021	Active Transport	MBRC	Lang St to Manley St
Lynfield Dr/Warner St, Caboolture - New Path & Bike Lanes	Cab8	2021	Active Transport	MBRC	Lynfield Dr between Yaldara Ave and Warner St, Including Warner St. Including on-road bike lanes
Lower King Street, Caboolture - New Path & Bike Lanes	Cab9	2021	Active Transport	TMR/MBRC	Mewett Street to Bruce Highway. Includes on-road bike lanes
Caboolture River Road, Morayfield - Path & Bike Lane Upgrade	CabS3	2021	Active Transport	MBRC	Walkers Road to Morayfield Road. Includes on-road bike lane. As part of planned road improvements
Bribie Island Road, Caboolture - Path Upgrade	CabE1	2021	Active Transport	MBRC	Highway crossing and access to airport industrial estate. Includes access to Beachmere Rd
Walkers Road, Morayfield - New Path & Bike Lanes	CabS4	2026	Active Transport	MBRC	Creek Crossing upgrade and on-road bike lane between Fennell Ct and Koala Drive
Grogan Road, Morayfield - Path & Bike Lane Upgrade	CabS5	2026	Active Transport	MBRC	Path upgrade to Aquatic Centre. Including bicycle awareness on Grogan Road
Wimbledon Drive, Morayfield - New Path	CabS6	2026	Active Transport	MBRC	Provide short-cut to school
Coach Road East, Burpengary East - Path & Bike Lane Upgrade	CabE2(a)	2026	Active Transport	MBRC	Path upgrade and on-road bike lanes Between North East Business Park and Eastern Service Road
Buckley Road, Burpengary East - Path & Bike Lane Upgrade	CabE2(b)	2026	Active Transport	MBRC	Path upgrade and on-road bike lanes Between North East Business Park and Eastern Service Road
Buchanan Road extension, Morayfield - New Path & Bike Lanes	CabS2(b)	2031	Active Transport	MBRC	New path and on-road bike lanes associated with new Buchanans Road to Caboolture River Road link including rail overpass and Morayfield Road intersection.

Table 3 - Caboolture - State Road Upgrades				
Project Title	**Year**	**Improvement Purpose**	**Funding**	**Description**
Lower King Street, Caboolture - Link Upgrade	2021	Capacity upgrade	DTMR	Between Bruce Highway and Mewett Street
Bruce Highway , Burpengary - Link Upgrade	2021	Capacity upgrade	DTMR	Between Uhlmann Road interchange and north of Deception Bay Road interchange
Bruce Highway , Morayfield - Link Upgrade	2021	Capacity upgrade	DTMR	Between Caboolture Bribie Island Road interchange and north of Buchanan Road interchange
Bruce Highway , Elimbah - Link Upgrade	2021	Capacity upgrade	DTMR	Between Beerburrum-Donnybrook Way interchange and north of Pumicestone Road interchange
Bruce Highway , Burpengary - Intersection	2021	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound with on-ramp from Uhlmann Road
Bruce Highway , Caboolture - Intersection	2021	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound with on-ramp from Buchanan Road
Bruce Highway , Caboolture - Intersection	2021	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound with on-ramp from Caboolture Bribie Island Road
Morayfield Road, Morayfield - Link Upgrade	2021	Capacity upgrade	DTMR	Between Uhlmann Road and Lower King Street
Lower King Street, Caboolture - Link Upgrade	2021	Capacity upgrade	DTMR	Between Mewett Street and Morayfield Road
Beerburrum Road / Hasking Street, Caboolture - Intersection	2021	Capacity upgrade	DTMR	Intersection upgrade
King Street / Smiths Road, Caboolture - Intersection	2021	Capacity upgrade	DTMR	Intersection upgrade
Beerburrum Road / Bertha Street, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Intersection upgrade
Pumicestone Road / Old Gympie Road, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Intersection upgrade
D'Aguilar Highway, Caboolture - Link Upgrade	2031	Capacity upgrade	DTMR	Between King Street and Bleakley Street
D'Aguilar Highway, Caboolture - Link Upgrade	2021	Capacity upgrade	DTMR	Between King Street and Atwood Street
D'Aguilar Highway / Pumicestone Rd Interchange, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Intersection upgrade
Bruce Highway, MBRC - Link Upgrade	2031	Capacity upgrade	DTMR	Between Pine River and Steve Irwin Way interchange
Bruce Highway, Burpengary - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway northbound with on-ramp from Uhlmann Road
Bruce Highway, Morayfield - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway northbound with on-ramp from Buchanan Road

Table 3 - Caboolture - State Road Upgrades				
Project Title	**Year**	**Improvement Purpose**	**Funding**	**Description**
Bruce Highway, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound with on-ramp from D'Aguilar Highway
Bruce Highway, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound off-ramp with D'Aguilar Highway
Bruce Highway, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Merge and diverge point of D'Aguilar Highway and Bruce Highway ramps
Bruce Highway, Caboolture - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound with on-ramp from Pumicestone Road
Bruce Highway, Elimbah - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway northbound with on-ramp from Pumicestone Road


TRANSPORT NETWORKS & CORRIDORS STRATEGY - CABOOLTURE
RD18
INT12
RD17
RD20
RD11
RD10
RD09
RD02
INT03
INT13
RD14
COASTAL VILLAGES AND BRIBIE ISLAND
NORTH LAKES, REDCLIFFE, MORETON BAY RAIL CORRIDOR
Legend
Active Catchment
Future MBRC Intersection Upgrade
MBRC Intersection Investigation
Potential State Intersection Upgrade
Future MBRC Road Upgrade
MBRC Road Investigation
Potential State Road Upgrade
Roadspace Reallocation Investigation

Coastal Villages & Bribie Island District Profile

Assessing the Transport Networks and Corridors Infrastructure

The Desired Standards of Service (DSS) have been applied to Council's existing transport infrastructure network to identify capacity constraints and needs in provision and future requirements for transport network and corridor facilities.

Catchment profiles

The region has been divided into a series of district level catchments which reflect those identified in Council's Strategic Framework. The intent of the district planning area profiles is to identify the current and future transport network and corridor infrastructure needs for parts of our region that share a similar geographical context.

The district area profiles determine the future trunk requirements for district level transport linkages to major destinations, and between districts and sub-districts. The analysis considers the influence both local and regional destinations have on the demand for new and upgraded facilities. The profile will inform a program of infrastructure requirements over a twenty year planning horizon.

Methodology

To complete a thorough assessment of the existing and future transport networks and corridors in the Coastal Villages and Bribie Island district, the following steps were undertaken:

1. Demographic Analysis – A brief demographic analysis was used to identify the key attractors, the extent of growth and the spread of that growth across the districts in the region.
2. Corridor types – The corridors were classified by road hierarchy and category of place types through which they pass.
3. Performance standards - Appropriate "Desired Levels of Service" (DSS) were determined to provide benchmarks against which the performance of the network will be assessed.
4. Functional Analysis – The analysis of the function of transport network and its constituent facilities was undertaken to identify potential shortfalls in the distribution of linkages and movement opportunities to serve the needs of users in accessing key attractors. The analysis identifies where the desired connectivity and functionality fall short of the desired strategic intent.
5. Capacity Analysis – The strategic model was used to project existing and anticipated traffic volumes and determine capacities required to meet the DSS.
6. Future infrastructure - Recommendations were developed, based on opportunities for shifts to more sustainable modes, as well as growth assumptions, the desired standards of service, committed development, and principles of transport planning as identified in the Networks and Corridors Strategy.
7. Future programs and actions - A series of solution sets for each district were identified which demonstrated the desired standards of service. Of the total scope of new or upgraded facilities necessary to meet standards throughout the district, the most strategically important projects were selected as high priorities for implementation.

These selected projects were subject of scoping and costing to inform the subsequent consideration for delivery.

