

# Route Strategy: Tugun to Coolangatta

Document no: IW251600-0000-CR-RPT-0003  
Revision no: 1.1

Department of Transport and Main Roads  
CN-14817

Tugun to Coolangatta Multi Modal Corridor Study  
29 June 2022



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**Client name:** Department of Transport and Main Roads  
**Project name:** Tugun to Coolangatta Multi Modal Corridor Study  
**Client reference:** CN-14817 **Project no:** IW251600  
**Document no:** IW251600-0000-CR-RPT-0003 **Project manager:**  
**Revision no:** 1.1 **Prepared by:**  
**Date:** 29 June 2022 **File name:** IW251600-0000-CR-RPT-0003.docx  
**Doc status:** Final

## Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
0	14/4/22	Draft final for review				
1.1	29/6/22	Final issue				

Any content relating to the Gold Coast Airport, Gold Coast Heavy Rail Extension and personal information (for example names) have been removed from this report.

Gold Coast Airport will confirm the light rail route and station location serving the airport precinct as part of their master planning development.

Possible future heavy rail extension and station is subject to a separate planning project by TMR and further information can be found at: <https://www.tmr.qld.gov.au/projects/gold-coast-heavy-rail-extension-varsity-lakes-to-gold-coast-airport>

The Appendices have been removed due to the technical nature of these documents.

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## Executive summary

### Overview

This report is the final deliverable for the Tugun to Coolangatta Multi Modal Corridor Study. The principal purpose of the study was to consider the strategy, needs and functions of all modes of transport, including integration and interfacing requirements over the planning horizon to 2041, within the study corridor. The study's ultimate purpose was to identify the land requirements to enable implementation of a preferred range of transport infrastructure solutions including for Light Rail, buses, pedestrians, bike riders, private transport (including freight) and prevent encroachment by development.

The extent for this Route Strategy is from Boyd Street, Tugun to the QLD/ NSW border at Coolangatta. The corridor is approximately 5km in length and includes the Gold Coast Highway plus its service roads (Coolangatta Road and Golden Four Drive) as well as land within the airport terminal precinct, between Tugun and Kirra. Between Kirra and the NSW border the study corridor encompasses both Musgrave Street/ Marine Parade to the north and Coolangatta Road/ Tweed Street to the south. For the purpose of this study, the corridor has been split into four sections as follows Bilina, Airport, Kirra and Coolangatta

This report provides detailed background information on existing conditions, discusses future issues (including opportunities and constraints) and outlines the strategic drivers for investigating changes to transport infrastructure and services within the corridor. This document then sets the 'vision' for the corridor and describes the option development and option assessment in later stages of the project. Finally, this document describes the preferred option in terms of new and augmented transport infrastructure within the study area.

### Planning context

After reviewing relevant policy and strategy documents, the following specific directions and desired changes were identified to help guide this study:

- Light Rail between Broadbeach South and Coolangatta is a key assumption of higher order plans such as the South East Queensland Regional Plan (*ShapingSEQ*) and Regional Transport Plans for South East Queensland and therefore will need to be accommodated in any corridor planning.
- Upgraded high quality (principal) cycle facilities are expected to be provided as a priority (within the next 10 years) – this includes facilities on the Gold Coast Highway/Coolangatta Road corridor to support the existing Oceanway shared path facility on the coastal corridor
- Transport and land use planning should seek to complement the outcomes of the Burleigh Heads to Tugun Route Strategy whereby through traffic is encouraged to use the M1 to support a more attractive and liveable coastal corridor. Nevertheless, the Gold Coast Highway from Stewart Road (Tugun-Currumbin Road) to the airport will need to remain an efficient movement corridor to cater for oversized and hazardous goods vehicle as well as support Tugun Bypass tunnel closures.
- The Gold Coast Airport is a key destination within the 'Southern Gateway' Regional Economic Cluster. Improving access to this node (which will increasingly accommodate more than just airport passengers and workers) from the wider region, through a wider range of mode options is a major opportunity.
- There is need to accommodate population growth and additional housing within the corridor which is within the existing urban footprint, in order to protect green spaces. However, development and density should provide variety and should enhance the character of the southern Gold Coast villages and centres.

