

Appendix A

Terms of Reference (ToR)



CoastConnect

Caloundra to Maroochydore Quality Bus Corridor

Terms of Reference for Concept Design and Impact Management Plan

February 2008

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1 What is CoastConnect?

1.1 Project Description

The Queensland Government, through TransLink, has commenced a detailed feasibility study into the facilities and services needed to deliver a quality bus corridor between Caloundra and Maroochydore.

This corridor will act as a future spine for an integrated and efficient bus network for the rapidly growing southern portion of the Sunshine Coast. It is an integral part of the Queensland Government's long-term plan to meet the transport needs of this part of Southeast Queensland.

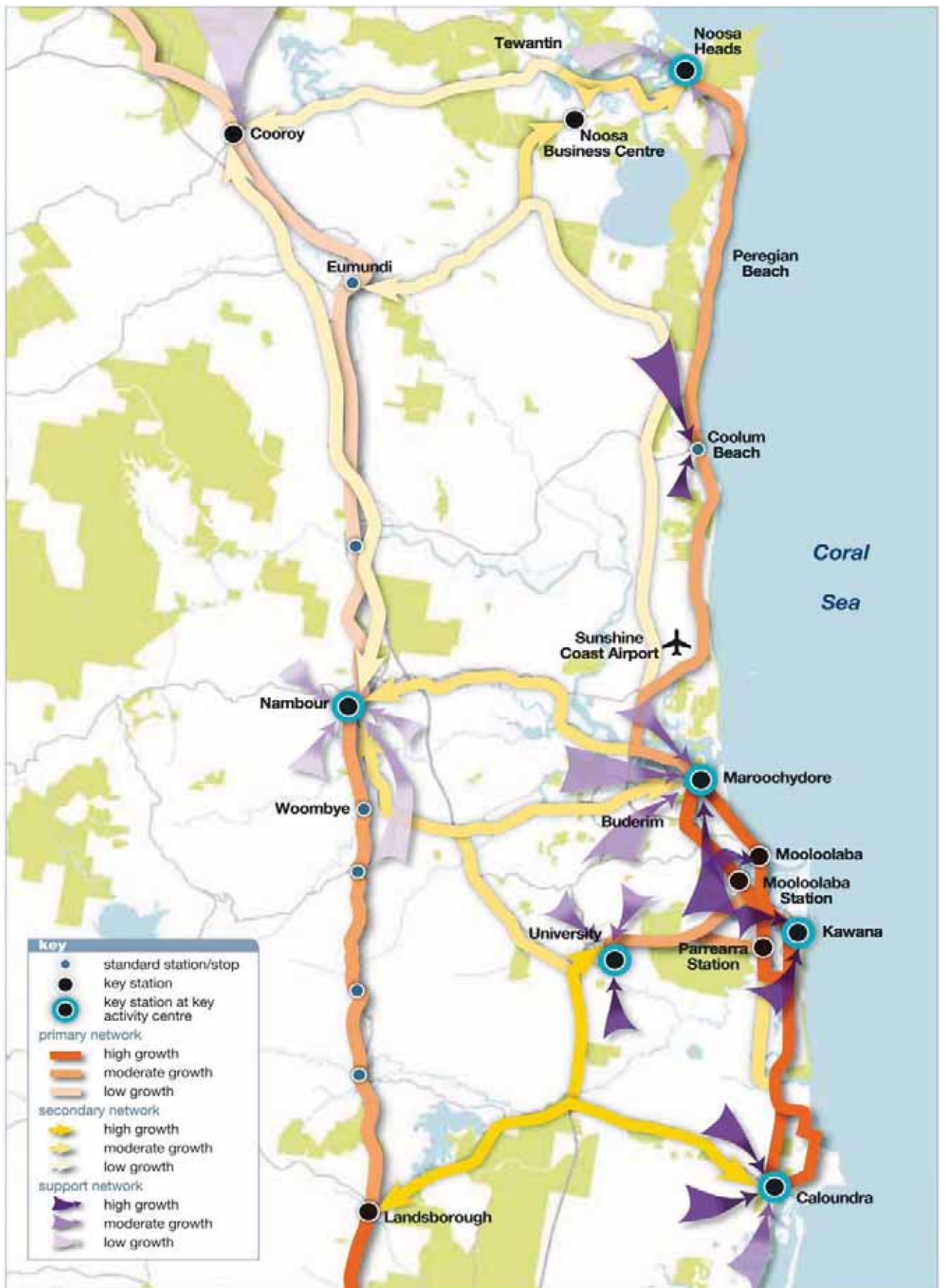


Figure 1 - Map of the Sunshine Coast Region, TransLink Network Plan

1.1.1 Part of a bigger plan

First proposed in the Implementation Plan of CAMCOS in 2000, the need for a reliable and competitive bus service is also clearly articulated in the TransLink Network Plan (TNP), to support the high growth public transport network between Caloundra and Maroochydore (as depicted in Figure 1).

Almost \$10 billion has been allocated to boost public transport, pedestrian and cycling infrastructure over the next 20 years as part of the South East Queensland Infrastructure Plan and Program (SEQIPP). This includes \$160 million for the planning and staged delivery of the quality bus corridor from Caloundra to Maroochydore by 2015.

Queensland Transport has also commenced investigations into the optimum public transport corridors for the northern part of the Sunshine Coast. This study (Nautilus) is focused on corridor requirements envisaged for the 2026-2050 timeframe and is expected to make its recommendations by mid 2009.

The provision of bus priority between Caloundra and Maroochydore has also been recognised in other key planning documents as an integral part of a more sustainable and integrated transport system for the Sunshine Coast. The Local Growth Management Strategies (LGMS) of both Caloundra City and Maroochy Shire are reliant upon much higher usage of public transport.

1.1.2 Planning so far

TransLink, in conjunction with Caloundra City, Maroochy Shire and the Department of Main Roads, undertook a pre-feasibility investigation (Caloundra to Maroochydore Public Transport Connection Study, February 2007) to identify a possible corridor for bus priority treatments between Caloundra and Maroochydore. Refer to Figure 2 for the potential quality bus corridor.

The recent release of Caloundra's draft LGMS nominates the site of the existing Caloundra Aerodrome as the location for the expanded City Centre which proposes a new transport interchange at the future CAMCOS (Sunshine Coast rail) rail station. Similarly, recent investigations by Maroochy Shire as part of its Maroochydore City Centre Master plan, have identified possible alternative locations for the Maroochydore rail and bus interchange on and adjoining the golf course near Aerodrome Road.

The TransLink Network Plan (TNP) has identified continuing issues of traffic congestion and consequent bus delays on the Sunshine Coast. These issues affect the capacity of the scheduled bus network to deliver an efficient, easily understood, reliable and safe bus service and, as a result, grow and retain the market for bus travel. If public transport is to provide a realistic alternative to private car travel, it must be reliable and frequent, and have priority through congested areas.

The TNP identifies the challenge for public transport on the Sunshine Coast to grow from 29,000 passengers per day in 2004–05 to at least 80,000 passengers (i.e. 6.5% of all trips on public transport) per day by 2011¹. If this is to be achieved, the capacity of the bus service to offer a viable alternative to the car must be greatly improved.

¹ For the entire Sunshine Coast subregion

In particular, with the lower density residential areas which dominate the emerging western areas east of the Bruce Highway unlikely to contribute their target share to the overall target level, the coastal strip covered by the core study area is likely to be required to meet a public transport market share in excess of 6.5%.

Why was the corridor selected?

The key benefits of the corridor include:

- most direct route between the existing and emerging activity nodes;
- services more people around current Sunbus operations;
- complements the future CAMCOS rail network;
- better connections to community services, facilities and local activity centres;
- opportunity to minimise impacts upon residential areas;
- less environmental impact by using existing transport corridors; and
- potential to meet and create demand

What next?

With a potential corridor proposed for CoastConnect (as depicted in Figure 2), the next step is to investigate and report on the best alignment option(s) within the corridor.

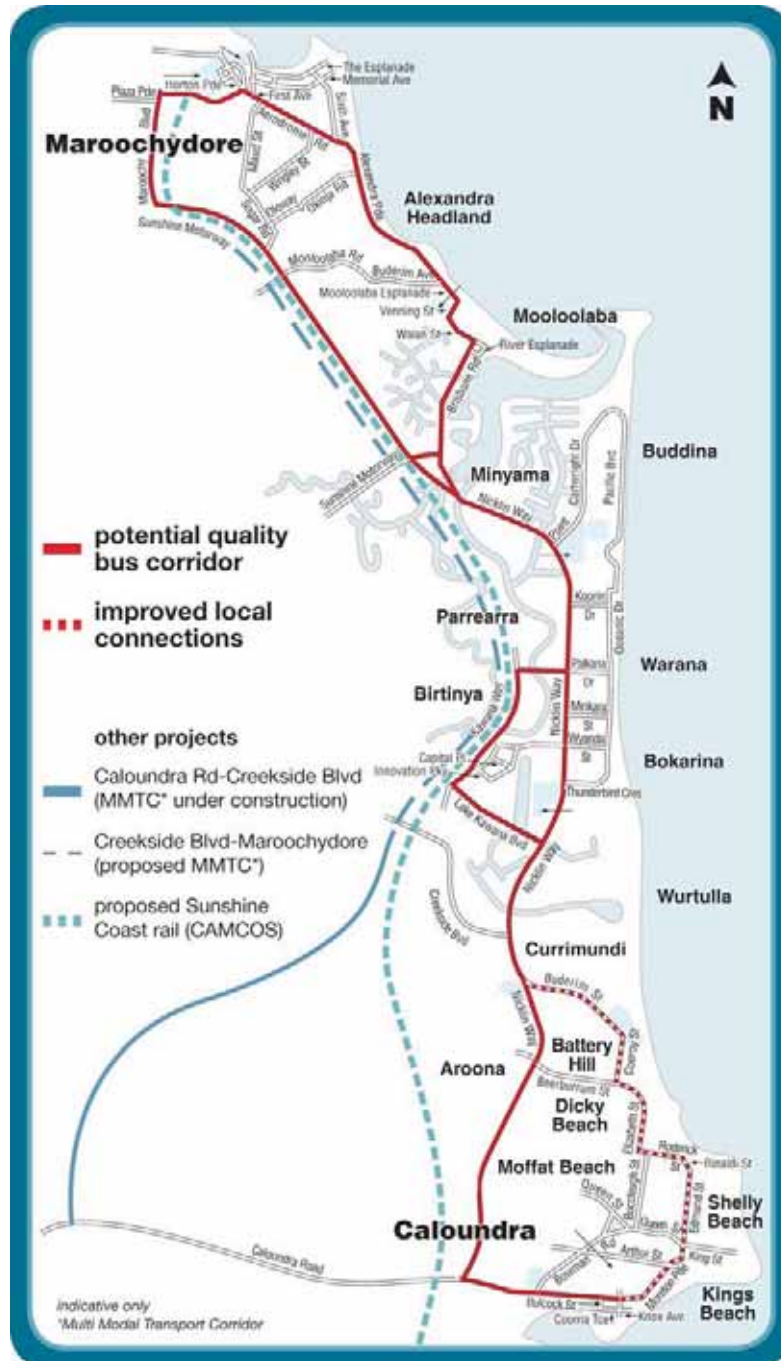


Figure 2 – Quality bus corridor Catchment Map

1.2 Contact us or find out more

You are encouraged to participate in the development of the preferred alignment(s) for CoastConnect.