Profile Summary

The Coastal Villages and Bribie Island district forms the north-eastern boundary of the Moreton Bay Region. The district includes a range of coastal, rural, rural residential and suburban communities, natural features including the wetlands and aquatic habitats of the Pumicestone Passage and the coastal foreshores of Bribie Island, Godwin Beach, Sandstone Point, Ningi, Toorbul, Meldale, Donnybrook and Beachmere.

Strategic Planning Directions

In the next 20 years little change is expected due to planning constraints associated with coastal hazard and the environmental sensitivity of the catchment of the Moreton Bay Marine Park and the iconic Pumicestone Passage.

Demographics

The population assumptions for the Coastal Villages and Bribie Island district reflect the planning directions outlined in Council's Strategic Framework. The table below identifies that the district is projected to have an additional 3,095 residents up to 2031. This represents the lowest growth district in the region with less than 1% of the region's growth.

Estimated Population Growth – MBRC Planning Assumptions			
District Planning Catchment	***2011***	***2031***	***Growth***
Coastal Villages and Bribie Island Planning Area	31238	34333	3095
Moreton Bay Region	381,651	528,770	147,119

Coastal Villages and Bribie Island District Planning Area Population Assumptions

Based on trends, these new residents will include families moving into more affordable housing options on the urban fringe of the Brisbane metropolitan area, those seeking quiet retirement, and those seeking coastal amenity.

Transport Networks and Corridors Assessment

Bribie Island comprises distinct residential areas focused on the the ocean beach and on Pumicestone passage, with a range of local services and employment. The Coastal Villages mainly comprise small remote centres seperated by constrained land (agricultural and flood affected land). Centres are generally connected by State Roads.

Transport Networks and Corridors Planned Improvements

Council has limited ability to improve state roads. Consultation with TMR is required to facilitate necessary improvements on the State road network to resolve known capacity/accessibility issues amd constraints.

Transport Networks and Corridors Solutions

The transport networks and corridors recommendations are identified in the District and Local catchment maps which can be accessed from the links and key map on the Council website.

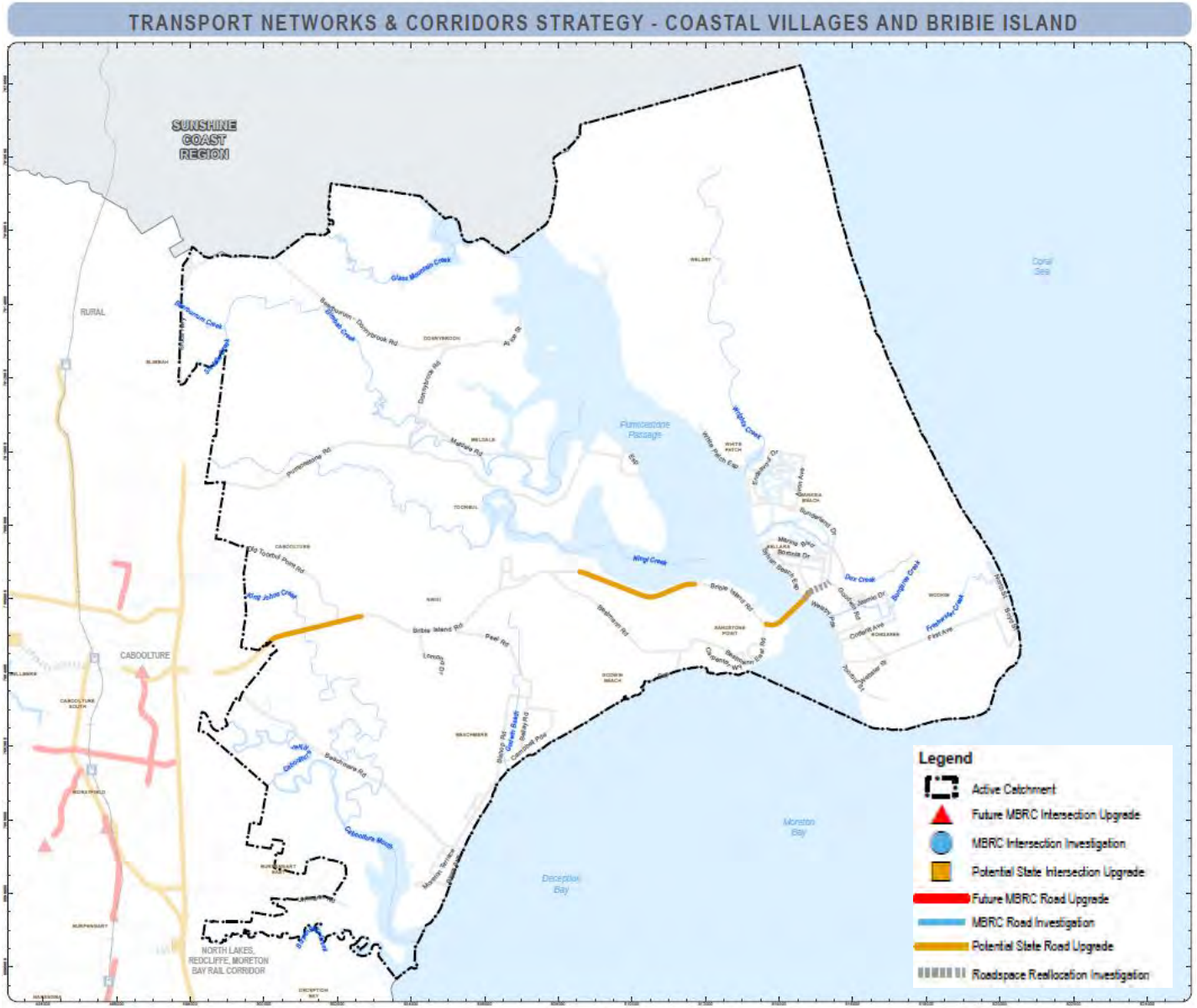
Table 1 identifies priority active transport projects necessary to meet active transport user needs in accessing major destinations within 15 minutes walking or cycling distance, together with critical linkages to connect otherwise separate communities. The table also identifies the recommended sequence for implementation.

Table 2 identifies the State-controlled road corridor projects necessary to connect the various localities across Moreton Bay and to provide external linkages. This table identifies broad timeframes to indicate when the projects would be required.

The following tables identifies priority transport infrastructure required for the Coastal Villages & Bribie Island areas to service anticipated growth for the next 20 years.

Table 1 - Coastal Villages & Bribie Island - Active Transport Upgrades					
Project title	**Ref**	**Year**	**Improvement purpose**	**Funding**	**Description**
Bestmann Road East/Bribie Island Road, Sandstone Point - Path & Bike Lane Upgrade	BR1	2031	Active Transport	TMR/MBRC	Upgrade footpaths and provide on-road bike lanes along Bestmann Road and Bribie Island Road approaches to Bribie Island Bridge

Table 2 - Coastal Villages & Bribie Island - State Road Upgrades				
Project Title	**Year**	**Improvement Purpose**	**Funding**	**Description**
Caboolture Bribie Island Road, Caboolture - Link Upgrade	2021	Capacity upgrade	DTMR	Pasturage Road to Bestmann Road
Bribie Island Road, Ningi – link upgrade including active transport provision	Further investigation	Link upgrade	DTMR	Improvements within Ningi community including priority crossings for pedestrians and cyclists
Bribie Island Bridge – Link upgrade	Further investigation	Link upgrade	DTMR	Bridge upgrade including provision for pedestrian and cyclists


TRANSPORT NETWORKS & CORRIDORS STRATEGY - COASTAL VILLAGES AND BRIBIE ISLAND
SUNSHINE COAST REGION
RURAL
CABOOLTURE
NORTH LAKES, REDCLIFFE, MORETON BAY RAIL CORRIDOR
Glass Mountain Creek
Donnybrook Rd
Donnybrook Creek
Pumicestone Passage
Bribie Island Rd
Ningi Creek
Deception Bay
Moreton Bay
Coral Sea
Legend
Active Catchment
Future MBRC Intersection Upgrade
MBRC Intersection Investigation
Potential State Intersection Upgrade
Future MBRC Road Upgrade
MBRC Road Investigation
Potential State Road Upgrade
Roadspace Reallocation Investigation

North Lakes, Redcliffe, Moreton Bay Rail Corridor - District Planning Catchment

Assessing the Transport Networks and Corridors Infrastructure

The Desired Standards of Service (DSS) have been applied to Council's existing transport infrastructure network to identify capacity constraints and needs in provision and future requirements for transport network and corridor facilities.

