



2 STRATEGIC CONTEXT

CHAPTER SUMMARY AND CONCLUSIONS:

- As a large decentralised state, Queensland faces challenges in ensuring the supply chain can link producers with export markets. The Port of Townsville (PoT) is a strategically important piece of transport infrastructure that provides the final link in the supply chain for a range of industries and producers in north Queensland. Demand at the PoT is forecast to increase in the long-term, with growth in containerised and break-bulk freight, and liquid/dry bulk commodities.
- The upgrade of the Mount Isa Line and Townsville rail corridor, including the delivery of TEARC, is seen as a priority by the Australian Government, Queensland Government, Townsville City Council and supply chain markets. TEARC has been identified as critical enabling infrastructure to support the optimal port layout and PEP.
- There are a number of current policies and existing studies which highlight the strategic need and benefits of TEARC for regional economic development:
 - Provide additional rail capacity and ability to accommodate longer trains to support the efficiency of the resources sector.
 - Provide additional access capacity to support new operations within the PoT. There is some latent capacity within the PoT but not sufficient space for new entrants that constrains growth, and potentially future throughput volumes.
 - Improve freight efficiency and boost capability of the PoT by removing bottlenecks within the port caused by road and freight movement conflicts through at-grade crossings.
 - Support the activation of the Townsville State Development Area by providing a strategic freight link with direct access to the PoT, North Coast Line and Mount Isa Line.
 - Diverts freight away from the North Coast Line, helping to address road network impacts associated with at-grade crossing and urban amenity impacts from freight rail operations within the urban areas of Townsville.
- The strategic context of TEARC is strongly identified as an enabling infrastructure investment to support future PoT development. The Project is also identified as a critical enabler for the optimal future PoT layout. In particular, the designation of the PoT as a Priority Port under the *Sustainable Ports Development Act 2015* ensures increased coordination of the PoT expansion plans with TEARC.
- TEARC is also strategically aligned with the Townsville development plans, including the development of the Townsville City Waterfront Priority Development Area and the Townsville State Development Area (TSDA).
- TEARC provides strongly aligned planning benefits to Townsville.

This chapter outlines:

- Policy context that supports the TEARC DBC.
- Key land development and infrastructure delivery projects influencing the TEARC DBC.
- The assessments undertaken in the TEARC PE.



2.1 Policy Context

Key policy drivers that influence the TEARC DBC include:

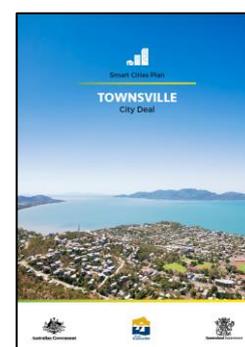
- Smart Cities Plan – *Townsville City Deal (2016)*
- TSDA – Development Scheme
- Townsville Port Expansion Project
- Mount Isa Line Rail Infrastructure Master Plan
- Northern Australia Infrastructure Audit
- Australian Infrastructure Plan
- National Priority List
- Priority Port Master Plan
- A Strategic Blueprint for Queensland’s North West Mineral Province.

2.1.1 Smart Cities Plan – *Townsville City Deal (2016)*

The *Townsville City Deal (2016)* is a 15-year commitment between the Australian Government, Queensland Government and Townsville City Council to work together to deliver a program of planning, reform and investment in Townsville.

The program has six objectives aimed at improving the competitiveness of Townsville:

- Capital of the North
- Innovative and Connected City
- Port City
- Industry powerhouse for the North
- Defence hub
- Enabling infrastructure.



TEARC supports the delivery of Industry Powerhouse for the North and Port City objectives by supporting efficient supply chain operations.

The development of a TEARC DBC is specifically noted as an action of the Industry Powerhouse for the North objective. The action is to prepare the TEARC business case by the end 2017.

TEARC is identified as enabling infrastructure, supporting other actions in the program including the future development of the TSDA and PoT. A subsequent activity under the Industry Powerhouse for the North objective is to investigate how TEARC delivery can be considered as a part of the broader innovative funding and financing options associated with the acceleration of the TSDA and the future expansion of the PoT.

The *Townsville City Deal (2016)* confirms the Prime Minister, the Hon Malcolm Turnbull MP committed \$150 million in May 2016 to the delivery of the TEARC, including the joint funding of the DBC with the Queensland Government and subject to the findings of the business case. The Australian Government has subsequently transferred \$3 million of this funding to the Department of the Prime Minister and Cabinet to explore options for innovative financing and value capture opportunities for the delivery of this project and other



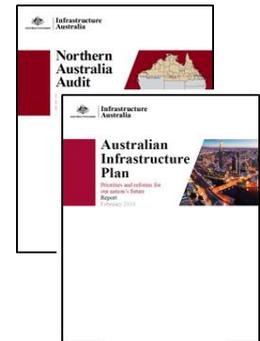
projects associated with the Townsville City Deal. This work is currently being undertaken in parallel to the development of the TEARC DBC.

A key centrepiece of the *Townsville City Deal (2016)* is “to establish Townsville as the preferred location in North Queensland for significant industrial development through the expansion of the PoT, the acceleration of development within the Townsville State Development Area, the TEARC and the Townsville Industrial Development Board.”

2.1.2 Northern Australia Infrastructure Audit & Australian Infrastructure Plan

The *Northern Australia Infrastructure Audit (2015)* assessed critical economic infrastructure gaps and requirements to meet projected northern Australia population and economic growth through to 2031.

The *Northern Australia Infrastructure Audit* identifies northern Australia is rich in natural resources and agricultural land, but lacks the infrastructure to fully exploit its growth potential. It concludes economic development in northern Australia requires resilient export related infrastructure with sufficient capacity, good connections with southern Australia, and links between the growing urban economies of Darwin, Cairns, Townsville, Mackay and their hinterlands.



