



3 DEFINING THE SERVICE NEED

CHAPTER SUMMARY AND CONCLUSIONS:

- The *Townsville City Deal (2016)* is a 15-year commitment between the Commonwealth of Australia, the State of Queensland and the Townsville City Council for a collective program of planning, reform and investment which aims to grow the economy of Townsville, and strengthen Townsville as a prosperous and lifestyle-rich city. The development of major infrastructure in rail, roads and the port will improve the competitiveness of Townsville as a centre for industry and business. The development of infrastructure will follow the strategy of progressively improving the liveability of residential areas that are negatively impacted on by noise, dust, road delays and safety at level crossings.
- TEARC will assist in addressing the following issues which impact on the competitiveness of Townsville:
 - The existing freight rail configuration does not enable future port expansion plans.
 - The competitiveness of Townsville is constrained by freight network inefficiencies.
 - Freight rail movements through Townsville is reducing liveability.
 - Improve urban amenity by providing the opportunity to remove the existing Jetty Branch connecting to the PoT and subsequently reduce heavy freight movements through urban areas.
 - Provide an integrated transport network connecting the North-West Minerals Province to the PoT and provide streamlined port-road-rail interfaces.
- The existing rail network is able to support some freight growth. Any increase in the number of trains will reduce urban amenity. The strategic response is to implement TEARC to handle any significant increase in the numbers of trains to the port.
- A number of important strategic responses and business solutions have been identified as a result of the TEARC DBC, which include:
 - addressing the complexities and inefficiencies of port operations
 - ensuring future port lease renewals are aligned to the Port Master Plan objectives
 - addressing line speed constraints on the Mount Isa Line (including the provision of passing loops and other upgrades)
 - regulatory reform to encourage industry growth, reduce input costs and a level the playing field between road and rail transport
 - exploring options to remove the Jetty Branch access into the PoT which would provide a stepped increase in urban amenity for south Townsville residents.

3.1 Introduction

Townsville is an important coastal infrastructure hub for North Queensland with the PoT, North Coast Line, Mount Isa Line and associated road network supporting the mining, agricultural and general industry.

The use of the rail and road systems to the PoT has increased over time. Key rail access corridors are well within city and residential areas that is less than desirable from an overall safety, operational and urban amenity perspective. A commitment to improving port access was made with the establishment of the Eastern Access Corridor as a multi-modal road and rail corridor, providing direct access to the port from the Mount Isa Line and North Coast Line, and State road network. Road network improvements were introduced in 2012 with the opening of the Southern Port Road.



The Service Need for TEARC has evolved over time, reflecting changes in domestic policies, urban needs and economic factors. Earlier investigations assessed the feasibility of the project in terms of its ability to meet rail demand forecasts and improve urban amenity. Recent policy developments have moved the emphasis toward addressing the need to grow the ‘competitiveness’ of Townsville.

Table 3.1 summarises the potential stakeholders of the project and their interest in it. Chapter 12 discusses the stakeholder engagement strategy for this DBC. The service need is multilayered from the strategic, to the transport and then the community and environmental needs. The engagement strategy supported this multilevel approach.

This chapter discusses the key issues constraining the overall competitiveness of Townsville and how this relates to the potential development of TEARC as a means of enhancing freight movement efficiency, port development and land use outcomes.

Table 3.1 Stakeholders and Interest in the Project

STAKEHOLDER CATEGORY	INTEREST IN THE PROJECT
Port of Townsville	Key beneficiary of the project and member of the PSC and PCG; will be interested in connectivity issues around existing road and rail
Townsville City Council	SAG member and will want to ensure a positive outcome for the city and community; high interest in job creation and economic benefits
Adjacent stakeholders - Cluden	Residents will receive new rail line; high interest in project impacts including noise, amenity, property impacts and property values
Adjacent stakeholders – near the Port	Residents will receive new rail line; high interest in project impacts including noise, property impacts and property values
Adjacent stakeholders – North Coast line	Residents will be interested in potential removal of existing North Coast line and level crossings including timeframes and rehabilitation or reuse of the area
Residents and action groups	Residents and local action groups will have a general interest in Townsville and its economic prosperity; including any social and financial impacts on residents
Elected representatives - State	Alignment runs through a number of electorates with local elected representatives interested in job creation and state election
Elected representatives - Federal	Alignment runs through a number of electorates with a high level of interest in project in relation to City Deal
QR	As the owner of the North Coast and Mt Isa lines, QR has a high level of project interest; particularly surrounding the potential removal of the North Coast line through Townsville and removal of four level crossings
Rail operators	Operators on the North Coast and Mt Isa line are currently supportive of the project
Industry	Industry groups will have some level of interest in the project, particularly how it affects their freight