You can comment on these Terms of Reference and/or register your interest with the Project Team. Opportunities to have you say will be advertised in the Sunshine Coast Daily and via the project website, newsletters, static displays and community information sessions.

Phone: 1800 848 000 (*free call*)*

** Higher rates apply from mobile phones and pay phones. STD rates will apply if calling from outside south east Queensland.*

Email: coastconnect@transport.qld.gov.au

Write to: CoastConnect Project Team

(*no stamp required*) Reply Paid 6376

Maroochydore BC QLD 4558

Visit: www.translink.com.au/project

Interpreter: 13 14 50 (*for people of non-English speaking backgrounds*)

TTY: 13 36 77 (*quote 1800 550 277*)

2 Quality bus corridors

2.1 What is a quality bus corridor?

The quality bus corridor could take several forms. Essentially the proposed treatments for this quality bus corridor are road-based facilities that allow buses to bypass congested areas and to operate competitively with or faster than private cars. Quality bus corridors are generally on or within an existing road corridor in the median or on the edge of the road corridor. They include treatments such as signal priority at intersections, transit lanes or exclusive bus lanes.

Queensland Transport (TransLink) has determined that priority bus based options are preferable for this corridor at this stage because it offers a high-quality service, combined with a dynamic and flexible bus-based system which can build upon the existing system. Priority bus treatments can service a wide catchment because buses have the flexibility to easily enter and exit the corridor to pick up and drop off passengers in residential areas and destinations within and away from the corridor. This means that access to the quality bus corridor is as close as your local bus stop. Additionally, priority bus treatments have the ability to meet changing land use needs by varying the catchment routes.

Priority bus treatments have a high load carrying capacity. While other public transport modes may be viable in the future, current and forecast land use patterns and travel demand do not warrant the cost of options such as rail or light rail on this corridor at present. However, the priority bus treatments would be planned and designed to a corridor width that could allow future conversion to light rail or other suitable technology if desired and supported by patronage and land use patterns.

2.2 Why do we need a quality bus corridor?

The Sunshine Coast's transport system needs to develop in a way that maintains quality of life for its residents, and enhances the region's attractiveness for industry and tourism. To achieve this, there are some significant issues we need to face.

The biggest of these is that our region is one of the fastest growing in Australia. The SEQ population is expected to grow by more than 1 million people by 2026, taking us to 3.6 million people (up from 2.4 million in 2001). In 2005, the Sunshine Coast population was approximately 280,000 people and this is expected to almost double to 480,000 people by 2026. This represents a growth rate of 2.6% pa, almost double the rate for the rest of Queensland over the same period.

Along with this population growth, we are also seeing:

- an increase in the number and length of trips that people are making
- an increasing average age of the population
- increasing social diversity – i.e. lifestyles, ethnicity
- smaller family and household sizes
- a growing proportion of casual and part-time jobs alongside more flexible work practices.

The way we live (i.e. the location, density, design, and self containment of our neighbourhoods) is also affecting the way that this growth in travel is happening.

The result of population and employment growth, changing demographics and our current land use patterns is that travel growth is continuing to outstrip population growth. This means more cars, more drivers, more congestion and longer travel times.

Improved public transport will have a vital part to play in effectively addressing these challenges to protect and enhance our lifestyle. In particular, public transport will have to play a central role in:

- allowing people to travel easily to major destinations
- managing travel demands
- supporting economic growth
- protecting the environment
- providing fair and equitable access
- making the most of resources.

The *SEQ Regional Plan (SEQRP)* recognises the importance of enhancing public transport opportunities and aims to increase the current proportions of trips made on public transport. Through SEQIPP, the state government has outlined a comprehensive program of infrastructure works to be completed by 2026, to support an increase in the proportion of trips made by public transport. It is vital that we continue to deliver new and innovative forms of public transport infrastructure that can enhance a system to provide fast, frequent and reliable services that are competitive with the private car.

The planning of major transport infrastructure must be considered alongside broader urban development, regional planning requirements and lifestyle choices. This is the only way that we can facilitate integration of land use and transport planning, thereby achieving sustainable regional social, environmental and economic development.

The SEQRP provides the overarching framework for managing growth and development in the region. Key directions in the Plan include leading growth with infrastructure, linking jobs with growth and ensuring that new and existing urban land is used efficiently. The Plan requires each local authority in the region to prepare a Local Growth Management Strategy (LGMS) as a means of implementing the key directions of the SEQRP at the local level.

2.3 What is the Vision?

By 2016 the public transport link between Caloundra and Maroochydore will have substantially reduced bus travel times from what they were in 2006.

The corridor will be highly visible, with clearly demarcated public transport priority systems and state-of-the-art infrastructure.

The stations along the corridor will be located at major activity centres and interface with future CAMCOS train stations.

These stations will be supported by high-quality bus stops at local centres and attractors along this high-quality public transport corridor.

All vehicles, stops and stations will be easy to access and be clearly recognisable. This major public transport spine will connect people to where they need to go along the corridor, quickly and efficiently.

It will provide fast, frequent and reliable public transport services and be the dominant people-mover between the Caloundra and Maroochydore centres.

CoastConnect will support the CAMCOS railway by providing feeder bus services and enabling modal interchange at key nodes.

To achieve this vision, four key objectives have been defined for the project. These are:

1. To develop a priority public transport corridor that promotes, and encourages people to use public transport to get to their destination
2. To provide a high-quality public transport link between Caloundra and Maroochydore that improves the reliability and speed of public transport along the corridor and offers a real alternative to the private vehicle.
3. To create a landmark public transport priority corridor that is visibly distinctive and positively contributes to building the image and economy of the Sunshine Coast.
4. To integrate high-quality station and stop environments with activity centres and the surrounding environment, and to contribute to providing quick and efficient sustainable movement networks.

3 Terms of Reference

3.1 How Terms of Reference are developed

The Terms of Reference (ToR) have been prepared in light of preliminary investigations to identify the corridor, the prior experience of the Queensland Government and stakeholder feedback.

3.2 How Terms of Reference are used

The ToR will guide how the CDIMP is undertaken and what it will investigate, including the scale, scope, intent and depth of investigations undertaken by TransLink, its consultants and its sub-consultants in preparing the CDIMP.

The ToR will also form the benchmark for measuring the content and outputs of the final CDIMP.

4 Concept Design and Impact Management Plan

4.1 What is the CDIMP?

Before a decision can be made on the future of CoastConnect, a series of in-depth studies to assess its benefits and impacts will be undertaken. Referred to as the Concept Design Impact Management Plan (CDIMP), this next stage of work will build on the outcomes of the pre-feasibility study (see Figure 3).

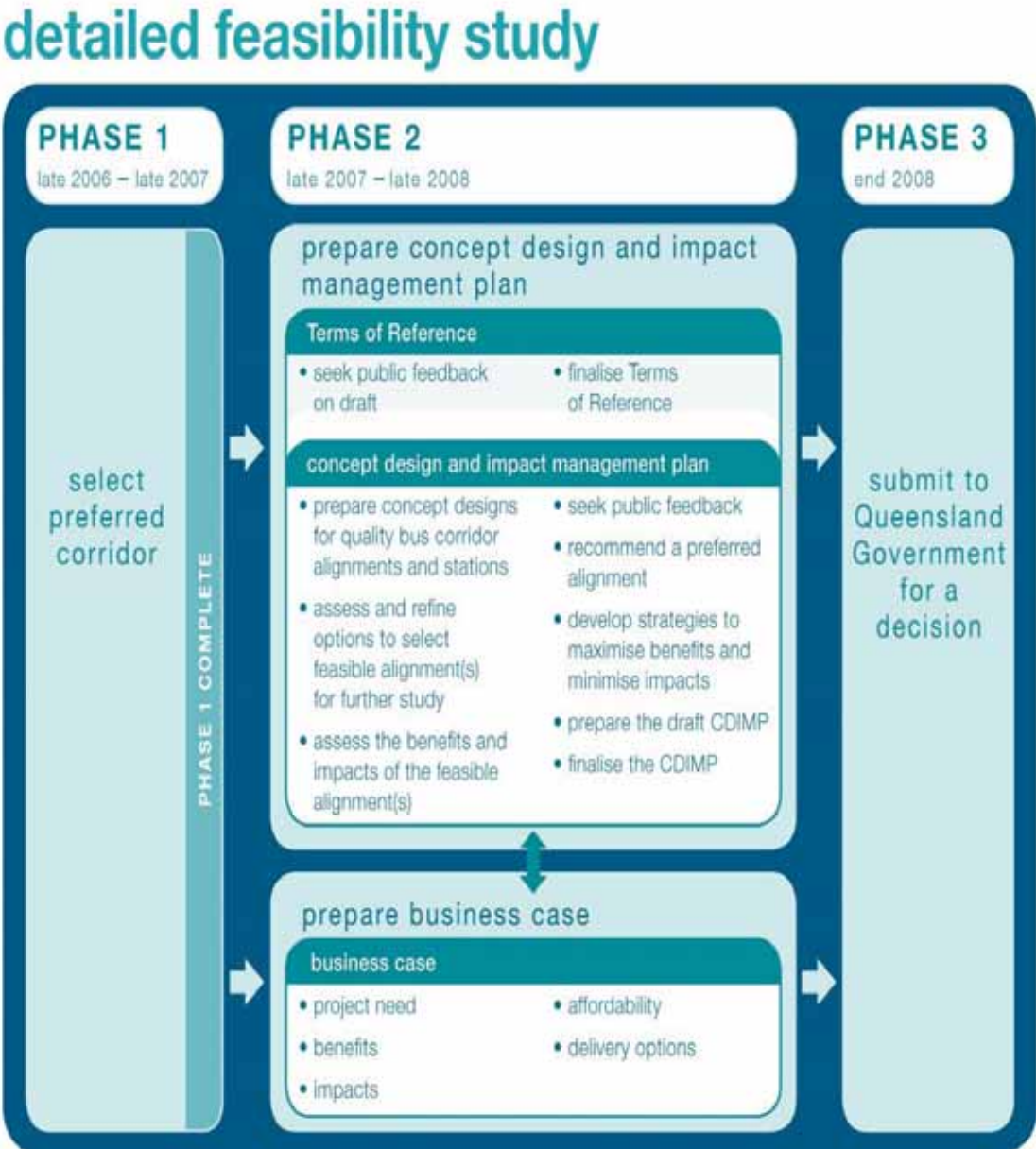


Figure 3 - Detailed Feasibility Study

Throughout the study, TransLink will be seeking solutions that can deliver faster and more reliable bus travel times and which suit the varying character of the existing major road links and the surrounding suburbs. These solutions could vary from transit lanes or bus lanes in the median or on the road edges to queue jump or priority sections at individual locations, such as traffic signals or major access points. It is likely that no one solution will fit the entire length of the corridor.

