

Executive summary

Overview and background

CoastConnect is a Queensland Government initiative to improve public transport and sustainable travel on the Sunshine Coast. It is an important part of the Queensland Government's long-term plan to meet the transport needs of the fast-growing Sunshine Coast region by providing faster and more reliable public transport options.

In 2007, the estimated resident population of the Sunshine Coast Regional Council area was 303,050 people. In 2031, the projected population is expected to be as high as 558,880 people. This massive growth brings with it the need to move more people more efficiently between the key centres of Caloundra, Kawana, Mooloolaba and Maroochydore. The principal challenge for the region is to manage this growth in ways that will sustain the Sunshine Coast's lifestyle. Better public transport will make sure the Sunshine Coast keeps moving, improve mobility for those without ready access to a car and cater for the increasing number of people who are choosing to travel in a more sustainable way.

The objectives of the Concept Design and Impact Management Plan 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 centres
- integrate with future and current public transport, pedestrian, cycling and road networks
- identify project need, impacts and benefits with regard to the transport network, social fabric, urban context and physical environment
- propose a design and potential management practices to minimise the impacts and maximise the benefits to the community and the transport system
- develop a project that is feasible, deliverable, and provides a value-for-money solution
- complement the planned introduction of rail services along the Beerwah to Maroochydore rail line (CAMCOS) and support the Sunshine Coast Regional Council Growth Management Position Paper
- recognise and coordinate with the transport infrastructure programs of the Department of Transport and Main Roads and the Sunshine Coast Regional Council.

To achieve these objectives, an extensive consultation process has been undertaken to ensure that community and stakeholder feedback was considered throughout the project's development.

This project proposes a mixture of public transport and cycle lane infrastructure improvements to suit different parts of the coast, including:

- bus lanes – dedicated lanes for buses and emergency vehicles
- bus queue bypasses – additional lengths of lane to enable buses to bypass the traffic waiting at traffic lights
- dedicated on-road cycle lanes within the corridor
- bus stations in key activity areas
- bus stop upgrades.

These improvements will make bus travel on the Sunshine Coast faster, easier and more reliable than ever before and provide an attractive and sustainable alternative to the private car.

The need for CoastConnect is outlined in a range of Queensland Government planning policies and strategies, including the South East Queensland Regional Plan, the South East Queensland Infrastructure Plan and Program (SEQIPP), the Draft Connecting South East Queensland 2031, the Integrated Regional Transport Plan, and the TransLink Network Plan. The 2010 SEQIPP includes an estimate for the staged delivery of the project between 2014 and 2019.

CoastConnect will be well integrated with other transport projects, including the Beerwah to Maroochydore rail line (also known as the CAMCOS rail line) and the Multi Modal Transport Corridor (MMTC). CAMCOS and the MMTC will principally cater for high-speed commuter trips from Maroochydore to Caloundra and beyond. The CoastConnect project is designed to cater for shorter trips for local residents, shoppers and tourists.

The Department of Transport and Main Roads (DTMR) has prepared this Concept Design and Impact Management Plan (CDIMP) to provide a preliminary analysis of the project's potential benefits and impacts. The CDIMP contains the results of technical investigations and extensive community consultation with property owners, community members and stakeholders. All feedback has been considered in the finalisation of the CDIMP.

The project has been planned to be built and opened in stages. Planning for the entire corridor is being undertaken now to identify and protect the land needed for the project. Planning now for the project will help minimise potential impacts in the future and ensure the project is well integrated as the Sunshine Coast continues to grow and develop. It is important to plan public transport networks ahead of population and employment growth to ensure future development occurs in a sustainable way. Once the corridor is protected, any development that is proposed within the protected project corridor is subject to assessment by the DTMR. This means the department can place certain conditions on new developments to ensure they are well integrated with any future public transport improvements to be introduced as part of the CoastConnect project.

