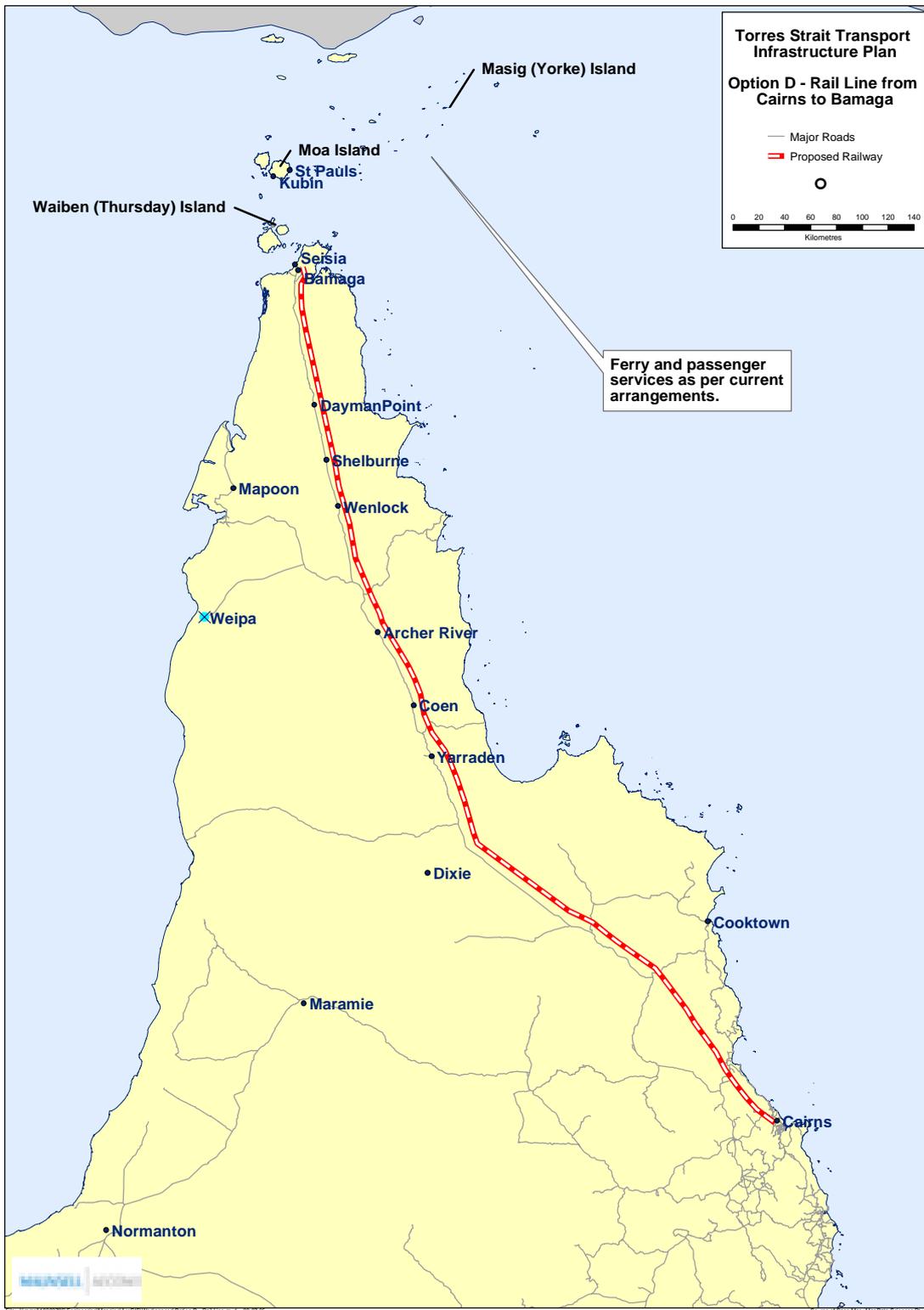


Figure 7.3 Option D – Rail Line from Cairns to Bamaga



Source for Base Map: MapData Sciences Pty Ltd

7.5 Option E – Option A with Additional Improvements

This option retains the existing services currently operating in the Torres Strait (as per Option A), however it includes additional improvements to the connections between Horn Island and Thursday Island. Two options have been strategically considered for this connection:

- Improved ferry connections; and
- Roll-on roll-off ferry.