STAKEHOLDER CATEGORY	INTEREST IN THE PROJECT
Peak industry associations	Local industry associations will want to be informed about the impacts the Project will have on local amenity and future development opportunities
Energy providers	Impacts on existing utilities
Queensland Government Agencies	There are several state agencies that will be involved in the options assessment and any impacts on community, infrastructure and existing transport networks
TMR	Project owner
Australian Government Agencies	There are several Australian Government agencies that will be involved in the options assessment, with particular interest in delivery of the City Deal, Project cost and funding
Traditional Owners	The Native Title Representative Body
Environmental and community groups	There are a number of environmental groups that have active campaigns to protect the Great Barrier Reef from Port expansion activities.
Media	As well as being part of the City Deal, this will be a significant Project for Townsville that will attract both local community and media attention

3.2 Factors influencing the Competitiveness of Townsville

All levels of government have committed to positioning Townsville as the “Capital of the North”, with the intention of growing the city as the economic powerhouse of Northern Australia. The *Townsville City Deal (2016)* aims to grow the economy of Townsville and strengthen Townsville as a prosperous and lifestyle-rich city. This deal will be delivering major infrastructure, creating new and sustainable jobs, and enhancing the liveability of the city.

Delivering major infrastructure will increase the competitiveness of Townsville by providing a more efficient rail, road and port supply chain linked to the TSDA.

TEARC is identified as a key piece of enabling infrastructure to expand export operations, retain existing industries and attract new economic investment including growth within the TSDA and redevelopment of the PoT.

There are a number of factors discussed in Sections 3.2.1 to 3.2.4 impacting the competitiveness of Townsville which have a bearing on TEARC including economic contraction, regulatory issues, supply chain constraints at the PoT and the decline in urban amenity.

In summary, these issues deter capital investment and offer less incentive to retain existing and grow industry within Townsville. As employment opportunities in mining industries decline and large employers take their operations offshore, unemployment in Townsville continues to rise, reducing demand and constraining economic growth. The rise in social issues including higher crime rates and the migration of younger workers to other regions is negatively impacting the attractiveness and viability of Townsville as a place to live.



3.2.1 Economic Contraction

The PE⁶ for TEARC was prepared during the mining boom with medium to high demand projections from 10 to 15mtpa, excluding coal exports. At the time an additional 10mtpa of coal exports was being forecast for the PoT and considered in TEARC in the economic sensitivity analysis.

The PE identified the following service requirements (needs) for TEARC to:

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

These service needs have been reanalysed under this DBC and are discussed later in this chapter.

The end of the mining boom led to contractions in many of Queensland's regional economies. This is reflected in the current demand forecasts provided in Chapter 4. Although the Townsville economy remains relatively diversified, it was highly geared towards mining and related industries and activities. The slowdown in the resources sector with the decline in world commodity prices has further inhibited the flow of investment to regional Queensland.

Slower economic growth is also partly due to the level of business activity enjoyed during the construction phase of the mining boom not being sustained through the operational phase. The 50% contraction in gross regional product since the peak of the boom in 2013 has led to a sharp downturn in investor confidence and employment⁷. Unemployment has reached 10.7%⁸, almost double the state average with youth unemployment⁹ climbing to 17.6% inducing many to leave the city in search of work. These figures highlight the need to rebalance the economy of Townsville and retain workers by supporting existing industries, attracting new business and boosting overall productivity.

Port operations, particularly the export of natural resources from the North-West Minerals Province, remain key drivers in the economy generating more than \$5.6b in the 2015-16 financial year¹⁰. The PoT faces domestic competition from other ports including Abbot Point, Darwin and Brisbane. Expanding export operations and value-add industries in Townsville is vital to supporting the economy, requiring the port and associated infrastructure to operate efficiently and offer the capacity to meet demand.

The PoT has been identified as one of four priority ports in North Queensland under the *Sustainable Ports Development Act 2015*. Port operations are constrained by the size of vessels the port can accommodate and inefficiencies in the rail and road interfaces. The Port is currently developing a landside and marine development master plan to expand the port, improve operations and attract new customers. A staged approach to the implementation of the plan has been adopted, the first stage addresses the need to accommodate larger vessels with the immediate benefit of existing customers becoming more efficient, and being in a position to offer more competitive rates resulting from economies in scale. Future implementation stages will involve the development of the rail and road systems interfacing and servicing the port to provide an integrated and efficient import/export hub linking to the Mt Isa and North Coast Lines.