The CDIMP will be guided by these ToR and will:

- Identify the preferred alignment and concept design for bus priority measures between Caloundra and Maroochydore on the corridor identified in the pre-feasibility report.
- Identify alignment and corridor issues including capacity and impacts on other transport modes (cars, bicycles & freight).
- Identify the potential environmental, social and economic benefits and impacts of possible treatments.
- Outline strategies to maximise the potential benefits and manage or reduce the potential impacts of these treatments
- Provide information on options to the public and stakeholders
- Consider community and stakeholder input when developing the preferred alignment option(s)
- Inform the Business Case analysis which will detail the need, benefits, cost, impacts, affordability and delivery options for the proposal

The CDIMP is a very detailed and robust way of planning. It will allow for greater stakeholder and community involvement in the project and achieve better planning and design outcomes.

TransLink will submit the CDIMP and the associated Business Case to the Queensland Government in late 2008, to inform its decision on how and when these bus priority treatments should proceed.

4.2 CDIMP Objectives

The objectives of the quality bus corridor CDIMP are to:

- Develop a priority public transport corridor that promotes, accommodates and encourages people to use public transport.
- Provide a safe and accessible bus service between Caloundra and Maroochydore that improves capacity, efficiency and reliability of public transport along the corridor, and is embraced by Sunshine Coast community, businesses and stakeholders.
- Create an iconic public transport priority corridor that is distinctive and positively contributes to building the image and economy of the Sunshine Coast.
- Integrate high standard bus interchanges, stations and stops into the urban built form, natural environment and major activity centre's.
- Integrate with future and current public transport, pedestrian, cycling and road networks.

- Explore all sustainable features that can be utilised in both the physical infrastructure and operational systems and incorporate where possible.
- Identify project need, impacts and benefits with regard to the transport network, social fabric, urban context and physical environment.
- Propose a design and management strategy to minimise the negative impacts and maximise the benefits to the community and the transport system.
- Provide a safe public transport environment, including robust planning that provides versatility and flexibility for the corridor that will cater for future needs.
- The design shall support and integrate with future network and service planning improvements (eg new routes, higher frequencies, etc.).
- Identify and evaluate opportunities for delivery of the bus corridor including staging to utilise proposed funding of bus priority measures and preferred links.
- Develop a project that is feasible, and deliverable, that provides a value for money solution.
- Compliment the planned introduction of rail services along the CAMCOS corridor and support MSC and CCC's (or the new Sunshine Coast Regional Council) LGMS.
- Recognise and coordinate with the transport infrastructure programs of MR, MSC and CCC (or the new Sunshine Coast Regional Council).

To achieve these objectives an interactive and inclusive public consultation process will be undertaken with the community, stakeholders and interested parties to ensure that public feedback is incorporated into the evaluation of viable alignment options.

4.3 Study area

The potential corridor for the quality bus corridor forms the study area for the CDIMP (See Figure 1). The study area represents the proposed area of investigation. A preferred alignment for the priority bus treatments will be identified, following consultation and detailed investigation, within the study area.

4.4 Process for developing the CDIMP

The CDIMP process consists of three important stages:

1. Terms of Reference
2. Concept design
3. Impact management.

4.4.1 The Terms of Reference stage

These Terms of Reference will provide guidance on the scope, intent and depth of investigation required in preparing the CDIMP.

4.4.2 The concept design stage

The concept design stage will take the potential corridor, identified in the pre feasibility study and identify the priority bus alignments within this study area. This will include investigating a range of possible alignments and considering design issues against the broad social, environmental and economic benefits and impacts raised by the impact management process. This will involve:

- Developing and documenting planning principles and design guidelines for the quality bus corridor.
- Developing criteria for evaluating alignment options.
- Developing and selecting alignments, including:
 - potential priority bus alignment options such as station / stop and interchange options;
 - interaction with all other corridor uses/users;
 - conducting initial evaluation and sieving;
 - investigating, refining and short-listing feasible alignment(s); and
 - evaluating feasible alignment(s) in greater depth
- Seeking public feedback on the alignment(s) and documenting comments and responses to key issues raised.
- Selecting and recommending a final alignment based on feedback and technical assessments.
- Developing and determining the precise final alignment(s) and key design features for the quality bus corridor between Caloundra and Maroochydore.
- Analysing delivery options, including project staging.
- Transport modelling to determine impacts on the network and how the corridor will function over time with associated patronage estimates.

A range of possible implementation scenarios based on timing and staging of delivery and opportunities for integration with other state or local government initiatives will be considered.

The concept design stage will be documented as part of the draft and final CDIMP.

4.4.3 The impact management stage

The impact management stage occurs in parallel with the concept design stage and investigates the concept design options and the preferred alignment in detail.

The impact management process will involve:

- Reviewing and analysing existing environmental factors within the study area to inform alignment development evaluation and selection.
- Analysing the potential benefits, impacts and opportunities presented by the proposed alignments on the existing environment, land use and infrastructure.
- Evaluating delivery options, including project staging.

- Identifying strategies to maximise the benefits of the proposal and minimise the impacts through impact management and mitigation strategies.
- Integrating the CoastConnect project with other elements of South East Queensland's transport network including:
 - The TransLink network, by developing a Network Integration Strategy to integrate new and existing operational and infrastructure elements and make provision for connections where appropriate.
 - The broader transport network, including the CAMCOS railway, the road, cycling and pedestrian networks and future improvements to the Sunshine Motorway and the multi modal transport corridor being developed by Department of Main Roads (DMR).
 - Significant non-transport projects which will have an impact on the preferred corridor. For example Caloundra LGMS, Kawana Hospital and Quad Park impacts, as well as Structure Planning being undertaken by the respective Councils in conjunction with the State Government at the Caloundra Airport and Maroochydore CBD.
- Documenting community and stakeholder comments and responses to key issues raised.

The CDIMP will include analysis of cumulative impacts on economic, social and environmental values directly caused by the quality bus corridor. The cumulative impacts of the project will be considered over time and in conjunction with other major projects, approved and known to be proceeding at the time of commencing operations. Scenarios will be compared to current public transport operations and the future situation if the quality bus corridor does not proceed. The most likely and beneficial scenario(s) will be the basis for detailed investigations in the CDIMP.

The impact management stage will be documented as part of the draft and final CDIMP.

4.5 4.5 Scope of the CDIMP

The CDIMP will:

- Describe relevant aspects of the existing environment to be affected by the quality bus corridor.
- Describe the need, outcomes and benefits of the quality bus corridor.
- Document the process used to develop and select an alignment for the quality bus corridor.
- Identify and assess the likely environmental, economic and social impacts of the quality bus corridor during construction and operational phases.
- Propose and define measures to capture the benefits of the proposal and mitigate or avoid adverse impacts of the proposed works.
- Develop an implementation plan for capturing the benefits and mitigating adverse impacts, including appropriate monitoring of actual adverse impacts and appropriate management of these impacts during construction and operation.

- Conduct and report on consultation with affected local communities and other interested parties regarding the proposed quality bus corridor.
- Conduct and report on consultation with stakeholders regarding integration of potential bus stations and supporting and associated infrastructure with surrounding land uses.

4.5.1 Quality bus corridor planning layouts

The CDIMP will produce planning layouts for the following:

- priority bus treatments and measures between Caloundra and Maroochydore;
- bus stations at strategic locations as determined in the planning process and including all associated infrastructure;
- connection of the quality bus corridor to the existing and likely future Caloundra and Maroochydore bus stations / interchanges;
- connections to other potential feeder systems as required;
- reinstatement of parking, pedestrian and cycle infrastructure to and across the quality bus corridor; and
- list of sequenced implementation actions.

4.5.2 Network integration

As part of the CDIMP, a Network Integration Strategy will be developed to integrate a broad range of policy and planning guideline areas including but not limited to:

- Bus station location criteria
- Quality bus corridor access locations
- Inter-modal access locations
- Bus / Rail Interchanges
- Pedestrian and cycling access and associated network facilities
- Bus operations and route planning
- Operating infrastructure information systems and real time passenger information systems (RTPIS).

4.6 How will the CDIMP be implemented?

The recommended alignment and design features will be determined by the Project Team in consultation with stakeholders and the community.

An important feature of this is the auditing and compliance components, particularly in the design and construction phases of the project. This will guide the successful implementation of the CDIMP.

4.7 CDIMP indicative timeline

The indicative timing of future key milestones is set out below (subject to change).

Indicative timing	Activity
November 2007	<ul style="list-style-type: none">• Public launch of the CoastConnect project and commence ToR consultation
January-February 2008	<ul style="list-style-type: none">• Development of quality bus corridor alignment options
April - May 2008	<ul style="list-style-type: none">• Consultation and public display of possible alignment options
May 2008 – November 2008	<ul style="list-style-type: none">• Options refinement and preparation of Final CDIMP documentation
November 2008	<ul style="list-style-type: none">• Finalise Business Case
Dec 2008	<ul style="list-style-type: none">• Present final Business Case and CDIMP to Government for decision

5 What will the CDIMP investigate?

For the relevant areas of investigation the CDIMP will provide:

- a description and analysis of the existing situation;
- a description and analysis of benefits and impacts (during construction and operation);
- recommended management strategies to
 - maximise benefits and manage or mitigate potential impacts;
 - guide the project to completion; and
 - assess the feasibility of the proposed measures (during construction and operation).

The consultation and communication component will outline the proposed strategies for community involvement and provision of information and will report on feedback provided by the community.

A key component of the CDIMP is the auditing process that will ensure the project complies with the intent of the CDIMP.

All investigations and assessments will take into consideration the Queensland Government's commitment to a sustainable growth management strategy for South East Queensland. Sustainability will be a consistent theme throughout the report.

The remaining sections will be structured as appropriate to the subject matter and as outlined in the relevant section of these Terms of Reference.