Catchment profiles

The region has been divided into a series of district level catchments which reflect those identified in Council's Strategic Framework. The intent of the district planning area profiles is to identify the current and future transport network and corridor infrastructure needs for parts of our region that share a similar geographical context.

The district area profiles determine the future trunk requirements for district level transport linkages to major destinations, and between districts and sub-districts. The analysis considers the influence both local and regional destinations have on the demand for new and upgraded facilities. The profile will inform a program of infrastructure requirements over a twenty year planning horizon.

Methodology

To complete a thorough assessment of the existing and future transport networks and corridors in the North Lakes, Redcliffe and Moreton Bay Rail Corridor district, the following steps were undertaken:

1. Demographic Analysis – A brief demographic analysis was used to identify the key attractors, the extent of growth and the spread of that growth across the districts in the region.
2. Corridor types – The corridors were classified by road hierarchy and category of place types through which they pass.
3. Performance standards - Appropriate "Desired Levels of Service" (DSS) were determined to provide benchmarks against which the performance of the network will be assessed.
4. Functional Analysis – The analysis of the function of transport network and its constituent facilities was undertaken to identify potential shortfalls in the distribution of linkages and movement opportunities to serve the needs of users in accessing key attractors. The analysis identifies where the desired connectivity and functionality fall short of the desired strategic intent.
5. Capacity Analysis – The strategic model was used to project existing and anticipated traffic volumes and determine capacities required to meet the DSS.
6. Future infrastructure - Recommendations were developed, based on opportunities for shifts to more sustainable modes, as well as growth assumptions, the desired standards of service, committed development, and principles of transport planning as identified in the Networks and Corridors Strategy.

7. Future programs and actions - A series of solution sets for each district were identified which demonstrated the desired standards of service. Of the total scope of new or upgraded facilities necessary to meet standards throughout the district, the most strategically important projects were selected as high priorities for implementation. These selected projects were subject of scoping and costing to inform the subsequent consideration for delivery.

Profile Summary

The North Lakes, Redcliffe, Moreton Bay Rail Corridor district includes the suburbs of Redcliffe, Rothwell, Mango Hill, North Lakes, Griffin, Deception Bay, Murrumba Downs, and Kallangur, Petrie Village & Dakabin. The district is large, predominantly urban, and consists of a broad mix of distinct communities. Over the past 10 to 15 years this catchment has seen the greatest quantum of growth in the region.

The communities within the district vary considerably, from the residential suburbs of Murrumba Downs and Kallangur in the west to Redcliffe, an established coastal centre with great quality recreation and sporting facilities, in the east. The large wedge of suburbs between Kallangur and Redcliffe are dominated by broad scale residential land subdivision and the commercial centre of North Lakes/Mango Hill. These suburbs have been among the fastest growing in Australia. In some circumstances that growth has occurred so rapidly, infrastructure has struggled to keep pace.

To the north and west, new residential areas are emerging from the rural and rural residential patchwork of communities that previously separated the former local government areas of Caboolture and Pine Rivers.

With the introduction of the Moreton Bay Rail Link (MBRL), this district will continue to grow rapidly with broad scale residential land subdivisions dominating development over the next 10 years, complemented by more intensive infill development near activity nodes.

Strategic Planning Directions

This catchment is expected to experience the greatest scale of growth in the region over the next 20 years. Greenfield residential and employment areas around the MBRL and residential areas adjacent to the existing north coast rail line at Dakabin will continue to grow rapidly over the next 10 years, after which greenfield sites will become scarce. From that time, pressure is expected to turn to infill and higher density development and redevelopment around district and major activity centres and rail stations.

Demographics

The population assumptions for the North Lakes, Redcliffe and Moreton Bay Rail Corridor district reflect the planning directions outlined in Council's Strategic Framework. The table below identifies that the district is projected to have an additional 74,285 residents up to 2031. This represents half of the total growth for the Moreton Bay Region.

Estimated Population Growth – MBRC Planning Assumptions			
District Planning Catchment	***2011***	***2031***	***Growth***
North Lakes, Redcliffe, Moreton Bay Rail Corridor Planning Area	163184	237468	74285
Moreton Bay Region	381,651	528,770	147,119

North Lakes, Redcliffe, Moreton Bay Rail Corridor District Planning Area Population Assumptions

Based on trends, the majority of these new residents will be families moving into more affordable housing options on the urban fringe of the Brisbane metropolitan area.

Transport Networks and Corridors Assessment

The North Lakes, Redcliffe, Moreton Bay Rail Corridor is dominated by State Roads (Anzac Ave & Deception Bay Road, Dayboro Road). Intersections with and between these heavily trafficed routes experience significant congestion. The planned Moreton Bay Rail Link will provide a significant east-west transport corridor, increasing accessibility and mode choice to this area.

Transport Networks and Corridors Planned Improvements

North South Arterial from Griffin to Mango Hill, combined with the Mango Hill Ring Road is expected to provide local connections between Kallangur, Murrumba Downs, Griffin, Mango Hill and North Lakes, reducing the reliance on State Roads. Localised improvements on the Old Gympie Road in Dakabin will result in a more permeable network.

Transport Networks and Corridors Solutions

The transport networks and corridors recommendations are identified in the District and Local catchment maps which can be accessed from the links and key map on the Council website.

Table 1 identifies priority road corridor and intersection projects necessary to meet a full range of user needs, and the recommended sequence for implementation.

Table 2 identifies priority active transport projects necessary to meet active transport user needs in accessing major destinations within 15 minutes walking or cycling distance, together with critical linkages to connect otherwise separate communities. The table also identifies the recommended sequence for implementation.

The following tables identifies priority transport infrastructure required for North Lakes, Redcliffe & Moreton Bay Rail Link to service anticipated growth for the next 20 years.