Detailed impact management planning will be undertaken closer to the staged delivery of the project. The next stage of impact management planning will investigate the project alignment in more detail and update management strategies where appropriate to maximise benefits and minimise impacts of the project. This is because CoastConnect is proposed to be delivered in stages and impacts identified today are likely to be different in five or ten years time. This ensures that strategies consider any advancements in technology that could contribute to better outcomes for the community.

Community consultation

Extensive community consultation has been undertaken to help guide the planning and ensure CoastConnect meets the needs of existing and future residents and public transport users. Comments from the community, property owners and stakeholders, along with the results of technical studies, have been used to refine the plans during the life of the project. The consultation program for the project consists of four separate phases, as described below.

Table ES-1: 5 phases of the consultation program

Phase	Subject of communication	Timing
Phase 1	Terms of Reference	19 November to 16 December 2007 (completed)
Phase 2	Draft plans	8 September to 17 October 2008 (completed)
Phase 3	Revised draft plans	29 June to 7 August 2009 (completed)
Phase 4	Close out	Late 2010

A number of methods were used to inform and consult with the community, including the establishment of a project hotline, email, reply paid postal service, website, print and radio advertisements, newsletters, direct mail letters to key stakeholders and property/business owners, individual meetings, flyers, fact sheets, feedback forms, information kits, project displays, information sessions, a stakeholder liaison group and a community reference group.

Between late 2007 and August 2009, the project team received 330 formal written submissions and had one-on-one discussions with more than 1,000 community members, stakeholders and property owners.

Consultation statistics:

- 330 submissions
- 188 project and property hotline calls
- 182 feedback forms
- 385 attendees at information sessions and displays
- 267 property meetings
- 197 calls to property owners.

In its feedback, the community generally stated it wants the project to make bus trips faster and more reliable, minimise impacts on property and parking, minimise impacts on Alexandra Parade and Aerodrome Road, and ensure construction impacts can be appropriately mitigated. The issue that provoked the most interest during community consultation was the proposed solution for Alexandra Parade and Aerodrome Road. Based on community feedback and the results of technical studies, the draft plans were revised to minimise impacts on these areas.

Property and business owners whose land might be required for the project were priority stakeholders and received the highest level of consultation and communication with the project team. Individual letters and meetings were organised to ensure issues could be dealt with in private and with confidentiality.

Sustainability

Sustainability is a central theme for the Queensland Government's approach to planning for the future of the state. CoastConnect contributes to sustainability by:

- Providing more sustainable transport options. The primary contribution of public transport and non-motorised transport networks to sustainability is a greater efficiency in the use of resources, such as road space, fuel and travelers' time. Other sustainability benefits include reduction in the environmental footprint of travel (that is, fewer vehicle emissions and a resultant improvement in air quality). In addition, by improving the accessibility of a place, public transport infrastructure attracts a variety of land uses to one location, usually in proximity to a public transport stop, thus contributing to a more compact and diverse land use pattern that is widely considered more sustainable (for example, Transit-Oriented Development(TOD)/communities).
- Incorporating sustainable infrastructure elements and by incorporating sustainable practices and processes in the project delivery. The design, materials and procedures used in the construction, operation and maintenance of bus infrastructure can also enhance sustainable outcomes by minimising harm and adopting opportunities for mitigation, benefit or improvement. Adopting a whole-of-life approach to the sustainability of products and materials promotes value-for-money through minimised resource consumption and cost savings on consumables, maintenance and disposal.

Legislative requirements

Planning and preservation of the CoastConnect corridor is governed principally by the *Transport Infrastructure Act 1994 (Qld)*. A range of approvals will be required for preservation of the corridor, and future construction activities and operation under the *Integrated Planning Act 1997 (Qld)*, other state legislation and possibly Commonwealth legislation. A general indication of the approvals, permits and licences that may be triggered during the project is outlined in the CDIMP; however the necessary planning applications will need to be assessed closer to the project delivery date, as the local government planning schemes and planning legislation are likely to change between now and when approval for the project will be sought.

Five major approvals pathways are identified in this chapter:

- Integrated Development Assessment System
- designation of land for community infrastructure
- declaration of a significant project
- authorised works
- transport infrastructure.

Determination of a preferred approvals pathway has not been undertaken at this stage due to the potential for changes to occur. The preferred approvals pathway will need to be assessed before approvals for the project are sought. This will inform the eventual approval pathway(s) selected.

Concept design and engineering

The concept design process included the identification of potential corridor alignments and bus priority measures and the selection of preferred bus stop and bus station locations and treatments. Infrastructure has been developed for the concept design to a level appropriate for corridor preservation and impact assessment.

Design criteria, assumptions, adjoining planning projects, construction issues and other related information were considered in the planning stages as part of the concept design process. A number of design standards and documents have been used as reference points, including the Road Planning and Design Manual and Road Drainage Design Manual, Austroads publications, TransLink Transit Authority Public Transport Infrastructure Manual, Department of Transport and Main Roads Busway Planning and Design Manual, Australian Standards and Australian Standard Handbooks, and local authority standards.

The CDIMP contains a comprehensive description of the existing transport corridor and the various infrastructure improvements proposed to be made as part of the CoastConnect project. Concept design drawings showing bus stops, bus priority measures and station locations are contained in Volume 3.

The concept design potentially directly impacts approximately 113 properties along the CoastConnect corridor. They are a combination of 'full' and 'partial' property resumptions and include a mix of residential, commercial and state government-owned properties. The Department of Transport and Main Roads has been in contact with potentially directly affected property owners and will continue to engage with property owners into the future.

The cost estimate for the project has been prepared to meet the DTMR policy of estimates being 'unlikely to be exceeded but not excessively conservative' and has been prepared in accordance with DTMR specification standards. Where necessary, engineering assumptions were made to ensure that the estimate includes all aspects of the construction delivery scope. The costs of land acquisition were determined by DTMR property services and include a market assessment. No allowance has been made for demolition.

The following tasks are to be undertaken during further detailed design phases for the quality bus corridor:

- detailed ground topographical survey of the project site, including public utility plant
- detailed design of the preferred alignment, incorporating the inputs from the detailed technical investigations and the refinements required following the community consultation process.

Further design phases should also consider the following elements in more detail: anticipated construction methodology, potential construction waste management and materials, maintenance, staging issues, and operational engineering issues.

Traffic

Traffic analysis for CoastConnect was carried out to ensure that the project does not create adverse impacts on the operation of the wider road network and that the project improves bus travel times on the corridor.

Traffic investigations included strategic modelling in VISUM, micro-simulation modelling in VISSIM and intersection modelling using SIDRA at some key intersections. The strategic modelling determined future traffic patterns based on implementation of planned projects and land use changes, and then compared this with the implementation of CoastConnect. The VISUM modelling also assessed the change in bus patronage over time and due to CoastConnect.

The modelling shows that the project will increase public transport patronage and shorten travel times for buses by up to 13 minutes in peak times. These are substantial travel time savings that will also bring about associated social, environmental and economic benefits to the Sunshine Coast community. These types of travel time savings will make bus travel fast, frequent and reliable and will make catching the bus an attractive transport option for the future. Travel time savings will be achieved through:

- buses bypassing congestion. CoastConnect will give buses their own priority in the transport network (either in dedicated bus lanes or in bus queue bypasses at major intersections)
- providing high-quality on-road stations and bus interchanges.

According to the modelling, car travel times may increase slightly along the corridor as a result of the project. However, the benefits of improved public transport patronage combined with quicker and more reliable bus travel are expected to significantly outweigh any potential minor impacts on private vehicle travel. Overall, the CoastConnect project will significantly increase the people-carrying capacity in the Caloundra to Maroochydore corridor.

The transport modelling will be further refined in the future as staging options are considered and analysed in greater detail.

Pedestrian and cycle access

Good cycle and pedestrian access to transport infrastructure encourages greater use of public transport. Currently the study corridor is heavily car dependent. The cycle and pedestrian network needs to be continuous, attractive, safe, convenient and accessible for all users in order to promote cycling and walking as viable modes, both as an access mode to public transport and as a mode of transport along the corridor.