The CDIMP process will include appropriate levels of investigation into the following areas, producing outputs at a concept design level suitable for progressing into detailed design.

- 5.1 Traffic & transport
- 5.2 Network integration strategy
- 5.3 Alignment selection
- 5.4 Concept design and engineering
- 5.5 Social environment/impacts
- 5.6 Cultural heritage/impacts
- 5.7 Economic environment/impacts
- 5.8 Land use and planning
- 5.9 Urban design, landscape and visual environment
- 5.10 Ecology
- 5.11 Hydrology and hydraulics
- 5.12 Water quality
- 5.13 Noise and vibration
- 5.14 Air quality
- 5.15 Soils, topography and geomorphology
- 5.16 Climate (micro-climate)
- 5.17 Legislative and policy requirements
- 5.18 Consultation and communication

5.1 Traffic and Transport

The CDIMP should identify the existing and future cases for all modes of transport in the study area (public transport, private car, cycling, walking). This will be undertaken in the context of current plans and policies and known future projects. A thorough evaluation of the likely impacts of the quality bus corridor options on all other road users e.g. cars; cyclists and pedestrians will be conducted.

The CDIMP will take account of transport modeling outputs from work currently being undertaken by TransLink and a multi agency project team. It is anticipated that these modeling outputs, when completed, will be provided to the successful CDIMP consultant and inform all subsequent CDIMP outputs.

5.1.1 Description of existing transport network

The CDIMP will:

- Describe existing transport operations in terms of
 - traffic flows;
 - public transport services;
 - pedestrian movements and facilities; and
 - cycle movements and facilities.
- Identify key intersections and congestion points; and
- Identify major travel trends.

5.1.2 Transport demand and traffic forecasting

The CDIMP will forecast:

- travel trends, existing and desired (i.e. Integrated Regional Transport Plan targets);
- public transport trends, existing and desired;
- bus volumes, current and future year scenarios;
- traffic volumes, current and future year scenarios; and
- pedestrian and cycle volumes, current and future year scenarios.

5.1.3 Existing and future parking demand

The CDIMP will:

- assess existing car and bicycle parking demand; and
- forecast future car and bicycle parking demand and impacts.

5.1.4 Potential transport impacts

The CDIMP will:

- Inform planning for network integration strategies such as connections to the quality bus corridor (including stations) to accommodate regional access requirements.

- Document forecast/modelled traffic volumes on corridor roads (existing and future intersection operations and queue lengths on all signalized intersection approaches).
- Estimate route travel times and delays.
- Make provisions for pedestrians, cyclists, public transport services and other special operating facilities along or across the quality bus corridor during construction and operation.
- Make provision for access to quality bus corridor stations, including pedestrian and cycling connectivity to meet existing and future needs.
- Make provision for access to existing and future train and bus stations.
- Assess impacts of the quality bus corridor on existing and expected future traffic flows.
- Identify information systems for public transport system users.
- Qualitatively assess impacts on parking demand for residents and businesses as a result of the proposed quality bus corridor.
- Assess impacts on available parking supply within the quality bus corridor and propose replacement parking strategies where reasonable and feasible.
- Assess impacts of proposed U-turn facilities on traffic within the study area.

5.2 Network Integration Strategy

A Network Integration Strategy will be developed to facilitate the efficient integration of recommended quality bus corridor alignment and concept design into the broader transport network. This strategy will involve:

- quality bus corridor station location criteria;
- inter-modal access;
- pedestrian and cycling access and associated facilities;
- bus operations and route planning; and
- staging of bus priority measures.

5.2.1 Quality bus corridor station and stop location criteria

The locations of quality bus corridor stops and stations are crucial components of the overall system. In developing station location criteria, the following require consideration:

- proximity of residential areas and size of potential *walk-and-ride* catchment;
- proximity of local shops and services;
- relationship to surrounding local transport corridors;
- serviceability by local feeder bus services;
- impacts of stations on the amenity of the surrounding environment;
- potential for park 'n ride or kiss 'n' ride facilities; and
- ease of access by pedestrians and cyclists.

5.2.2 Inter-modal access

Inter-modal access locations are areas that bring together different modes of transport, allowing passengers to change their mode of travel. For example, this can include bus–rail interchanges, taxis, and other modes of transport.

In determining inter-modal access locations, the following requires consideration:

- proximity of existing and future transport infrastructure to the potential quality bus corridor alignment;
- route optimisation strategies;
- passenger demand;
- pedestrian and cycle end-of-trip facilities;
- parking and control requirements; and
- safety.

5.2.3 Bus Stations

Bus stations are operationally important as they allow bus service combinations and passenger access to alternative destinations. Placement of bus stations requires consideration of the following:

- route optimisation;
- passenger service demand;
- serviceability and operational efficiency; and
- station design.

5.2.4 Pedestrian and cycling access and associated facilities

Allowing for pedestrian and cycle networks along and across the quality bus corridor, as well as into stations, is an important element to be considered in the CDIMP. The following requires consideration:

- Providing for pedestrian and cycle access to bus stops and stations by integrating with existing or planned networks.
- Identification of the need for pedestrian and cycle crossing points across the bus priority corridor.
- Identification of the supporting infrastructure required for promoting cycling and walking as preferred modes of access to the majority of stations – for example, end-of-trip facilities such as cycle parking, water, resting spots, safe and unobstructed access.

5.2.5 Bus operations and route planning

In planning for quality bus corridor operations and bus routes, the following requires consideration:

- existing demand and patronage on current services;
- existing and future forecast passenger demand along specific routes;

- existing and future forecast passenger demand for express services;
- integration with planned future and existing services;
- optimising bus travel times and route penetration;
- bus operation and scheduling needs – driver facilities, layover, timing and bus turnaround; and
- strategic planning for growth in public transport network and operations.

5.2.6 Bus priority staging

Quality bus corridor staging options should be investigated and recommendations made for implementation of staged bus priority measures.

The assessment will identify the benefits and triggers for implementation options along the corridor.

5.3 Corridor Alignment Selection

5.3.1 Alignment option development process

The CDIMP will outline the process used to develop and refine possible alignment options into a preferred alignment option within the identified corridor. This will include a summary of issues considered and any resulting amendments.

5.3.2 Alignment option evaluation

The evaluation process will be described including:

- Methodology;
- evaluation criteria;
- design life and effectiveness over time; and
- results and sensitivity testing.

5.3.3 Selected alignment option(s)

The final CDIMP will describe the preferred alignment option(s) within the study corridor, including inherent staging options, selected for more detailed evaluation in the draft CDIMP and the reasons for selection. Issues arising from community and stakeholder feedback on options shall also be described in the final CDIMP.

5.4 Concept design and engineering

The engineering component of the CDIMP will involve description and analysis of the following areas:

- existing transport corridor;
- proposed quality bus corridor alignments;
- land requirements (property);
- associated infrastructure;
- operational engineering issues;
- safety;
- potential construction waste management and materials;
- impacted utility services;
- anticipated construction methodology;
- staging issues;
- maintenance;
- design criteria; and
- field measurement and survey.

5.4.1 The existing transport corridor

The CDIMP report is to provide a detailed description of the transport corridor and general background information. It will require inputs from the following engineering disciplines:

- geotechnical;
- structural;
- civil;
- traffic;
- hydrology and hydraulics; and
- electrical and communications;

5.4.2 Proposed quality bus corridor alignment(s)

The proposed quality bus corridor alignment(s) will be presented with the following information:

Developed options

- location (maps of the proposed alignment options)
- planning layouts for each option showing
 - quality bus corridor (including stations) in sufficient detail and accuracy to clearly show impacts to affected properties, other transport modes and parking
 - minimum right-of-way required for transport corridors to accommodate the ultimate development of the quality bus corridor and rationalised in relation to existing property boundaries and land uses
 - bus stop arrangement impacts

Selected alignment

- Includes information shown in option plan layouts
- major carriageway structures and other proposed works where relevant
- appropriate traffic signage strategies
- high level conceptual design of intelligent transport systems for traveller information, quality bus corridor operations, surveillance and enforcement information systems for motorists and public transport system users
- service roads, location, minimum carriageway widths and facilities such as pedestrian and cycle access and paving
- physical impacts on local watercourses and waterways (for example, piers or embankments) and any works required to mitigate any impacts from the quality bus corridor
- type, location and extent of road carriageways, bridges and earthworks for the quality bus corridor stops and stations / interchanges

5.4.3 Land requirements

The expected land requirements for the quality bus corridor shall be identified and presented. This will include:

- extent and nature of land required; and
- estimated timelines for expected land requirements.

5.4.4 Associated infrastructure

The CDIMP will include a description of the existing major structures and service facilities along the alignment corridor including parking pedestrian and cycling facilities. This should include recent and proposed works by QT, DMR, CCC and MSC.

5.4.5 Operational issues

The CDIMP will include a description of the proposed quality bus corridor operational issues, including:

- Bus layover and bus driver facilities at bus stations and bus exchanges.
- Incident management procedures and planning, including relevant fire and passenger safety features proposed within the quality bus corridor, stations and associated infrastructure.
- Emergency services provision.
- HOV lane/bus lane/T2-T3 lane enforcement strategies on the quality bus corridor.

5.4.6 Safety

The CDIMP will include a description of safety issues, including:

- Crime Prevention Through Environmental Design (CPTED) recommendations, including local pedestrian and cycle access pathways.
- Safety requirements for operation of the quality bus corridor (including safe access for maintenance) patron safety, on waiting and accessing the corridor.
- Incident management strategies.
- Issues arising out of consultation with Queensland Emergency Services and the Queensland Police Service.
- Emergency vehicle access to and use of the quality bus corridor, including considering the need for and practicality of providing emergency vehicle access locations and associated facilities.
- Access to reticulated water supplies for fire fighting within the quality bus corridor and stations.
- Road safety audit of the preferred quality bus corridor alignment.

5.4.7 Waste management and materials

The CDIMP will include a description of the likely production and management of waste during construction. This will require the development of an indicative waste inventory and a description of the management strategies for storage, treatment and disposal with regard to the Environmental Protection (Waste) Policy. The strategies are expected to involve the principles of waste avoidance, reuse, recycling, treatment and disposal.

A whole of life assessment of the recommended alignment and concept design will be undertaken to identify likely short and long term waste issues. Where waste is taken off site for disposal or reuse the following details will be considered:

- safety audits;
- methods for the removal and disposal of hazardous materials in the event of incidents/accidents;
- methods and sites for spoil disposal including likely times and days that materials would be transported from the site;
- whole-of-life assessment; and

- suitability of waste material for reuse.