The *Northern Australia Infrastructure Audit and Australian Infrastructure Plan (2016)* identifies the need to upgrade Mount Isa – Townsville Rail Corridor to address speed, train lengths, axle loadings constraints, weather resilience and urban amenity in Townsville.

2.1.3 National Priority List

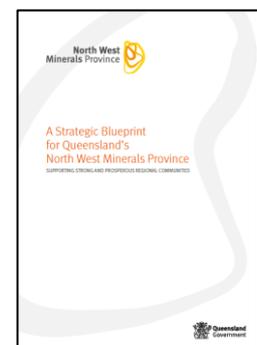
The Infrastructure Australia (IA) *National Priority List* identified The Mount Isa – Townsville Rail Corridor, including TEARC, as a national priority in 2010. Its significance to economic development was reconfirmed in the 2017 update, and is categorised as “Early Stage - nationally significant issue or problem, but the identification or development of the right solution is at an early stage”.

The IA National Priority List finds “The Mount Isa - Townsville rail corridor, including TEARC, is identified as a supply chain of national significance that requires capital investment to support future economic development.”

2.1.4 Strategic Blueprint for Queensland’s North West Minerals Province

A *Strategic Blueprint for Queensland’s North West Minerals Province (2016)* was prepared by the North-West Minerals Province Taskforce with the support of the Queensland Government, to address the social and economic issues and opportunities facing the resources sector in the region. The Department of State Development is responsible for leading the implementation of the blueprint.

The blueprint contains a range of short and medium-term actions (2017 – 2021) under three strategic priorities. TEARC is identified as a key action supporting Strategic Priority 2. Diversifying the regional economy and creating employment opportunities. It acknowledges the Queensland Government commitment to continuing to support feasibility work for more stable and reliable freight services between Mount Isa and Townsville.





The *Strategic Blueprint* states:

- Common user infrastructure provides the opportunity to drive down development costs for individual projects, with multiple users contributing to the development of, and benefiting from key forms of infrastructure required for mining and other projects. This may include transport infrastructure such as road, port and rail.

This project is expected to create greater capacity on this section of the Mount Isa Line rail system, which is a critical link between the Province and the PoT.

2.2 Industrial Development & Urban Renewal Planning

The proposed development of TEARC cannot be considered as a standalone project in the context of other related projects in Townsville. The other industrial development and urban renewal projects that inform the development of TEARC include:

- PoT Expansion Project
- PoT Priority Port Master Plan
- TSDA
- Townsville City Waterfront Priority Development Area
- Townsville City Plan.

These plans are summarised in further detail below.

2.2.1 Port of Townsville

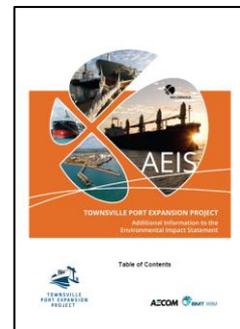
The *Port Expansion Project (PEP)* was initiated by the PoT in 2011 and has been developed under the umbrella of the Priority Port Master Planning process. The PEP is currently the subject of both Australian and Queensland Government AEIS review and approval processes, which are in the final stages. The project is intended to respond to the immediate need to cater for larger ship sizes in the channel and swing basins, and address the medium and long-term need for additional berths.

The ultimate scope of the port expansion includes:

- Deepening and widening of existing approach channels
- A new deep water outer harbour
- Six additional berths in the new harbour
- Reclamation of 152 hectares of land for new berths, bulk cargo storage and a rail loop.

The project is proposed to be a staged development with the initial works for channel widening planned to commence in late 2017, subject to AEIS approval. The PEP is not included in the TEARC DBC reference project scope of work. Future stages of the PEP will require TEARC to proceed.

A *Priority Port Master Plan* is currently being prepared for the PoT. The Department of State Development is leading the master planning process working with the PoT, Townsville City Council and other key stakeholders.





The *Priority Port Master Plan* process will supersede the previous *Port Development Plan 2010 – 2040 (2009)*, which outlines proposed short, medium and long-term development and infrastructure needs to support port trade forecasts.

Master planning of the PoT is a port related action of *Reef 2050 Long-Term Sustainability Plan* and mandated under the *Sustainable Ports Development Act 2015*. This master planning process seeks to optimise the use of infrastructure and address operational, economic, environmental and community relationships as well as support supply chain and land uses opportunities.



The *Priority Port Master Plan* process is currently in its early phases of background assessment that will inform the preparation of the draft master plan for comment.

The *Port Development Plan 2010 – 2040* identifies the need for TEARC as an enabler for the future development of the Port in the medium term.

- The *Port Development Plan* found “PoT services two freight links that are of national strategic importance, the Mount Isa Line and North Coast Line. Constructing TEARC to integrate the supply chain between the Mount Isa and North Coast Lines with the PoT will support increased transport volumes, provide a competitive advantage to Townsville for export trade.”

The *Port Infrastructure Layout and Land Allocations Study (2016)* was prepared to inform the current Priority Port Master Plan process.

The purpose of the report is to:

- develop an infrastructure and land use layout to accommodate forecast trade volumes to 2043/44
- optimise existing infrastructure and available port land
- ensure future port expansion plans can be accommodated.

The report identifies “the construction of TEARC and its associated rail loop within the port eastern reclamation area is a critical enabler for the optimal port layout to be achieved”. It notes without TEARC:

- The proposed dry bulk rail loop cannot be delivered without a new rail connection to the loop.
- Dry bulk rail receipt multi-user facilities cannot be installed.
- The general cargo area cannot be fully developed.
- The general cargo spur line and intermodal facility cannot be developed.

Future growth of the port is constrained by current infrastructure layout and location of dedicated unloading facilities interfacing to the current rail network within the port. TEARC will enable the PoT to develop an optimum layout as part of its PEP with new rail loops on the eastern reclaimed land. The PoT will plan to progressively relocate single use unloading facilities (e.g. sugar and Glencore) to the new area, which over time will negate the requirement for the Jetty Branch. As the timing of the future port layout changes are not known, the removal of the Jetty Branch cannot be scheduled with any certainty. The Jetty Branch is excluded from the DBC Reference Project, its removal is likely to be subject of a future business case, possibly in conjunction with the PEP.



2.2.2 Townsville State Development Area

The TSDA was declared in 2003. It encompasses 4,915 hectares of industrial land located about six kilometres south-east of the Townsville CBD and two kilometres south of the PoT. The TSDA is intended to accommodate industries including; manufacturing (chemicals and metals production), minerals processing, intermodal freight and logistics, and bulk storage. Vast areas of the TSDA have yet to be developed. Key activities established in the precinct include two intermodal freight terminal facilities, metal refineries and a meat processing facility.

A preserved corridor owned by the Queensland Government for TEARC traverses the TSDA. The TSDA Development Scheme zones the TEARC corridor as a Materials Transportation/Services Corridor Precinct. Its alignment was defined based on preliminary investigations carried out by the Department of Main Roads and QR between 1996 and 2000 (Figure 2.1).

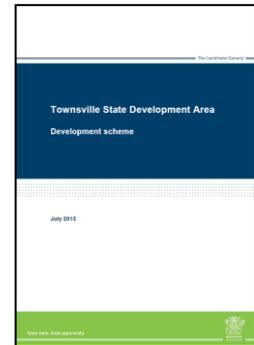
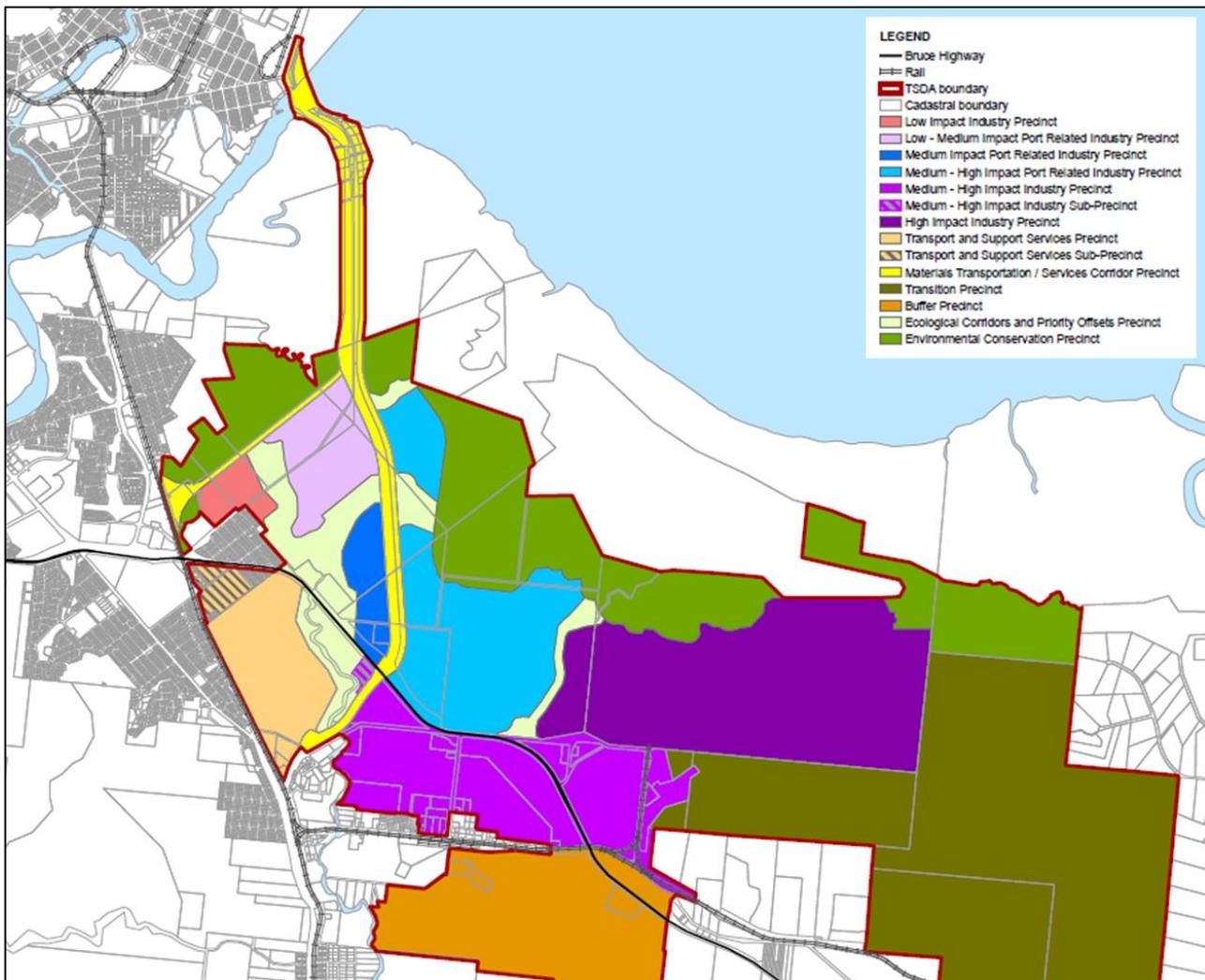


Figure 2.1 Townsville State Development Area



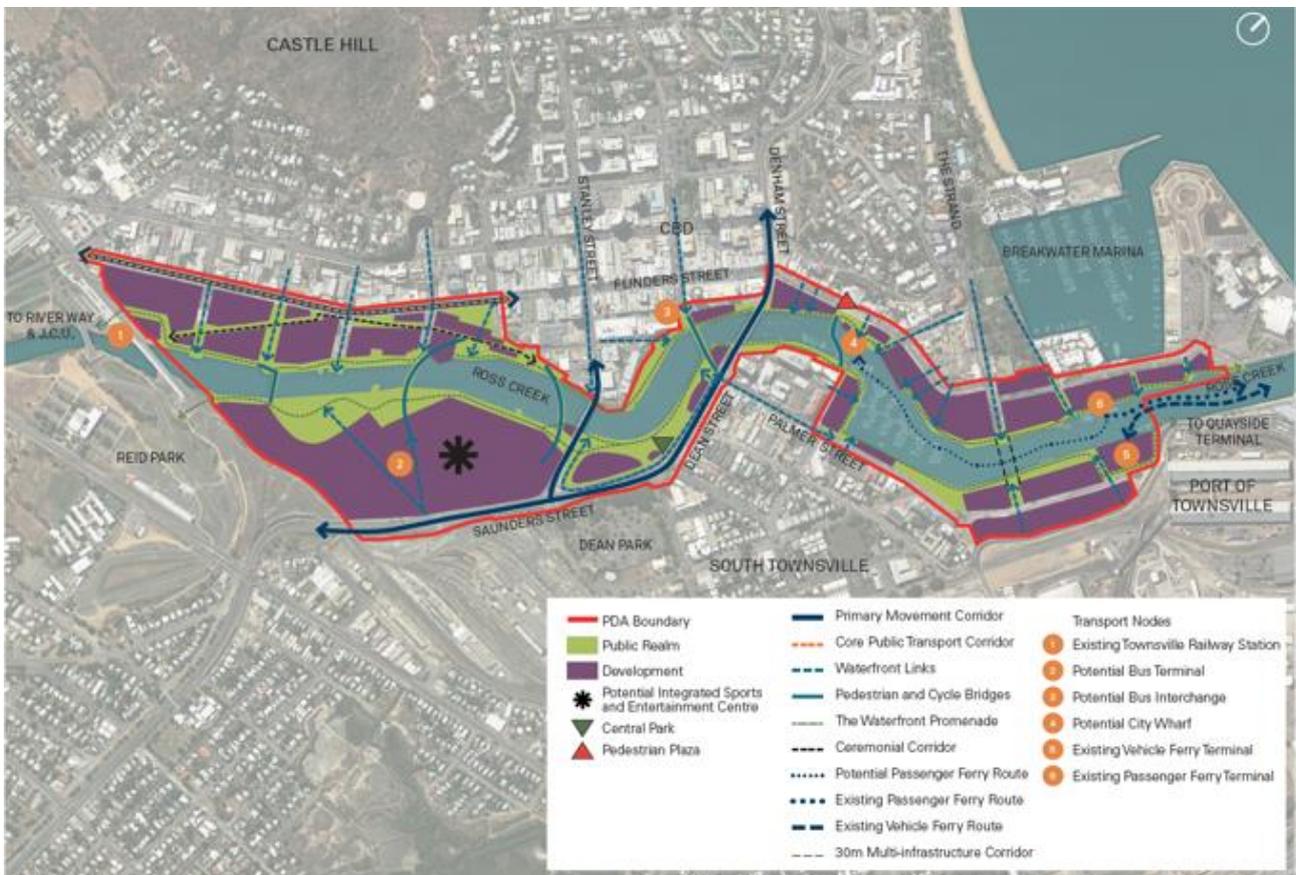


2.2.3 Townsville City Waterfront Priority Development Area

The Townsville City Waterfront Priority Development Area (PDA) was declared in 2016. It includes approximately 97 hectares of land that is located on both sides of Ross Creek, directly adjacent to Townsville Central Business District (CBD) and port activities. The precinct is planned to accommodate 30,000 people and include mixed-use development, public open space and community facilities as an extension to the existing CBD. The precinct will include the new North Queensland Stadium.

The PDA adjoins the existing North Coast Line branch into the PoT. The PDA and adjoining residential precinct incurs amenity impacts from rail operations. These impacts will increase with future growth in rail freight demand. TEARC offers the potential to divert freight rail movements away from the North Coast Line, helping to alleviate pressure on the road network, improve freight efficiency and deliver improvements to urban amenity and safety. The Townsville waterfront PDA is shown in Figure 2.2.

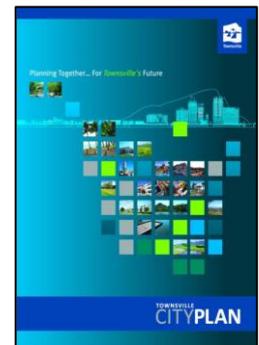
Figure 2.2 Townsville City Waterfront Priority Development Area



2.2.4 Townsville City Plan

The Townsville City Plan is targeting a population of 270,000 – 300,000 by 2031. An increase of approximately 100,000 with targeted employment growth of 50,000.

The city has historically achieved sustained growth from its strong defence, port and transport sectors, and by its strategic importance as a transport hub for the North-West Minerals Province and North Queensland agricultural sector. Future growth is anticipated in transport, storage and logistics industries, manufacturing (metals, food and beverage), defence, the knowledge economy (including education and





research), the aviation industry, health, professional services, building/building supplies and tourism.

As the city population grows, it is increasingly important to plan for the future to support the revitalisation of the CBD and improve links between key economic precincts. The North Coast Line currently runs through the heart of the southern Townsville suburbs and causes amenity impacts to adjoining urban areas. Multiple level crossings also contribute to delays and safety issues on the road network.

With major new residential developments planned for the south of Townsville and potential future growth in freight rail demand, road and urban amenity impacts are likely to increase. TEARC offers the opportunity to divert freight rail movements away from the North Coast Line, and ultimately the removal of Jetty Branch rail access to the PoT adjacent to Perkins Street, helping to alleviate pressure on the road network, improve freight efficiency and deliver improvements to urban amenity and safety.

2.3 Mount Isa Line

There have been a number of previous freight demand and supply chain studies undertaken to inform planning and delivery on the Mount Isa Line, including TEARC. Key documents and infrastructure projects that provide context to the strategic importance of TEARC include:

- Mount Isa Line Rail Infrastructure Master Plan (2012)
- Mount Isa – Townsville Economic Zone 50 Year Freight Infrastructure Plan (2012)
- Mount Isa Line works and the proposed Mount Isa to Tennant Creek Rail Link.

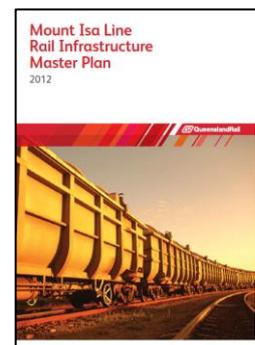
2.3.1 Mount Isa Line Rail Infrastructure Master Plan

The *Mount Isa Rail Infrastructure Master Plan (2012)*, prepared by QR, investigated low, medium and high growth scenarios to 2020 for the Mount Isa Line.

The plan acknowledges the PoT is a critical supply chain partner on the Mount Isa Line and is the primary destination for most products hauled on the line. The plan identifies that TEARC becomes essential once tonnage levels reach 20mtpa, due to the traffic congestion caused by a large number of trains servicing the PoT across numerous level crossings within the Townsville urban area, which negatively impacts on traffic flows and urban amenity.

The plan identified the following potential benefits of TEARC:

- Increased volumes transported on the Mount Isa Line through the PoT.
- Improved efficiency with longer and faster trains.
- Reduced bottlenecks in and around the PoT.
- Improved urban amenity, including increasing safety and reducing traffic delays by diverting bulk freight transport away from Townsville suburbs.

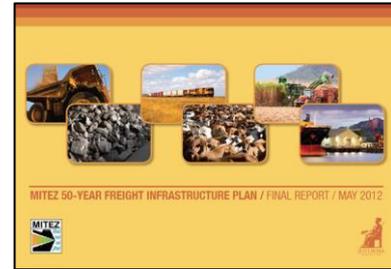




2.3.2 Mount Isa – Townsville Economic Zone 50 Year Freight Infrastructure Plan

The *Mount Isa – Townsville Economic Zone 50 Year Freight Infrastructure Plan (2012)* was prepared for the Mount Isa – Townsville Economic Zone at the request of Infrastructure Australia. This report considered the overall demand outlook for the freight transport system and supply chain including the Mount Isa Line, TEARC, TSDA and PoT.

The plan forecasts the PoT will have a demand (medium demand scenario) of up to 20mtpa, which includes 10mtpa of coal. The plan notes the PoT will retain demand for high-value, low volume commodities. There is an emerging regional trend to low-value, high-volume commodities in the medium to longer term, such as coal and magnetite that will require more rail-to-stockpile infrastructure.



The plan acknowledged the outcomes of the *TEARC Preliminary Evaluation: Economics and Market Sounding (2011)* report and noted the need for the analysis on specific commodities that would benefit from TEARC.

The plan recommended it would be prudent to:

- Investigate the potential to extract greater efficiency in the short to medium term from the existing North Coast Line and Jetty Branch into the PoT for use by existing commodities passing through the port.
- Continue planning for TEARC, given its capacity for potentially handling coal and proximity to the TSDA that could accommodate stockpile infrastructure.
- Investigate the optimal timing for the implementation of TEARC, taking into consideration the transition costs and risks associated with transitioning existing port users to utilise the alternative rail corridor.

2.3.3 Mount Isa to Tennant Creek Proposed Rail Link

A number of studies by the Australian, Northern Territory and Queensland Governments have been completed to analyse the need to develop a 600 km rail link between Mount Isa and Tennant Creek in the Northern Territory. This would connect the North-West Mineral Province with the Port of Darwin. The potential rail link is considered to be enabling infrastructure to provide seamless supply-chain connections between regions around Mount Isa and Tennant Creek with the ports of Townsville and Darwin.

Subject to the technical, environmental, financial and economic feasibility of the Mount Isa to Tennant Creek proposed rail link, the Mount Isa – Darwin rail link will potentially be contestable, assuming costs are comparable with the PoT. The supply-chain cost and efficiency benefits over the existing routing via Mount Isa -Townsville would need to be attractive to use the Port of Darwin. This was not considered to be a material impact on the TEARC DBC and has been excluded from the scenario analysis for the TEARC DBC.

2.4 Townsville Eastern Access Rail Corridor

Key previous studies and investigations which form the basis to the TEARC DBC include the:

- Townsville Port Access Study (1996)
- Townsville Port Access Impact Assessment Study (2000)
- Eastern Access Corridor Preservation and South Port Road development
- TEARC Preliminary Evaluation: Economics and Market Sounding (2011).



2.4.1 Townsville Port Access Study and Port Access Impact Assessment Study

The *Townsville Port Access Study (1996)* and subsequent *Townsville Port Access Impact Assessment Study (2000)* were commissioned to identify a suitable transport access for the PoT which minimised the impact on Townsville urban areas and met demand to 2025. The study investigated both the upgrade of the existing road and rail port access corridors and the development of a new eastern corridor. The studies recommended:

- Road and rail access should be maintained on the existing corridor along on Perkins Street and Jetty Branch.
- A new Eastern Access Corridor be preserved enabling the merits of future road and rail access to be considered once there was an emerging capacity need.

The report indicated the construction of a new road connection within the preserved corridor (known as the Southern Port Access Road or Southern Port Road) is likely to be warranted in the short term and that a new rail link would be only warranted in the long-term. The report noted the urban amenity improvements would likely be one of the primary benefits of the Eastern Access Corridor, as it would reduce impacts on residents in terms of noise, vibration and exhaust emissions, and improve safety through reduced risk of incidents involving dangerous goods.

2.4.2 Corridor Preservation and Southern Port Road

The Queensland Government endorsed the *Townsville Port Access Impact Assessment Study (2000)* in November 2001 to allow detailed planning and land acquisition of the Eastern Access Corridor.

The 7.5 km Southern Port Road was constructed between 2008 and 2012 and is a designated heavy vehicle route linking the Flinders and Bruce Highway with the PoT. The road has delivered increased capacity to support freight movements to and from the port, and has reduced heavy vehicles in the Townsville urban area

2.5 TEARC Preliminary Evaluation

The *TEARC Preliminary Evaluation: Economics and Market Sounding (2011)* was prepared on behalf of QR. The document focused on:

- tonnage demand projections based on anticipated mining and port activity
- preliminary economic analysis using benefits cost analysis methods
- preliminary market sounding for private sector involvement and delivery options.

The document drew on existing demand forecasting reference documents, and was not informed by rail capacity simulation, preliminary engineering design and cost estimation.

The report provided the following highlights and findings.

2.5.1 Preliminary Evaluation Scope

Service Needs —The service requirements for TEARC defined in the PE were to:

- meet growing demand on the Mount Isa Line
- facilitate the use of 1,400m long trains
- reduce bottlenecks in the PoT
- improve urban amenity for suburbs of Townsville.

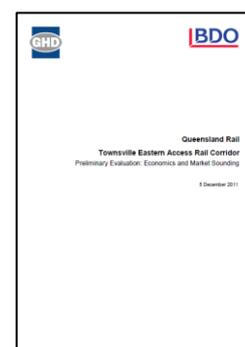


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Demand Projections: The PE adopted the following demand projections for the period 2012 to 2030 (excluding coal):

- 8mtpa (low demand scenario)
- 10.4mtpa (medium demand scenario)
- 15.3mtpa (high demand scenario).

Note the sensitivity analysis included an additional 10mtpa of coal with the high case. However, the NPV was lower with coal because of the additional investment required for infrastructure in rail, rollingstock and port.



Nameplate Capacity of the PoT: The PoT trade figure in 2010/11 was 10.6mt. If single track constraints along the Jetty Branch were addressed with some upgrades to terminal operations the nameplate capacity of the PoT is assumed to be 15mtpa.

With the addition of Berth 12 wharf, associated balloon loops and channel dredging for Panamax vessels the nameplate capacity will rise to 25mtpa.

Project Scope—The PE evaluated the following options (\$million in 2011 dollars):

- Base Case (\$410m):
 - Staged upgrades to the Mount Isa Line to accommodate 1000m trains for all operations.
 - Track upgrades from the Jetty Branch into the Port to remove existing single-line constraints.
 - Berth 12 marine works and channel dredging works.
 - Construct a new balloon loop on the reclaimed area as part of Berth 12 works.
 - Extract maximum value by increasing capacity through operational efficiency enhancements.

The PE states “The Coordinator General declared the Berth 12 wharf and dredging a “significant project” meaning the project will proceed regardless if TEARC goes ahead or not. For this reason, the Berth 12 wharf and associated balloon loop and channel dredging is in the Base Case for economic analysis.”

- Project Case (\$735m less \$174m for PoT Berth 12 and balloon loops):
 - Development of TEARC a new 8 km rail link from the NCL near Cluden, through the TSDA and to the PoT. TEARC will be a double track configuration and require a fixed bridge over the Ross River.
 - Grade separation works at Abbott Street.
 - Staged upgrades to the Mount Isa Line and yards to accommodate 1400m trains (\$101m).
 - Channel dredging works and reclamation (\$55m).
 - Remove single track (Jetty Branch) and reconfigure the Xstrata terminal operations (\$40m).

A conveyor option was considered as an alternative to TEARC to carry stockpiled and bulk materials from the TSDA to the PoT. This option was not taken forward in the Project Case, as this option would only cater for bulk mineral materials such as coal or magnetite and would not be able to handle general freight.

The Project Case did not include the removal of either the North Coast Line or the Jetty Branch.

The PE identified TEARC could begin with a single-track configuration with a passing loop to reduce capital cost which would allow the opportunity to stage the project. No detailed engineering, environmental, social, legal and implementation assessments of the options were completed in the PE.



The findings of the economic and market sounding identified:

- The Project Case was economically viable under a medium and high demand scenario.
- There was some interest from market participants in private sector ownership of TEARC, but preferably packaged with wider freight assets for a regulated third-party owner.
- Sufficient scope for value generation from Public Private Partnership delivery options to warrant further investigation.

Table 2.1 summarises the key goals and problem definition for TEARC from the PE.

Table 2.1 PE Outcomes

TASK	KEY ISSUES
Goal Definition	<ul style="list-style-type: none"> ▪ The Townsville Economic Gateway Vision links the Port with the Townsville TSDA. ▪ TEARC is the critical missing link in this vision. ▪ The TSDA has a valuable role in supporting the future development and growth of Townsville. Given its proximity to the port, opportunities for port-related industries, logistics and freight distribution have been identified as highly desirable uses of land adjacent to TEARC. ▪ The Mount Isa - Townsville corridor is the strategic link between the North-West Queensland Minerals Province and the PoT. It represents one of the most significant supply chain and logistics routes in Queensland. The significant challenge is transporting produce by rail.
Problem Identification	<ul style="list-style-type: none"> ▪ The PoT and Mount Isa Line are constrained to 1000m trains. ▪ Trains lengths within the port are constrained to 650m due to short sidings, and level crossings with roads. ▪ Up to 15mtpa port capacity can be achieved by upgrading the existing single track (Jetty Branch) and terminals (Xstrata). ▪ Significant inefficiencies exist because of the amount of shunting movements needed. ▪ Community impacts and amenity issues arise from running trains through suburban areas.
Problem Assessment	<ul style="list-style-type: none"> ▪ Tonnage projections are forecast to grow beyond current operational capacity levels. ▪ Train numbers and frequencies will increase in line with growing demand. ▪ This will exacerbate the existing economic, environmental and social impacts. ▪ There is limited scope to improve the efficiency of the port in its current configuration.
Problem Analysis	<ul style="list-style-type: none"> ▪ Significant investment in passing loops will be needed to meet demand using 1,400m trains. ▪ Significant investment in rolling stock will be needed to meet demand using 1,400m trains. ▪ Inefficiencies at the port and delays to vehicles at level crossings will result from 1,400m trains.
Option Generation	<ul style="list-style-type: none"> ▪ 1400m trains by constructing TEARC and lengthening existing passing loops and yards on the Mount Isa Line. ▪ Overland conveyor systems linking the TSDA to the Port. ▪ Upgrade from Direct Train Control (DTC) to Remote Controlled Signals (RCS). ▪ Track strengthening to increase axle load limits from 20 to 26 tonnes. ▪ Contestability of PoT with Abbot Point for coal exports in particular.
Option Assessment	<ul style="list-style-type: none"> ▪ TEARC and associated 1400m upgrades has an NPV of \$241m and BCR of 4.65 for the high case. ▪ There was some interest from market participants in private sector ownership of TEARC, but preferably packaged with wider freight assets for a regulated third-party owner. ▪ A stakeholder workshop found sufficient scope for value generation from Public Private Partnership delivery options to warrant further investigation.



2.6 Reconfirming the Preliminary Evaluation Outcomes

2.6.1 Changes to Service Needs and Project Case Scope in DBC

Since the preparation of the PE, there are two key factors that influence the evaluation of TEARC in the DBC:

- Freight Demand—The slowdown in the resource sector since the PE required a reassessment of minerals and other freight demand profiles for rail capacity.
- PoT—Changes to planning assumptions and delivery of associated projects within the port.

These factors suggest the Service Needs and scope of the Project Case presented in the PE needs to be adjusted for the purposes of the DBC.

Table 2.2 compares the Service Needs adopted in the PE to the updated Service Needs in this DBC.

The detailed justification of the updated Service Needs is documented in this Chapter. Details on the Base Case and Project Case included in the DBC are discussed in Chapter 5.

Table 2.2 PE and DBC Comparison of Service Needs

PRELIMINARY EVALUATION	DETAILED BUSINESS CASE
Meet growing demand on the Mount Isa Line	Meet revised demand forecasts (Chapter 4 DBC)
Facilitate the use of 1,400m long trains	Cater for 1,000m long trains initially with the ability to extend passing sidings on TEARC to 1,400m, if required in the future
Reduce bottlenecks in the PoT	Reduce bottlenecks in the PoT
Improve urban amenity for suburbs of Townsville	Improve urban amenity for suburbs of Townsville

Freight demand Mount Isa and North Coast Lines—The PE adopted demand forecasts for the PoT which identified high resource demand and high commodities prices. This supported a large number of potential mines to be viable or on-line which required access to the Mount Isa Line and the port. Since the preparation of the PE, there has been a decline in actual rail volumes to the PoT. In 2014, there was 12.7mtpa throughput at the port, which has since reduced to 8.5mtpa in 2016, representing a reduction of 4.2mtpa.

The DBC adopts the following demand scenario projections to 2051:

- 8.3mtpa (2017), peaking at 10.6mtpa (2037), declining to 7.6mtpa (2051) (Scenario 1 – Central demand case)
- 8.2mtpa (2017), declining to 5.8mtpa (2051) (Scenario 2 – Low demand scenario)
- 8.8mtpa (2017), peaking at 14.8mtpa (2037), increasing to 13.5mtpa (2051) (Scenario 3 – High demand scenario).

A Future Demand Case was produced and used for PoT Master Planning purposes. It is not utilised for the DBC economics modelling.

- 9.0mtpa (2017) increasing to 27.3mtpa (2051) (Future Demand Case).

The Future Demand Case would require additional infrastructure (which is not a like-for-like comparison on a cost basis with the low, medium and high demand scenarios):

- Mount Isa line to accommodate 1,400m trains



STRATEGIC CONTEXT

- bulk stockpile and handling facilities
- new berths and ship loaders.

The total rail demand forecast, excluding road transport is:

- 6.0mtpa (2017) declining to 3.3mtpa (2051) (low demand scenario)
- 6.0mtpa (2017) declining to 3.9mtpa (2051) (central demand scenario)
- 6.3mtpa (2017) increasing to 8.6mtpa (2051) (high demand scenario).
- 6.5mtpa (2017) increasing to 22.3mtpa (2051) (additional future demand case).

The total road demand forecast, excluding rail transport is:

- 2.2mtpa (2017) increasing to 2.6mtpa (2051) (low demand scenario)
- 2.3mtpa (2017) increasing to 3.7mtpa (2051) (central demand scenario)
- 2.5mtpa (2017) increasing to 5.0mtpa (2051) (high demand scenario).

The PE reported the theoretical capacity of the Mount Isa line is on average 19 to 20mtpa with 1,000m trains and 27 to 28mtpa with 1,400m trains.

As a result of the changes in freight demand the Service Needs and scope of the Project Case were re-evaluated for the DBC, the changes of which are detailed Table 2.3.



Table 2.3 Reconfirming of Preliminary Evaluation (Freight Demand Implications)

REVIEW OF PRELIMINARY EVALUATION (CHANGE TO THE DETAILED BUSINESS CASE)	RATIONALE
<p>Delete the Service Need, 'meet growing demand on the Mount Isa Line'.</p> <p>Delete the Service Need, 'facilitate the use of 1,400m long trains'.</p> <p>Delete scope of works from the Project Case associated with Mount Isa Line from Project Case.</p>	<p>Rail operations analysis undertaken as part of the DBC has identified the high demand on the Mount Isa Line that was previously forecast in the PE is no longer present. There is no motivation for operating 1,400m trains and undertaking the associated capacity improvements. Further detail on the change of demand and proposed forecast scenarios is presented in Chapter 4.</p> <p>The upgrade of the Mount Isa Line for 1,400m trains is excluded from the DBC Reference Project.</p>
<p>Create a new Service Need, 'meet supply chain demand'.</p>	<p>The PoT priority port master plan process has identified, despite the port having latent capacity there are constraints in the ports ability to introduce new (demand) customers. The constraints are as a result of inefficiencies and operational limitations with its existing configuration and tenure arrangements on single use berths. The PEP includes the proposed development of new multi-purpose common use berths to support new demand and accommodate new customers. These berths will require rail access via future rail loops accessible from TEARC to provide the optimum layout.</p>
<p>Create a new Service Need, 'longer trains'.</p>	<p>The PoT priority port master plan process has identified there are inefficiencies with rail access to specific berths within the port, as trains (up to 1,000m) need to be broken into shorter lengths (up to 250 – 400m) for some freight types. TEARC allows longer trains to access port berths and improved port efficiency through fewer rail movements.</p>

PoT—The PE was based on high freight demand and sought to address capacity and efficiency constraints along the Mount Isa – Townsville supply chain including on the Mount-Isa Line, rail access to the port via TEARC and port infrastructure. The PE identified the following scope of work in the Project Case for the PoT:

- Remove single track from the Jetty Branch and upgrade the Xstrata (now Glencore) terminal.
- Channel dredging and land reclamation.

This excluded the Berth 12 and balloon loops as this work is being progressed by the PoT.

Changes to the Project Case in the PE which are to be included in the DBC as a result of the PoT PEP are detailed in Table 2.4.



Table 2.4 Reconfirming of Preliminary Evaluation (PoT Implications)

REVIEW OF PRELIMINARY EVALUATION (CHANGE TO THE DETAILED BUSINESS CASE)	RATIONALE
Delete scope of works from the Project Case associated with the PoT.	The scope of work identified in the PE is included in the PEP. The first stage of the PEP includes channel and berth 12 works scheduled to be constructed between 2017 and 2022. The outcomes of the priority port master plan that is in early stages of preparation, will inform and confirm the future development of the port including implications for rail alignments within the port to support terminal and berths. TEARC is identified as critical enabling infrastructure to support the optimisation of the port layout and PEP. These projects are in early definition stage as part of the priority port master plan. They have been excluded from the TEARC DBC evaluation to avoid duplication of accrued benefits in subsequent project business cases.

2.7 Conclusions

This DBC and the scope of the Reference Project consider the implementation of the 8.3 km of TEARC line and associated road grade separations. The Reference Project excludes any upgrades to the Mount Isa line for 1,400m trains, the North Coast Line (south of the Sun Metals Branch and north of the Jetty Branch) and work associated within the port through the PEP. The Reference Project includes the grade separation for Abbott Street and the Southern Port Road.

Table 2.5 summarises the changes in scope between the PE and this DBC.

The PoT upgrades are being managed under a separate initiative the Port Expansion Project and it was agreed by the key stakeholders to remove any Port upgrades from the DBC. Consideration was given to relocating the Port facilities to allow sugar and Glencore trains to fully utilise TEARC, however it was agreed with the PoT that this would be considered as part of the Port Expansion Plan.

The Mt Isa line and any requirement for upgrades to cater for 1,400m long train lengths was agreed by the stakeholders to be removed from the scope of this DBC because the demand forecast is relatively flat for the medium case (Scenario 1). QR does not foresee a requirement for 1,400m long trains at this time.



Table 2.5 PE and DBC Comparison of Scope of Work

SCOPE		PRELIMINARY EVALUATION		DETAILED BUSINESS CASE	
		BASE CASE	PROJECT CASE	BASE CASE	PROJECT CASE
PoT	Berth 12 and balloon loops	In-scope	Excluded	Excluded	Excluded
	Remove single track and terminal upgrades		In-scope		
	Channel dredging and reclamation				
TEARC	Connection to the North Coast Line	Excluded	In-scope	Excluded	In-scope
	Alignment through the TSDA				
	Bridge over Ross River				
Abbott Street	Abbot Street Grade Separation (road-over-rail)	Excluded	In-scope	Excluded	In-scope
	Avoided cost for Abbot Street Deviation				
Mount Isa Line	Mount Isa Line capacity improvements 1,400m train capacity	Excluded	In-scope	Excluded	Excluded

Red Text indicates change between Primary Evaluation and Detailed Business Case

The Base Case includes the existing rail and road system, excludes the Mount Isa line, the North Coast Line (south of the Sun Metals Branch and north of the Jetty Branch) and any work associated with the port.

The DBC takes up the option from the PE to build a single track with a passing loop to reduce the capital cost that allows for staged approach for the future as required.

TEARC facilitates access to the existing port balloon loops. The Jetty Branch remains in use for existing customers such as sugar and Glencore. The Jetty Branch cannot be removed without major changes within the port to relocate the unloading facilities for existing customers. This work is outside the scope of the DBC Reference Project as the timing of these changes is not known.

The economic assessment of the PE Project Case included benefits to be gained from being able to operate 1,400m long trains as opposed to the current 1,000m long trains. The savings in rail operating costs and externalities were a major contributor to the economic benefits of the PE.

The DBC economic assessment of TEARC is independent of the PEP and the Mount Isa line. TEARC is based on potential road vehicle delay savings and improvements in rail efficiency.

TEARC is a priority infrastructure project to enable the future landside development of the PEP to be realised.