Improved ferry connections

This improvement considers the combined freight and passenger services between Cairns, Bamaga and Thursday Island, with a connecting ferry service to OSTI communities. Possible improvements could include co-ordinating fares, ticketing and information services, and also improving safety, frequency and the cost of services.

Roll-on roll-off ferry

A roll-on roll-off operation between Thursday Island and Horn Island would provide significant benefits in moving people, cargo, and vehicles between the islands. It is noted that most of the major infrastructure to support the residents of Thursday Island is located on Horn Island, such as the water supply dam, landfill, airport and seaport. Therefore, such a ferry would provide for more economical movement between the islands. The following proposal was put forward in the study undertaken by PCQ and the TSRA in January 2003.

The following features were proposed for the ferry:

- 100 passenger capacity;
- 18 vehicle capacity;
- Will cater for demand for next 20 years plus; and
- Estimated cost of \$2.5 million, plus on-going operational costs.

The roll-on roll-off ferry services contributes to the system integration strategy and provides savings for a number of stakeholders, for example:

- Ambulance services provided by emergency services;
- School bus travel provided by Queensland Transport and Education Queensland; and
- Garbage and other waste services provided by TSC.

The original feasibility study conducted an economic evaluation of the roll-on roll-off ferry based on full cost recovery by PCQ for the shore based infrastructure which is a significant proportion of the overall cost. The full cost recovery model significantly raises ticket prices and affects the economic viability of the service. However, if an initial grant was to fund the shore based infrastructure, the economic viability of the service would improve greatly such that it would have been viable at the time of the study. The original feasibility study requires updating and should also consider the economic impact of an initial capital grant for construction of infrastructure rather than a full cost recovery model.

7.5.1 Bridge connection

An alternative (long term) bridge connection could also be strategically considered, linking Horn Island with Thursday Island.

Based on previous studies undertaken on a proposed bridge, approximate details are:

- Length of 2.18km, comprising of 67 X 32 spans, and 1 X 34 navigation span;
- Width of 8.6m (between kerbs);
- Approximate roadworks to connect the bridge:
 - 100m on Thursday Island;
 - 800m on Horn Island; and
- Cost estimates (approximate 2005 costs):
 - Bridge cost assuming \$5,000/m²: \$101 million;

7.7 Assessment of Transport Options

The transport options developed through the stakeholder consultation process were assessed to qualitatively measure how well the identified options meet the community needs and desires. The methodology and results are discussed below.

7.7.1 Multi-Criteria Analysis

The multi-criteria analysis (MCA) for assessing the transport options for the Torres Strait includes eight evaluation criteria. These criteria underlie the planning framework vision, desired outcomes and objectives outlined in Section 6.0, to allow for a broad evaluation of the transport options in relation to key transport issues and community needs and values. This provides a focused assessment of the transport options and the easy identification of the most appropriate transport option for the Torres Strait.

The evaluation criterion includes the following categories:

1. Integration;
2. Accessibility;
3. Connectivity;
4. Serviceability;
5. Cost of Implementation;
6. Attractiveness to Travellers;
7. Community Development; and
8. Environmental Responsiveness.

Integration

Aspects of the transport options assessed under the integration criteria include:

- Effectiveness to integrate a range of transport modes that provide inter-island access and links to Cairns at centrally located and identifiable nodes; and
- Linkages with regionally significant centres of population, employment, community services and facilities, shopping and recreation.

Accessibility

Aspects of the transport options assessed under the accessibility criteria include:

- Number of transport options available;
- Equitable access amongst the island language groups and across the broader Torres Strait region; and
- Flexibility of routes to respond to special travel requirements and in emergencies.

Connectivity

Aspects of the transport options assessed under the connectivity criteria include:

- Travel time between outer islands to key nodes;
- Number of travel route options between nodes;
- Directness of routes within island language groups and across the broader Torres Strait region; and
- Service coverage.

Serviceability

Aspects of the transport options assessed under the serviceability criteria include:

- Safety, comfort and reliability of the transport system to operate in all conditions; and
- Practicality of the system to manage passenger and freight transport requirements.