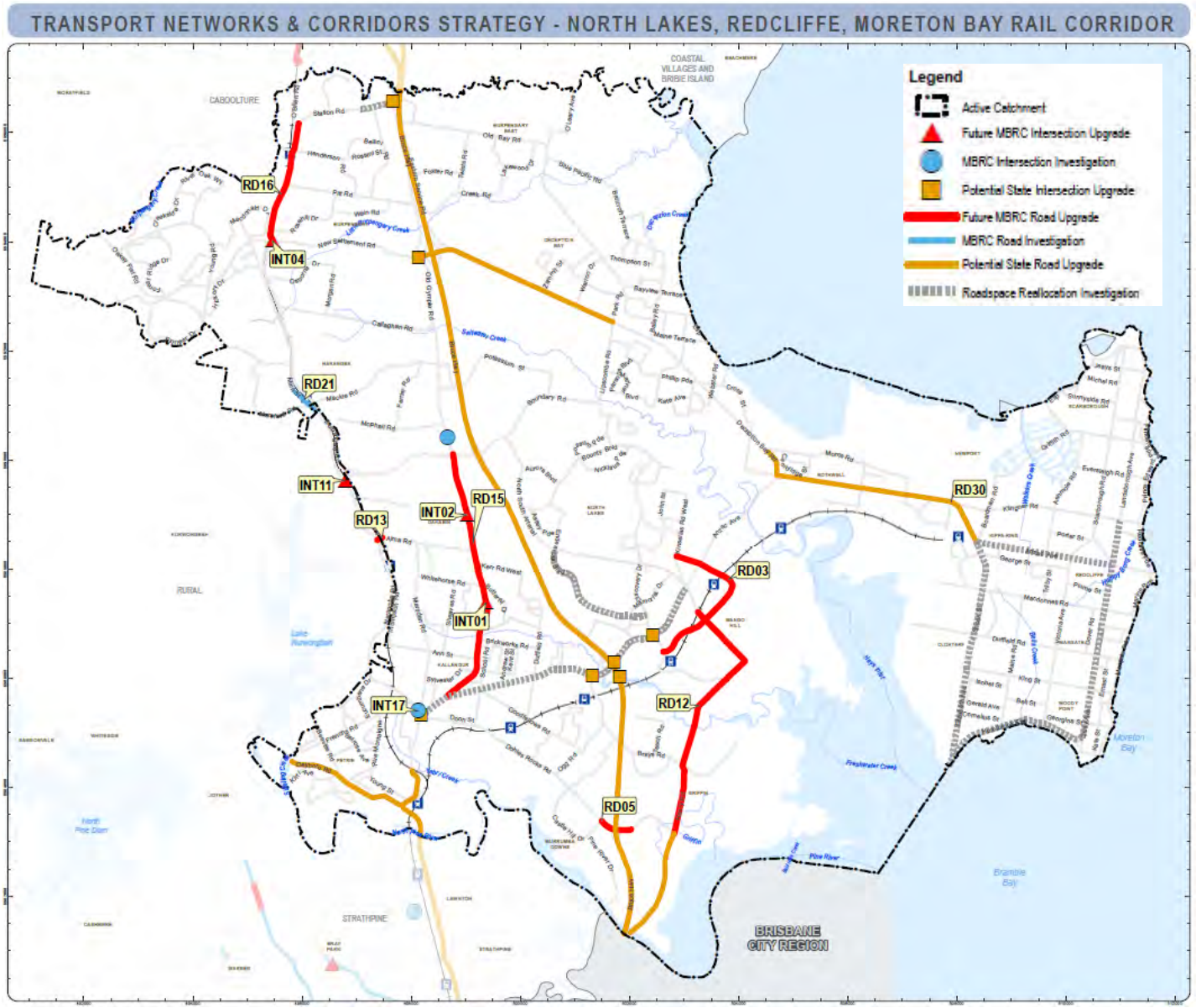
Table 1 - North Lakes, Redcliffe & Moreton Bay Rail Link - Road Capacity Upgrades

Project Title	Ref	Year	Improvement Purpose	Funding	Description	Local Catchment
Old Gympie Road/Macarthur Drive, Kallangur - Intersection	INT01	2016	Capacity upgrade	MBRC	Signalisation	Kallangur
Old Gympie Road/Hughes Road, Kallangur - Intersection	INT02	2016	Capacity upgrade	MBRC	Signalisation	Dakabin
Mango Hill Ring Road, Mango Hill - New Road	RD03	2016	Facilitate Development	MBRC	New Corridor for local connectivity	North Lakes Mango Hill
Dohles Rocks Road, Murrumba Downs - Intersection and Corridor Upgrade	RD05	2016	Capacity upgrade	DTMR/MBRC	Goodrich Road to Bruce Highway intersection upgrade and road widening	Kallangur
Burpengary Road/New Settlement Road, Burpengary - Intersection	INT04	2021	Capacity upgrade	MBRC	Signalisation, Bridge Works and localised widening	Narangba
NSUA Mango Hill to Griffin, Mango Hill - New Road	RD12	2021	Facilitate Development	MBRC	New 2 lane road between Mango Hill and Griffin	Griffin
Alma Road/Narangba Road, Dakabin - New Road	RD13	2026	Facilitate Development	MBRC	New rail bridge and intersection with Narangba Road	Dakabin
Boundary Road/Narangba Road, Dakabin - Intersection	INT11	2026	Capacity upgrade	MBRC	Signalisation	Dakabin
Old Gympie Road, Dakabin - Kallangur - Intersection and Corridor Upgrade	RD15	2026	Capacity upgrade	MBRC	Boundary Road to Anzac Ave intersection upgrade and localised widening	Kallangur / Dakabin
Burpengary/Station Road, Burpengary - Intersection and Corridor Upgrade	RD16	2026	Capacity upgrade	MBRC	O'Brien Road to Rosehill Drive intersection upgrade and localised widening	Narangba / Burpengary
Main Street , Narangba - Intersection and Corridor Upgrade	RD21	Beyond 2031	Capacity upgrade	MBRC	Kelly Street to School Street	Narangba
Narangba Rd/Marsden Road, Kallangur - Intersection	INT17	Beyond 2031	Capacity upgrade	MBRC	Signalisation	Kallangur
North Lakes Drive/The Corso, North Lakes - Intersection Upgrade	INT28	Further investigation	Capacity upgrade	MBRC	Signalisation	North Lakes Mango Hill

Table 2 - North Lakes, Redcliffe & Moreton Bay Rail Link - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
Burpengary Road, Burpengary - New Bike Lanes	BE4	2016	Active Transport	MBRC	On-road bike lanes from Burpengary Creek to Henderson Road. Associated with planned road improvements
Omara Road, Narangba - New Path & Bike Lanes	N1	2016	Active Transport	MBRC	Continuation of shared path along Omara Rd reserve, including crossing of New Settlement Road
Anzac Ave, Kallangur - Path Upgrade	K1	2016	Active Transport	TMR/MBRC	Boulevard Treatment from School Rd to Duffield Rd
Narangba Road/Anzac Ave, Kallangur - New Bike Lanes	K2	2016	Active Transport	TMR/MBRC	On-Road bike lanes from Hanlon Road to Anzac Ave, including intersection improvements at Anzac Ave.
North Lakes Drive/Discovery Drive, North Lakes - New Path & Bike Lanes	NL2 (a)	2016	Active Transport	MBRC	New off-road path from North Lakes Drive to Discovery Drive.
Bay Ave, Deception Bay - Path Upgrade	DB6	2016	Active Transport	MBRC	Boulevard treatment, path widening and crossings
Morris Road, Rothwell - Path & Bike Lane Upgrade	DB2	2016	Active Transport	MBRC	Deception Bay Road to Gynther Road, on-road bike lanes. New and upgraded paths.
Gynther Road, Rothwell - New Path & Bike Lanes	DB3	2016	Active Transport	TMR/MBRC	New path and on-road bike lanes. Includes crossing of Anzac Ave
Sutton Street, Redcliffe - Path Upgrade	Red1	2016	Active Transport	MBRC	Continuation of Boulevard Treatment Anzac Ave to Mall Way
Esplanade, Redcliffe - Path Upgrade	Red4	2016	Active Transport	MBRC	Path upgrade and connection to cross streets between Klinger Road and Shields St
Anzac Ave/Boardman Rd, Kippa-Ring - Path Upgrade	Red 5	2016	Active Transport	MBRC	Boulevard Treatment and upgrade of Boardman Rd/Elizabeth Ave intersection between Klinger Rd and Kappella St
Nottingham Street, Kippa-Ring - New Path & Bike Lanes	Red 6	2016	Active Transport	MBRC	New path and bicycle awareness zone between Chelsea Street and Fleet Drive
Duffield Road, Margate - New Bike Lanes	Red8	2016	Active Transport	MBRC	On-road bike lane marking (lanes already exist) between Margate Parade and Victoria Ave
New Settlement Road, Narangba - New Path & Bike Lanes	N2	2021	Active Transport	MBRC	New shared path between Young Road and Coachwood Place, connecting to off-road facilities
Dohles Rocks Road, Murrumba Downs - Path & Bike Lane Upgrade	K3	2021	Active Transport	TMR/MBRC	Bweteen Goodrich Road and Wagner Road. Shared paths and on-road bike lanes, associated with planned road improvements