⁶ TEARC Preliminary Evaluation GHD, BDO (Dec 2011)

⁷ Townsville Economic Development Scorecard (2016)

⁸ Department of Employment: Unemployment Rate by Labour Force Region (2017)

⁹ Australia's Youth Unemployment Hotspots: Snapshot (2016)

¹⁰ Queensland Government Statistician's Office – Queensland and Australia Trade Data, 2005-06 to 2015-16 (2016)



3.2.2 Regulatory Issues

- Rail pricing for freight

The Mount Isa and North Coast Lines are owned by QR and deemed essential. In Queensland, contracts for the use of essential rail infrastructure are negotiated within bounds set by the Queensland Competition Authority¹¹. This section of the Queensland network is not regulated. The use of rail infrastructure by rail freight is priced through contracts with individual rail operators that includes Aurizon and Pacific National¹².

- Road pricing for freight

The cost of road freight using publicly-owned road infrastructure is priced by a combination of annual registration and fuel-based road user charges on heavy vehicles. Australia uses a Pay-As-You-Go (PAYGO) model to determine the user charges. The National Heavy Vehicle Regulator and TMR regulate the use of road networks by heavy vehicles¹³ with the calculation of charges being undertaken by the National Transport Commission. The charges enable heavy vehicles to use parts of the road network commensurate with the type of vehicle¹⁴.

The PAYGO model is a direct charging pricing mechanism based on distance, with the routes travelled constrained by the appropriate heavy vehicle network. A network is distinct from a link such as the Flinders Highway that runs roughly parallel to the Mount Isa rail line¹⁵. There is no publicly available information regarding TMR directly charging for road freight or heavy vehicle operators for specific use of the Flinders Highway.

- Relationship between rail and road pricing for freight

Road freight has an inherent advantage over rail in that passenger and other light vehicles use roads extensively. Many costs including street lighting, signage and traffic management, and the minimum pavement costs for light-vehicle use that are 'common' or 'un-attributable' can be largely shared with other road users.

In contrast to road provision, rail infrastructure generally operates within a commercial structure. Charges for many rail services fall well below their long-run economic costs, as assessed by regulators. Exceptions to this finding are generally limited to the transport of coal¹⁶.

- Competition between rail and road for freight

The varying pricing arrangements for road and rail have been identified as the possible cause of distortions in competition between road and rail for freight cargo. The potential for these distortions is strongest in general freight markets with relatively long-distance line hauls or high traffic densities, such as highways or roads which run parallel to rail lines, including to urban ports¹⁷. Within this broadly defined scenario where road and rail may compete, there are further conditions that must be met to allow any meaningful competition, as supported by evidence between the modes.

¹¹ <http://www.qca.org.au/Rail>

¹² Queensland Rail (2012) *Mount Isa Line Rail Infrastructure Master Plan*

¹³ <https://www.tmr.qld.gov.au/business-industry/Heavy-vehicles/National-heavy-vehicle-regulator.aspx>

¹⁴ <https://www.ntc.gov.au/heavy-vehicles/heavy-vehicle-charges/>

¹⁵ <https://atap.gov.au/framework/policy-choices-system-planning/4-multi-modal-network-planning.aspx>

¹⁶ Australian Government Productivity Commission (2006) *Road and Rail Freight Infrastructure Pricing Productivity Commission Inquiry Report*

¹⁷ Infrastructure Australia (2011) *National Land Freight Strategy*



The choice of transport mode generally involves a trade-off between cost and several service quality factors. Key freight service quality factors include transit time, reliability and service frequency. The relative importance of these service factors is highly contingent on the nature of the freight, bulk or non-bulk. Bulk freight generally involves large quantities of homogenous product, typically transported in large quantities and without packaging, while non-bulk freight is generally characterised as any containerised freight and often involves heterogeneous goods being moved between dispersed locations.

The available evidence demonstrates there is little competition between road and rail for freight in aggregate, for bulk and non-bulk freight cargo¹⁸. While competitive distortions between road and rail are possible, the evidence suggests these distortions are limited and (even if network road charges were greatly increased) rail would not derive much benefit given the limited interchange ability between the two modes¹⁹. Circumstances where road and rail do compete include the transport of some grains and non-bulk freight between capital cities²⁰.

The complexity of rail regulation, commercial arrangements and road/rail policies has generally incentivised the use of road over rail transport for non-bulk freight. Road freight has an inherent advantage over rail in that asset management and operational costs of road infrastructure are largely shared with other road users. The asset management and associated costs for operators are more complex for rail freight providers than that of road freight providers. The potential for distortions in general freight markets are strongest with relatively long-distance line hauls or high traffic densities, such as highways or roads that run parallel to rail lines, including to urban ports²¹.

3.2.3 Supply Chain Constraints at the Port of Townsville

The PoT is one of four priority ports identified by the Queensland Government in Northern Queensland under the *Sustainable Ports Development Act (2015)*. To protect the economic potential of the region and provide a sustainable future for the Great Barrier Reef, no new ports are permitted to be built.

The Queensland Government is developing master planning for the priority ports in accordance with the *Sustainable Ports Development Act (2015)* and to meet its commitments under the Reef 2050 Long Term Sustainability plan.

The PoT has developed the PEP that includes a program of staged development over 30 years to meet the Ports medium to long-term trade capacity requirements. This PEP is consistent with the master plan. A number of smaller port projects have recently been completed, with other projects currently underway to improve the efficiency and capacity of existing port infrastructure, including upgrades of Berth 4, Berth 8 and Berth 10 and the demolition of Berth 6/7.

The first phase of the PoT 30-year expansion program includes the Channel Capacity Upgrade project, which involves widening of the sea channels to cater for larger ships and a larger swing bay. The dredge spoil can no longer be disposed of at sea and will be pumped to a new reclaim area for future landside development.

¹⁸ Bureau of Infrastructure, Transport and Regional Economic (2009) *Road and rail freight: competitors or complements?*

¹⁹ Australian Government Productivity Commission (2006) *Road and Rail Freight Infrastructure Pricing Productivity Commission Inquiry Report*

²⁰ Bureau of Infrastructure, Transport and Regional Economic (2009) *Road and rail freight: competitors or complements?*

²¹ Infrastructure Australia (2011) *National Land Freight Strategy*



The stages are:

- Stage 1 – Channel Widening

Widening of the channel from 92m to between 120m (at the sea channel) and 180m (at the entrance) with dredge material being beneficially re-used and placed in the Ports new reclamation area (152 hectares). This stage also includes the construction of Berth 12.

Planned start date is late 2017 (subject to approval of the AEIS) with an estimated completion in 2022.

- Stage 2 – Swing Basin and Berths

Construction of up to three new berths (14,15 & 16) and swing basin construction in the outer harbour.

This stage is estimated to take five years from commencement.

- Stage 3 – Swing Basin and Berths

Construction of an additional two berths (17 & 18) and deepening of the channel.

This stage is estimated to take five years from commencement.

Subsequent stages of the PEP involve the creation of additional berths to accommodate larger ships and long-term forecast trade growth. The new berths will require new landside development on the reclaimed land from dredging to the east of the current port operations. This landside development will include new rail loops that will need to be connected to TEARC to enable the port to operate efficiently.

The PEP will need to develop a detailed plan and cost to reorganise and relocate the existing unloading facilities for sugar and Glencore to the eastern side of the port. The PoT will need to negotiate with current leaseholders to seek in principal agreements on the relocation of their facilities. The timing and approval for the relocation of these existing unloading facilities is highly dependent on the timing and availability of TEARC.

The DBC project team had meetings with the PoT on the status of planning of the relocation of the existing unloading facilities and concluded the concept was not sufficiently developed to include in this DBC. The scope of the Reference Project allows for connection to the existing balloon loops at the port and retains the Jetty Branch.

3.2.4 Decline in Urban Amenity

Urban amenity has a significant bearing on the liveability, urban development opportunity and competitiveness of a city. At present all freight movements are through industrial, commercial and urban areas in Townsville, which lowers urban amenity and limits the opportunities for urban renewal and uplift. Freight rail movements through residential areas expose residents to noise, dust and potential safety issues from hazardous cargo. Although the rail operators must have safe working practices in place for the handling and transport of hazardous cargo, the risk still remains for an incident unless the cargo can be removed completely from the area.

As the city expands around the existing rail corridors, and if the rail demand grows, these issues are expected to grow.



3.3 Definition of Problem and Service Needs

An investment logic-mapping workshop was held with the key project stakeholders to define issues constraining the competitiveness and attractiveness of investment in Townsville. This workshop offered an opportunity to review, clarify and agree upon the program logic underpinning the proposed investment. The service need, expected benefits of the project, and strategic responses to address identified problems were explored and captured in the Investment Logic Map (ILM) as shown in Figure 3.1. The percentages represent the relative weightings for each of the problems and benefits.

It is evident from the revised demand outlook and supported by the outcomes of the ILM workshop, some of the original service needs from the PE in terms of 'growing demand' on the Mt Isa line are not currently applicable.

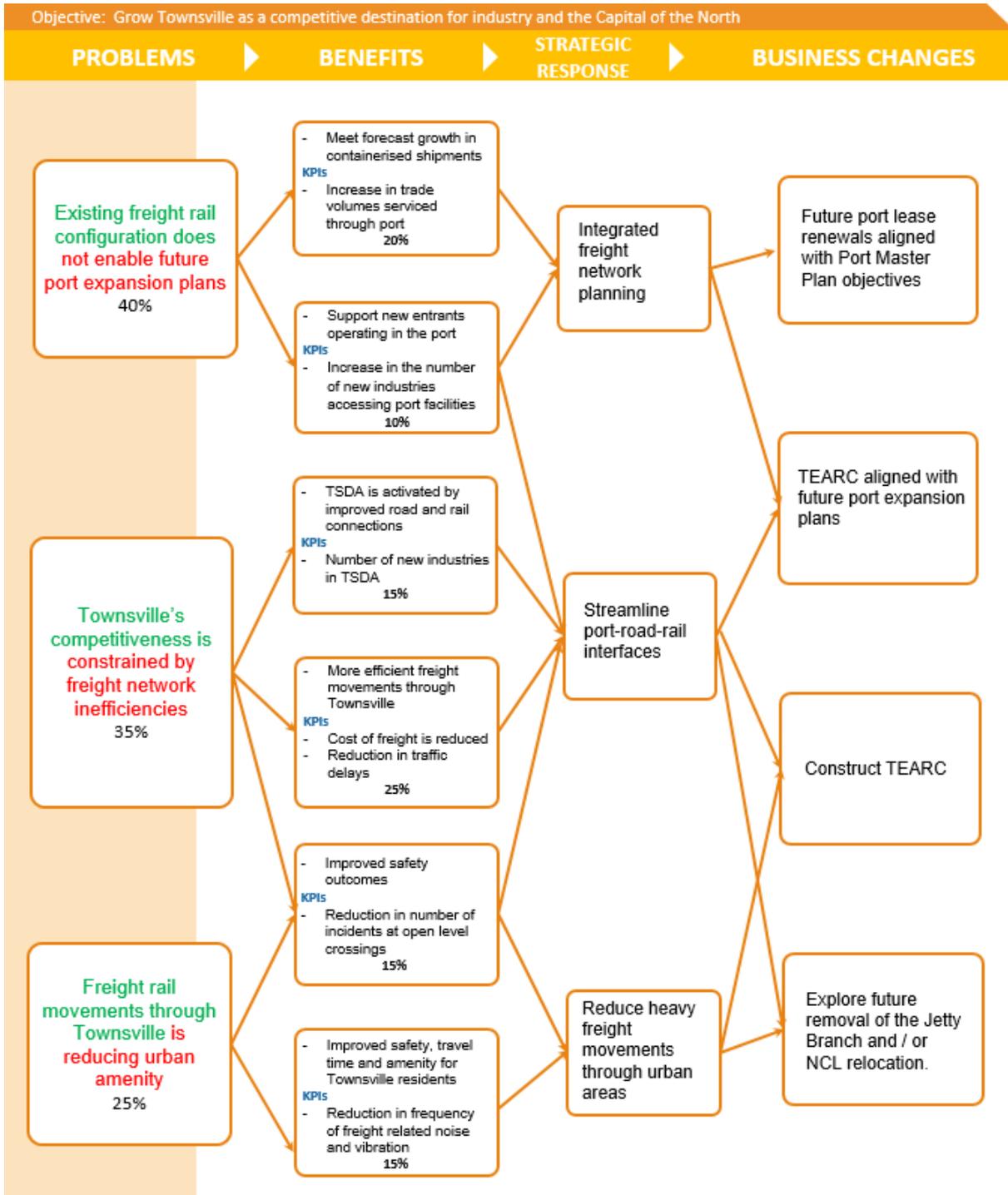
This chapter outlines the strategic objectives, core problems, expected benefits and strategic responses identified through the Investment Logic Mapping process.

The ILM process identified three core problems relating to the strategic objective of growing Townsville as a competitive destination for industry and as the Capital of the North:

- Existing freight rail configuration does not enable future port expansion.
- Townsville's competitiveness is constrained by freight network inefficiencies.
- Freight rail movements through Townsville is reducing urban amenity.



Figure 3.1 Investment Logic Map²²



²² Percentages represent the weighting of the importance of the problem and benefit



Table 3.2 maps the problems to TEARC Service Needs.

Table 3.2 DBC Service Needs

PROBLEM	SERVICE NEEDS
Existing freight rail configuration does not enable future port expansion plans	Ability for the Port to accommodate new customers and meet the Ports projections of growth in containerised shipments and any potential export growth
Townsville’s competitiveness is constrained by freight network inefficiencies	Provide for longer trains into the Port Reduce bottlenecks and complexity of operations in the Port
Freight rail movements through residential areas are negatively impacting on urban amenity (noise, dust, delays) and safety at level crossings	Improve urban amenity for suburbs of Townsville Reduced risk of safety incidents at open level crossings

3.3.1 Existing Freight Rail Configuration Does Not Enable Future Port Expansion Plans

The volume of cargo that can be moved to and from the PoT by rail is currently constrained due to sub-optimal rail layouts and various dedicated user and commodity specific rail receival facilities within the port. The current rail alignment to and through the port has numerous at-grade road crossings, leading to potential safety issues both within and outside the port.

Planning to expand the PoT is underway. While both the port and the existing railway can continue to operate as is, opportunities for freight network efficiency are lost, compromising Townsville’s competitive export position.

Key issues identified include:

- Road congestion due to trains queuing across at-grade road/rail crossings.
- Underutilisation of Berth 11 as bulk materials handling infrastructure that does not support multi-user activity.
- Over utilisation of Berth 3 for trucked dry bulk material.
- Fragmentation of port yards makes optimisation of infrastructure (roads, road/rail dumps, berths) through multi-user access difficult, resulting in inefficient operations.
- Minimal land area available immediately behind container and break-bulk berths 3 and 4.
- Community interface issues with dusty and noisy dry bulk activities and odorous livestock activities occurring at Berths 8, 9 and 10, the berths closest to the city.
- Existing dredge spoil management area is nearing capacity requiring development of a new method or area to dispose of dredged material. Additional reclaim area would allow continued beneficial re-use of this material.
- Congestion, over-utilisation of berths and inefficient operations can add to operational costs for port customers, while underutilisation of berths and existing infrastructure can result in lost business opportunity for the port.
- The current configuration of port and rail network restricts the ability of the Port to gain economies of scale and therefore to reduce average costs in the future.



- TEARC will be required to address these issues in conjunction with both the marine and landside port upgrades.
- Berth Utilisation

The existing berths are not used effectively due to the port lease arrangements and berth ownership. Some of the berths such as berth 11 are dedicated to bulk mineral exports and cannot be utilised by other customers. Berth 3 is almost fully utilised. The Port would need to free up capacity on the berth, or provide an alternative berth to accommodate forecast in growth in containerised shipping. Table 3.3 shows the recent utilisation of the berths for the PoT.

Table 3.3 Existing Berth Use

BERTH	EXISTING PRODUCT BERTH INFRASTRUCTURE CAPABILITY	2015/2016 UTILISATION %	2015/2016 THROUGHPUT (T)
1	Bulk Liquids	28	1,120,038
2	Bulk Nickel (currently not in use)	33	1,638,690
3	Multi-purpose (incl. containers)	80	1,702,694
4	Multi-purpose. Crane upgrade.	44	645,898
8	Bulk material/multi-purpose	44	1,884,841
9	Sugar, molasses, motor vehicles, bulk, general cargo	30	1,545,664
10	Navy/cruise/multi-purpose (incl. cattle)	44	288,718
11	Bulk mineral export	17	403,025

The PEP will provide a roadmap to improving the capacity and flexibility of the port through a staged approach:

- Stage 1 – Initial outer harbour reclamation, channel widening and development of Berth 12.
- Stage 2 – Ultimate outer harbour reclamation and development of Berths 14, 15 and 16.
- Stage 3 – Channel deepening and development of Berths 17 and 18.

In the longer term TEARC will be required to address the service needs of the PoT as delivered through the PEP.

3.3.2 Townsville's Competitiveness is Constrained by Freight Network Inefficiencies

The existing freight network in Townsville is subject to time delays and capacity constraints. The inefficiencies described below, increase costs for industry and reduce their competitiveness.

Network inefficiencies are generated by road/rail interfaces as cargo moves through urban areas (e.g. along the Jetty Branch and along the North Coast Line).

Key issues identified include:

- Traffic congestion delays arising from congestion at level crossings and reduced line speeds cost residents, commercial vehicles and freight operators' time and money.
- Mount Isa Line restrictions, the maximum speed along the line is 80 km/h, the poor quality of some sections of track has led to many speed restrictions. This compounds the delays experienced once the trains reach Townsville urban areas, reducing the competitiveness of hauling along the Mount Isa Line.



- The existing rail infrastructure into the port restricts train lengths for freight and bulk goods unloading which reduces the efficiency of the operations.
- The existing rail corridor along the Jetty Branch does not allow for effective connection to the new Port rail loops to the east of the current facilities proposed by the PEP.

TEARC is part of a 'last mile' solution that will significantly reduce freight movements through urban areas and reduce road/rail interfaces both inside and outside the port. Maintaining consistent asset capability along the rail network will allow industries across Northern Queensland to link to an effective freight system, unlocking the economic potential of the region and positioning Townsville as the optimal supply chain environment. Realisation of full efficiency and competitiveness would require additional investments over and above the reference project considered in the DBC.

3.3.3 Freight Rail Movements through Townsville is Impacting on Liveability

Freight rail movements through Townsville are impacting on liveability such as Community Impacts, Road Safety and Travel Time. Key issues are summarised below.

- Community Impacts:

The number of rail movements to the PoT is impacting urban amenity of the suburban areas of Townsville.

There is a weekly average of 175 train movements on the Jetty Branch into the PoT (derived from TEARC DBC demand and rail simulation modelling). The average does not reflect the higher peak number of train movements during the sugar-harvesting season.

The number of train movements accessing the PoT is projected to increase to an average of about 203 train movements per week, representing an increase of about 17% between 2017 and 2047 (based on Scenario 1 – Central demand case detailed in Chapter 4).

Table 3.4 details the estimated number of Number of Train Movements on the Jetty Branch to PoT between 2017 and 2047 for the Base Case.



Table 3.4 Estimated Number of Train Movements on the Jetty Branch to PoT

YEAR	ANNUAL	AVERAGE WEEKLY	AVERAGE DAILY
2017	9,100	175	25
2022	9,464	182	26
2027	9,464	182	26
2032	10,920	210	30
2037	10,920	210	30
2042	10,556	203	29
2047	10,556	203	29

Based on Scenario 1 - Central demand case detailed in Chapter 4

Based on the aforementioned (Table 3.4) train movements, there is an average of 1 to 2 trains every hour throughout the year accessing the PoT, negatively impacting urban amenity.

Urban renewal is planned along the rail corridor that includes the Townsville City Waterfront Priority Development Area adjoining the Jetty Branch. Existing freight rail movements along the Jetty Branch create urban amenity issues along the corridor, including noise, vibration, reduced air quality and low visual amenity. The forecast increase in train movements to meet freight demand at the port will compound these issues. These impacts will influence the attractiveness of the Townsville Priority Development Area (PDA) site as an urban renewal site and its ability to act as a catalyst for broader urban renewal opportunities in the neighbouring residential areas.

- Road Safety:

At-grade road-rail crossings introduce increased risk to road safety and rail operations.

On the North Coast Line and Jetty Branch, from where the Mount Isa Line joins the North Coast Line at Stuart to the PoT entry, there are 11 at-grade road crossings that includes one pedestrian crossing.

From 2008 to 2017 there have been a total of 175 incidents with approximately 20 incidents per year.

As identified in Table 3.5, there is an estimated weekly average of 175 train movements (2017) on the North Coast Line to the PoT. This is forecast to increase to 203 train movements by 2047. The forecast increase in train movements to meet freight demand at the port, and increased road traffic will increase the potential safety risks at the at-grade level crossings.

- Travel Time

Travel time on the road network is impacted by disruptions caused by freight trains accessing the PoT activating at-grade road-rail crossings. Abbott Street and Boundary Street are key corridors that feed traffic onto road links with the at-grade road-rail crossings. Table 3.5 identifies the growth in general traffic volumes along the key road corridors.



Table 3.5 General Traffic Volumes on Abbott Street and Boundary Street (Average Annual Daily Traffic)

YEAR	2016	2022	2026	2036
Abbott Street	3,551	8,618	13,684	14,924
Boundary Street	8,391	11,506	14,622	23,182
Perkins Street	357	1,031	1,706	2,680

Source: Southern Townsville Strategic Model

It is estimated the road network is currently disrupted on average for up to 9 hours 40 minutes per week from freight trains activating the at-grade crossings. By 2047 it is forecast the time the road network will be disrupted will increase by 45 minutes to 10 hours 25 minutes per week.

Table 3.6 identifies the estimated average number of minutes per week the road network is disrupted from at-grade level crossings due to freight train movements for the Base Case. The times in Table 3.6 relate to the estimated time the at-grade crossings are closed for trains' movements, not person minutes of delay to road users.

The weekly and daily times represent an average and do not reflect the higher number of train movements during at peak sugar harvesting season, where the number of times the crossings are activated is more frequent and therefore disruption time to the road network is greater.

As the Reference Project retains the existing Jetty Branch, sugar-harvesting freight would continue to use existing rail infrastructure.



Table 3.6 Delay Minutes At-grade Crossings Activated

YEAR	ANNUAL	AVERAGE WEEKLY	AVERAGE DAILY
2017	30,576	588	84
2022	32,032	616	88
2027	31,304	602	86
2032	35,308	679	97
2037	35,672	686	98
2042	33,124	637	91
2047	32,760	630	90

Based on Scenario 1 - Central demand case detailed in Chapter 4

- Excludes Jensen Street and Southwood Road at grade crossing

Future planned developments will generate significant additional traffic volumes and increase congestion at existing at-grade road-rail crossings. The additional travel time will impact on both business and community liveability. Currently the identified growth and development includes:

- urban development adjoining the Mount Isa and North Coast Lines
- new employment areas at TSDA, Roseneath Medium Impact Industrial Precinct, Woodstock Industrial Land and Stuart Industrial Estate
- residential growth at Townsville City Waterfront Priority Development Area
- Elliot Springs land release to the south of Townsville that will accommodate over 26,000 people upon completion in 2050.

Whilst the demand and frequency for existing public transport routes (Route 208 University to CBD and 209 Stuart to CBD) is currently low. Increased urban density in southern Townsville (including the Elliot Springs land release) will generate the demand for increased service frequencies and the introduction of new routes. Timetable reliability and efficiency of the public transport system will be impacted by the forecast increase congestion caused at existing at-grade road-rail crossings.

3.4 Overall Benefits of TEARC

The economic benefits of the TEARC Reference Project included in Chapter 7 can be divided into three broad categories:

- Rail freight benefits through a reduction in the cost of freight transportation on rail.
- Reduced rail crashes and negative externalities.
- Road user benefits: reduced cost of travel on the local south Townsville road network due to reduction in delays from freight trains (e.g. at level crossings).

At a strategic level, TEARC will provide further broader benefits and enable the implementation of the PoT master plan, and improved freight efficiency to and from the port. This integrated rail, road and port plan is expected to contribute to the competitiveness of Townsville as a major port for import and exports for the region.



In turn, this will likely foster increased:

- industry investment, particularly in value-add industries
- economic resilience through diversification of the regional economy
- employment opportunities
- new opportunities for urban renewal and development.

Reducing freight movements through urban areas and providing a freight rail link through the TSDA, will encourage industries to establish operations along the new rail alignment, helping to activate the precinct and shift freight movements away from the inner city and residential areas. In addition to improved safety, congestion and urban amenity, this may promote the development of the Townsville CBD and the Townsville Waterfront PDA.

TEARC is expected to play a role in addressing some, but not all of the aforementioned problems. Many urban amenity and safety issues would be mitigated or removed over time.

At a project level, TEARC is expected to contribute to a number of strategic benefits for economic development that are detailed in Table 3.7.

Table 3.7 Overall Contribution of TEARC to Broader Initiatives

PROBLEM	EXPECTED BENEFITS
Existing freight rail configuration does not enable future port expansion plans	<ul style="list-style-type: none"> ▪ Port can meet expected growth in container shipments ▪ Increased trade volumes can be serviced through the port ▪ Export-led growth in Townsville ▪ Enabler for the expansion of the port ▪ Support new entrants to operate in the port
Townsville’s competitiveness is constrained by freight network inefficiencies.	<ul style="list-style-type: none"> ▪ TSDA activation through improved rail connections to port ▪ Reducing freight costs ▪ More efficient freight movements through Townsville
Freight rail movements through Townsville is reducing liveability	<ul style="list-style-type: none"> ▪ Opportunities for urban renewal ▪ Reduced noise and vibration impacts on urban neighbourhoods ▪ Reduced road network delays ▪ Reduced risk of safety incidents at open grade level crossings

3.5 Strategic Response

Emerging strategic plans and policy objectives are now focused on enhancing the competitiveness of Townsville. TEARC is identified as a key enabling project through which a stronger industry base and export hub may be developed by improving the efficiency of port operations. The project is also expected to improve urban amenity, reduce the risk of safety incidents and open up opportunities for urban renewal in Townsville.



The existing rail network can handle some freight growth, albeit inefficiently. Any increase in the number of trains will reduce urban amenity. The strategic response to mitigate the reduction in amenity is to implement TEARC.

- Some of the issues identified fall outside the scope of TEARC and should be looked at from a strategic perspective. These issues will need to be considered and addressed in order to fully realise the overarching objective of growing Townsville as a competitive destination for industry and Capital of the North.
- The realisation of benefits from TEARC exclude the following issues:
 - Constructing TEARC to create a competitive rail freight network between Queensland, the North-West Mineral Province, Townsville industry, and the PoT.
 - Addressing the complexities and inefficiencies of port operations.
 - Ensuring future port lease renewals are aligned to the Port Master Plan objectives.
 - Addressing line speed constraints on the Mount Isa Line, including the provision of passing loops and other upgrades.
 - Regulatory reform to encourage industry growth, reduce input costs and a level the playing field between road and rail transport.
 - Exploring options to remove the Jetty Branch into the PoT that would provide a stepped increase in urban amenity for south Townsville residents.

TEARC will be an enabler in order to provide a resolution to these issues.

The final TEARC DBC will inform further studies and investigations to be undertaken as part of existing commitments and future opportunities under the *Townsville City Deal (2016)* including:

- the PoT channel capacity upgrade and port expansion
- acceleration of the TSDA
- maximisation of export opportunities
- supply chain prioritisation.

The Australian Government, Queensland Government and Townsville City Council will also continue working on the identification of innovative financing and value capture opportunities on the wider economic benefits related to TEARC, acceleration of the TSDA and expansion of the port.