5.4.8 Utility services

The CDIMP will investigate potential impacts on existing and proposed utility services, including:

- requirements for relocation or protection of existing services;
- disruptions and costs of impacts on existing services;
- opportunities for the provision of future service corridors;
- provision for planned future services; and
- allowance for access to enable regular and emergency maintenance.

5.4.9 Construction issues

Construction issues requiring consideration in the quality bus corridor development could involve:

- likely construction techniques and equipment used;
- impacts on existing traffic (including pedestrian and cycling traffic) and proposed high-level conceptual traffic management strategies;
- timing of construction, extraction, drilling and blasting works (as appropriate);
- construction workforce parking impacts on existing roads and parking areas;
- impacts of construction on adjacent properties;
- impacts on corridor traffic capacity;
- noise and other environmental issues; and
- *No Go* areas at different times of year for example peak holiday seasons, weekends etc.

5.4.10 Staging

Staging issues requiring consideration during planning, designing, construction and operation of the quality bus corridor could involve the following:

- Identifying opportunities for staged delivery of the quality bus corridor.
- Sequencing of construction to minimise impacts on residents, businesses, commuters and local traffic.
- Identifying and prioritising components of quality bus corridor improvements in relation to maximising operational efficiencies during the construction period and while other transport infrastructure projects in the region are underway.
- Identifying the impacts of construction staging upon the following:
 - transport and traffic, including pedestrian and cycling traffic;
 - local and regional economic impacts;
 - quality bus corridor operational planning and network integration;
 - local residents and businesses;

- localised parking impacts;
- general community; and
- physical environment.
- Relativity to other projects.

5.4.11 Asset management

Issues requiring consideration during construction and operation of the quality bus corridor could involve:

- optimal material choices for maintenance minimisation;
- ease of maintenance and repair;
- standardisation and robustness of quality bus corridor components;
- ease of replacement and improvement of communication and shelter components;
- *whole of life* considerations in the optimisation of design; and
- strategies for managing and minimising vandalism (part of CPTED).

5.4.12 Design criteria

Design criteria requiring consideration in the CDIMP will involve:

- Design standards for all components of the quality bus corridor, such as:
 - quality bus corridor design speeds;
 - typical roadway cross sections of the quality bus corridor;
 - vertical and horizontal geometry;
 - treatments for structures;
 - traffic control and management;
 - pavements;
 - drainage and stormwater management;
 - lighting;
 - signage and line marking;
 - aesthetics and urban design;
 - noise amelioration;
 - cultural; and
 - bus stations and associated facilities.
- Pedestrian and cycle access facilities to, along and across the quality bus corridor.
- Future public transport opportunities.
- Incorporation of Crime Prevention Through Environmental Design (CPTED) strategies in station and quality bus corridor design.

5.5 Social environment

5.5.1 Description of existing environment

Existing social values that may be positively or negatively affected by the quality bus corridor should be described through demographic and stakeholder analysis and the identification of social services and facilities. The amenity and use of the study corridor should also be described.

The existing social environment should be described by:

- Developing a set of social indicators to describe current social conditions in the study area.
- Describing existing social conditions
 - health;
 - housing;
 - social infrastructure;
 - recreational infrastructure (parks/green space);
 - community values;
 - amenity;
 - connectivity; and
 - community safety and access.
- Identifying social indicators and social infrastructure.
- Conducting centre surveys, user surveys, corridor surveys.

5.5.2 Potential benefits, impacts and mitigation measures

The CDIMP is to define and describe the potential benefits and impacts of the quality bus corridor on the social environment and propose mitigation measures to facilitate positive outcomes or to minimise or avoid impacts.

To assess the effects of the proposal on the social environment, the assessment should:

- Analyse the existing social data and the results of consultation with the community to identify potential changes to demography; equity; quality of life; and community values, which may result from the quality bus corridor.
- Undertake quantitative and qualitative assessment to determine specific social impacts and benefits within the study corridor and describe any wider impacts and benefits.
- Undertake specific consultation to clarify and qualify likely impacts and benefits, including community members, elected representatives and other stakeholders.
- Review relevant aspects of other technical studies (physical, noise, air, economics, visual) to identify particular and cumulative impacts on amenity, recreation, access, housing and other social factors.

- Identify potential social benefits and impacts, including: property impacts; quality of life; amenity (air, noise, landscape and visual); pedestrian, cycle and disability; connectivity; changes to population diversity; changes to the social environment; employment and equity in local distribution of community benefits.
- Develop management strategies to balance community benefits and minimise negative impacts, including development of design, construction and operational strategies.

5.6 Cultural heritage

5.6.1 Description of existing environment

The CDIMP should:

- Describe the existing values for indigenous and non-indigenous cultural heritage sites, places and their values, that may be affected by the quality bus corridor in accordance with the Queensland Aboriginal Cultural Heritage Act 2003 and the Queensland Heritage Act 1992.
- Prepare a cultural heritage survey to describe indigenous cultural heritage sites, places and their values and conduct it with the involvement of the Aboriginal parties for the study area and/or by an appropriately qualified cultural heritage practitioner, including:
 - engage and consult with relevant Aboriginal parties for:
 - areas of significance to that community, including archaeological sites, natural sites, story sites etc.
 - appropriate community involvement in field surveys.
 - provision of a statement of significance for identified object or areas located during the surveys.
 - any requirements by communities relating to confidentiality of site data.
 - identification and consideration of any places listed in the Register of the National Estate; the Commonwealth Heritage List; the National Heritage List and/or the Queensland Heritage Register; Cultural Heritage Database and the Cultural Heritage Register (maintained by the Department of Natural Resources and Mines); any local government heritage register; and, any existing literature relating to the affected areas that may be impacted by the proposed activities.
 - conducting surveys of the proposed area of development to locate and record Indigenous and non-Indigenous cultural heritage objects and areas.

In determining the significance of any cultural heritage object or areas located, as a minimum, investigations and consultation should be undertaken in such a manner and detail consistent with statutory responsibilities and duties of care, (Queensland Aboriginal Cultural Heritage Act 2003; Queensland Heritage Act 1992; and, Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984) so that a Cultural Heritage Management Plan (CHMP) can be developed to manage areas and objects of cultural heritage significance.

5.6.2 Potential benefits, impacts and mitigation measures

The CDIMP is to:

- Provide a description of any likely impacts on sites of indigenous and non-indigenous cultural heritage.
- Identify indigenous cultural heritage impacts in consultation with relevant Aboriginal parties.
- Identify means of mitigating any adverse impacts on indigenous and non-indigenous cultural heritage values and enhancing any positive impacts.
- Detail the overarching process for the management of identified indigenous cultural heritage impacts including the establishment of a CHMP, which should
 - provide a process for the management of Aboriginal cultural heritage places and values within the study area;
 - be negotiated with relevant Aboriginal parties' representatives and be completed prior to the commencement of project works;
 - establish agreed measures for managing the project with respect to:
 - avoiding harm to Aboriginal cultural heritage;
 - minimising harm to Aboriginal cultural heritage, to the extent that harm cannot be reasonably avoided.

In accordance with the provisions of Part 7 of the Queensland Aboriginal Cultural Heritage Act 2003, the CHMP will be negotiated with relevant Aboriginal parties' representatives and must be completed prior to the commencement of project works.

5.7 Economic environment

The CDIMP will evaluate the direct, indirect and cumulative benefits and impacts of the quality bus corridor on the local and regional economies. This should include but not be limited to:

- direct user benefits, such as travel time savings, reduced private vehicle operating costs and road safety improvements;
- indirect benefits and impacts to the broader community such as through global transport network effects (induced travel, modal shifts etc);
- quantify disbenefits, including congestion;
- benefits and impacts on existing and potential businesses and commercial properties within the study area (catchment);
- impacts from construction activity;
- socio-economic effects such as employment and land use changes;
- environmental effects;
- impacts to residential properties; and
- project costs.

An evaluation framework to estimate the benefits and costs of the project should be established and clearly described. This framework should, as a minimum:

- provide a clear definition of the economic objectives and scope of the quality bus corridor, including the extent of the study area(s) for the purpose of economic assessment;
- set and justify a timeframe for analysis that reflects the economic life span of the quality bus corridor as a public asset;
- identify and justify an appropriate project-specific discount rate;
- identify and examine all quantifiable costs, benefits and impacts of the quality bus corridor and associated infrastructure;
- identify non-quantifiable benefits and impacts of the quality bus corridor and associated infrastructure that are not able to be taken into account in the economic analysis; and
- identify, where appropriate, the distribution of net benefits and net costs to key stakeholders residing or operating within the study area.

All data used in the economic analysis should be as accurate, current and relevant as possible with reference made to the source of the data and its credibility. Costs and benefits, including social and environmental costs and benefits, are to be quantified where possible. All assumptions underpinning the analysis are to be outlined explicitly, and the sensitivity of the analysis to key parameters is to be established. A cost-benefit analysis can be complemented by a computable general equilibrium (CGE) analysis to assess net economic impacts. This would be expected to capture socio-economic effects, such as the impact on employment.

Care should be taken to ensure that benefits accounted for are the most appropriate and relevant to the objectives and scope of the quality bus corridor and that double counting does not occur. The analysis should adhere generally to the economic assessment requirements contained in the Queensland Treasury Project Evaluation Guidelines (March 1997) or any subsequent advice issued by Treasury during the CDIMP preparation.

5.8 Land use and planning

5.8.1 Description of existing environment

The CDIMP should:

- Describe the existing land uses, both within and impacting on the study area, and the planning framework for the proposed works.
- Identify current land use within and adjacent to the area of the proposed quality bus corridor, including adjacent activity centres.
- Identify use of directly affected private property, required agreements and acquisition issues.
- Identify in broad terms the regional patterns of development throughout the whole of the catchment area, and in particular, have regard for the South East Queensland Regional Plan (SEQRP) and related land use planning studies, including the Local Growth Management Strategies (LGMS) and neighbourhood planning process of both CCC and MSC.
- Identify tenure patterns and specific tenures of the study area, including registered Native Title claims and possible future land use from LGMS.
- Identify current planning designations within and adjacent to the area of proposed works as per the CCC City Plan and the MSC Planning Scheme.
- Determine compatibility of the quality bus corridor with the desired intent of CCC City Plan and MSC Planning Scheme as per the relevant planning scheme provisions and emerging urban renewal opportunities.
- Determine compatibility with the SEQIPP and Program 2007-2026 and the SEQRP and other regional planning documents including the Integrated Regional Cycle Network Plan for South East Queensland, the Integrated Regional Transport Plan for South East Queensland and Transport 2007.
- Consider requirements of the project under relevant State Planning Policies.