Table 2 - North Lakes, Redcliffe & Moreton Bay Rail Link - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
Ogg Road, Murrumba Downs - New Path & Bike Lanes	K4	2021	Active Transport	MBRC	New path on eastern side from Goodfellows Road to Brays Road
Marsden Road, Kallangur - New Bike Lanes	K5	2021	Active Transport	MBRC	On-road bike lanes between Narangba Road and Anne Street
Young Street, Petrie - New Bike Lanes	P1	2021	Active Transport	MBRC	Bicycle awareness marking
Rue Montaigne, Petrie - New Bike Lanes	P2	2021	Active Transport	MBRC	On-road bike lanes between Frenchs Road to Woonara Drive (connects to off-road paths)
Frenchs Road, Petrie - New Bike Lanes	P3	2021	Active Transport	MBRC	On-road bike lanes and intersection upgrades between Beeville Rd and Rue Montaigne
Brays Road, Griffin - Path & Bike Lane Upgrade	G1	2021	Active Transport	MBRC	Ogg Road to Tesch Road including Bruce Highway overbridge
North Lakes Drive, North Lakes - Path & Bike Lane Upgrade	NL1	2021	Active Transport	MBRC	Active transport priority and crossings from Memorial Drive to Kerr Road East
Discovery Drive/Halpine Drive, Mango Hill - Path & Bike Lane Upgrade	NL2 (b)	2021	Active Transport	TMR/MBRC	Path upgrade and on-road bike lanes along Discovery Drive and Halpine Drive, including Anzac Ave intersection
Memorial Drive/Discovery Drive, North Lakes - New Bike Lanes	NL3	2026	Active Transport	MBRC	Formalise on-road bike lanes from North Lakes Drive to Davenport Parade, adressing conflict points
Saltwater Creek Connection, North Lakes - New Path & Bike Lanes	NL4	2026	Active Transport	MBRC	Upgrade path on Bounty Bvd Provide new shared path across Saltwater Creek between Bouty Bvd to Moreton Downs Drive (Deception Bay)
Moreton Downs Drive, Deception Bay - Path & Bike Lane Upgrade	DB1	2026	Active Transport	MBRC	Path widening and on-road bike lanes between Arena Place and Deception Bay Road
John Street Precinct, Redcliffe - New Path	Red2	2026	Active Transport	MBRC	Non Trunk - Connecting Anzac Ave to Humpybong Creek Paths
Porter Street, Redcliffe - New Path & Bike Lanes	Red7(a)	2026	Active Transport	MBRC	New path and on-road bike lane
Portwood Street, Redcliffe - Path & Bike Lane Upgrade	Red7(b)	2026	Active Transport	MBRC	New path on south side and on-road bike lanes
Klinger Road/Boardman Road, Kippa-Ring - Intersection	INT20	2031	Active Transport	MBRC	Signalisation - subject to Kippa-Ring/Redcliffe Transport Integration Project
Station Road/Old Gympie Road, Burpengary - New Path	BE3(a)	2031	Active Transport	TMR/MBRC	Intersection improvements at Station Road and path across Old Gympie Road and Bruce Highway

Table 2 - North Lakes, Redcliffe & Moreton Bay Rail Link - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
Arthur Drewett Drive, Burpengary - New Path	BE3(b)	2031	Active Transport	MBRC	Bruce Highway overbridge to Old Bay Road


TRANSPORT NETWORKS & CORRIDORS STRATEGY - NORTH LAKES, REDCLIFFE, MORETON BAY RAIL CORRIDOR
Legend
Active Catchment
Future MBRC Intersection Upgrade
MBRC Intersection Investigation
Potential State Intersection Upgrade
Future MBRC Road Upgrade
MBRC Road Investigation
Potential State Road Upgrade
Roadspace Reallocation Investigation
RD16
INT04
RD21
INT11
RD13
INT02
RD15
INT01
INT17
RD03
RD12
RD05
RD30
CABOOLTURE
COASTAL VILLAGES AND BRIBIE ISLAND
RURAL
STRATHPINE
BRISBANE CITY REGION

Rural - District Planning Catchment

Assessing the Transport Networks and Corridors Infrastructure

The Desired Standards of Service (DSS) have been applied to Council's existing transport infrastructure network to identify capacity constraints and needs in provision and future requirements for transport network and corridor facilities.

Catchment profiles

The region has been divided into a series of district level catchments which reflect those identified in Council's Strategic Framework. The intent of the district planning area profiles is to identify the current and future transport network and corridor infrastructure needs for parts of our region that share a similar geographical context.

The district area profiles determine the future trunk requirements for district level transport linkages to major destinations, and between districts and sub-districts. The analysis considers the influence both local and regional destinations have on the demand for new and upgraded facilities. The profile will inform a program of infrastructure requirements over a twenty year planning horizon.

Methodology

To complete a thorough assessment of the existing and future transport networks and corridors in the Rural district, the following steps were undertaken:

1. Demographic Analysis – A brief demographic analysis was used to identify the key attractors, the extent of growth and the spread of that growth across the districts in the region.
2. Corridor types – The corridors were classified by road hierarchy and category of place types through which they pass.
3. Performance standards - Appropriate "Desired Levels of Service" (DSS) were determined to provide benchmarks against which the performance of the network will be assessed.
4. Functional Analysis – The analysis of the function of transport network and its constituent facilities was undertaken to identify potential shortfalls in the distribution of linkages and movement opportunities to serve the needs of users in accessing key attractors. The analysis identifies where the desired connectivity and functionality fall short of the desired strategic intent.
5. Capacity Analysis – The strategic model was used to project existing and anticipated traffic volumes and determine capacities required to meet the DSS.
6. Future infrastructure - Recommendations were developed, based on opportunities for shifts to more sustainable modes, as well as growth assumptions, the desired standards of service, committed development, and principles of transport planning as identified in the Networks and Corridors Strategy.
7. Future programs and actions - A series of solution sets for each district were identified which demonstrated the desired standards of service. Of the total scope of new or upgraded facilities necessary to meet standards throughout the district, the most strategically important projects were selected as high priorities for implementation.

These selected projects were subject of scoping and costing to inform the subsequent consideration for delivery.

Profile Summary

The Rural district forms the western portion of the region and represents the largest geographical area. The district can be broken into three distinct portions, north, central and south. The district includes large expanses of rural and agricultural land in the north and water supply catchments and natural mountainous landscapes in the southern and central portions. The rural townships of Woodford, D'Aguilar and Wamuran service the agricultural landscape to the north with Samford Village and Dayboro in the south surrounded by mountain ranges. The central portion of the district is serviced from established urban areas to the east.

Strategic Planning Directions

In the next 20 years only small incremental changes are planned in this district, with the notable exception of the Caboolture West investigation area to the south of Wamuran. The expected growth in Caboolture West is not considered through this assessment as master planning has not yet determined the feasibility, scope and timing of potential development of this area.

Small areas of Suburban and Next Generation Suburban Neighbourhoods are planned along the eastern edge of this district on the urban fringes of Narangba, Bellmere, Morayfield and Caboolture.

Demographics

The population assumptions for the Rural district reflect the planning directions outlined in Council's Strategic Framework. The table below identifies that the local area is projected to have an additional 6,467 residents by 2031. This represents approximately 4% of the growth of the region.

Estimated Population Growth – MBRC Planning Assumptions			
District Planning Catchment	***2011***	***2031***	***Growth***
Rural Planning Area	31620	38088	6467
Moreton Bay Region	381,651	528,770	147,119

Rural District Planning Area Population Assumptions

Based on trends, the majority of these new residents will be families moving into more affordable housing options on the urban fringe of the Brisbane metropolitan area, or those seeking a semi-rural amenity and lifestyle.

Transport Networks and Corridors Assessment

Activity and development areas are dispersed through the Rural district, with higher density villages such as Woodford, Dayboro and Wamuran providing a focus for the rural and semi-rural communities. State controlled roads connect centres, often forming the main streets through these communities. These areas experience only limited congestion issues.

Transport Networks and Corridors Planned Improvements

Council has limited ability to improve state roads. Consultation with TMR is required to facilitate necessary improvements on the State road network to resolve known capacity/accessibility issues amd constraints.