## Current situation

The Tugun to Coolangatta study area is physically constrained by the Pacific Ocean to the east and the Cobaki Broadwater to the west. Within this part of the City of Gold Coast, the Gold Coast Highway and the M1 (Pacific Motorway) are the primary transport links. The Gold Coast Highway between Tugun and Kirra performs a key north-south arterial road function carrying an average annual daily traffic (AADT) of 39,000 in 2019 (2019 AADT Report) and 38,000 AADT in 2020 (2020 AADT Report), while the M1 to the west provides a regional and national north-south motorway function, carrying almost 64,000 vehicles per day in 2019 south of Stewart Road (2019 AADT Report). The AADT on the M1 was significantly affected by COVID-19 in 2020 and 2021 due to the QLD/NSW border closure, reducing to 38,000 in 2020.

The Gold Coast Highway (and its parallel service roads) are a dominant feature within the Bilinga, Airport and Kirra sections of the study area. East of the airport, the nature of the road network is much less strategic with Coolangatta Road/ Tweed Street and Musgrave Street/ Marine Parade forming 'distributor' type roads links between the Gold Coast Highway and the twin towns of Coolangatta/ Tweed Heads.

Along the coastal corridor, a strategic off-road shared path called the Oceanway, provides an attractive and uninterrupted facility for pedestrians and bike riders.

Within the study area are two high frequency bus routes, the 700 operating from Tweed Heads to Broadbeach South and the 777 operating from Gold Coast Airport to Broadbeach South (limited stops). These are supported by a range of connector, local and school bus routes.

Overall, the Tugun to Coolangatta study area is a multi-modal corridor in nature carrying general traffic, high frequency bus services as well as pedestrians and bike riders.

## Route planning pressures

Population projections for Queensland are developed by the Queensland Government Statisticians Office (QGSO) for forecast years including 2041 where TMR allocates these forecasts to specific "zones" to be used for transport model forecasting purposes based on their future planning. For this project, the TMR (QGSO2018) was adopted to forecast population and employment growth which was done by analysing the zones within the study area (between Boyd Street, Warner Street and Airport). Based on this analysis, over a 22-year period between 2019 and 2041 the residential population of the study area is projected to rise from 7,200 to 11,800 (a 64% increase) and employment to rise from 5,700 to 7,700 (a 35% increase). Most of the population growth is along the coastal strip straddling the Gold Coast Highway.

Analysis of future traffic volumes and passenger movements using the Gold Coast Strategic Transport Model (GCSTM) was undertaken to inform the scale of change and growth in transport demands between:

- Base 2019 GCSTM scenario and
- Future2041 GCSTM scenarios
  - No road network changes in QLD compared to 2019
  - Light Rail extended to Burleigh Heads

The analysis found that between 2019 and 2041:

- North of Stewart Road, trips on the Gold Coast Highway are estimated to increase by 10% (increase of 2,800 vehicles per day) however Pacific Motorway (M1) volumes increase by 76% from 95,700 to 168,100 vehicles per day between 2019 and 2041. Public transport accounted for 18% of total trips on the Gold Coast Highway in 2019 but reduce to 14% of total trips in 2041 (as vehicle trips increase while public transport trips remain similar).
- All trips on the Gold Coast Highway south of Stewart Road are estimated to increase substantially:
  - North of Boyd Street traffic volumes are estimated to increase by 85%, carrying up to 74,900 vehicles per day.

- South of Boyd Street: traffic volumes are estimated to increase by 62% (from 40,400 vehicles per day in 2019 to 65,600 vehicles per day in 2041) and by 156% south of the Gold Coast Airport (to 37,900 vehicles per day in 2041)
- Coolangatta Road and Musgrave Street in Kirra each increase by around 50% with volumes approximately 17,900 vehicles per day on each corridor.