5.8.2 Potential benefits, impacts and mitigation measures

The CDIMP should:

- Discuss the potential impacts of the quality bus corridor on existing and likely future land use including compliance of the project with relevant planning policies and provisions including consistency with the South East Queensland Regional Plan, the CCC and MSC Plans and its associated local plans, policies and land use designations.
- Address any impact on existing residential, commercial and other sensitive activities in the vicinity of the quality bus corridor that will arise from the project's construction and operation
- Assess and provide mitigation measures for land acquisitions and consider issues associated with changing property access, and construction of noise barriers adjacent to residential areas and other noise sensitive places.
- Performance criteria should be specified where possible and protection measures identified for public spaces during construction stages.

5.9 Urban design, landscape and visual

5.9.1 Description of existing environment

The project has the potential to facilitate urban design, landscape and visual improvements within the study area and across a wider area. The urban design, landscape and visual analysis should consider the project as a whole, on its merits within a wider context and at a local level in terms of project surface works.

To evaluate the urban design, landscape and visual elements of the quality bus corridor, the CDIMP should:

- Assess the existing urban design, landscape and visual context of and issues within the study area.
- Describe the overall visual elements and values of the built, landscape and street form in key locations, including access and amenity considerations for residents, pedestrians, cyclists and public transport users including relationships with green and recreational spaces, activity centres and other character setting elements.
- Identify landscape elements that contribute to the landscape amenity of the local community including those elements protected by orders or similar laws.
- Develop urban design, landscape and visual goals and objectives for the quality bus corridor as a whole and in terms of key locations.
- Develop urban design, landscape and visual assessment principles for the quality bus corridor as a whole and for key locations.

- Provide details and mapping of the existing urban environment within the study corridor that may include:
 - urban form;
 - density and height;
 - massing and scale;
 - view sheds;
 - legibility and local accessibility; and
 - aesthetics and character.
- Describe the existing landscape conditions and the landscape context within the study area with regard to:
 - character;
 - amenity; and
 - setting.

5.9.2 Potential benefits, impacts and mitigation measures

The CDIMP should:

- Identify any perceived visual impacts
- Identify mitigation measures for any perceived visual impacts
- Seek to identify ways to preserve or enhance visual amenity associated character setting elements, including green space and built environments (structures & buildings)
- Consider a range of treatments on visual elements and urban design opportunities, including surface landscaping, station design, quality bus corridor stops and siting along with the design of surface structures including noise mitigation structures and appropriateness of any cultural literacy (public art) elements
- Identify and mitigate lighting impacts, particularly associated with the construction phase
- Assess the overall urban design, landscape and visual outcomes of the quality bus corridor
- Develop urban design, landscape and visual concepts for the key locations identified, reflecting predicted changes to land use, public amenity and public access
- Present urban design concepts and consider similar measures or programs
- Assess likely visual impacts of the proposed works on the landscape and viewer perceptions of changes to the landscape
- Investigate landscape opportunities, such as:
 - Integrating existing landscape features into the planning and design of the bus stations and interchanges for the quality bus corridor
 - Developing a consistent landscape strategy that may be applied throughout the quality bus corridor to take advantage of landscape elements.

Urban environment investigation areas

- The CDIMP should investigate the following urban environment areas:
 - visual amenity;
 - view sheds;
 - urban form;
 - lighting on the surrounding environment;
- placement of visual signage;
- aesthetics and character; and
- water sensitive urban design.

Landscape investigation areas

The CDIMP should investigate landscape issues such as:

- Changes to visual/physical character, amenity and setting
- Changes to the existing road outlooks along the proposed quality bus corridor.

5.10 Ecology – flora and fauna

5.10.1 Description of existing environment – terrestrial

To assess terrestrial flora and fauna the study should:

- Conduct terrestrial flora and fauna assessments in all areas to identify the presence of species, communities and habitat that may be affected by quality bus corridor construction and operations, including but not limited to:
 - spoil placement areas;
 - construction haulage routes;
 - machinery storage areas; and
 - areas affected by earthworks or structures.
- Identify areas of habitat that may be affected by the project, especially from noise, dust or other particulates and light impacts.
- Assess the strategic importance of all waterway crossings as green spaces and ecological corridors.
- Identify the presence of terrestrial fauna and flora species listed under the Environment Protection and Biodiversity Conservation Act, Nature Conservation Act, Vegetation Management Act and the CCC & MSC Planning Schemes and Schedules that may potentially be impacted by the proposed activities.
- Identify the presence of significant terrestrial fauna and flora species that may potentially be impacted by the proposed activities.
- Identify floral communities with potential for habitat, landscape or community value within the study area.
- Undertake a review of information on terrestrial flora and fauna at potential spoil placement sites to determine the presence of species of conservation interest, communities of concern or other matters relevant to the assessment of impacts on terrestrial flora and fauna.

5.10.2 Description of existing environment – aquatic

To assess aquatic and intertidal flora and fauna the study will:

- If bridges are to be widened or new bridges constructed, conduct a baseline marine plant survey for at least 100 metres upstream and downstream of any new crossings.
- Identify protected aquatic environments and potential impacts on those habitats.
- Identify the presence of aquatic flora and fauna listed under the Environment Protection Biodiversity Conservation Act and Nature Conservation Act and the CCC & MSC Planning Schemes and Schedules that may potentially be impacted by the proposed activities.
- If either construction or spoil placement are proposed to occur in a waterway, describe the existing marine plant community potentially impacted on by the proposed activities and identify the value of marine plants in all waterways with regard to Fish Habitat Areas and conservation significance.

- Include riparian areas, in-stream habitat, and fauna habitat and wildlife corridors in flora and fauna investigations.

5.10.3 Potential benefits, impacts and mitigation measures

The CDIMP is to define and describe the potential benefits and impacts of the quality bus corridor on terrestrial and aquatic flora and fauna and provide mitigation measures to minimise or avoid adverse impacts and capture positive impacts.

The discussion should cover:

- All potential direct and indirect effects likely to lead to environmental harm on flora and fauna, including short-term and long-term effects and whether the effects would be reversible or irreversible.
- Strategies for protecting any rare and threatened communities, species or habitat for rare and threatened species or species should be described, including any obligations imposed by State or Commonwealth legislation or local government statutory instrument.
- Impacts on the ecological values of the affected area arising from construction, decommissioning the construction sites or operating the quality bus corridor including:
 - Clearing, salvaging or removing vegetation;
 - Indirect effects on remaining vegetation; and
 - The potential impact that may result from removal of marine plants, placement of spoil, or storm water run-off.
- Impacts on flora and fauna from any alterations to the surface and ground water environment with specific reference to potential impacts on riparian vegetation, wetlands and other sensitive vegetation communities.
- Environmental management measures to minimise potential impacts on aquatic flora and fauna values.
- Options to restore intertidal habitats post construction, should these habitats be disturbed, or other appropriate mitigation options to offset the loss of any fish habitat functions and services.

5.11 Hydrology / hydraulics

5.11.1 Description of existing environment

The CDIMP should describe existing significant hydraulic features including floodplains, creeks and local drainage crossed by the quality bus corridor. This description should identify flooding, overland flow and storm surge characteristics, land subject to inundation as well as regulatory requirements of CCC & MSC.

5.11.2 Potential benefits, impacts and mitigation measures

The CDIMP is to:

- Determine the design measures required to provide an appropriate level of flood immunity considering issues of practicality, capital and ongoing costs and consequences of failure.
- Undertake hydrologic and hydraulic modelling to calculate the potential hydraulic impacts of the concept design in terms of water level, discharge and velocity. Design event magnitudes ranging from 2 year antecedent rain index (ARI) to 100 year ARI should be considered.
- Determine the design measures required to minimise these hydraulic impacts and satisfy regulatory requirements.

5.12 Water quality

5.12.1 Description of existing environment – groundwater

The CDIMP should:

- review the significance of groundwater in the study area, together with groundwater use in neighbouring areas
- identify the depth to groundwater, as well as flow direction and users
- record all groundwater facilities within the influence of the project
- take into account the findings of the acid sulphate soil assessments
- describe the environmental values of the groundwater in terms of:
 - values identified in the Environmental Protection (Water) Policy
 - sustainability, including both quality and quantity
 - physical integrity, fluvial processes and morphology of groundwater resources.

5.12.2 Description of existing environment – surface water

The CDIMP should:

- Describe the watercourses affected by the quality bus corridor and outline the significance of these waters to the catchment system in which they occur.
- Assess existing water quality in surface waters and wetlands likely to be affected by the quality bus corridor, which should provide the basis for a long-term monitoring program, with sampling stations located upstream and downstream of the project.

- Describe water quality from available information, including seasonal variations or variations with flow, where applicable and data is available.
- Consider a relevant range of physical, chemical and biological parameters to gauge the potential for environmental impact on any affected watercourse or wetland system.
- Describe the environmental values of the waterways to the affected area in terms of:
 - values identified in the Environmental Protection (Water) Policy;
 - sustainability, including ongoing maintenance of quality; and
 - comparability with any Water Resource Plans, the South East Queensland Regional Water Quality Management Strategy, Land and Water Management Plans and other local government stream management initiatives relevant to the catchment, to the extent that any of the above are relevant.
- Describe the water quality objectives associated with environmental values for local catchments and watercourses where relevant, so that impacts from any proposed releases resulting from construction or operation of the quality bus corridor can be determined.
- Identify local flooding issues.

5.12.3 Potential benefits, impacts and mitigation measures – groundwater

The CDIMP should include an assessment of any groundwater resources affected by the quality bus corridor. The assessment should:

- consider the impacts of the quality bus corridor on groundwater resources;
- define the extent of the area within which groundwater resources are likely to be affected and the significance of the project to groundwater depletion or recharge;
- take into account the potential impact of the quality bus corridor on any affected groundwater regime caused by the altered porosity and permeability of any land disturbance;
- identify any groundwater dependent ecosystems;
- outline the management options available to monitor and mitigate these impacts; and
- investigate the potential for draw-down on known and potentially contaminated groundwater and, if relevant, identify measures to manage and mitigate significant contaminant migration to adjacent previously uncontaminated sites.

5.12.4 Potential benefits, impacts and mitigation measures – surface water

Key surface water management strategy objectives include:

- measures to avoid or minimise any proposed release, including but not limited to source reduction and water recycling;
- maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota and downstream wetlands);

- protection of important local groundwater aquifers;
- measures proposed to avoid or minimise afflux (localised flooding) resulting from changes to drainage patterns; and
- consideration to kerb and Channel flow widths and water splash to pedestrians and cyclists.