Cost of Implementation

Aspects of the transport options assessed under the cost of implementation criteria include:

- Capital costs associated with constructing/implementing the transport system; and
- Operating costs of the transport system.

Attractiveness to Travellers

Aspects of the transport options assessed under the attractiveness to travellers criteria include:

- Likely cost of fares for travel and freight transport; and
- Appeal of using a particular mode of travel within the Torres Strait and to Cairns.

Community Development

Aspects of the transport options assessed under the community development criteria include:

- Opportunities to generate local employment in its construction/implementation and on-going operation;
- Ability to support social development through greater community interaction within the island language groups and across the broader Torres Strait region; and
- Ability to provide access to social services, community facilities, shopping and recreation.

Environmental Responsiveness

Aspects of the transport options assessed under the environmental responsiveness criteria include:

- Ability to maintain environmental values;
- Likely effect on marine systems and environments; and
- Likely effect on terrestrial flora and fauna.

7.7.2 Findings of the Multi Criteria Analysis

The scoring of the transport options against the criteria and ranking of the transport options is summarised in **Table 7.3**.

The eight criteria were assigned a score between 1 and 6. A score of 1 meant that the transport option does not effectively address the criteria, whereas a score of 6 means that the transport option does effectively address the criteria. In some cases there are no real differences between options in terms of some criteria. In this case they are scored equal.

Each criterion has an equal weighting in the MCA because they:

- Assess the key aspects that are necessary in an efficient transport system which interrelate; and
- Address key issues and community values which are considered to be most important when implementing transport improvements in the Torres Strait (eg serviceability cost of implementation, attractiveness to travellers, community development and environmental responsiveness).

Table 7.3 Multi-Criteria Analysis of Transport Options for the Torres Strait

Criteria	Option					
	A	B	C	D	E	F
Integration	3	4	4	2	4	3
Accessibility	3	4	4	3	4	3
Connectivity	4	3	3	2	5	3
Serviceability	5	3	3	4	5	3
Cost of Implementation	6	2	2	1	5	4
Attractiveness to Travellers	3	4	4	1	4	4
Community Development	2	3	3	3	3	5
Environmental Responsiveness	5	3	3	2	4	4
Total Score	31	26	26	18	34	29
Ranking	2	4	4	6	1	3

Based on the findings of the MCA, the ranking of the six transport options from most suitable to least suitable are:

1. Option E – Continuation of current services (Option A) with additional improvements;
2. Option A – Continuation of current services;
3. Option F – Sea transport proposal;
4. Option B – Establish a second passenger and freight hub at a central island;
5. Option C – Hub and spoke arrangement for passenger transport by ferry; and
6. Option D – Rail line from Cairns to Bamaga.

This ranking means that it is most likely that Option E is the most suitable transport network to service the Torres Strait, as it best supports the planning framework vision, desired outcomes and objectives outlined in **Section 6.0**. Therefore, Option E will form the basis for developing actions in the integrated transport plan outlined in **Section 8.0**.

An explanation for the scores is outlined below.

Integration

Options B, C and E ranked the highest score for this criterion and are considered to equally provide high levels of integration. Option B includes the implementation of a second major transport hub at Yorke Island to provide local access to inter-island and Cairns air services for both inner and outer islands. Option C includes small transport air/ferry hubs at central islands within island language groups which link with inter-island and Cairns air services via the existing major transport hub at Horn Island. Option E will also contribute significantly to integration, but in a different way, through improved ferry connections between the main inner islands.

Option A and F will provide sound levels of integration. Option A will consist of a continuation of existing transport services which provide adequate levels of integration. Option F includes the introduction of a new inter-island ferry service.

Option D will provide the lowest level of integration. This is evident as the rail system would terminate at Bamaga which would necessitate interchanging between bus and ferry to reach airport and ferry services at Thursday and Horn Islands. Similarly, freight carried on the rail line will require additional handling compared to it being transported to the region entirely by ship from Cairns.

Accessibility

Options B, C and E ranked the highest score for this criterion and are considered to equally provide high levels of accessibility. Option B provides a high degree of accessibility by structuring transport services around a two hub configuration which allows for local access amongst inner and outer islands and connections between the two hubs. Option C provides a high degree of accessibility by linking a higher order hub to centrally located islands within each island language group, where local transport services then operate to local inter-island services within the island language group. Option E provides a high degree of accessibility by advancing existing freight and passenger services between Cairns and Thursday Island with a connecting ferry service to outer islands. It also includes a roll-on roll-off ferry between Horn and Thursday Islands.