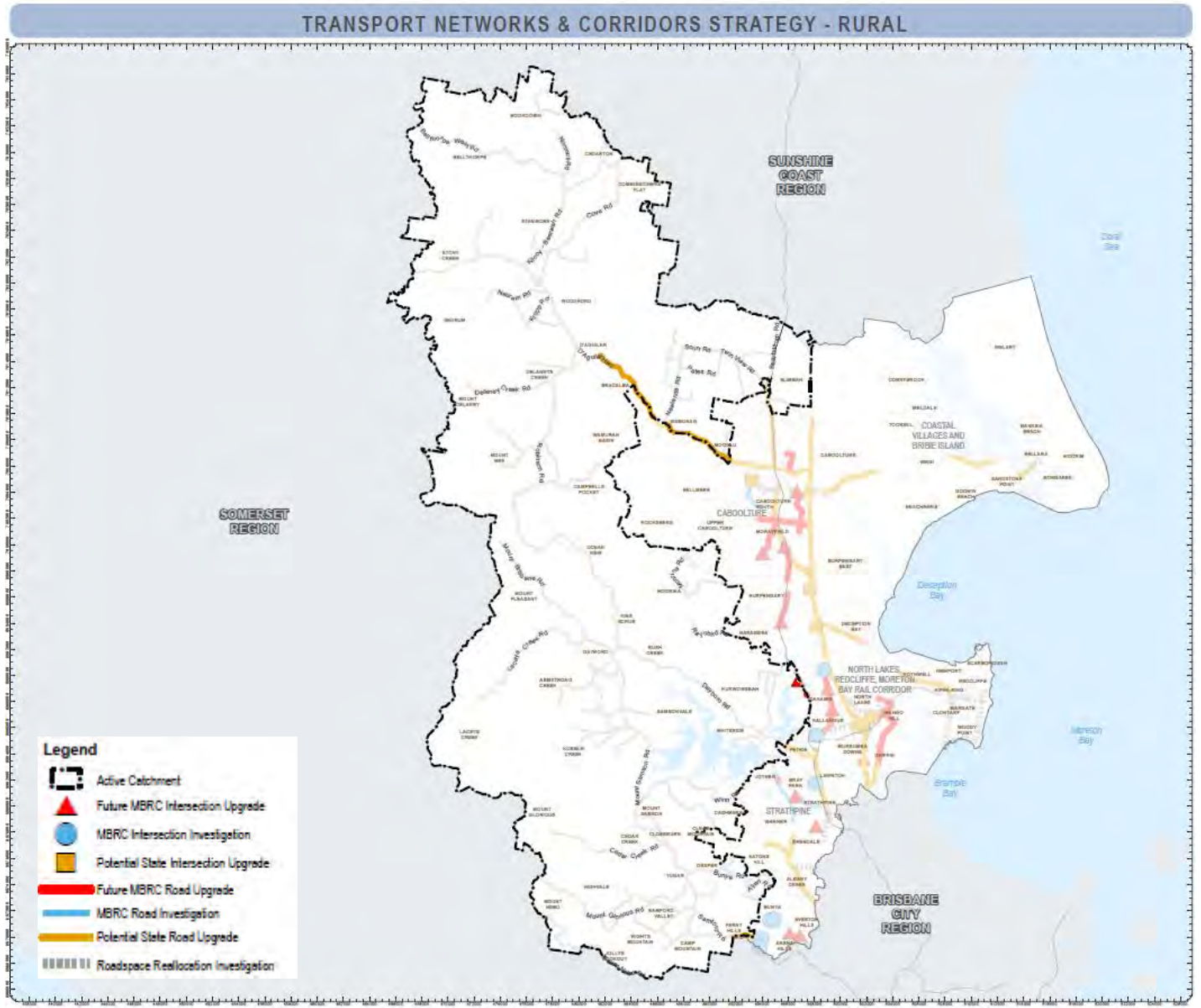
Transport Networks and Corridors Solutions

The transport networks and corridors recommendations are identified in the District and Local catchment maps which can be accessed from the links and key map on the Council website.

Table 1 identifies the State-controlled road corridor projects necessary to connect the various localities across Moreton Bay and to provide external linkages. This table identifies broad timeframes to indicate when the projects would be required.

The following table identifies priority transport infrastructure required for the Rural areas to service anticipated growth for the next 20 years.

Table 1 - Rural - State Road Upgrades				
Project title - State Road Upgrades	**Year**	**Improvement Purpose**	**Funding**	**Description**
Samford Road, Samford to Ferny Hills - Link Upgrade	2021	Capacity upgrade	DTMR	Between Owarra Avenue West and Main Street
Mount Glorious Road (Pei Road) / School Road, Samford - Intersection	2021	Capacity upgrade	DTMR	Intersection upgrade
Bruce Highway, Elimbah - Link Upgrade	2021	Capacity upgrade	DTMR	Between Beerburrum-Donnybrook Way interchange and north of Pumicestone Road interchange
Beerburrum Road, Elimbah - Link Upgrade	2031	Capacity upgrade	DTMR	Between McDougall Road and Tuckeroo Drive
Steve Irwin Way / Beerburrum-Donnybrook Road, Elimbah - Intersection	2031	Capacity upgrade	DTMR	Intersection upgrade
D'Aguilar Highway, Caboolture - Link Upgrade	2031	Capacity upgrade	DTMR	Between King Street and Bleakley Street
Bruce Highway, MBRC - Link Upgrade	2031	Capacity upgrade	DTMR	Between Pine River and Steve Irwin Way interchange
Bruce Highway, Elimbah - Intersection	2031	Capacity upgrade	DTMR	Merge point of Bruce Highway southbound with on-ramp from Steve Irwin Way
Bruce Highway, Elimbah - Intersection	2031	Capacity upgrade	DTMR	Intersection of Beerburrum-Donnybrook Way / Bruce Highway southbound off-ramp


TRANSPORT NETWORKS & CORRIDORS STRATEGY - RURAL
SUNSHINE COAST REGION
SOMERSET REGION
BRISBANE CITY REGION
COASTAL VILLAGES AND BRIBIE ISLAND
CABOOLTURE
NORTH LAKES REDCLIFFE MORETON BAY RAIL CORRIDOR
STRATHPINE
Legend
Active Catchment
Future MBRC Intersection Upgrade
MBRC Intersection Investigation
Potential State Intersection Upgrade
Future MBRC Road Upgrade
MBRC Road Investigation
Potential State Road Upgrade
Roadspace Reallocation Investigation

Strathpine - District Planning Catchment

Assessing the Transport Networks and Corridors Infrastructure

The Desired Standards of Service (DSS) have been applied to Council's existing transport infrastructure network to identify capacity constraints and needs in provision and future requirements for transport network and corridor facilities.

Catchment profiles

The region has been divided into a series of district level catchments which reflect those identified in Council's Strategic Framework. The intent of the district planning area profiles is to identify the current and future transport network and corridor infrastructure needs for parts of our region that share a similar geographical context.

The district area profiles determine the future trunk requirements for district level transport linkages to major destinations, and between districts and sub-districts. The analysis considers the influence both local and regional destinations have on the demand for new and upgraded facilities. The profile will inform a program of infrastructure requirements over a twenty year planning horizon.

Methodology

To complete a thorough assessment of the existing and future transport networks and corridors in the Strathpine district, the following steps were undertaken:

1. Demographic Analysis – A brief demographic analysis was used to identify the key attractors, the extent of growth and the spread of that growth across the districts in the region.
2. Corridor types – The corridors were classified by road hierarchy and category of place types through which they pass.
3. Performance standards - Appropriate "Desired Levels of Service" (DSS) were determined to provide benchmarks against which the performance of the network will be assessed.
4. Functional Analysis – The analysis of the function of transport network and its constituent facilities was undertaken to identify potential shortfalls in the distribution of linkages and movement opportunities to serve the needs of users in accessing key attractors. The analysis identifies where the desired connectivity and functionality fall short of the desired strategic intent.
5. Capacity Analysis – The strategic model was used to project existing and anticipated traffic volumes and determine capacities required to meet the DSS.
6. Future infrastructure - Recommendations were developed, based on opportunities for shifts to more sustainable modes, as well as growth assumptions, the desired standards of service, committed development, and principles of transport planning as identified in the Networks and Corridors Strategy.
7. Future programs and actions - A series of solution sets for each district were identified which demonstrated the desired standards of service. Of the total scope of new or upgraded facilities necessary to meet standards throughout the district, the most strategically important projects were selected as high priorities for implementation.