The CDIMP is to:

- define the potential impacts of the quality bus corridor on the water environment;
- outline strategies for protecting water resource environmental values including reduced consumption during construction and operation;
- outline how nominated quantitative standards and indicators may be achieved;
- outline how the achievement of the objectives may be monitored and managed;
- describe the potential for environmental harm to be caused by the proposed works to environmental values for water as expressed in the Environmental Protection (Water) Policy;
- address the potential for the quality bus corridor to provide habitats for disease vectors;
- describe measures to control mosquito and biting midge breeding;
- outline water management measures for construction and operational stages to address surface water quality, quantity, drainage patterns and sediment movements;
- identify possible sources of ‘releases’ from proposed construction worksites and construction works, and characterise possible releases, in terms of their location and likely contaminants;
- describe options for managing such releases and mitigating any adverse impacts that might result;
- consider the implications of climate change and possible sea level rise; and,
- discuss options for mitigation and the effectiveness of mitigation measures, with particular reference to sediment, acidity, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

Reference should be made to the Environmental Protection (Water) Policy, *Water Act 2000* and the Australian and New Zealand Environment and Conservation Council 2000 guidelines.

5.13 Noise and vibration

5.13.1 Description of existing environment

The existing noise and vibration environment should be assessed by:

- reviewing available data from any ambient noise monitoring in the study area;
- conducting limited additional baseline noise and vibration monitoring at selected locations, primarily at sensitive locations in the vicinity of quality bus corridor stations.

5.13.2 Potential benefits, impacts and mitigation measures – construction

To assess construction impacts the following should be undertaken:

- Identify and qualitatively assess potential noise and vibration impacts which may arise from the construction of the project, including noise and vibration generated by surface construction sites
- identify and assess potential noise and vibration impacts associated with potential spoil disposal haulage routes
- Identify typical mitigation measures to address construction noise and vibration impacts, including work plans and modification of equipment, construction techniques and timing of construction.
- Outline communication strategies to be adopted to inform people potentially affected by quality bus corridor activities and the options available to minimise the adverse impacts of noise emissions

This assessment is to include qualitative noise and vibration impacts to or on critical areas e.g. educational facilities and health care facilities, and ground vibration effects on equipment within such facilities.

5.13.3 Potential benefits, impacts and mitigation measures – operational

To assess operational impacts the following should be undertaken:

- Assess the likely direct noise impacts associated with the quality bus corridor.
- If applicable, carry out calculations to assess operational phase vibration and regenerated noise impacts in critical shallow tunnel areas.
- Identify and qualitatively analyse significant changes in traffic noise generation on the road network that may be associated with the quality bus corridor.
- Qualitatively assess and document the noise predictions against relevant guidelines, legislation and standards.
- Compare predicted noise levels with planning levels stated in the Environmental Protection (Noise) Policy 1997.
- Discuss potential operational noise and vibration management measures, including measures to limit vibration impacts to noise sensitive equipment if required.

5.14 Air quality

5.14.1 Description of existing environment

The aim of the air quality assessment is to:

- identify sensitive places nearby the recommended alignment;
- describe any known sources of dust, odours and particulate emissions influencing air quality within the study area;
- review existing meteorological data and analyse prevailing wind directions and threshold wind speeds (for dust and particulate generation);
- identify the main air quality issues associated with the proposed quality bus corridor; and
- ascertain the potential for nuisance and amenity impacts associated with air emissions from the proposed works including dust, odours and particulates

The scope includes:

- legislative and regulatory requirements for construction air emissions and establishing relevant construction air quality goals (Environmental Protection (Air) Policy); and
- consistency with the South East Queensland Regional Air Quality Strategy.

To assess the air quality changes associated with the quality bus corridor, the following tasks should be undertaken:

- Qualitative analysis of existing and predicted air quality in terms of vehicle emissions, photochemical smog, particulates, dust and odours and relevant meteorological data
- Discuss climatic and meteorological factors affecting air quality impacts, including:
 - The effects of adverse conditions (for example inversions, mixing heights and sea breeze conditions) on air quality impacts
 - Ambient air quality in areas likely to be affected by the project with information on those pollutants which are expected to be influenced by emissions from the proposal (particular attention should be given to photochemical smog (ozone), oxides of nitrogen, particulates including fine particulates, lead, carbon monoxide and volatile organic compounds)
 - Likely future trends in ambient air pollutant levels given existing trends in emissions.
- Include the above information in a public health risk assessment, including (but not restricted to):
 - Qualitative estimation of emission rates
 - Estimating ambient concentrations using dispersion modelling, calibrated and based on existing monitoring data
 - Identifying populations and estimating exposure levels.

5.14.2 Potential benefits, impacts and mitigation measures – construction

The CDIMP should describe environmental impacts of air borne emissions, including dust and odours, during construction (nuisance impacts), including:

- Reviewing project details and likely construction activities (location of route, surface excavations, site compounds, stockpiles and proposed transport routes to spoil disposal sites etc).
- Discussing the proximity of construction activities to nearest sensitive places.
- Recommending requirements for heavy (construction) vehicles and machinery compliance with the Diesel Vehicle Emissions National Environmental Protection Measure.
- Identifying air quality issues associated with the preferred location for site compounds and construction works etc, and discussing the potential for air (dust and odour) emissions from these sources and the likely risk of nuisance impacts.
- Reviewing any proposed control methods for construction works (including during tunnelling if applicable).
- Recommending management measures which would minimise air emissions, including dust and odour impacts on adjacent and affected surrounding receivers during these works.
- Outlining communication strategies to be adopted to inform people potentially affected by quality bus corridor activities and the options available to minimise the adverse impacts of air emissions.

5.14.3 Potential benefits, impacts and mitigation measures – operational

Impacts on air quality during the operation of the quality bus corridor should be assessed in accordance with the Environmental Protection (Air) Policy.

The assessment should:

- Identify likely impact of air emissions from the quality bus corridor on air quality (pollution levels are to be compared with National Health and Medical Research Council and the Environmental Protection Agency guidelines. Reference should be made to the National Environmental Protection Measures (NEPM's) guidelines and any relevant international guidelines and standards).
- Identify and describe potential emission sources (including fugitive emissions) and detail source characteristics and emission characteristics (for example, concentration, and mass emissions rate).
- Predict ground level concentrations at areas surrounding the quality bus corridor route and provide a comparison with accepted air quality criteria (includes considering the potential for interaction with plumes with existing and approved future sources in the vicinity of the route).

- Assess the significance of the predicted ground level concentrations of each pollutant, including:
 - estimating the number of persons likely to be exposed to elevated concentrations and the likely frequency and times of occurrence;
 - describing the likely consequences of elevated ground level concentrations (eg, health effects, vegetation damage, damage to structures); and
 - describing appropriate management plans, where required, to assess the potential risk of exposure assessment to reduced indoor air quality during quality bus corridor operations.
- Describe air pollution reduction strategies in both the local, sub-regional and regional context (eg, adjustable speed controls to ensure smooth flowing traffic, buffers, reduced trip times).
- Describe the potential for increased or decreased photochemical smog formation and other regional air quality impacts resulting from changing emissions of NO_x or VOCs from the changes in motor vehicle use and the relocation of buses into an exclusive unimpeded two-way carriageway.
- Assess the capacity of the air environment to accept further emissions of air pollutants and discuss the impact of relevant strategies and agreements (eg, National Strategy for Greenhouse Gas Emissions).
- Use a recognised road traffic pollution model to predict ground level concentrations.
- Describe the model(s) used and the meteorological conditions considered, including:
 - All assumptions used in the predictions;
 - Potential errors and limitations of any modelling conducted; and
 - Consideration of these issues in the final predictions.

5.14.4 Impacts of greenhouse gas emissions

The CDIMP should:

- Assess any greenhouse gas emission impacts of the quality bus corridor during construction and operation.
- Calculate and present changes in the volume of greenhouse emissions resulting from the quality bus corridor.
- Propose actions to mitigate any volume of greenhouse gas emissions attributable to the project.

5.15 Soils, topography and geo-morphology

5.15.1 Description of existing environment

The CDIMP should include descriptions and mapping of the topographical, geomorphologic and geological features of the study area including:

- The topography of the site with contours shown at suitable increments, with respect to Australian Height Datum.
- Landforms of the study area and surrounding areas, including an analysis of subsurface and slope stability where ever appropriate. Landform patterns and elements should be described using the standardised classification of the *Australian Soil and Land Survey Field Handbook, McDonald et al, (1990)*.
- Significant geological and landform features.
- The presence of potentially economically significant mineral, energy and extractive material resources.
- The geology of the wider area, with particular reference to the physical and chemical properties of surface and sub-surface materials, and geological structures likely to be intercepted during construction.
- Hazards such as geological faults, unstable areas and erosive soils.

The CDIMP should also:

- Describe soil profiles in areas likely to be affected by surface works, with reference to *McDonald et al (1990) and Australian Soil Classification Isbell (1996)*.
- Investigate the potential risk for intercepting acid sulphate soils and groundwater draw-down during construction. The DNRM should be contacted to determine the need and parameters for an acid sulphate soil investigation, or alternative approaches to addressing the risk of intercepting potential acid sulphate soils. Investigation of acid sulphate soils will be undertaken, consistent with *State Planning Policy 2/02 and* informed by the technical documents referred under "Acid Sulphate Soils"
- Conduct an overview of data on contaminated lands to identify sites likely to contain contaminated soils that require off-site disposal.

5.15.2 Potential benefits, impacts and mitigation measures

Detailed descriptions of the potential impacts and mitigation measures on soils are required, including erosion risk, settlement risk, rehabilitation potential, acid sulphate soils and contaminated land.

Erosion risk

The CDIMP should:

- Assess likely erosion effects, especially those resulting from the removal of vegetation, both on-site and off-site for all disturbed areas.
- Develop strategies to prevent or control erosion. These should be developed with regard to preventing soil loss in order to prevent significant degradation of local waterways by suspended solids.

Settlement risk

The CDIMP should present an assessment of the risk and consequence of settlement to adjacent land resulting from the quality bus corridor construction.

Rehabilitation potential

The CDIMP should:

- include strategies for establishing and rehabilitating worksites;
- recommend topsoil stripping, stockpiling and replacement procedures; and
- address the minimisation of topsoil storage times to reduce fertility degradation.

Acid sulphate soils

If an investigation into potential acid sulphate soils is required as an outcome of discussions with DNRM. The CDIMP should identify and outline strategies to manage acid sulphate soils based on assessment in accordance with:

- *Guidelines for Sampling and Analysis of Lowland Acid Sulphate Soils in Queensland. Ahern CR, Ahern MR and Powell B (1998)*
- *State Planning Policy 2/02 Guideline*
- *Acid Sulphate Soils Laboratory Methods Guidelines in the Queensland Acid Sulphate Soils Technical Manual. Ahern CR, Melena AE and Sullivan LA (2004)*
- *Soil Management Guidelines in the Queensland Acid Sulphate Soils Technical Manual. Dear SE, Morre, NG, Dobos SK, Watling KM and Ahern CR (2002)*
- *Legislation and Policy Guide in the Queensland Acid Sulphate Soils Technical Manual. Dear SE, Moore NG, Watling KM, Fahl D and Dobos SK (2004)*

Contaminated land

The CDIMP should:

- Outline strategies to address the potential impacts associated with disturbance to any existing contaminated land and possible contamination of land from construction or operation of the quality bus corridor.
- Outline strategies to prevent land contamination (within the meaning of the Environmental Protection Act), including proposals for preventing, recording, containing and remediation of any contaminated land likely to be intercepted by construction works.
- Identify all sites on the Environmental Management Register within the study area, including clearly identifying sites above bedrock.
- Indicate how the quality bus corridor would comply with existing Site Management Plans for sites located within proposed surface works areas.
- Include emergency procedures for activities that have the potential to cause further soil contamination, including (but not limited to) emergency response actions to be taken in the event of:
 - Fuel leaks from storage or during refuelling procedures
 - Underground / above ground spills of contaminated soil.

Construction spoil

The CDIMP should:

- Assess extracted material in terms of its suitability for use as construction material and its contribution to the extractive material supply on the Sunshine Coast, compared with disposal to land fill.
- Identify the possible sites for the placement of construction spoil.
- Indicate the anticipated quantities of spoil to be removed from each of the construction sites.
- Describe the options for construction spoil haulage routes in relation to sensitive activities.

5.16 Climate (micro-climate)

5.16.1 Description of existing environment

Provide details on the existing climate within the corridor over a five year period with regard to the following:

- monthly minimum and maximum temperatures;
- average monthly rainfall and rainfall patterns;
- average wind speeds and predominant directions;
- relative humidity, temperature and evaporation; and
- number of fogs (monthly and seasonally).

5.16.2 Potential benefits, impacts and mitigation measures - Climate

Provide details of the impacts upon the micro-climate within the quality bus corridor with regard to:

- dust nuisance;
- revegetation;
- erosion risk;
- watering rates; and
- potential adverse climatic conditions which would need to be accommodated during the design, construction and operation of the quality bus corridor.

5.17 Legislative and policy requirements

The CDIMP should:

- Identify all the legislative, policy and permitting requirements needed to undertake construction and operation of the quality bus corridor, including land tenure arrangements.
- Identify the legislation under which the permit, licence or environmental authority is required, together with the administering authority and the trigger mechanism for obtaining the permit, licence or environmental authority.
- Consider all relevant international conventions and Commonwealth and State legislation.

Relevant legislation may include:

- *Environmental Protection Act (1994)*
- *Integrated Planning Act (1997)*
- *Transport Infrastructure Act (1994)*
- *Water Act (2000)*
- *Fisheries Act (1994)*
- *Nature Conservation Act (1992)*
- *Environment Protection and Biodiversity Conservation Act (1999)*
- *State Development and Public Works Organisation Act (1971)*
- other relevant acts as listed in the Main Roads Environmental Legislation Register (2001).
- *Land Act*

5.18 Consultation and communication

5.18.1 Guiding principles

The quality bus corridor forms a significant component of the TNP. It is important for people living in the corridor to have input into the planning process to ensure the quality bus corridor best meets the needs of existing and future populations.

To that end, the CDIMP should:

- include active consultation with directly and indirectly impacted stakeholders;
- detail the methodology used to identify perceived benefits, impacts and impact mitigation measures that may arise from the project;

- report on consultation with stakeholders and community members throughout the study period, including a table of findings that identifies:
 - groups, agencies, and people who have been consulted (individuals will not be publicly identified to protect their privacy)
 - issues raised
 - strategies adopted to resolve concerns and/or enhance particular positive impacts.

The Queensland Government is committed to community consultation, better decision-making and to achieving optimum outcomes for the community. Implementing an integrated communication and consultation program is an integral part of the CDIMP process as it will maximise opportunities for the two-way exchange of information between the project team, stakeholders and the general public.

5.18.2 Communication and Consultation Objectives

The communication and consultation objectives of the project include:

- inform and educate stakeholders and community about all facets of the project to foster meaningful input and outline the value of participation in the CDIMP;
- establish and promote two-way communication mechanisms to enable community involvement;
- ascertain and report on stakeholder and community concerns and issues;
- manage stakeholder and community expectations of the project;
- provide accessible, inclusive and timely opportunities for community members to participate in consultation; and
- provide feedback to participants on how their views and concerns have been addressed in the final CDIMP.

5.18.3 Stakeholder groups

Input will be actively sought from:

- local and state government agencies;
- peak interest organisations;
- properties within 2km of the potential alignment and potentially affected landowners;
- community and special interest groups (youth, disabled, seniors, environment etc); and
- Sunshine Coast public.

5.18.4 Communication and Consultation Activities

The following activities are planned to facilitate community involvement and will occur throughout the CDIMP period:

- project newsletters will be distributed throughout the corridor;
- letters will be distributed to property owners directly or indirectly affected;
- advertisements will be placed in the Sunshine Coast Daily advising of consultation dates and opportunities;
- static and staffed displays will be staged at central locations during active consultation periods;
- presentations and briefings will be made to peak interest organisations and to community and/or interest groups by request;
- project website will be regularly updated; and
- project hotline, reply paid service and email address will be established to manage inquiries.

5.19 Management strategies

The management strategies outline how to manage potential benefits, impacts and project delivery.

The CDIMP will include a management program and auditing plan outlining recommendations and commitments to be adopted as design, construction and operational performance criteria.

The management program and auditing plan will involve a Management Overview Strategy and a monitoring plan for CDIMP compliance.

5.19.1 Management Overview Strategy

The Management Overview Strategy (MOS) will guide the implementation and integration of mitigation and management measures in each of the investigation areas.

The management strategies in each area will:

- Clearly define, separately list and number all actionable and auditable commitments to be made by TransLink and the construction contractors to protect the environment and landowners, including:
 - who will do the work;
 - what the work is;
 - when the work will be carried out; and
 - to whose satisfaction the work will be carried out.
- Define a method of receiving and recording community enquiries and/or complaints for appropriate corrective action and follow up.
- Prepare a risk management strategy for each and every actionable and auditable commitment.

- Detail means by which monitoring of any adverse impact is to be undertaken, including an appropriate program for future monitoring including location, testing methods, procedure, reporting and verification.
- Define threshold levels or criteria to be applied on monitoring programs and detail proposed recipients of reports.
- Designate responsibility for monitoring and reporting arrangements.
- Ensure safeguards are being effectively applied.
- Identify how any unspecified impacts requiring remedial measures are to be managed.
- Measure any differences between predicted and actual impacts.

Monitoring reports will detail:

- the affects on the existing environment and social amenity identified by the monitoring process; and
- the steps to be taken to keep adverse impacts to acceptable levels.

5.19.2 Monitoring plan for CDIMP compliance

Design and construction process

The approved CDIMP will form part of the brief for the design commissions and construction contracts.

The CDIMP should establish the processes to:

- Assess compliance with the CDIMP by reviewing:
 - detailed documentation produced for the design commissions and construction contracts; and
 - the proposals submitted by contractors.
- Ensure construction contractors produce Environmental Management Plans as a requirement of their contracts.
- Ensure that contractors comply with their respective Environmental Management Plans.
- Audit the process to monitor that works are being undertaken so that they comply with the approved CDIMP and instigate appropriate action if required.
- Set out the frequency of audits, depending upon the activities being undertaken (it is envisaged that audits will occur at three (3) monthly intervals).
- Produce a progress report shortly after each audit for each of the contracts.
- Produce a Final Compliance Report outlining how the works have complied with the CDIMP at the completion of all the construction contracts.
- Review proposals from the designers and construction contractors for variations or changes to the CDIMP and recommend the appropriate action.
- Make relevant changes to the CDIMP if the action results in a change to ensure that the CDIMP at all times reflects the work that is to be undertaken.

6 STYLE AND FORMAT

6.1 Degree of detail

The CDIMP is a document to aid decision makers and to inform the general public of the potential impacts of the quality bus corridor and the proposed management of those impacts. The document is to be written in a clear, concise and objective style that is easily understood by the general reader. The level and nature of investigations will be relative to the likely extent and scale of impacts.

6.2 Status of information

All information in the CDIMP report will be made available to the general public except where matters of individual privacy, intellectual property and commercial probity require confidentiality.

Reference to any culturally sensitive confidential information should be indicative only and disclosure of any such information must be negotiated with traditional custodians.

Other confidential information supplied by or to TransLink must be clearly identified and placed in discrete attachments to the main report, together with a statement of confidentiality.

6.3 Format

The CDIMP document will consist of a multi-volume report. In addition to a project summary and recommendations, it will cover each of the investigation areas:

- Alignment selection
- Concept design and engineering
- Social environment
- Cultural environment
- Economic environment
- Land use and planning
- Urban design, landscape and visual
- Ecology
- Hydrology and hydraulics
- Water quality
- Noise and vibration
- Air quality
- Soils, topography and geomorphology
- Transport and traffic
- Network integration strategy
- Legislative and policy requirements
- Consultation and communication
- Management strategies.

Appendix 1 – Advisory bodies

Primary advisory bodies:

- Caloundra City Council
- Department of Emergency Services
- Department of Local Government, Planning, Sport and Recreation
- Department of Main Roads
- Department of Natural Resources and Mines
- Disability Services Queensland
- Environmental Protection Agency
- Maroochy Shire Council
- Office of Urban Management
- Queensland Ambulance Service
- Queensland Fire Service
- Queensland Health
- Queensland Police Service
- Queensland Rail
- Queensland Transport

Secondary advisory bodies:

- Bus and Coach Association of Queensland
- Bus Operators Association
- Bicycle Queensland
- Department of Communities
- Department of Education
- Department of Housing
- Department of Public Works
- Department of State Development, Trade and Innovation
- Department of Tourism
- SunBus
- Taxi Council of Queensland.

Appendix 2 – Abbreviations

ARI	Antecedent Rain Index
CCC	Caloundra City Council
CDIMP	Concept Design and Impact Management Plan
CGE	Computable General Equilibrium
CHMP	Cultural Heritage Management Plan
CPTED	Crime Prevention through Environmental Design
DNRM	Department of Natural Resources and Mines
MSC	Maroochy Shire Council
NEPM	National Environmental Protection Measures
NIS	Network Integration Strategy
SCC	Sunshine Coast Council
SEQ	South East Queensland
SEQIPP	South East Queensland Infrastructure Plan and Program
SEQRP	South East Queensland Regional Plan
TNP	TransLink Network Plan
ToR	Terms of Reference