As parts of the project alignment run along the existing or future Principal Cycle Network (as set out in South East Queensland Principal Cycle Network Plan 2007 — the plan that guides the future development of cycle infrastructure in the region), there are opportunities to deliver improvements to the cycle network as part of the project. The project proposes significant improvements to cycle infrastructure in line with the network plan along parts of Nicklin Way, Lake Kawana Boulevard and Alexandra Parade. These improvements are expected to significantly improve local cycling infrastructure. In addition, bicycle parking at key stations is proposed and this will be investigated in future in liaison with the Sunshine Coast Regional Council and the TransLink Transit Authority. Bicycle user groups should be consulted in future design stages and during the development of construction management plans. Through this consultation, issues such as suitable redirection of bicycle traffic would be addressed and the appropriate groups would be informed prior to construction.

The project acknowledges the importance of good pedestrian connections and bus stops and stations will be designed for maximum accessibility by passengers on foot. Recommendations have been made for improvements to pedestrian connections, including potential pedestrian overpasses at key stations and changes to pedestrian crossings to maximise safety and accessibility at key locations.

Consultation will continue between the DTMR, the Sunshine Coast Regional Council (SCRC) and the TransLink Transit Authority (TransLink) on the provision of pedestrian and cycle infrastructure in the future. DTMR recognises the role Council will play in providing or enhancing connecting pathways in partnership with this project.

Parking

CoastConnect requires a number of changes to the road corridor in order to provide the required clearances for the on-road cycle lanes, bus lanes and bus queue bypass lanes. Where feasible, the encroachment by the road corridor on parking and property has been minimised, but there are areas of the corridor in which impacts are unavoidable in order to provide the priority facilities. Chapter 8 of the CDIMP describes the location and extent of these parking impacts, considering local business, land use and parking demand. It also investigates and identifies mitigation measures, such as the creation of replacement parking areas.

As the plans have been refined the number of parking impacts in the corridor has been reduced. Replacement parking opportunities have been investigated in a number of locations including Boolarong Crescent and near the Seabreeze Caravan Park. The viability of the proposed replacement parking areas is to be further investigated to more accurately determine suitable layouts and timing of implementation. This is to be undertaken in conjunction with SCRC.

No park-and-rides are proposed as part of the project. TransLink will design bus routes that make it easy for bus patrons to access the CoastConnect bus priority corridor via their local bus at their local stop. This reduces the need for bus patrons to drive to a station as local buses will continue to do their neighbourhood rounds before heading onto the bus priority corridor. The future Beerwah to Maroochydore rail line is likely to include provision for park-and-rides at several locations. While no bus stations will have park-and-rides, DTMR has explored opportunities for appropriate kiss-and-ride areas at a number of locations, where feasible. Providing kiss-and-ride areas at bus stations encourages people to use public transport rather than drive all the way to their destination.

Closer to construction, DTMR will work with local residents, business owners and the Sunshine Coast Regional Council on appropriate parking measures near stations.

Economic environment

Rapid population growth and increasing congestion on the Sunshine Coast present a compelling case for improvements to public transport infrastructure. CoastConnect will encourage more sustainable travel in the Caloundra to Maroochydore corridor, which will result in significant economic benefits to not only existing bus and road users, but the community at large.

Chapter 9 of the CDIMP reviews the available literature and provides case studies to show that smaller cities and communities can successfully reduce their private car dependence by encouraging the use of public transport and non-motorised travel. It provides a preliminary analysis of the potential economic benefits and impacts of the project, including discussion on user benefits, community benefits, and how proposed parking changes might affect business activity in the corridor.

This qualitative economic assessment demonstrates that public transport can bring significant economic benefits to both large and small cities. Benefits include reducing community transport costs, supporting city development, boosting employment and local business, providing land use opportunities through urban regeneration, and boosting the productive capacity of the economy.