These transport analyses illustrate that there will be substantial traffic growth in the network, without enhanced public transport especially on the Gold Coast Highway south of Stewart Road (85% - 156% growth within Bilinga) and on the M1 Pacific Motorway north of Stewart Road (59%-76% growth and approx. 168,100 vehicles per day). This reinforces the opportunity that enhanced public transport could play in managing the growth in transport demand on the southern Gold Coast and reduce pressure on the road network by 2041. A key conclusion is the need to protect the corridor to allow for Light Rail to be implemented, in some form, at some point in the future.

### Route vision

Using the findings from the analysis of existing conditions and future challenges, combined with stakeholder inputs and feedback, an overarching vision statement for this project's study area was developed as follows:

*"The Tugun to Coolangatta corridor will connect the southern Gold Coast and its collection of distinct and unique places, with their varied character, density and scale. The corridor and communities along it will connect seamlessly through cross-corridor connections and to the wider city and region with enhanced public and active transport facilities as alternatives to private vehicle travel. Light Rail stations served by frequent, reliable G: link services, will integrate with and further activate key precincts, villages and centres (including the airport precinct). Appropriate and diverse land uses will establish within a comfortable walking distance of the stations, contributing to more vibrant and affordable communities. High quality active transport infrastructure will complement major public transport investment to help in sustainably accommodating more people as the corridor becomes a more desirable place in which to live, work, learn and play."*

This vision was supported by service requirements for the four distinct sections of the study area: namely Bilinga, Airport, Kirra and Coolangatta, which were used to guide the option development process.

### Longlist options

Option development involved first developing a longlist of LRT alignment options, followed by further design development and assessment of a shortlist of more detailed layout options.

Longlist option development and assessment was, in itself, a multi stage process that involved:

- Step 1: Identifying the most feasible corridor(s) within each section of the study area. For Bilinga, only one broad corridor (Gold Coast Highway) was identified, with two corridors for the Airport and Kirra precincts and three corridors in Coolangatta.
- Step 2: Identifying the station location investigation areas through a review of current and future resident and employment locations within a five to 10 minute walk of Light Rail. As a result, five broad station location areas were recommended, namely Bilinga, Airport, North Kirra, Kirra and Coolangatta with an overall average station spacing of between 900-950m.
- Step 3: Taking the agreed corridor and station locations above, basic option concepts were developed. Key alignment features and cross section arrangements were identified, with consideration for the issues and opportunities for each option that may require further investigation.
- Step 4: The basic concepts and supporting information was presented to key stakeholders from TMR and the City of Gold Coast in May 2021. Feedback on each option was recorded and used to finalise the long list prior to evaluation.
- Step 5: A high level assessment framework was then developed and applied to help 'filter' the longlist corridor options down to a shortlist. This qualitative multi criteria analysis (MCA) was developed to be consistent with TMR Smarter Solutions MCA tool.

This process resulted in two shortlist options in each of the four sections of the study area, with the ability for any option in one section to be combined with any option in the adjacent section.

## Shortlist options

For the shortlist options (two per study area section) that passed through the longlist filter, each was subject to further testing and refinement including:

- Different traffic access/ intersection configuration options
- Different Light Rail alignment options (within the selected corridor)
- Different station location sub-options (within the recommended investigation areas)

Through this refinement stage, the project team were able to identify the issues and opportunities with each option. The final refined short-listed options were:

- B1-3: Between Gold Coast Highway and Golden Four Drive through Bilinga
- B2-3: Centre of Gold Coast Highway through Bilinga
- A1-3: Closer to airport terminal through Airport precinct
- A2-3: Closer to Gold Coast Highway through Airport precinct
- K2-2: Musgrave Road, Miles Street and old railway cutting through Kirra
- K3-2: Coolangatta Road and old railway cutting through Kirra
- C2-2: Griffith Street through Coolangatta
- C3-1: Chalk Street through Coolangatta

These eight shortlist options were then assessed using a new MCA specific to the shortlist. The MCA framework was developed in conjunction with TMR and City of Gold Coast and included consideration of the TMR smarter solutions MCA guide, the Infrastructure Australia (IA) MCA guide and the Project corridor vision.

A Technical Working Group (TWG) workshop was held in September 2021 with relevant stakeholders including City of Gold Coast, various TMR divisions and Transport for NSW (TfNSW). Participants reviewed the draft MCA findings and scores for each option and feedback was used to draw the following conclusions:

- In Bilinga, the preferred alignment was between the Gold Coast Highway and Golden Four Drive (known as B1-3). Currently there is significant vegetation in this zone and as such additional investigation was recommended to seek greater visual separation, retain mature trees wherever possible and to deliver a road corridor that creates an entry/gateway statement to the Gold Coast from the Airport;
- In the Airport, the preferred alignment (known as A1-3) resulted in a consolidated multi-modal (Light Rail, heavy rail and bus) public transport facility located between the airport terminal and the proposed new internal Airport distributor road (approx. 150-180m from the airport terminal building). However, it was noted that heavy rail alignment constraints needed to be investigated further to confirm viability of this location;
- In Kirra, Option K3-2 was the recommended preferred concept to take forward, with LRT located within the Coolangatta Road corridor.
- In Coolangatta, the option C3-1 was the recommended preferred concept to be taken forward, with Light Rail located immediately south of Chalk Street;
- The emerging preferred corridor option was therefore identified as B1-3 + A1-3 + K3-2 + C3-1

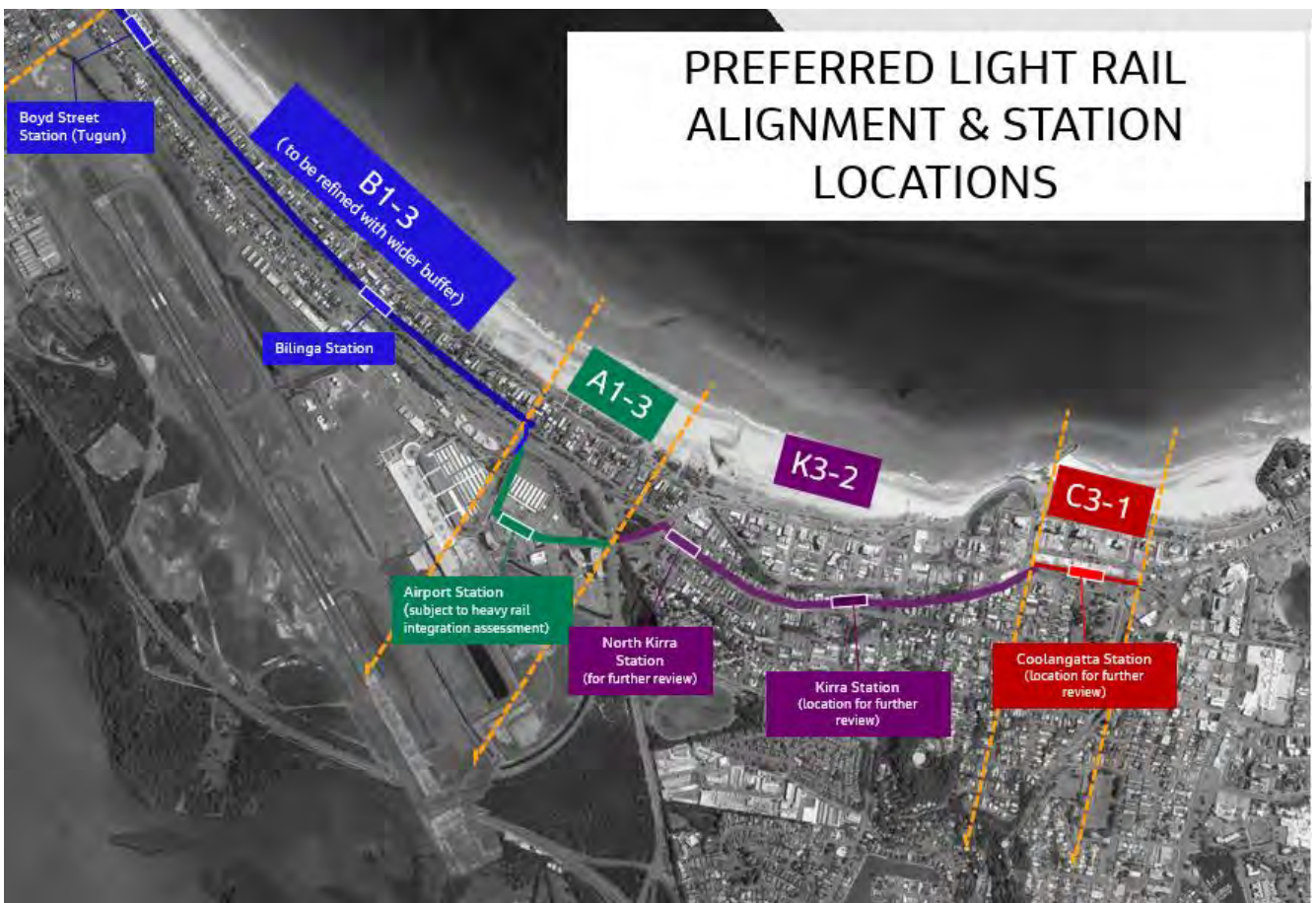


Figure A: Emerging preferred Light Rail alignment and station locations post MCA

## Preferred option

The refinement of the emerging preferred corridor option from the MCA included the following steps:

- Review stakeholder feedback and confirm the key design philosophy and design parameters guiding the option refinement
- Undertake additional investigations as required including traffic, land use, geometric design
- Update horizontal design including station location/ configuration and intersection layouts and complete conceptual three-dimensional (3D) design to confirm interfaces with existing features.

The refined preferred option as illustrated in Appendix J of this report included key refinements and changes as described on the following pages.



In **Bilinga**, the horizontal alignment was revised to retain a wider buffer between Golden Four Drive and the LRT corridor allowing some of the existing mature vegetation including Norfolk Island pines, to be retained. Further refinement was also undertaken with regard to local road access and connectivity between the Gold Coast Highway and the two service roads, Coolangatta Road and Golden Four Drive. Light Rail requires a rationalisation of the existing unsignalised accesses to improve safety and efficiency for all road users. The final design includes a new signalised all movement signalised T-intersection near the Airport and signalised access to/ from Gold Coast Highway north at Desalination Plant Road.



Figure B: Light Rail through Bilinga (looking south)

In the **Airport** section, extensive additional investigations were undertaken to inform feasible heavy rail alignments. A reassessment of the shortlisted public transport interchange location options reconfirmed that a station adjacent to the Rydges Hotel, around 150m from the southern end of the terminal building, provided the best outcome overall. Furthermore, the preferred option for the airport created a large area of unused TMR road corridor land between the Gold Coast Highway and the airport. This land was identified as being the optimal location for a new satellite depot and stabling facility for new Light Rail vehicles.



Figure C: Light Rail through Gold Coast Airport precinct (looking towards terminal building)

In the **Kirra** section, further analysis was undertaken of one station versus two with the agreed recommendation to progress with two stations, one at each end of Coolangatta Road to best serve existing and future land uses and the wider catchment. The location and orientation of the Kirra station was refined to reduce land impacts and improve traffic efficiency in the vicinity of Coolangatta Road and Miles Street. Following feedback from City of Gold Coast and further traffic and active transport analysis, changes were made to the cross section of Coolangatta Road to reduce this to one through lane each way, retain on street parking and provide on road cycle lanes.



Figure C: Light Rail through Kirra (looking east along Coolangatta Rd)

In the **Coolangatta** section, investigations were undertaken around specific station location options and following consultation with City of Gold Coast the terminus station was moved to Warner Street. This places the station more centrally to the precinct and provides good connectivity to Griffith Street and Marine Parade. The station location and configuration also considered a potential future extension into Tweed Shire, which is currently to subject of a Transport for New South Wales funded study. Further design development was also undertaken around the station, to include reconfigured at grade car parking, a station plaza area and bus stops/ kiss n ride facilities on Lanham Street. Lastly, options were investigated for the intersection of McLean Street/ Lanham Street/ Chalk Street with a revised arrangement allowing for all movements to/ from Lanham Street west to be retained.



Figure D: Light Rail terminus at Chalk Street/ Warner Street, Coolangatta