These selected projects were subject of scoping and costing to inform the subsequent consideration for delivery.

Profile Summary

The Strathpine district includes the regional activity centre of Strathpine and district level activity centres of Arana Hills, Albany Creek and Warner. It also includes employment areas in the Hills District, Brendale and Lawnton. A diversity of open space is included within the catchment, ranging from natural experiences in conservation area and linkages along riparian corridors, to large scale regional sporting facilities at the South Pine Sports Reserve.

Strategic Planning Directions

The future direction for the Strathpine district is predominantly one of consolidation. Large areas of the catchment are already developed and over time new growth will come from infill and redevelopment of sites in proximity to activity centres and rail stations. In the next 10 years, the majority of residential growth will occur in areas such as Warner, Joyner and Bray Park where Next Generation Neighbourhoods will be developed. Over time, higher densities will provide a diversity of housing in and around the activity centres of Strathpine, Bray Park, Lawnton, Arana Hills and Albany Creek, including intensification around the the rail stations.

The activity centres at Arana Hills and Albany Creek will continue to grow, with a focus on Strathpine/Brendale as one of the region's premier centres for employment.

Demographics

The population assumptions for the Strathpine district reflect the planning directions outlined in Council's Strategic Framework. The table below identifies that the catchment is projected to have an additional 22,281 residents up to 2031. This represents approximately 15% of the total growth for the Moreton Bay Region.

Estimated Population Growth – MBRC Planning Assumptions			
District Planning Catchment	***2011***	***2031***	***Growth***
Strathpine Planning Area	86709	108990	22281
Moreton Bay Region	381,651	528,770	147,119

Strathpine District Planning Area Population Assumptions

Based on trends, the majority of these new residents will be families moving into more affordable housing options on the urban fringe of the Brisbane metropolitan area.

Transport Networks and Corridors Assessment

The Strathpine district is dominated by State Roads (Gympie Road, South Pine Road through Brendale, the southern section of Old Northern Road, Eatons Crossing Road, and Samford Road). Strathpine town centre is dominated by Gympie Road, which runs directly through its core. This road carries a mix of through and local traffic. The rail corridor through Strathpine further limits the ability to achieve a permeable grid network.

Transport Networks and Corridors Planned Improvements

The Old North Road, west of Strathpine is the only MBRC controlled corridor crossing the North Pine River. Plans to upgrade the Youngs Crossing Road to improve flood resilience is planned in the short term. Longer term measures involve addressing bottlenecks at key intersections along corridors in this district. Longer term measures to manage traffic through strathpine are being investigated as part of the TIICP project.

Council has limited ability to improve state roads. Consultation with TMR is required to facilitate necessary improvements on the State road network to resolve known capacity/accessibility issues amd constraints.

Transport Networks and Corridors Solutions

The transport networks and corridors recommendations are identified in the District and Local catchment maps which can be accessed from the links and key map on the Council website.

Table 1 identifies priority road corridor and intersection projects necessary to meet a full range of user needs, and the recommended sequence for implementation.

Table 2 identifies priority active transport projects necessary to meet active transport user needs in accessing major destinations within 15 minutes walking or cycling distance, together with critical linkages to connect otherwise separate communities. The table also identifies the recommended sequence for implementation.

Table 3 identifies the State-controlled road corridor projects necessary to connect the various localities across Moreton Bay and to provide external linkages. This table identifies broad timeframes to indicate when the projects would be required.

The following tables identifies priority transport infrastructure required for Strathpine to service anticipated growth for the next 20 years.

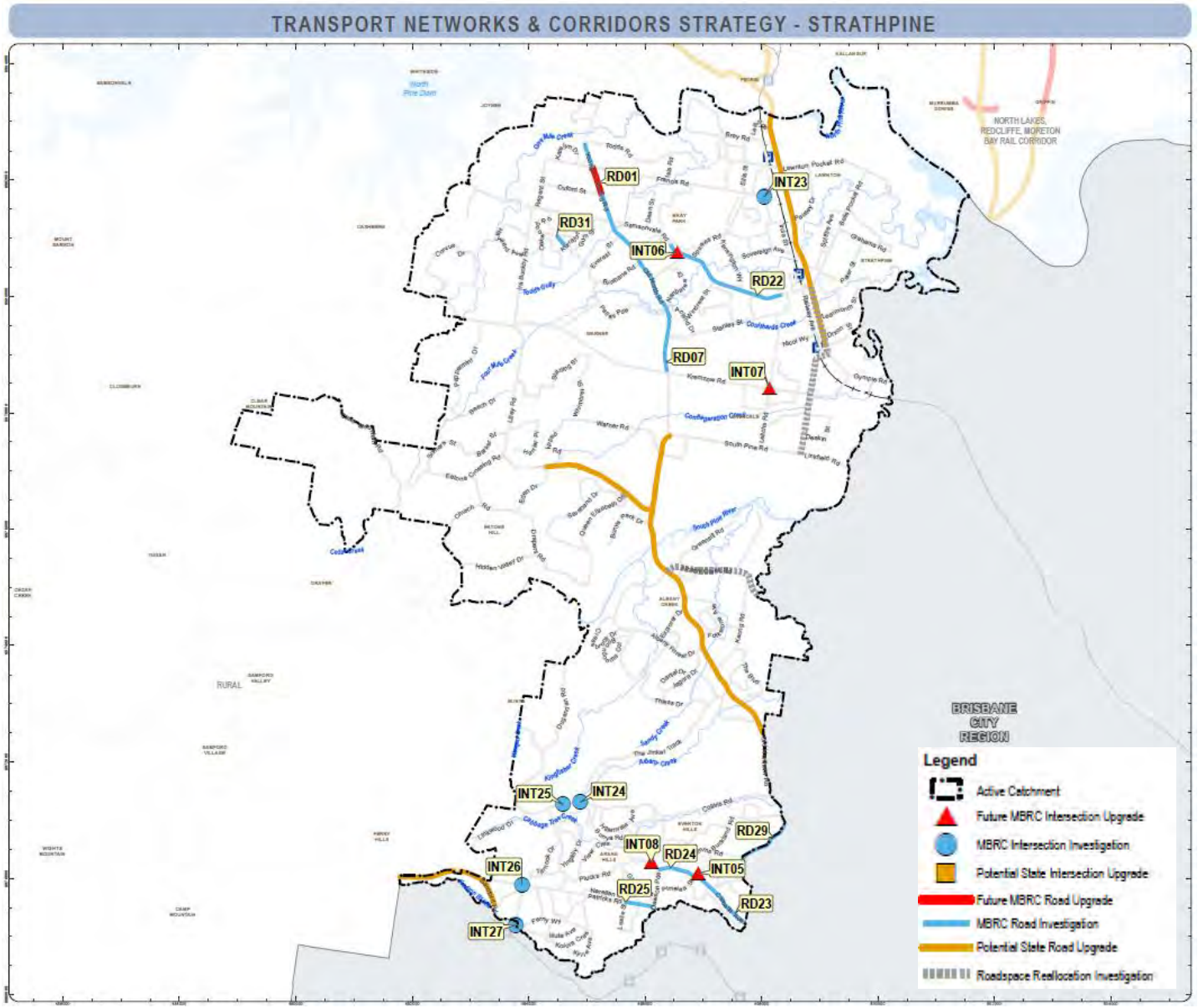
Table 1 - Strathpine - Road Capacity Upgrades						
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**	**Local Catchment**
Youngs Crossing Road, Joyner - Intersection and Corridor Upgrade	RD01	2016	Capacity upgrade	MBRC	Oxford Street to Francis Road widening	Strathpine North
South Pine Road/Camelia Avenue, Everton Hills - Intersection	INT05	2021	Capacity upgrade	MBRC	Upgrade to Signals	The Hills District
Samsonvale Road/Lavarack Road, Bray Park - Intersection	INT06	2021	Capacity upgrade	MBRC	Upgrade to Signals	Strathpine North
Kremzow Road/Leitchs Road, Brendale - Intersection	INT07	2021	Capacity upgrade	MBRC	Upgrade to Signals	Strathpine North
South Pine Road/Plucks Road,, Arana Hills - Intersection	INT08	2021	Capacity upgrade	MBRC	Upgrade to Signals	The Hills District
Patricks Road, Arana Hills - Intersection and Corridor Upgrade	RD25	Beyond 2031	Capacity upgrade	MBRC	Ferny Way to Grove Ave localised widening including signalisation of Cycas St and Leslie St intersections	The Hills District
Samsonvale Road, Strathpine - Road Upgrade	RD22	Beyond 2031	Capacity upgrade	MBRC	Vercase Ave to Bland St	Strathpine North
Camelia Avenue, Everton Hills - Road Upgrade	RD23	Beyond 2031	Capacity upgrade	MBRC	Caladenia Ct to Hibiscus St	The Hills District
South Pine Road, Everton Hills - Road Upgrade	RD24	Beyond 2031	Capacity upgrade	MBRC	Plucks Rd to Camelia Ave	The Hills District
Old North Road, Brendale/Bray Park - Intersection and Corridor Upgrade	RD07	Beyond 2031	Capacity upgrade	MBRC	South Pine Road to Samsonvale Road intersection upgrade and localised widening	Strathpine North
Kurrajong Drive to Mondial Drive, Bray Park - New Road	RD31	Further investigation	Capacity upgrade	MBRC	New road to improve local connectivity	Strathpine North
Francis Road/Sparkes Road, Lawnton - Intersection Upgrade	INT23	Further investigation	Capacity upgrade	MBRC	Signalisation	Strathpine North

Table 1 - Strathpine - Road Capacity Upgrades						
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**	**Local Catchment**
Bunya Road/Jinker Track, Arana Hills - Intersection Upgrade	INT24	Further investigation	Capacity upgrade	MBRC	Signalisation	The Hills District
Bunya Road/Blackwood Drive, Arana Hills - Intersection Upgrade	INT25	Further investigation	Capacity upgrade	MBRC	Signalisation	The Hills District
Patricks Road/Cesar Road/Gordon Road, Arana Hills - Intersection Upgrade	INT26	Further investigation	Capacity upgrade	MBRC	Signalisation	The Hills District
Gordon Road/Ferny Way, Ferny Grove - Intersection Upgrade	INT27	Further investigation	Capacity upgrade	MBRC/Brisbane City Council	Signalisation	The Hills District
Queens Road, Arana Hills - Intersection and Corridor Upgrade	RD29	Further investigation	Capacity upgrade	MBRC	South Pine Road to Old North Road	The Hills District

Table 2 - Strathpine - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
South Pine Road Rail Crossing, Brendale - Path Upgrade	St1	2016	Active Transport	TMR/MBRC	Improve facilities at rail crossing and approaches
South Pine River Shared Path, Strathpine - Path Upgrade	St3	2016	Active Transport	MBRC	Re-instate and upgrade flood affected sections of path
Samsonvale Road, Bray Park - Path & Bike Lane Upgrade	St4(a)	2016	Active Transport	MBRC	Upgraded shared path from Rail Crossing to Bland Street, including rationalisation of roadspace across bridge
Bells Pocket Road, Bray Park - Path Upgrade	St5	2016	Active Transport	TMR/MBRC	Gympie Road to Robel Street including intersection with Gympie Road and crossings
Chinook Street, Everton Hills - New Bike Lanes	HD4	2016	Active Transport	MBRC	Provide on-road bike lanes and links to off-road paths
Railway Avenue, Strathpine - Path & Bike Lane Upgrade	St2	2021	Active Transport	MBRC	Upgrade path and provide bicycle awareness from Samsonvale Road to Hall Street
Samsonvale Road, Bray Park - Path Upgrade	St4(b)	2021	Active Transport	MBRC	Upgrade substandard sections of path between Bland Street and Old North Road

Table 2 - Strathpine - Active Transport Upgrades					
Project Title	**Ref**	**Year**	**Improvement Purpose**	**Funding**	**Description**
Dorothy Street Precinct*, Strathpine - New Path & Bike Lanes	St6	2021	Active Transport	MBRC	New link between Flynn Ln and Learmonth St associated with a new road proposal
Leitchs Road, Brendale - New Bike Lanes	St7(a)	2021	Active Transport	TMR/MBRC	On-road bike lanes and new path on western side between Kremzow Road to South Pine Road, including South Pine Road Crossing
Leitchs Road, Brendale - New Path & Bike Lanes	St7(b)	2021	Active Transport	MBRC	New path and on-road bike lanes between South Pine Road and Cribb Road
Albany Creek Road, Albany Creek - Path Upgrade	AC1	2021	Active Transport	TMR/MBRC	Connection of off-road path on Albany Creek Road to Albany Creek Service Road (Keong Rd to Wruck Cres)
Dawson Parade/Pimelia Street, Arana Hills - Path & Bike Lane Upgrade	HD3	2021	Active Transport	MBRC	Formalise footpaths, connect to off-road links, provide on-road bike lanes and/or awareness zones between Patricks Road to South Pine Road
Ferny Way, Ferny Hills - New Bike Lanes	HD5	2021	Active Transport	MBRC	Provide on-road bike lanes
Cabbage Tree Creek to Bunya Road, Everton Hills	HD6	2021	Active Transport	MBRC	Path along cabbage Tree Creek corridor parallel to Collins Road from James Street road reserve to opposite cooloola Court, a bridge over Cabbage Tree Creek and an off-road path to Bunya Road, Everton Hills.
Woodhill Road/Hutton Road/Caesar, Ferny Hills - Path & Bike Lane Upgrade	HD1	2026	Active Transport	MBRC	Formalise footpaths, connect to off-road links, provide on-road bike lanes and/or awareness zones between Bunya Road and Patricks Road
Paticks Road, Arana Hills - Path & Bike Lane Upgrade	HD2	2026	Active Transport	MBRC	Formalise footpaths, connect to off-road links, provide on-road bike lanes and/or awareness zones between Ferny Way and Dawson Parade
Leitchs Road, Albany Creek - New Path	St7(c)	2026	Active Transport	MBRC	New river crossing and approaches to Leitchs Rd S

Strathpine - State Road Upgrades				
Project Title	**Year**	**Improvement Purpose**	**Funding**	**Description**
Samford Road, Samford to Ferny Hills - Link Upgrade	2021	Capacity upgrade	DTMR	Between Owarra Avenue West and Main Street
South Pine Road, Eatons Hill - Link Upgrade	2021	Capacity upgrade	DTMR	Between Old North Road and Albany Road
Linkfield Road, Brendale - Link Upgrade	2021	Capacity upgrade	DTMR	Westbound direction between South Pine River and Coes Lane
Old Northern Road, Albany Creek - Link Upgrade	2021	Capacity upgrade	DTMR	Between Albany Creek Road and Chinook Street
Eatons Crossing Road, Eatons Hill - Link Upgrade	2021	Capacity upgrade	DTMR	Between South Pine Road and Eden Drive
Gympie Road, Petrie to Strathpine - Link Upgrade	2021	Capacity upgrade	DTMR	Between Anzac Avenue and South Pine Road
Dayboro Road, Joiner to Petrie - Link Upgrade	2021	Capacity upgrade	DTMR	Between Youngs Crossing Road and Anzac Avenue


TRANSPORT NETWORKS & CORRIDORS STRATEGY - STRATHPINE
RD01
INT23
RD31
INT06
RD22
RD07
INT07
INT25
INT24
RD29
INT08
RD24
INT05
INT26
RD25
RD23
INT27
NORTH LAKES, REDCLIFFE, MORETON BAY RAIL CORRIDOR
BRISBANE CITY REGION
Legend
Active Catchment
Future MBRC Intersection Upgrade
MBRC Intersection Investigation
Potential State Intersection Upgrade
Future MBRC Road Upgrade
MBRC Road Investigation
Potential State Road Upgrade
Roadspace Reallocation Investigation