The potential economic effects of changes to on-street parking are also examined in the CDIMP. Research suggests that the impact of the CoastConnect changes would be negligible if on-street parking reduction is accompanied by appropriate mitigation and parking management measures. Moreover, CoastConnect is likely to stimulate long-term business turnover by improving access to commercial precincts in the corridor and by facilitating higher density developments at key station sites.

The anticipated long-term economic benefits of the CoastConnect proposal are expected to significantly outweigh any potential short-term economic impacts. A quantitative economic analysis would be undertaken in a future planning phase to assist government with future decisions around staging and construction funding.

Network integration

Chapter 10 of the CDIMP outlines the proposed strategy for operating buses on the CoastConnect corridor and integrating the corridor with the broader public transport network. It contains an analysis of current bus services operating in the corridor. Detailed planning on how local routes will service communities will be undertaken closer to the project opening. However, capacity for these extra services has been considered in station and infrastructure designs.

The CoastConnect Network Integration Strategy provides information that will:

- inform the detailed design process by outlining key requirements for various corridor sections and at stops and stations based on proposed operational arrangements
- assist with preparing a detailed operating plan for construction and operations of the CoastConnect corridor including:
 - planning for service changes including the introduction of the proposed high frequency priority routes
 - reviewing the existing local feeder network to ensure appropriate service coverage and integration with services operating on the corridor
 - optimising travel times, frequency and operating hours for services
 - coordinating bus and rail services
 - timetabling and vehicle scheduling
 - planning for detailed operational needs including bus-turnaround facilities, layover areas and driver amenities.

Additional planning would also inform and be informed by future updates to the TransLink Network Plan.

Ground conditions

A study was carried out to assess the existing physical environment, including the presence or absence of Acid Sulfate Soils (ASS), along the proposed transport corridor. The study comprised a review of available published geology and spatial system data and test pits dug on-site.

In general terms the topography of the corridor comprises three distinct geomorphic terrains as follows:

- the southern topographic high area has gently to moderately inclined slopes at Battery Hill/Caloundra with surface levels (RL) up to 30 m Australian height datum (AHD) in Caloundra and up to about 20 m AHD in Battery Hill
- the central coastal plain portion of the proposed corridor is on flat, low-lying, swampy terrain between Currimundi and Mooloolaba. Prior to urban development, this area was subject to frequent flooding and was poorly drained. Laterally extensive but shallow filling is anticipated in this area. RL of the coastal plain before filling was generally about 1.5 m to 2.5 m AHD
- the northern topographic high area along the proposed corridor is at Alexandra Headland. The RL along the eastern loop portion of the corridor is about 5 m to 15 m AHD along Mooloolaba Esplanade and up to 25 m AHD along Alexandra Parade.

Previous work (PB 2008) indicates that topsoil in the area is generally absent, as the corridor alignment covers only previously disturbed and urbanised area and the soil types along the corridor are not described in detail.

The proposed corridor is underlain by the following geological units:

- **Landsborough Sandstone** – Jurassic age sedimentary rocks comprising sandstone, shale and siltstone
- **Tertiary age poorly consolidated sediments** - Comprising quartzose to sublabilite sandstone, claystone, conglomerate and minor olivine basalt
- **Quaternary** – Pleistocene and Holocene age alluvial deposits comprising, clay, silt, sand and gravel, floodplain alluvium
- **Quaternary** – Pleistocene and Holocene age estuarine and tidal delta sediments comprising, sandy mud and muddy sand.

Disturbance of existing topography could change drainage patterns, slopes and the subsurface moisture regime, thereby impacting on the current geomorphologic processes. Due to the relative flat terrain; other than the southern and northern topographic highs, sealed surfaces and trained surface run-off, the potential impacts on the current geomorphic processes are anticipated to be insignificant. The proposed works are not anticipated to impact on ASS or on groundwater regimes that could impact on the ASS. Potential geotechnical constraints mainly comprise the potential for interference with ASS at auxiliary structures, slope stability of cuts in sloping terrain and subsurface conditions at potential bridge-widening sites in the Mooloolaba area.

Hydrology, hydraulics and surface water quality

Chapter 12 of the CDIMP discusses the potential corridor impacts on flooding and surface water quality.