Option D and Option F will generally provide similar levels of accessibility for different reasons. Option D will not provide improved accessibility between inner and outer islands, but will provide an alternative reliable transport mode for passengers and freight to the region from Cairns. Option F will improve the accessibility between the inner and outer islands albeit on a rotational, rather than direct trip. It will not impact the accessibility to Cairns.

Option A provides adequate levels of accessibility, however this is bettered by the introduction of new infrastructure and service improvements in all other options apart from Option D which

Connectivity

Option E scored the highest score for this criterion. It will provide the greatest level of connectivity as it consists of improvements to existing transport services which under normal operation provide wide service coverage, direct trips and acceptable travel times.

Option B and C will provide similar levels of connectivity. Option B will generally provide good connectivity for local inter-island trips within the inner and outer island groups, however it provides limited connectivity for trips between the outer and inner islands. Option C will generally provide good connectivity within the same island language group, however it provides limited connectivity for trips between island language groups due to the single hub configuration.

Option F will provide a low level of connectivity as the new service would operate an indirect all-stops route to each islands, rather than a point-to-point service. Option F also does not provide direct services to major transport hubs for air services such as Thursday/Horn Island and Yorke Island.

Option D will provide the lowest level of connectivity between existing transport hubs, as the rail system would terminate at Bamaga and would require the implementation of a number of interchanges between ferry and bus services to access existing air and ferry service hubs at Horn Island and Thursday Island.

Serviceability

Option A and E scored the highest score for this criterion. These options will consist of the continuation of existing transport services which are already proven to provide a high level of serviceability in relation to safety, comfort and reliability.

Options B, C and F are likely to perform similarly to each other, but not as well as Options A and E.

Option D will provide reliable and comfortable passenger transport between Cairns and the Torres Strait, however due to the need for additional handling of freight from truck to ferry, it may not be as practical for freight transport.

Cost of Implementation

Option A will have the lowest cost of implementation as it will consist of a continuation of existing transport system.

Option E be the next lowest cost option, with the only costs being for the improved connectivity between Horn and Thursday Islands (roll-on roll-off ferry and improved ferry connections). Note that this does not account for the cost of the bridge connection between Horn Island and Thursday Island.

Option F is likely to have slightly higher implementation costs than Option E as it will involve the establishment of new sea transport services.

Option B and C would have similar implementation costs. Option B will have implementation costs associated with establishing and operating a second air and ferry hub at Yorke Island. Option C will have implementation costs associated with upgrading and operating a major freight and passenger hub at Thursday/Horne Island for ferries.

Option D will have significant implementation costs associated with the construction of the rail line and establishing transfer facilities between Bamaga and Thursday/Horn Island.

Attractiveness to Travellers

The findings of a travel survey conducted as part of the study identified that most people travelling between the various Torres Strait islands and to Cairns considered air transport as the most attractive travel option due to comfort and travel time. Ferry trips were generally not supported, particularly for longer trips, due to rough ocean conditions. The continuation of existing air services (Option A) without improvements to cost, reliability and directness of some air services is not considered to be as attractive as Options B, C and E which include improvements to these aspects of air transport in the area.

Ferry services provided by Option F will be more suited to freight transport and for short inter-island trips, rather than longer passenger journeys, but provides an improvement over option A.

Option D is not considered to be an attractive travel option to Cairns due to the travel time, cost of fares and need to transfer to a ferry from Bamaga to Thursday/Horn Island.

Community Development

Option F is likely to provide community benefit as it will increase local employment opportunities during its operation. It will also provide safe and reliable freight and passenger transport between the Torres Strait and other remote areas of Cape York to Cairns. The rail line will also have significant tourism value by providing a comfortable and unique method of visiting the area.

Option B, C, D and E will each provide structured approaches to servicing the transport needs of the Torres Strait with similar levels of community development within and between language groups. This will allow for greater community interaction throughout the Torres Strait than Option A.