Much of the project corridor passes through flat, low lying coastal land in which the stormwater drainage systems have been extensively modified by urban development. The road widening works will involve extensions to existing systems, considerable pipe upgrades may be required where the existing systems do not comply with current standards for capacity.

Low-lying sections of the existing roads may currently be vulnerable to flooding. Under current conditions, this presents significant problems for providing adequate drainage and flood immunity. Future design stages would benefit from more detailed consideration of the potential impacts brought about by climate change (such as rising sea levels and higher intensity rainfall) and how the project could best respond to these potential impacts.

Given the sensitivity of the receiving waters, systems also need to be constructed to treat and improve water quality of discharges from the road surface. It is expected that the constraints of available space, low elevation and the lack of hydraulic head will limit the extent and effectiveness of these systems.

It is recommended that a water quality monitoring program be implemented in a future design stage. The purpose of the water quality monitoring programme is to verify current conditions, which would assist the design of the stormwater quality treatment devices and compliance with the site-based water quality objectives.

Ecology

The CoastConnect project is proposed within a corridor that is highly urbanised and developed. Much of the area's original vegetation has been cleared and replaced by residential, business/commercial, industrial and community facility land uses. While some small pockets of green and/or open space are still present, these areas are fragmented. They have also been highly altered and generally do not represent vegetation with high ecological integrity. Despite this, these green and/or open spaces are valued at a social and community level because they provide places in which for recreation and outdoor activities.

Desktop and field-based assessments of ecological values within the proposed project area were undertaken to inform the study. The studies found that ecological impacts are likely to be focused around bridge widenings (Currimundi Creek, Tokara Canal and Lake Kawana), the proposed removal of small pockets of coastal vegetation, and the proposed removal of small pockets of on-street landscaping.

Where marine plants will be disturbed or cleared, a permit will be required from the Department of Employment, Economic Development and Innovation pursuant to the *Fisheries Act 1994* and off-sets may be required. Where development works will occur close to waterways, implementation of a construction management plan is recommended. Other typical mitigation strategies would include introduction of coastal planting to supplement and strengthen dunal vegetation and coastal landscaping and replacement of on-street landscaping in accordance with the Sunshine Coast Regional Council provisions.

To ensure ecological values within the project area are properly identified and protected, habitat values within the project corridor should be investigated in more detail closer to delivery of the project. Of particular importance for this project are potential impacts associated with waterway crossings (bridge widening and realignment). Detailed marine plant surveys, fauna investigations and monitoring in the vicinity of bridge works would be of benefit in future project stages.

With appropriate mitigation, no long-term ecological impacts as a result of the proposed CoastConnect project are predicted.

Land use planning

The coastal strip of the Sunshine Coast between Caloundra and Maroochydore is typified by low-density residential development, with higher densities emerging at key centres including Caloundra and Kawana (major activity centres under the SEQ Regional Plan) and Maroochydore (a principal activity centre under the SEQ Regional Plan). Planning strategy at a state, regional and local level is generally supportive of an increase in densities around these activity centres. Crucial to this is the provision of a fully integrated public transport network, of which CoastConnect will become a key part.

CoastConnect will impact the surrounding area both during the construction and operational phases. Potential benefits of CoastConnect include:

- improved accessibility, particularly to key activity centres
- provision of high-quality public transport to support transit-oriented development within key centres.

Other impacts resulting from CoastConnect – Caloundra to Maroochydore are expected to include:

- increased pressure on existing infrastructure as a result of stimulated development
- resumption of private property necessary for the project, including partial and complete acquisition
- changes to existing pedestrian, cycle and property access, particularly during the construction phase
- noise, dust, vibration and light impacts, particularly during the construction phase.

Measures will be put in place to mitigate impacts as far as possible. The design of CoastConnect may change over time and planning processes may change. It is expected that documentation and recommended mitigation of any planning and design changes will be incorporated into future planning phases.

Social environment

A social impact assessment was undertaken to examine what sort of social effects (positive and negative) the project may have on the local community. The assessment method included establishing the existing social profile of the area, identifying major construction activities associated with the project and assessing their impacts on the social environment.

The study area is an important population centre and a highly desirable place of residence, with a projected average growth of 2.1 % per annum for the next 20 years. Population is distributed unevenly within the study area, with greater concentration occurring in coastal centres in Caloundra, Kawana, Mooloolaba, Alexandra Headland and Maroochydore. Employment and other activities of regional significance are concentrated in these centres. A significant amount of travel occurs between these centres and is expected to increase markedly into the future.

The project's social benefits are significant and extend to the wider community. They include providing more reliable public transport options, increasing the convenience and connectivity of public transport to major employment and recreation centres and the health, and recreation and lifestyle benefits associated with improvements to cycle facilities. Negative impacts are largely focused in areas immediately adjoining the project alignment: they relate to such issues as property resumptions, some localised reduction in on-street car parking and the construction phase impacts.

Successful delivery of the project relies on mitigating impacts on communities. To do this, the project will need to provide support to people who need to relocate, manage construction impacts to maintain neighbourhood amenity during construction, and maintain a focus on improving amenity in the longer term through improved public transport and pedestrian and cycle infrastructure.

The assessment found that with the implementation of proposed mitigation measures to minimise impacts, CoastConnect is expected to make an overall positive contribution to equity, quality of life and community values in the study corridor.

Cultural heritage

The purpose of the cultural heritage investigations is to determine known or potential heritage values that relate to the development area and to the implementation of the development. The investigations also explore how those values should be recognised in the future development and management of the CoastConnect proposal.

Registers and historical agencies were consulted to determine the presence of known historical or Indigenous sites within the study area. Three items of local cultural heritage, one of which is listed on the Caloundra City Council heritage register, may be indirectly impacted by the proposed development.

For the most part, the CoastConnect proposal is located within previously disturbed areas. The majority of the land within the study area has been subject to previous disturbance from road construction and residential, commercial and industrial development. The proposed activities in the study area are generally unlikely to harm Aboriginal heritage where the development remains within the previously constructed road reserve or highly disturbed areas. The potential for Aboriginal sites to be uncovered at locations where road widening is required or in previously undisturbed areas is considered to be moderate. The relevant Aboriginal party should be consulted in future design and construction phases with regards to their involvement in the project.

Air quality

The greatest pressure on air quality over the next 20 years will come from the expected increase in car travel. Getting more people out of their cars and onto public transport is one way to improve air quality and help the environment. A desktop analysis and air quality modelling have been undertaken to assess the potential air quality impacts and benefits of the CoastConnect project. The assessment has been completed in accordance with the *Environment Protection Act 1994* and the associated Environmental Protection (Air) Policy 2008. Reference has also been made to goals specified within the relevant National Environmental Protection Measures (NEPM) and the National Environmental Protection Council (Ambient Air Quality) Measure.

The desktop review found that current air quality on the Sunshine Coast is generally good. To better understand the air quality impacts and benefits of the project, a quantitative assessment of potential future air quality has been undertaken. Predicted air quality impacts and emission profiles for modelled traffic volumes have been compared for 2016 and 2026 with and without the proposed CoastConnect project. Overall emission rates and associated pollutant levels are generally predicted to decrease or remain static when compared to levels without the project. Potential pollutants and particulates are expected to be within acceptable levels right along the corridor based on the predictive calculations. Overall, it is anticipated that CoastConnect would provide an overall minor net benefit to the air quality in the area. This is based on the assumption that a reliable and frequent bus service would reduce car dependency, thereby slowing the growth in private vehicle use along the Sunshine Coast by encouraging motorists to take cleaner and greener public transport.

It is anticipated that there will be dust impacts during the construction phase of the project. However, the implementation of the mitigation and management measures that will be included in the construction environmental management plan will help minimise impacts.

Further investigations may be required closer to construction to determine up-to-date air quality levels along the route. Further, surrounding land uses may differ (for example, the Sunshine Coast University Hospital may be constructed) so a review of all sensitive receptors should be undertaken prior to the start of construction.

Urban design

Achieving the right 'look and feel' for CoastConnect is an important part of the project. Good urban design has the ability to take a functional, physical entity (the bus corridor and its stations) and give it character through smart architecture, lighting, tailored design features, signage, furniture and artworks.

The existing corridor consists of a range of differing urban forms, land uses and road conditions. Chapter 18 of the CDIMP describes the existing character of the corridor and proposes ways in which the project can be custom-designed to fit in with the communities it will serve. Landscaping is also an important element of urban design. DTMR will work with Council to deliver improved landscape treatments at all major stations and at other important locations throughout the corridor.

The built form outcomes for bus stops and stations are conceptual designs only and are offered as an idea of what could be achieved. They are intended to illustrate the likely impact of chosen themes for the CoastConnect corridor and are not intended to be viewed as final designs. Additional urban design studies and investigations will be needed in future design stages, closer to construction. These would include pedestrian and movement studies around proposed stations and further detailed considerations of the best strategies to achieve the right 'look and feel' for the CoastConnect corridor.

Noise and vibration

An ambient noise monitoring study was conducted along the corridor. The noise monitoring results indicated that existing traffic noise levels were high along the corridor, particularly adjacent to Nicklin Way, Alexandra Parade and Maroochydore.

A preliminary study of construction noise and vibration was performed, and it was found that administrative controls and physical mitigation measures are likely to be required for construction activities where sensitive locations are nearby. Further detailed assessments of construction noise and vibration will be required closer to the construction phase of the project.

A preliminary study of potential bus noise and combined bus and traffic noise was conducted. The results of this study indicated that bus noise alone will not exceed 63 dB(A) L10 18h; the relevant criterion from the DTMR — Road Traffic Noise Management Code of Practice 2008. The L10 18h is the L10 1h average between 6 am and midnight. The L10 represents the noise level exceeded for 10 % of a given time period, in this case the time period is 1 hour.

A comparison of the traffic noise levels in year 2026, with and without the CoastConnect corridor in all sections, the comparison generally indicated that there would be no significant increase in traffic noise levels due to the presence of the corridor. Further detailed assessments of traffic noise and vibration will be required in later phases of the project.

Project staging

CoastConnect is proposed to be built and opened in stages. This is a major benefit of bus-based transport improvements — they can be built as needed and as funding becomes available. This means public money can be spent effectively when and where it is most needed. Apart from need and funding, the timing of other transport and local development projects is also an important consideration where staging is concerned.

CoastConnect is identified in the 2010 SEQIPP as a planned infrastructure project. Subject to government approval, the CoastConnect improvements are planned to be completed in stages between 2014 and 2019.

As with all major infrastructure projects, the availability of funding will depend on competing infrastructure priorities across the state and is subject to future government consideration.

Staging of CoastConnect will depend on timing of the MMTC. By integrating the delivery of the CoastConnect infrastructure with the provision of the MMTC, traffic impacts will be minimised for the local community. Planning is continuing for the MMTC and the MMTC and CoastConnect project teams are working together to assess opportunities for optimal delivery and integration.

In line with the broad timing set out in the 2010 SEQIPP, CoastConnect is earmarked for delivery between 2014 and 2019. While no decisions have yet been made on staging priorities and delivery timing or funding, early delivery elements could include the Maroochydore, Kawana Town Centre and Kawana Shoppingworld bus stations and bus stop improvements through Caloundra. These aspects will be taken into consideration as staging priorities are determined in the future. Other developments in the local area (such as the Sunshine Coast University Hospital, Kawana Town Centre, Caloundra City Centre, and the Maroochydore principal activity centre) will be taken into consideration as staging opportunities are investigated.

Staging information in the CDIMP is indicative only. CoastConnect's staging and delivery timing are subject to ongoing review and investigation. The Queensland Government will decide on staging priorities after a complete analysis of the project's anticipated economic benefits and impacts. Key dates will be announced in future.