Environmental Responsiveness

Options A is ranked the highest score for this criterion as it will retain the existing transport system and not include the introduction of new transport elements that may cause negative impacts on environmental values.

Option E and F will also retain much of the existing transport system with introduction of some new transport elements that may potentially cause negative impacts on environmental values.

Options B and C will introduce new elements to the transport system which could potentially cause negative impacts on environmental values

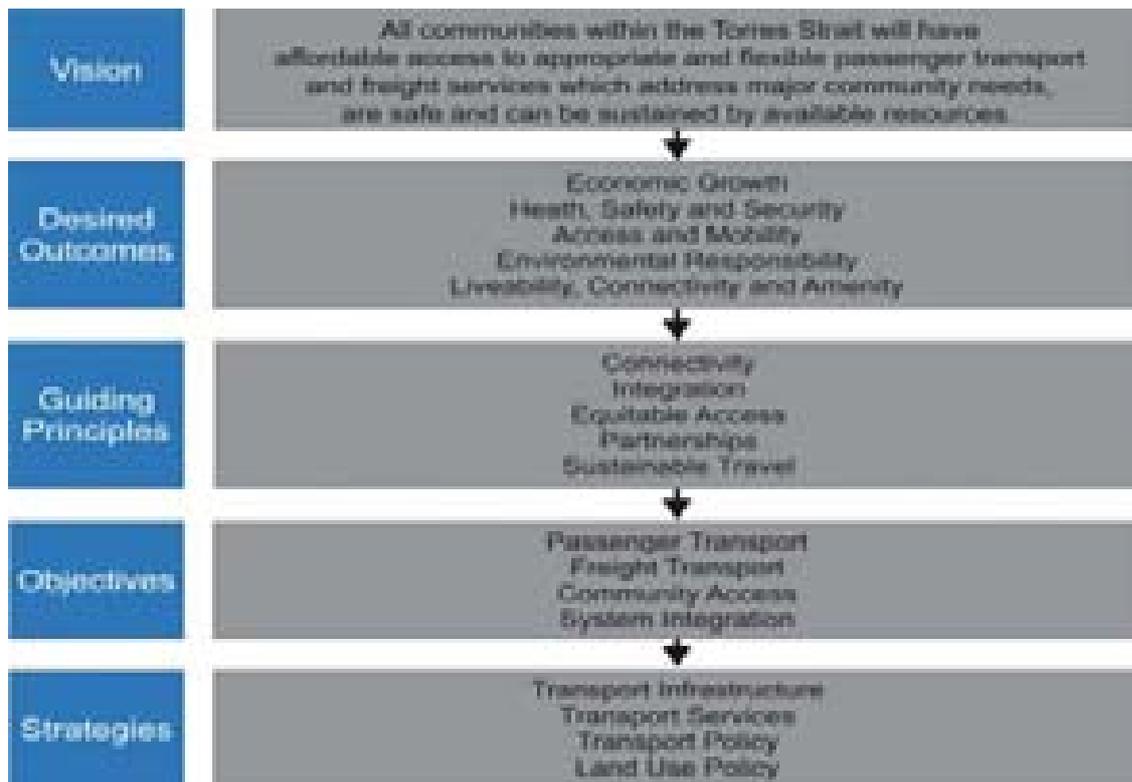
Option D will have significant environmental impact associated with the construction of the rail infrastructure.

8.0 Integrated Transport Plan

8.1 Strategies and Actions

This section identifies potential strategies to address the planning framework vision, desired outcomes and objectives outlined in Section 5.0.

Figure 8.1 Planning Framework



While the purpose of this study was to develop an infrastructure plan and actions, some complementary transport services issues were also identified. Recommendation are therefore made for further investigation of these issues.

The actions have been linked to the following four transport objectives:

- 1) Passenger transport – improve access and reduce travel costs;
- 2) Freight transport – improve freight facilities and efficiencies;
- 3) Community access – improve access to community support activities (admin centre, shops) and ensure these are integrated with transport networks; and
- 4) System integration – connect the islands’ communities and contribute to the way they live, work and play.

The actions have assigned to them lead agencies, supporting agencies and priorities.

The priorities relate to the following planning horizons, short term to 2010, medium term to 2015 and long term beyond 2016 to 2026.

The following abbreviations are used to describe the following implementation agencies: