PORT of BRISBANE
Here for the future

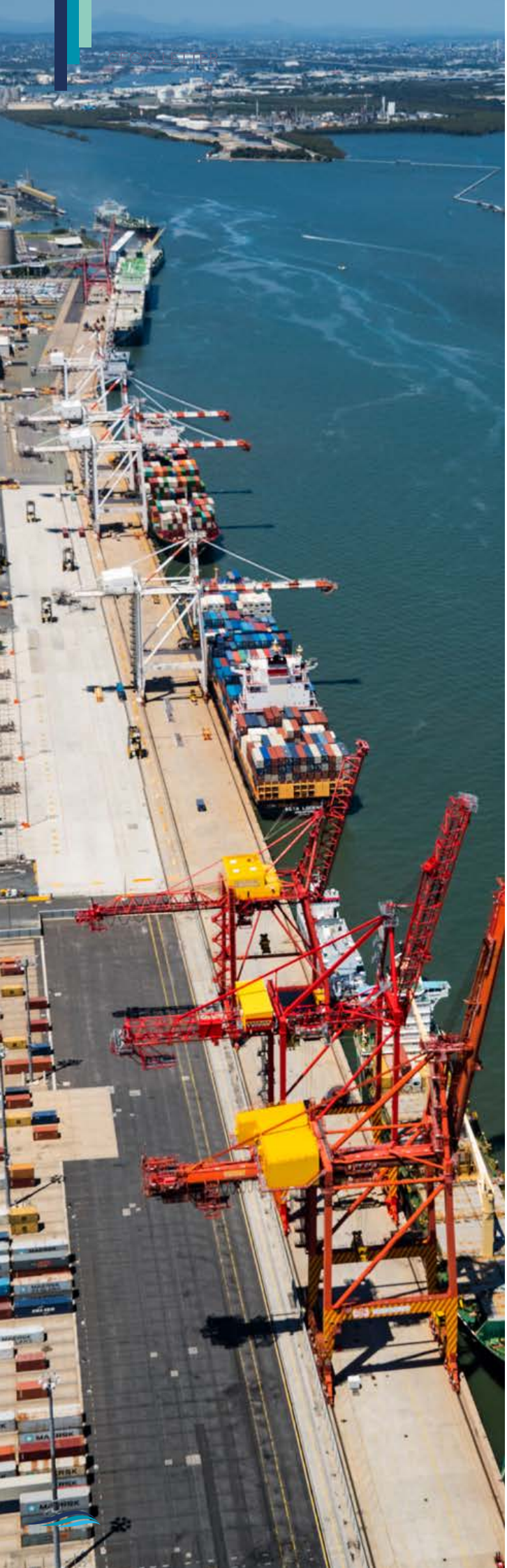
2018—2048

MASTER PLAN

contents

PORT OF

BRISBANE



CEO's Letter

The Port of Brisbane has a long and proud history of facilitating trade-related economic growth in Queensland and Australia.

From its origins exporting logs in the 1850's to today's recognition as Australia's 2017 Port of the Year, the Port of Brisbane has always relished its role in maximising economic opportunity in the region, in a stable and sustainable manner.

Since privatisation under a 99 year lease from the Queensland Government in 2010, Port of Brisbane Pty Ltd (PBPL) has continued its tradition of being an industry, environmental and community leader, particularly through its constructive relationships with stakeholders at all levels.

The Master Plan 2018-2048 is a result of close collaboration with our customers, partners and stakeholders, and charts a course forward for our organisation. It is a summary of our business operations and a roadmap for our future. We are committed to delivering strategies that account for and leverage the national significance of the port, while also being mindful of our growth and operations.

Our Master Plan focuses on our trade, property, infrastructure and environmental strategies. We adhere to relevant planning requirements across all levels of Australian governments and account for future potential legislative changes within our long-term planning to support our continued success which are all developed with sustainability principles in mind.

I support the actions and objectives of this plan and endorse it on behalf of PBPL and the Port of Brisbane.

Kind Regards,
Roy Cummins
Chief Executive Officer
Port of Brisbane

Port of Brisbane Master Plan

INTRODUCTION

The Port of Brisbane is one of Australia's fastest growing container ports and Queensland's largest multi-cargo port. The Port handles approximately $50 billion of trade through the port comprising more than 50% of Queensland's international trade.

Over the next 30 years, the Port will be required to sustainably cater for forecast growth including:

CONTAINER GROWTH
FROM ~1.35M TO
~4.8M TEUs

DRY BULK GROWTH OF 60%
12MT TONNES TO
~20MT

80% INCREASE IN CAR IMPORTS
FROM 280K TO MORE THAN
500,000

CRUISE SHIP VESSEL VISITATION
IN THE FIRST FIVE YEARS
~1,100

The Port of Brisbane Master Plan 2018-2048 details expected trade growth and presents our strategies to meet this growth, to support the needs of our region and the Port's future success.

This Master Plan seeks to broadly define the ongoing future development of the Port of Brisbane, how the needs of port users will be addressed and how development will be managed.

This document reflects PBPL's planned, and comprehensive approach, and supports the Port's long-term planning.

OBJECTIVES

1. To provide a conceptual projection of port development over the next 30 years.
2. To summarise the Port's history, community and environmental setting and values, land use planning, local primacy as a freight hub of national importance, driver of the state economy, regional operational footprint and strengths, weaknesses, opportunities and threats as a business.
3. To outline PBPL's growth projections/demand for future trade, property and infrastructure strategies at the port over the next 5-year Master Plan implementation period.
4. To confirm property strategies aimed at sustainably accommodating future trade growth.
5. To outline infrastructure provision including existing and future regional transport (road, rail and sea) corridors servicing the Port and the requirements for local infrastructure upgrades servicing growth within Brisbane Core Port Land (BCPL).
6. To identify key strategic investigation areas, within and beyond BCPL requiring additional investigation and consultation.
7. To establish the guiding parameters of an Environmental Management Framework (EMF) that identifies key environmental values and seeks to manage, minimise and/or mitigate impacts associated with future port growth.

About the Port of Brisbane

APPROX
$50 Billion
TRADE HANDLED

WET BULK IMPORTS
(CRUDE AND REFINED OIL
AND OTHER) MORE THAN
8.6MT

2,500
VESSEL CALLS
PER YEAR

THE PORT

The Port of Brisbane is one of Australia's largest and most diverse ports and serves Australia's East Cost Communities. The Port is recognised as a strategic asset of national importance providing critical links to world markets.

The Port is a major driver of the economy, including the trading hinterland of Queensland and large areas of Northern New South Wales. A diverse range of commodities transfer through the port, providing a firm foundation of economic stability.

With continued port growth over the next 30 years, it is anticipated that those directly employed by businesses at the Port of Brisbane will rise from the present estimated level of 2,000 workers to up to approximately 5,000 workers by 2025. Significant employment multipliers stemming from port business are also noted in surrounding local and regional economies.

ROLE OF PORT OF BRISBANE PTY LTD

The Port of Brisbane is managed and developed by the Port of Brisbane Pty Ltd (PBPL), under a 99-year lease from the Queensland Government.

PBPL is owned by the APH Group consortium, comprising four of the world's largest and most experienced infrastructure investors. The members are: Caisse de dépôt et placement du Québec; IFM Investors; QIC Global Infrastructure on behalf of its managed funds; and Tawreed Investments Ltd, a wholly-owned subsidiary of the Abu Dhabi Investment Authority.

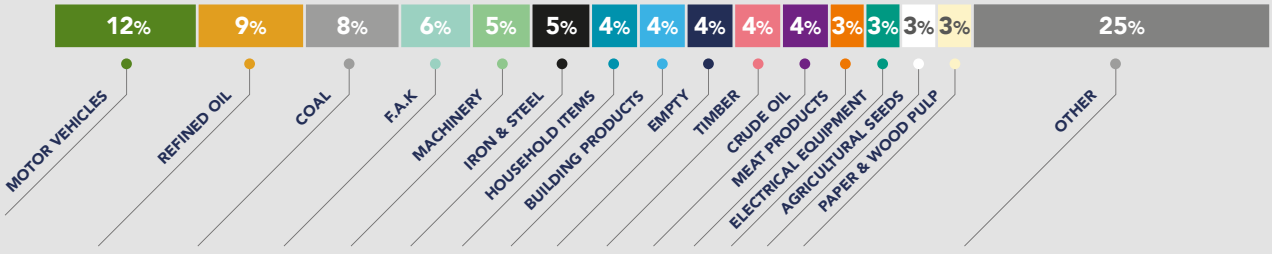
MORE THAN
$550 Million
FORECAST FOR PORT INFRASTRUCTURE IMPROVEMENTS

WE EXCEEDED
1.35 Million
CONTAINERS IN 2017/18

MORE THAN
278,000
MOTOR VEHICLES ANNUALLY

94% of Queensland's Containerised Trade

TRADE COMPOSITION FY2017 (BY REVENUE)



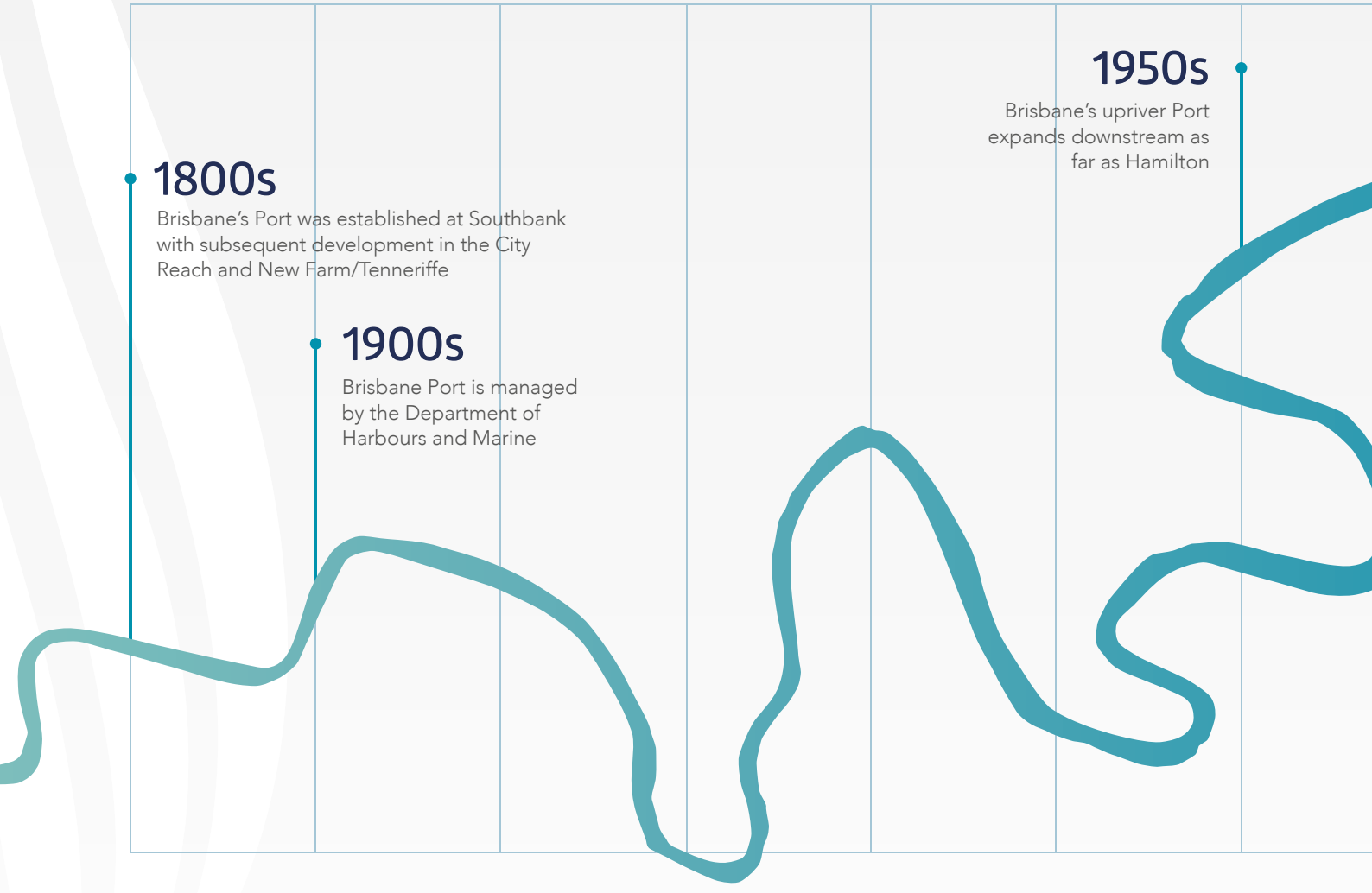
PBPL's role includes:

- The maintenance and development of the port and related facilities.
- Maintaining navigable access to the port for commercial shipping.
- Operation of the Brisbane Multimodal Terminal.
- Leasing and managing land for port-related services.
- Facilitation of the development approval process for developments on Brisbane core port land.

HISTORY

The history of European settlement in Brisbane is directly tied to the development and evolution of its port. In the 1800s, the city's port was originally located in the CBD at 'South Bank'. As progressively larger trading vessels were commissioned, Brisbane's port facilities moved downstream to 'the City Reach', Teneriffe, Newstead and eventually Hamilton. With containerisation in the 1970s ships became larger still and the strategic decision was taken to develop a 'deep-water' port at the mouth of the river. In 1976, the Port of Brisbane Authority was established by the State to oversee this project. With considerable reclamation and development at Fisherman Islands as a primary focus, the Authority became a Government-Owned Corporation in July 1994.

Between 1994 and 2010, the Port of Brisbane Corporation oversaw a period of port history characterised by substantial capital investment, rapid property development, record trade growth, the expansion of Fisherman Islands (including a 230Ha reclamation project for dredged material placement), and the relocation of strategic industries from up river estates to the river mouth.



1800s

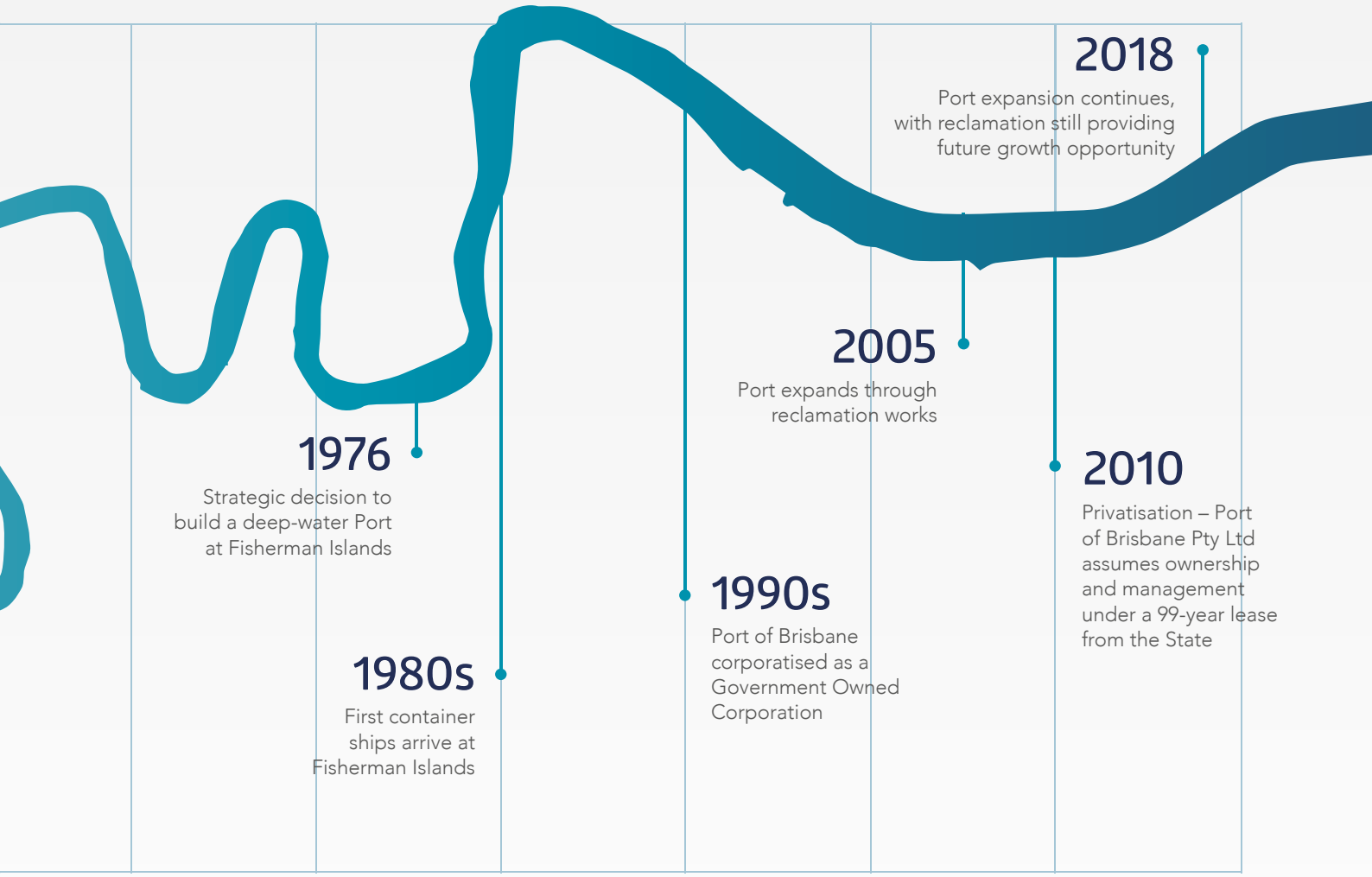
1850s

1960s

PRIVATISATION

As part of the 2010 'Renewing Queensland' plan, the Queensland Government transferred the Port of Brisbane business to a new company, PBPL, under the terms of a 99-year lease. Since 1 December 2010, PBPL has been owned by Q Port Holdings. PBPL's primary role is to facilitate trade growth through the commercial management of an efficient and customer-focused port.

PBPL does not control port movements, provide tug or pilotage services, or participate in any stevedoring activities. These operations are carried out by private operators who lease land from PBPL. Vessel traffic services are the responsibility of the Queensland Department of Transport and Main Roads.



1976

1980s

2005

FIG 1.1 Port of Brisbane Locality Plan

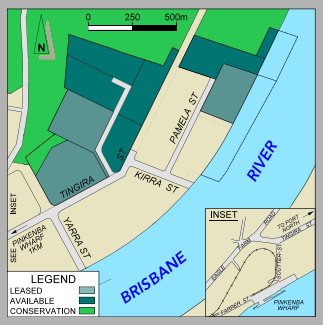
LOCATION AND PORT SURROUNDS

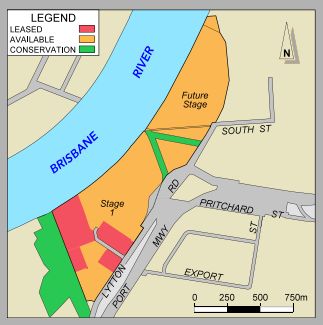
Location: The Port of Brisbane is located approximately 24 kilometres from the Brisbane CBD at the entrance to the Brisbane River and on the edge of Moreton Bay. This location provides the port with the strategic advantage of separating and buffering BCPL from residential and other urban land uses.

Area: The Port incorporates >1,860Ha of wet and dry 'land', designated for industrial, commercial and environmental/ buffering/open space purposes (the latter comprising approximately 693ha of conservation/greenspace)

Channel: The Port features world-class cargo handling capabilities and warehousing facilities and provides an interface between rail, road and sea transport. Operationally, 'Port Limits' (including shipping channels, berth pockets and swing basins) extend geographically beyond PBPL's 'core port lands' from north of Caloundra to the southern tip of Moreton Island and 16 kilometres up the Brisbane River to Breakfast Creek.

Quayline: The Port has property in the suburbs of Port of Brisbane (Port Bris, Port Central and Port Gate), Lytton (Port West), Pinkenba and Bulwer Island (Port North) and Colmslie. Collectively, these properties host 30 operating berths over more than 8.2 kilometres of quayline.





PORT NORTH (includes Hamilton and Pinkenba)

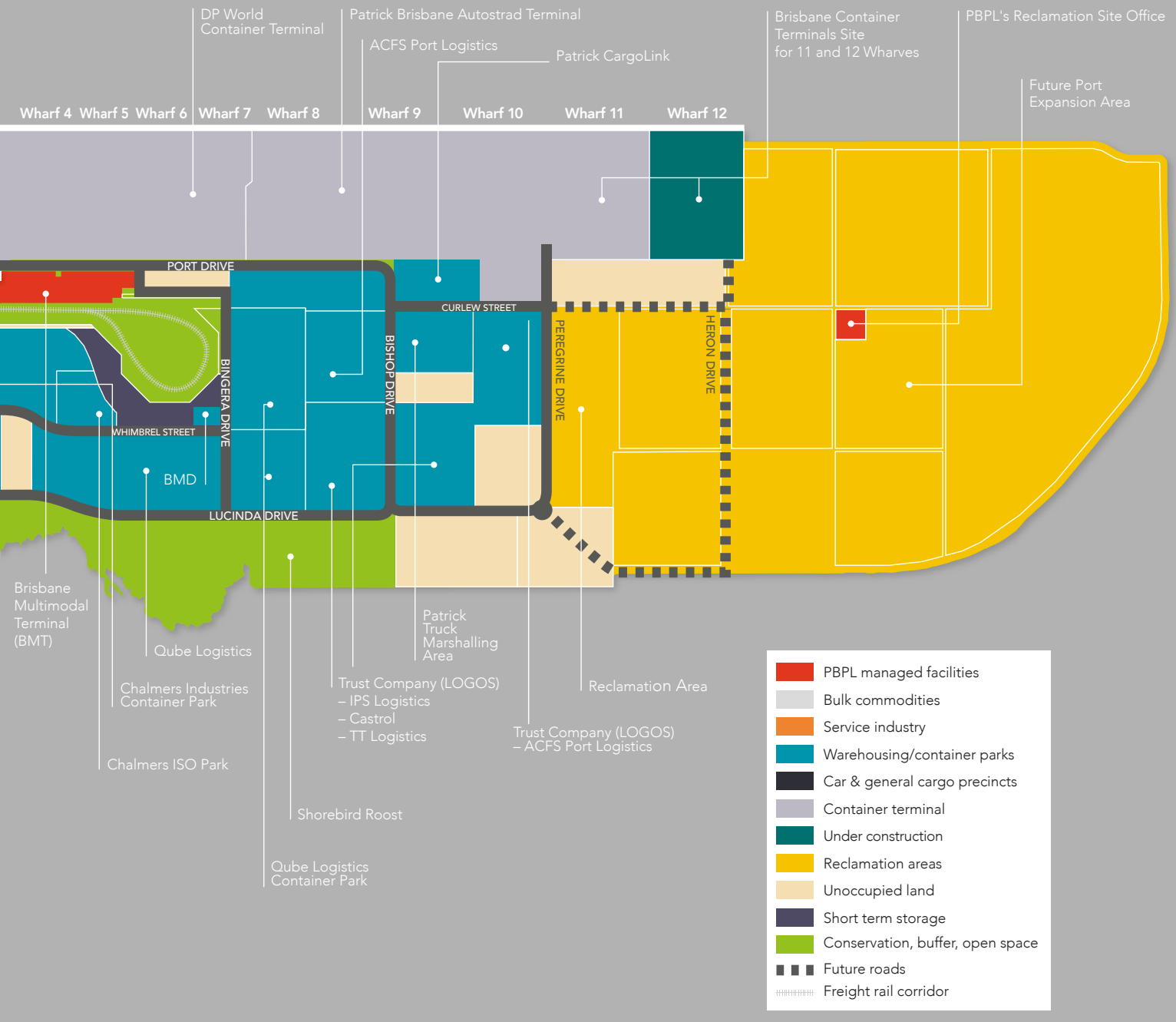
- Cement Australia (Qld) Pty Ltd
- GrainCorp Liquid Terminals Australia Pty Ltd
- GrainCorp Operations Limited
- Incitec Pivot Limited
- Puma Energy
- Qube Ports Pty Ltd
- Sibelco
- Viva Energy Australia Pty Ltd
- Wagners
- BP Bulwer Island
- Origin Energy LPG Limited
- Terminals Ltd (Asset Subsidiary Co Pty Ltd)

PORT WEST

- Bunnings
- Stora Enso Australia Pty Ltd

Sunstate Cement
Multi-user Terminal (MUT)
Queensland Commodity Exports
GrainCorp
SAMI Bitumen Technologies
Bulk Wharf No.1
Seafarers Centre
AAT Terminal
General Purpose Terminal
Crude Oil Wharf
Wharf 1
Wharf 2
Wharf 3
Queensland Bulk Handling
General Purpose Wharf
Coal Wharf
BULK TERMINALS DRIVE
SEAFARERS STREET
Caltex Refinery
Queensland Combined Emergency Services Academy
Caltex Tank Farm
Svitzer Australia
Smit Lamnalco
PBPL Operations Base
PORT DRIVE
Wharf Overflow Area
HOWARD SMITH DRIVE
Moreton Island Ferries
GrainCorp Truck Marshalling Area
SANDPIPER AVENUE
VISA Global Logistics
PORT DRIVE
Prixcar PDI
QPS Water Police
Owens Transport
Prixcar Car Storage
LUCINDA DRIVE
Public Boat Ramp
Autocare (PDI)
KITE STREET
OSPREY DRIVE
Caltex Truck Stop
Autocare Car Storage
Aurizon
Australian Border Force Container Examination Facility
BMD
Autocare
Monash Private Capital
– Steelforce
– Cast Metal Service
– Chalmers Industries
– Charter Holt Harvey
– Port Gate Logistics
Captain Bishop Bridge
Port Office (PBPL Head Office) & Visitors Centre
Port Central 1
Toll Logistics
PORT DRIVE
Chalmers Industries Freight Station
IOR Terminals
BRISBANE GPO 22km

PROPERTY TENANT MAP



PORT SURROUNDS

A RECOGNISED INDUSTRIAL HUB – SURROUNDING LAND USE

The majority of land neighbouring the port is within four Brisbane City Council (BCC) Zones: Industry, Special Industry, Industry Investigation and Conservation. Such classifications are consistent with the transport-oriented, industrial focus of PBPL's LUP.

Within close proximity to the Port is the Caltex Refinery and BP Fuel Terminal, the Lytton and Luggage Point wastewater treatment facilities, the Lytton Industrial Estate, the marine-based industries in the Hemmant area, the industrial estates of the Australia TradeCoast (including Brisbane Airport) and the various industrial/bulk terminals land uses along both sides of the Pinkenba reach of the Brisbane River.

SETTING

BCPL adjoins the Moreton Bay Marine Park which extends from Caloundra to the Gold Coast. The Moreton Bay Marine Park is a zoned, multi-use resource that includes areas of high conservation value while accommodating commercial shipping. Many of the flora and fauna species found in the park are protected under state, commonwealth and international legislation and conservation treaties.

BCPL sustains numerous significant features of ecological significance, including extensive intertidal flats, more than 150 hectares of remnant mangroves and salt marsh at the mouth of the river, seagrass areas, a purpose built 12Ha migratory shorebird roost, and bushland corridors that collectively provide habitat for a variety of fauna species and a physical buffer between sensitive land uses and the port.

NATURAL ENVIRONMENT AND AMENITY

The natural environmental values and resources at the port are managed in a sustainable manner to maintain biodiversity and ecological processes.

LOCAL AND REGIONAL PORT FOOTPRINT

PBPL supports the underlying planning principle of considering factors beyond the boundaries of port land that influence the development and operation of the port and how port development impacts upon surrounding areas and market hinterlands.

Fisherman Islands and Future Port Expansion Area – **Port of Brisbane**

PORT PLANNING FRAMEWORK

Port Planning Framework

OVERVIEW

The Port of Brisbane has national, state and regional significance and therefore a range of stakeholders are involved with its operations.

To support PBPL to effectively manage the Port and facilitate sustainable trade growth, its planning responds to, and is influenced by, a framework of Commonwealth, State and Local Government law, initiatives and policies, in addition to its own internal planning systems and tools.

COMMONWEALTH GOVERNMENT REQUIREMENTS

The Port is influenced by a broad suite of Commonwealth laws including customs, environmental and cultural heritage protection, biosecurity, maritime transport and security, hazardous wastes and rail safety.

In addition to such legislation, PBPL's business also responds to various Federal policies and strategies including The National Ports Strategy 2010 (Infrastructure Australia) whose purpose is to drive *"the development of efficient, sustainable and safe ports and related freight logistics that together balance the needs of a growing Australian community and economy, with the quality of life aspirations of the Australian people."* (NPS p.17 2011).

The NPS requires the development of 15-30 year plans for ports that address a range of objectives. This Master Plan, combined with the balance of PBPL's forward planning documents, satisfies NPS's objectives to ensure that the amenity of areas surrounding the port will not be adversely impacted upon as a result of port growth.

PLANNING SYSTEMS AT THE PORT OF BRISBANE – FRAMEWORK ARCHITECTURE (MACRO)

STATE GOVERNMENT/REGIONAL PLANNING REQUIREMENTS

In addition to Commonwealth policies, the Port is influenced by various pieces of State legislation, including but not limited to, the Building Act 1975, the Native Title (Queensland) Act 1993, the Transport Infrastructure Act 1994, the Transport Operations (Marine Safety) Act 1994, the Environmental Protection Act 1994, the Fisheries Act 1994, the Land Act 1994, the Coastal Protection and Management Act 1995, the Planning Act 2016, the Work Health and Safety Act 2011 and the Sustainable Ports Development Act 2015.

Collectively, this suite of laws and their accompanying policies seek to guide the planning, development and operation of Queensland's ports including the 15 trading ports that in 2017 collectively handled 340 million tonnes of cargo valued at ~$100 billion.

CITY AND NEIGHBOURHOOD PLANNING

PBPL and BCC have, over many decades, attempted to synthesise the land use planning and development of the port with its surrounding neighbourhoods and the city as a whole.

Collectively, the aforementioned laws and their accompanying policies, combine with PBPL's Head Lease provisions to influence the manner in which port development is managed in Brisbane. PBPL in turn employs a range of planning tools to meet these statutory requirements.

PORT OF BRISBANE PLANNING TOOLS AND SYSTEMS

PBPL's Strategic Planning Framework outlines the hierarchy of land use/business planning documents, tools and policies employed by PBPL to grow trade and meet its stated business vision, goals and objectives.

MARKET – EVOLUTION AND GROWTH

PBPL's planning also considers a range of external factors that influence the business. These include changes in general market, economic and geo-political conditions, the evolution and growth of trade, demographic changes and technological innovation.

THE NEXT 30 YEARS

The next 30 years

PBPL's Vision is to be Australia's leading port, here for the future.

Over the next 30 years, trade volumes through the Port of Brisbane will increase sustainably and the vital role the Port plays in servicing the population will become even more important.

PBPL is committed to supporting and facilitating this forecast growth in a sustainable manner and has developed several strategies across trade, property, infrastructure and environment as outlined in this document.

PBPL's Purpose is to drive economic prosperity for our customers and stakeholders by growing trade sustainably in a manner:

- That is Customer Centric, where PBPL becomes indispensable to our customers.
- That is Performance Focussed, where PBPL delivers continuously improved results.
- Where the port is a Supply Chain Enabler that is never the limiting factor on the Australian East Coast.
- That drives innovation and adds value across our supply chain.
- That invests to increase competitive intensity and harness growth opportunities.

To support PBPL to achieve its goal, it has identified the following objectives:

INCREASED AND EFFICIENT PORT ACCESS

Over the next 30 years, rail, road and ship access to the port needs to be improved in response to growth in both trade volumes and SEQ's population. Increased and efficient port access will be vital to PBPL's business and the region's economy and liveability. Currently, less than 2.5% of cargo is transported to and from the port by rail. This is significantly lower than the 20-30% rail freight mode share noted in many major cities internationally. This situation places significant pressure on the broader road and passenger rail network and has the potential to constrain trade growth at Port of Brisbane.

Actions required over the next 30 years at a glance:

- The identification and development of a dedicated, segregated freight rail corridor to the port
- Optimising channel capacity to safely and efficiently accommodate larger cargo and cruise vessels
- Monitoring and where necessary developing improved road access to the port
- Responding to/harnessing emerging freight transport technologies/practices including vehicle automation/platooning, inland freight hubbing, coastal shipping, drone transport etc.

DEVELOP ADDITIONAL PORT CAPACITY

By 2043, it is expected that the Port of Brisbane will handle over 4 million containers in addition to a considerably expanded bulk, general cargo, motor vehicle and cruise passenger transport task. To support such growth and meet market demands PBPL will be required to expand and increase the capacity of its existing infrastructure, and invest in new infrastructure as required.

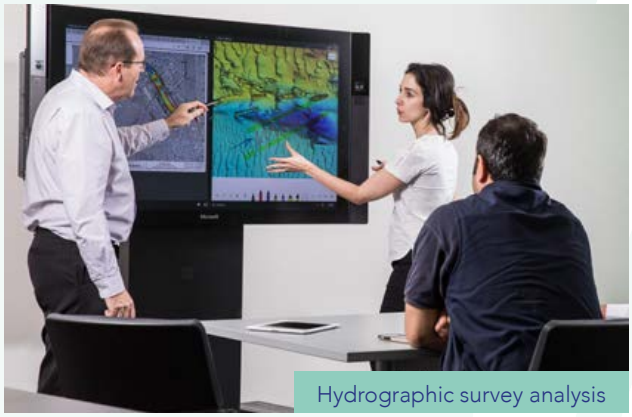
Actions required over the next 30 years at a glance:

- Improved pipeline connectivity.
- New warehousing/distribution centres.
- Additional handling and storage infrastructure.
- Development of a new cruise facility.
- New wharves and upgrades.
- Additional terminal and quayline capacity.
- Additional development to accommodate future port operations.
- Enhanced port amenity.
- Improved logistical solutions.

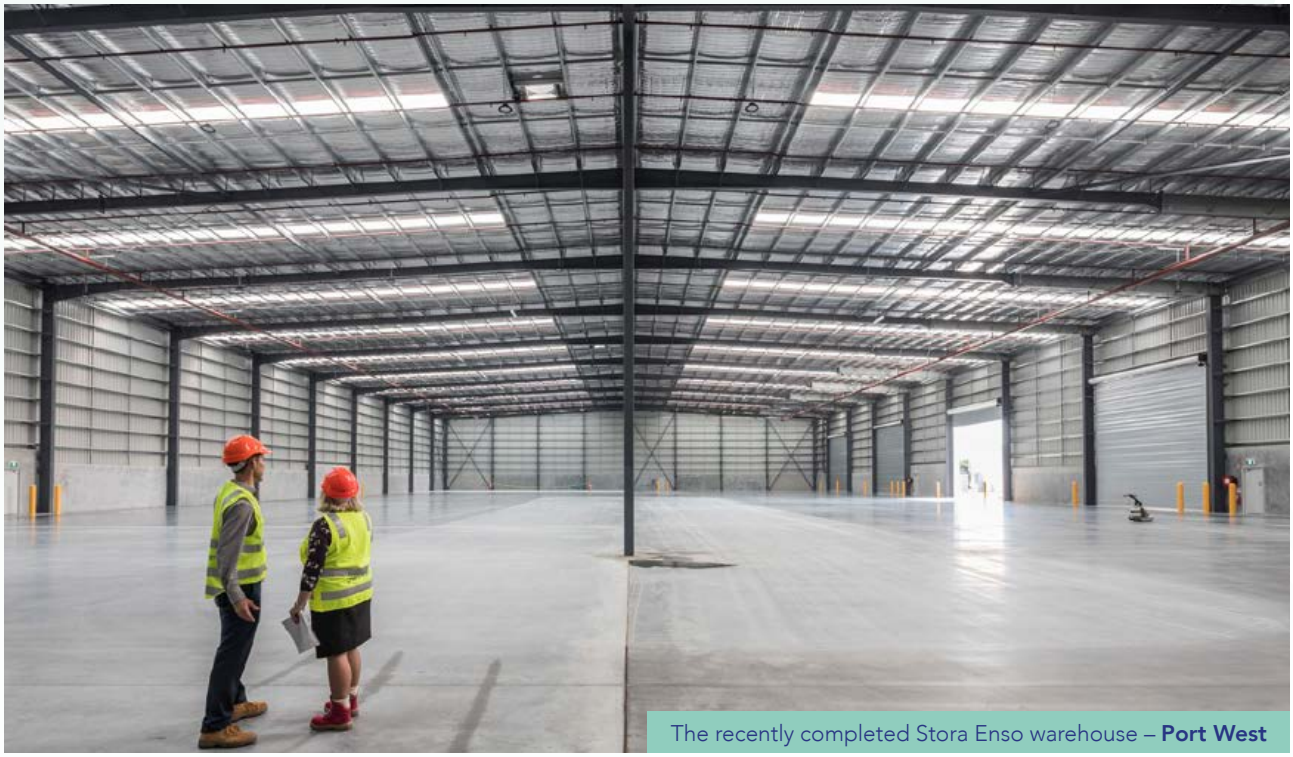
These objectives and high-level overviews of supporting actions are outlined in greater detail within PBPL's strategies for trade, property, infrastructure and environment.

Quayline and Reclaimation Area

Brisbane Multi-modal Terminal



Hydrographic survey analysis



The recently completed Stora Enso warehouse – **Port West**

Master Plan Strategies for port planning can be noted to include the following actions:

PORT PLANNING FRAMEWORK

TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitor and respond to market influences including but not limited to domestic and geopolitical factors, local and international economic influences and changing technology (e.g. vehicle automation, electric vehicles and battery storage, 3D printing, post-carbon energy innovations etc.), and their collective impact on trade, shipping and infrastructure investment across all areas of PBPL strategic and land use planning/investment. • Monitor key Federal and State legislation and government policies affecting the port (including ports, transport infrastructure, environmental management, planning etc.) and proactively lobby/make submissions that further the long-term interests of The Port. • Monitor BCC's city and local area neighbourhood planning and policies and positively contribute to policy formulation to ensure the port's business is given the highest possible priority. • Continue to foster positive working relationships with all tiers of government. • Work with BCC, DSDMIP and DTMR to develop a port planning overlay (similar to those being developed for the Priority Ports of Gladstone, Hay Point/Mackay, Abbot Point and Townsville) to ensure matters critical to future port efficiency, safety and sustainability are identified and considered in relation to development within the master plan footprint and the transport corridors that provide access to and from the port. • Engagement with industry partners (e.g. Queensland Ports Association (QPA), Ports Australia, port users, key industry bodies) to promote improved port efficiency, infrastructure access, environmental management and safety outcomes. • Pursue planning for nominated strategic projects including but not limited to channel optimisation, freight rail improvements, wet-bulk pipe connectivity, urban design and terminals/commodity precinct planning. • Management of all development on port land via the LUP Development Codes and associated guidelines. • Provide development assessment input on applications outside of Brisbane Core Port Land but within the Port of Brisbane Master Planning Footprint area where the project may have an impact on port operations and transport logistics. • Work with the Port Infrastructure Working Group (BCC, QUU, DTMR, Energex etc.) to monitor the provision and interface of infrastructure required to support projected port growth (this group will regularly monitor, review and refine the Priority Infrastructure Interface Plan (PIIP) as and when required).
SHORT-TERM (1-2 years)	• Bi-annual review of the Port of Brisbane Land Use Plan and, where necessary, the pursuit of amendments in accordance with TIA requirements. • Undertake and complete detailed site planning, tenure conversion, site engineering and development applications for the design and construction of a new cruise terminal and wharf at Luggage Point and the upgrading of Port Drive.
MEDIUM-TERM (3-5 years)	• Complete 5-year update of PBPL's Master Plan in accordance with leasing requirements (i.e. Prepare Port of Brisbane Master Plan 2023-2053) • Review and refinement of PBPL's Technical Guidelines • Instigate detailed planning, engineering, environmental impact analysis of potential port development options beyond the operational life of the FPE area.
LONG-TERM (6+ years)	• Develop a new Brisbane Port Land Use Plan by 2025 accommodating preferred options for development beyond the operational life of the FPE.

TRADE STRATEGY

Trade Strategy

To facilitate growth in trade volumes through the Port, PBPL has developed strategies for each of its key commodities. PBPL's measured, informed and long-term approach will support the Port to maximise its market share across all trade streams.

CONTAINERS

Containers make up more than half of the Port of Brisbane's overall trade revenue and has been the fastest growing commodity stream over the past 10 years.

Over the next 30 years, containers are forecast to grow from 1.35 million TEU now to ~4.8 million TEU per year by 2048. The container wharves at the Port of Brisbane have significant inbuilt capacity, meaning PBPL does not need to invest in new infrastructure to achieve greater TEU numbers for a considerable period.

To facilitate growth and maximise market share in the container sector, PBPL is exploring options to support greater connectivity and transport efficiency by improving road, rail and ship access to the port.

30 YEAR CONTAINER GROWTH TARGETS

Year	2018	2023	2028	2033	2038	2043	2048
VOLUME *(ANNUAL)*	~1.34M	~1.68M	~2.14M	~2.68M	~3.33M	~4.01M	~4.80M
GROWTH *(ANNUAL)*	-	~4.5%	~4.9%	~4.6%	~4.4%	~3.8%	~3.7%

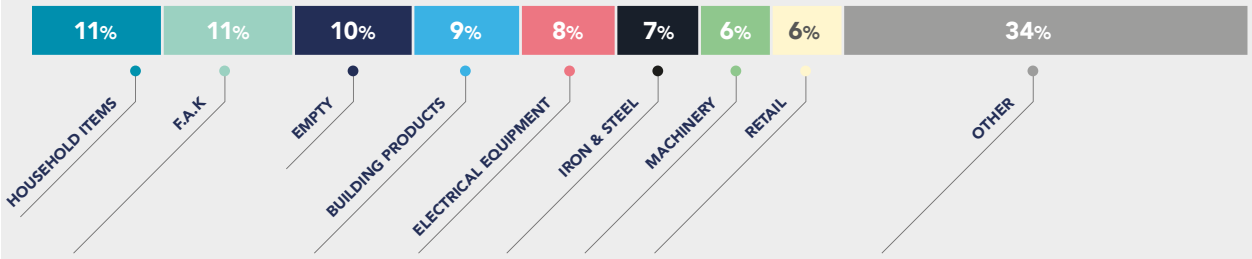
The table above demonstrates the targeted increase in TEUs and average container growth to 2048.

Import container trade types and volumes closely align with the Queensland and Northern New South Wales economic, population and Gross State Product (GSP) growth results. Continued strong growth in imported manufactured goods has led to higher volumes of imported full containers.

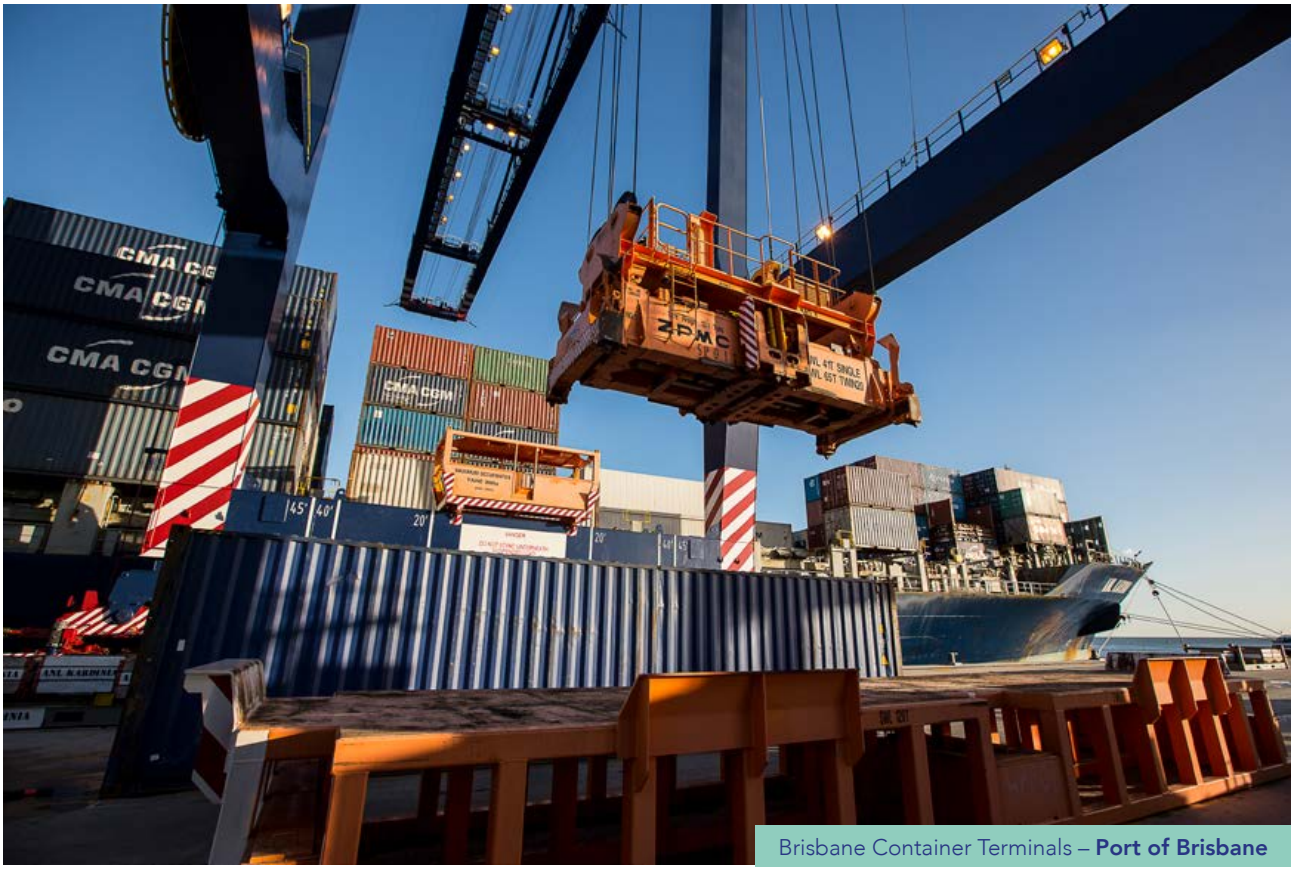
Export container trade through the Port of Brisbane includes agricultural products bound predominantly for Asia and the USA. The high seasonal and weather dependency of these exports creates increased levels of variability.

This disparity necessitates storage requirements for empty containers and drives growth in the export of empty containers to balance imports.

IMPORT CONTAINERISED TRADE FY2017-18 (BY TEU)



EXPORT CONTAINERISED TRADE FY2017-18 (BY TEU)



Brisbane Container Terminals – **Port of Brisbane**

ORIGIN AND DESTINATION – CONTAINER MOVEMENTS THROUGH THE PORT

More than 97% of all import and export containers passing through the Port of Brisbane are transported by road. The balance is transported by rail via the Brisbane Multimodal Terminal (BMT), primarily to/from the Darling Downs, central Queensland and Townsville.

Providing an improved/dedicated freight rail service to the port has the potential to unlock additional trade as demand grows via greater connectivity and transport efficiency.

Increasing rail transport to and from the port will also reduce congestion, improve road safety, reduce comparative road maintenance costs and reduce greenhouse emissions.

The quality of the road network and the capacity of rail to meet the growing freight task are critical to the Port's and the State's ability to optimise freight movement efficiency.

CONTAINER INFRASTRUCTURE STRATEGY

ADDITIONAL QUAYLINE INFRASTRUCTURE

The Port of Brisbane currently has the quayline capacity of eight, 300 metre long dedicated container berths, comprising approximately 2,460 metres of quayline.

Based on current utilisation rates, Port of Brisbane has the wharf infrastructure required to cater for forecast growth. With expected growth and high productivity (i.e. up to 2,000 TEUs per quayline metre), existing capacity would not be reached until beyond 2040, which would then require the development of a further berth from that date.

The container wharves are integrated with the terminal operations immediately adjacent to the wharves. As additional berth and terminals are required, the land immediately behind the wharves will be preserved to ensure future integration. Provision of additional landside infrastructure to meet demand, such as container parks and warehousing, is discussed in more detail in the Property Strategy section of this document.

IMPORT CONTAINERS

25%
ARE UNPACKED IN OR NEAR THE PORT

60%
ARE UNPACKED IN BRISBANE, THE MAJORITY BEING WITHIN 40KM OF THE PORT

90%
ARE UNPACKED IN BRISBANE OR ADJACENT REGIONS, THE MAJORITY BEING WITHIN 100KM OF THE PORT

EXPORT CONTAINERS

30%
ARE PACKED IN OR NEAR THE PORT

40%
ARE PACKED IN BRISBANE (MOST WITHIN 40KM OF THE PORT)

75%
ARE PACKED IN BRISBANE OR ADJACENT REGIONS, THE MAJORITY BEING WITHIN 100KM OF THE PORT

25%
ARE PACKED IN OTHER QUEENSLAND REGIONS (E.G. DARLING DOWNS, AND A SMALL PERCENTAGE ARE PACKED IN NORTHERN NSW)

The strategies that PBPL will employ to facilitate trade growth and maximise market share in the container sector are as follows:

CONTAINER TRADE STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Maintain close relationships with existing exporters and importers, including the owners of the product, via a customer relationship plan designed to focus on firstly identifying and secondly capturing contestable trade. • Review and update PBPL's Import/Export and Origin/Destination investigations so as to better understand the dynamics of PBPL's hinterland and the deployment of infrastructure investment/ services (e.g. road improvements, a dedicated freight rail connection to the port and coastal shipping) to meet market demands and bolster trade. • Explore opportunities to reduce supply chain costs for importers and exporters by improving road, rail and ship access • Target contestable import containerised materials and equipment relating to infrastructure and mining projects, by firstly identifying the projects in the pipeline and then market ourselves to logistics providers to these projects, design logistics solutions in the allocation of wharves and land and the use of the BMT. Identify infrastructure and logistical constraints, and facilitate solutions to these limitations. • Target contestable export agricultural products in Northern NSW within the limitations of the logistics chain. Identify contestable cargoes and any infrastructure and logistics constraints, facilitating solutions to these limitations. Market the advantages of the Port of Brisbane and continue to promote facilities on Fisherman Islands. • Improve the productivity and efficiency of the port and market the advantages of the Port of Brisbane to contestable regions in central NSW, partnering with port service providers to attract cargo. • Support initiatives aimed at improving the productivity and performance of the entire supply chain. Such initiatives could include additional investment in technology and automation, improved vehicle booking/scheduling, improved monitoring and sharing of stevedoring/ transport data to more accurately measure productivity, monitoring and (where necessary) investing in quayline and landside infrastructure etc.).
SHORT-TERM (1-2 years)	• Advocate for, and where appropriate take a leadership role in the development of rail infrastructure connecting to South Western QLD and Northern NSW to improve the global competitiveness of agricultural products from those regions (refer to Rail Access and Capacity section). • Investigate the opportunities and risks in increasing the capacity of the shipping channel to accommodate larger container vessels. • Liaise with shipping lines, stevedores, Australian Customs and Border Protection and Department of Agriculture to maximise the potential for additional transhipment and/or coastal shipping of containers. Develop initiatives that improve systems and reduce costs through the exchange of transhipment containers between different terminals. Develop marketing strategies in partnership with terminal operators, local shipping lines and authorities to improve services. • Investigate and plan for structural upgrades of older container wharves due to increases in vessel sizes
MEDIUM-TERM (3-5 years)	• Monitor performance of/demand for additional container handling and storage infrastructure and changes in container shipping within the port and adjust Infrastructure Strategies (e.g. channel deepening, wharf upgrades etc.) accordingly. • Monitor performance of/demand for additional container handling and storage infrastructure and changes in container shipping within the port and adjust Property strategies (re: supply and demand of land). • Explore the viability and opportunity-costs of linking improved freight rail services to the port with the establishment of inland freight hubs. • Monitor the performance of key road links to the port from both regional and metropolitan areas to ensure congestion and delays are minimised and to advocate for infrastructure upgrades, including rail. • Undertake capital works to upgrade the structural capacity of older container wharves due to increases in vessel sizes

CONTAINER TRADE STRATEGIES (CONT.)

TIMEFRAME	PROPOSED ACTION
LONG-TERM (6+ years)	• Review dynamics of container throughput and adjust strategies for additional quayline (berth and terminal)/FPE development accordingly. • Support the development of inland freight hubs where deemed economically viable.

The strategies that PBPL will employ to facilitate growth in general cargo and/or maximise market share are as follows:

GENERAL CARGO TRADE STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Promoting and supporting improved efficiency within the terminals, which will in turn create capacity for future growth. • Pursuing market-contestable imported project cargo relating to infrastructure and mining projects. • Develop additional storage areas for project cargo in close proximity to the terminal and the BMT, as well as spare berth capacity to handle projected increases in the trade, by reviewing permitted use flexibilities of other wharves. • Pursue/support simplified regulations regarding the movement of project cargo (and oversized cargo generally) and the use of Higher Productivity Vehicles (HPV) via improved access between PBPL properties and (via ongoing engagement with DTMR and the Queensland Police Service) the subsequent movement of larger payloads throughout the port's hinterland.

Break bulk unloading at Australian Amalgamated Terminals – **Port of Brisbane**

WET BULK

The wet bulk commodities traded through the port include crude and refined oil, bitumen, chemicals, tallow (fats and oils) and liquid fertiliser.

Wet bulk commodities contribute 15% to PBPL's trade volumes traded through the port and are expected to increase over the long-term. Wet bulk commodities are stored and handled in facilities at Pinkenba, Bulwer Island and Lytton, with additional facilities provided in the existing Fisherman Islands Bulk Precinct.

PETROLEUM PRODUCTS – CRUDE AND REFINED OIL

Queensland's petroleum products are imported as either refined product or as crude oil, with much of this product coming through the Port of Brisbane. Crude oil is processed at the Caltex refinery located in Lytton (adjoining PBPL's Port Gate estate).

Caltex's crude oil and refined products berths are complemented by a number of berths (e.g. VIVA Energy, Pinkenba, the Port North Common User Berth 1 (PNCUB1), GrainCorp Liquid Terminals etc.) which are used principally for the import and export of refined petroleum products.

The PNCUB1 (until recently the BP products berth) is expected to be utilised primarily for the import of refined fuels and/or LPG in the future. Other than the one-off increase when crude oil imports fall, PBPL expects a gradual, slow decline in unleaded petroleum products, with population growth offsetting greater fuel efficiency. 2-3% and 4-5% growth is expected in diesel and jet fuels respectively as those markets grow.

Port of Brisbane – Oil Tanker Unloading

WET BULK STRATEGY – DEDICATED WET BULK PRECINCT FOR THE IMPORT OF REFINED PRODUCTS

PBPL is pursuing a wet bulk strategy to establish a dedicated precinct on the north side of the Brisbane River for the import of refined products. The dedicated precinct would utilise the existing PNCUB1 and be a one berth operation initially. Further berths could be established if demand requires.

This strategy has the ability to provide third parties access to deep water. Having assumed ownership and control of the PNCUB1, PBPL intend to open access to this deep-water facility (via shared or new pipelines) to third parties. PBPL is considering various options for the development, ownership and operation of new/augmented pipeline infrastructure to connect to trade parties.

TALLOW (FATS AND OILS)

Tallow (animal fats and vegetable oils) is a by-product of the agricultural industry and is used in items such as soap and toothpaste, in addition to being an ingredient in biodiesel fuels. Growth in tallow exports is reliant upon growth (in animal kill numbers at abattoirs in SEQ), domestic consumption and world prices, making it difficult to predict future volumes.

CHEMICALS

Chemicals do not make up a large part of the port's wet bulk. They are forecast to achieve modest growth over the next 30 years.

WET BULK FERTILISERS

Fertilisers are forecast to achieve modest growth over the next 30 years. Fertiliser imports generally peak in line with strong agricultural growing seasons.

LNG AND LPG

Recent liquid natural gas and liquid petroleum gas projects in Queensland have seen the commencement of exporting these energy products.

There may be demand for growth in storage at the port for natural gas to supply industry and bunker vessels.

Petroleum product storage (Port Gate) – **Port of Brisbane**

WET BULK TRADE STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Support the establishment of a dedicated precinct on the north side of the Brisbane River (including at Port North) for the import of refined products. • Understand the major stakeholders in the industry, in particular their drivers when deciding on export facilities and location. • Promote Brisbane's capacity especially at Port North to energy companies as part of a broader marketing of the advantages of the Port of Brisbane as a preferred Wet Bulk port in contestable markets. • Explore opportunities to co-locate facilities with existing infrastructure in current wet bulk precincts such as Port North, in order to establish the Liquid Natural Gas (LNG)/Coal Seam Gas (CSG) trade through Brisbane.
SHORT-TERM (1-2 years)	• Initiate the development of pipeline connectivity between Port Gate, Port Bris and Port North and the negotiation/design of shared pipeline use/augmentation with wet bulk interests to optimise deep-water facilities access. • Further investigations into alternative refinery land use option in the event that Caltex opts to cease refining activities in Brisbane and convert their facility to a terminal-only operation.
MEDIUM-TERM (3-5 years)	• Transition refinery assets and areas to terminal facilities and associated port industry. • Develop suitable multi-user wharf and commodity handling infrastructure to meet growing demand in the wet bulk market. • Monitor the need to bring forward channel deepening infrastructure works if wet bulk volumes intensify.
LONG-TERM (6+ years)	• Facilitate additional deep water wharf access to wet bulk customers via the development of greater pipeline connectivity between bulk storage areas and strategic wharf assets (including links to Pinkenba and the Caltex crude berth). • Examine the cost/benefits and opportunity costs of providing for additional wet bulk handling wharves and terminals downstream of Berth 13 in the longer-term planning for the development of Port Bris.

DRY BULK

The trade in dry bulk products comprises mainly coal exports, grain and cereal exports, import of cement products, as well as other minor trades including woodchips and sand.

Dry bulk trade is a key feature of the port's diverse commodity base and contributes almost 12Mt to PBPL's trade volumes. Dry bulk is expected to increase by 60% by 2048 driven by increased demand for Australian resources and agribulk.

A detailed strategy is considered for the most valuable of these trades i.e. coal. Other more general strategies are considered for the remaining dry bulk trades.

COAL

The high calorific value and low sulphur coal exported through Brisbane is shipped to countries such as Japan, Korea, Taiwan and China for use in power generation from the Clarence-Moreton and Southern Surat Basins, which hold reserves in the order of 2B tonnes of thermal coal or ~19% of the national total. Much of this coal will be drawn into power stations only now being commissioned.

In 2017/18, coal exports through Brisbane were ~7.2Mt. Global prices and demand (particularly in China, Japan and India), determine the rate at which coal miners commit significant capital to capacity expansions. The Clarence-Moreton and Surat Basins have considerable potential for the large-scale development of coal resources beyond existing mines including at Wilkie and Kogan Creeks, Jeebropilly, New Acland and Cameby Downs.

The potential to grow coal exports beyond ~12MTpa is capped by the constraints of the port's existing freight rail network connections. Any increase in Brisbane's coal export throughput would require upgrades in rail freight capacity up to and including the construction of a dedicated freight rail corridor to the port that is segregated from the Brisbane passenger rail network.

The development of new rail infrastructure to the Port of Brisbane would facilitate growth in this (and other) trade. Immediate additional benefits to be gained from the construction of a dedicated freight rail corridor to the Port include:

- Facilitation of trade in other port cargoes, such as agricultural products from Western QLD and Northern NSW;
- Alleviation of longer term road congestion, with consequent improvements in road safety, environment and the liveability for the people of South East Queensland;
- The pass back of increasingly valuable passenger rail capacity to the broader Brisbane metropolitan system; and
- Capturing of employment and other economic uplift for Queensland which otherwise leak to southern ports/states.

Given the demand for Queensland's coal exports, the Port of Brisbane's volumes could also be expanded if additional capacity can be realised from the existing rail line and stockpiles at the port.

STRATEGIES FOR OTHER DRY BULK COMMODITIES

Dry bulk trades in Brisbane other than coal include:

- Cement (imports of clinker, gypsum and slag).
- Grain exports.
- Woodchip exports.
- Scrap metal exports.
- Dry bulk fertiliser imports.
- Silica and mineral sands exports.

The Port's dry-bulk facilities, predominantly at Fisherman Islands and Pinkenba, have flexible operational arrangements, with some fully dedicated to a particular user, and others sharing wharf facilities with other bulk and non-bulk trades. All wharves owned by PBPL currently have multi-user and common-user capabilities in order to maximise utilisation, affordability and reduce duplication of infrastructure. It is PBPL's intent that these precincts will remain a focus for the consolidation of dry-bulk trade streams.

Bulk grain loading for export – **Port of Brisbane**

TRADE TARGETS FOR TOTAL OTHER DRY BULK

As a result of forecast economic growth and the initiatives and strategies for these trades, total trade volumes in the long-term for non-coal dry-bulk are expected as follows.

CEMENT

- Clinker, gypsum and slag are key ingredients used to make cement. These ingredients are currently imported from Asia and are expected to grow over the next five years as high, current demand in the residential sector is cyclically balanced against larger project demands; for example the Queens' Wharf and Howard Smith Wharf projects.
- Currently there are several importers of these products, including Sunstate Cement (Fisherman Islands), Cement Australia and Wagners (Port North). Capacity upgrades to the existing Sunstate Cement and Cement Australia facilities, along with the construction of the Wagners cement wharf, will facilitate future growth.

GRAIN

- Grains include numerous seasonal crops. High rainfall seasons can produce record crops, as was the case in 2008/09 and 2011/12. Demand for bulk grain products such as wheat, barley, canola, chickpeas and sorghum is presently strong, and is expected to increase (as nations such as China and India grow).
- Given the seasonal nature and unpredictability of grain export volumes, it is difficult to accurately forecast annual grain volumes over the long-term. However, advances in dryland farming techniques, crop varieties and the improvements in water/irrigation availability represent significant potential for both growth and predictability in this sector. Also, there is potential to export a greater volume of bulk agricultural product from Northern New South Wales, if rail connections are extended into Northern NSW and a dedicated rail corridor to the port is developed.

WOODCHIP

- Softwood woodchips are produced in SEQ and exported to Japanese pulp facilities for the manufacture of newsprint paper and cardboard.
- Hardwood exports to China commenced in 2014, a new market that emerged following a drop in the value of the Australian dollar, and a sustainable supply of hardwood logs. Export woodchip is forecast to achieve modest growth by 2048, subject to market demand. The port's woodchip business (QCE) is located in the bulk precinct together with grain, cement and coal. Like many bulk commodities, this business experiences cyclic variations due to fluctuations in the value of the Australian dollar.

SCRAP METAL

- Scrap metal is exported from the Port of Brisbane throughout Asia. Exports of scrap metal are expected to vary with iron and steel prices, but modest growth is predicted in the long-term.

DRY BULK FERTILISER

- Modest growth in fertiliser products is forecast over the next 30 years. Fertiliser imports generally peak in line with strong agricultural growing seasons and as a result, there is little opportunity to actively increase this trade.

MINERAL SANDS

- Mineral sands are high value commodities which contain important minerals rutile, zircon and ilmenite. Currently, shipments continue in bulk and containers, and are linked to mining leases on Stradbroke Island. While the Queensland Government has recently indicated this source of mining products will be phased out by 2019, PBPL have recently secured additional trade in this market from alternative sources.

The strategies PBPL will employ to optimise dry bulk trades include:

DRY BULK TRADE STRATEGIES

COAL

TIMEFRAME	PROPOSED ACTION
ONGOING	• Develop deeper understandings of market demand and global trends in the energy sector to determine real future demand for coal exports through Brisbane. • Maintain up-to-date feasibility analyses to meet expected demand at the port, to the extent that the rail infrastructure can realistically deliver. • Working with track managers, rail operators and the coal companies to find ways to extract additional freight capacity out of existing rail infrastructure, to achieve at least 15Mtpa export capacity. • Utilise feasibility analyses to consider the need for additional infrastructure if necessary, with particular consideration given to different models for funding, ownership and operation. • Monitor the need to bring forward channel deepening infrastructure works if coal volumes intensify. • Facilitate the investigation and development of a dedicated freight rail corridor to the port.
SHORT-TERM (1-2 years)	• Seek to facilitate any development application for the expansion of the QBH stockpile while accommodating interim, short-term storage on this site if this project is delayed due to the present market conditions and regulatory approvals for coal mining.

OTHER DRY BULK

TIMEFRAME	PROPOSED ACTION
ONGOING	• Maintain strong relationships with all stakeholders in the grain supply chain, which will result in a deep understanding of the supply chain, its capacity and opportunities, strongly promoting the Port of Brisbane's export capacity. • Target incremental contestable export agricultural products in Northern NSW within the limitations of the logistics chain. Identify contestable cargoes. Identify infrastructure and logistics constraints, facilitate solutions to these limitations, such as truck marshalling on Fisherman Islands. • Market the advantages of the Port of Brisbane as a preferred Dry Bulk port in contestable markets. • Facilitate/support initiatives increasing rail capacity within the existing rail freight network and the development of a dedicated, segregated freight rail corridor to the port. • Accommodate seasonal peaks by making additional land available on short-term tenure. • Maintain strong relationships with all in the cement industry, strongly promoting the Port of Brisbane's cargo handling potential. • Monitor and report internally on industrial or market developments affecting cement imports. • Monitor policies and plans by all involved in the cement industry, focussing on any issues likely to affect import volumes. • Maintain strong relationships with all stakeholders in the grain supply chain, which will result in a deep understanding of the supply chain, its capacity and opportunities, strongly promoting the Port of Brisbane's export capacity.
LONG-TERM (6+ years)	• Examine the cost/benefits and opportunity costs of providing for additional bulk handling wharves and terminals downstream of Berth 13 in the longer-term planning for the development of the Port.

MOTOR VEHICLES

Motor vehicle imports handled at the Port of Brisbane represent approximately 95% of Queensland's car imports. They are a strategically important commodity to PBPL, particularly given the Port's availability of land and proximity to Asian manufacturing markets.

Traditionally, strong growth in imported motor vehicles has been driven by a combination of population growth in Queensland and Northern New South Wales, an increase in the number of cars per person and the declining average age of cars.

The 30-year growth forecast for motor vehicles is 2.0% by 2048 to >500,000 vehicles and takes into account the cessation of motor vehicle manufacturing in Australia.

Major overseas car brand manufacturers import vehicles directly to Australian Pre-Delivery and Inspection (PDI) facilities where vehicles are stored, processed and made compliant with Australian requirements.

The location of PDI facilities and storage on Fisherman Islands allows imported vehicles to be transported from the vessel to the PDI facility without incurring trucking costs, which significantly benefits the car industry and consumers.

The Port of Brisbane accommodates motor vehicles ships that are stevedored primarily at the AAT facility on Fisherman Islands.

PBPL's future trade and property strategies for motor vehicles will also accommodate for the likely growth in electric vehicles.

MOTOR VEHICLE TRADE STRATEGIES

PBPL's motor vehicle strategy seeks to maintain, enhance and grow the motor vehicle trade in a sustainable manner. While most of the forecast growth in this trade is a result of population growth and shifts in consumer needs, there is also the opportunity to grow by extending PBPL's hinterland into areas further south past Coffs Harbour and Port Macquarie.

The opportunity to increase motor vehicle transhipments in Brisbane is a function of:

- The charter costs of Pure Car Carrier (PCC) vessels being sufficiently high enough to realise utilisation benefits in excess of additional handling and storage costs.
- Having sufficient land at the port in close proximity to the wharves, to store the vehicles awaiting distribution to destination ports.

Pre-delivery inspection facilities – **Port of Brisbane Motor Vehicle Precinct**

Strategies that PBPL will employ to facilitate growth in motor vehicle imports and to maximise market share are as follows:

MOTOR VEHICLE STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Accommodating for greater demand for car imports as a result of the cessation of car manufacturing in Australia. • Actively market the importation of motor vehicles destined for central NSW through the Port of Brisbane, focusing on: land capacity to accommodate PDI facilities, lack of urban and road congestion and proximity of Brisbane relative to Port Kembla. • Market increased transhipment focussing on first port of call, reuse of ship space from vehicles unloaded in Brisbane, availability of land, reduced travel times and savings in Port call costs to other ports. • Maintain efficiencies by utilising the amount of land available on Fisherman Islands for PDI operations. • Incentivise and manage productivity improvement in the AAT facility to enhance cost efficiencies and maximise capacity to handle growth and transhipments, through productivity targets incorporated into lease and management agreement terms.
SHORT-TERM (1-2 years)	• Attempt to capture a greater share of the local car storage and PDI market by targeting local competitors in this market.
MEDIUM-TERM (3-5 years)	• Exploring options (via detailed/innovative architectural design and costing) for multi-level car storage and the capture of the electric car/automated vehicle markets.
LONG-TERM (6+ years)	• Where deemed economically viable, and according with broader opportunity-costs for Port Bris land use, developing multi-level car storage.

GENERAL CARGO

The general cargo trade in Brisbane comprises the importation of steel, machinery and equipment as well as a small volume of exported general cargo. General cargo is transported predominantly on mixed cargo type vessels operating as a semi-liner or tramp service and products are sourced predominantly from China, Indonesia, Japan and India.

Growth drivers include population growth, declines in local manufacturing (e.g. steel), consumer confidence in residential development, government investment in major infrastructure and major project development (particularly in resource and agricultural industries).

The general cargo trade is expected to experience only marginal growth for some time. The factors driving this growth include major infrastructure projects, commercial construction and housing projects in SEQ.

In recent times, the other main driver for importing general cargoes has been the need to service mining, LNG and CSG industry projects. While many of these projects have now completed their establishment and construction phases, it is likely that further waves of resources-driven investment will occur in the future (in parallel with cyclic improvements in this sector) along with complementary equipment-intensive development.

INFRASTRUCTURE STRATEGIES FOR GENERAL CARGO AND MOTOR VEHICLES

Fisherman Islands has dedicated motor vehicle and general cargo facilities that are in close proximity to the single rail head at the BMT (namely the AAT Wharves and the General Purpose Wharf). In addition, there are significant storage areas for these cargoes, creating valuable offerings to the general cargo, project cargo and motor vehicle industries.

As is the case for containers, key considerations for PBPL in growing the general cargo and motor vehicle trades include increasing wharf/terminal capacity, quayline productivity and berth utilisation, reducing ship dwell time and strategic projects.

BRISBANE MULTI-MODAL TERMINAL (INTERMODAL TERMINAL) TRADE

The BMT is an intermodal terminal providing an interface between rail/road and the container terminal operations at the Port of Brisbane. It is operated as a requirement of the Port Lease and is only used as a multimodal terminal for the movement of cargo into and out of the port by rail and for providing short-term storage for cargo moving through the BMT.

The BMT:

- Has 2 side-by-side 900m rail sidings and a dual gauge through-line linked with the Queensland rail network.
- Relies on sharing rail with other rail trade users and rail efficiency for non-bulk products.
- Handles containerised trade primarily from North and Far North Queensland (e.g. full containers comprise of 12% imports and 88% exports while empties were 88% import and 12% export).
- Handles some direct road traffic which is transferred to the container terminals.
- Provides storage services to clients who wish to keep containers at the port, either prior to or post shipping.
- Accommodates some project cargoes.

Cargo generated from SEQ is generally not transported by rail due to higher costs and lower efficiencies. In the longer term, towards the end of this plan timeframe, the lack of land for additional intermodal activities, combined with increased road congestion may drive the movement of more containers onto rail.

Cooper's Gap wind farm blades storage – **Port of Brisbane**

As more cargo is handled on rail, due to road congestion and an expanding hinterland, additional rail paths will become necessary. The economies of transporting cargoes by rail improve with increased competition and rail paths, leading to increased utilisation and lower costs. The development of a dedicated/segregated rail freight corridor to the port will be vital in this regard.

In order to cater for increased cargo volumes travelling to the Port on rail, PBPL has been a strong advocate for the preservation of a dedicated freight rail corridor from Acacia Ridge to the Port, and ultimately the construction of a Dedicated Freight Rail Corridor (DFRC).

A DFRC will not only deliver greater efficiencies for producers looking to export goods from the Port, but it will also improve Brisbane's liveability by potentially taking millions of trucks off roads, reducing traffic congestion, reducing road accident risk, and decreasing pollution.

The Federal Government's Inland Rail project and the State Government's Cross River Rail project are both laudable projects in their own right, but neither deliver dedicated freight rail access to the port. The parallel construction periods of these projects presents a unique opportunity for a DFRC to be designed and delivered.

COASTAL SHIPPING

The Federal and State Governments have, from time to time, proposed amendments to industrial relations regulations that are designed to allow internationally owned and crewed vessels to operate in the Australian coastal shipping trade. The push is to increase the coastal shipping industry nationally, and in doing so open the possibility of Queensland state development in this area. PBPL is open to facilitating coastal shipping services with ports in North Queensland (e.g. Townsville) and around Australia (e.g. in Tasmania and South Australia) where transfers of international to domestic cargo are handled by sea rather than via road or rail freight modes. This would involve organising wharf facilities for regular, dedicated ship calls and coordinating pricing arrangements in the supply chain to secure modal shifts.

Container unloading at the BMT – **Port of Brisbane**

Strategies for the BMT and Coastal Shipping are noted to include:

BMT/COASTAL SHIPPING STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Expanding the business to cover other services such as the storage and staging of containers. • Periodic review of the cost base to ensure appropriate cost recovery. • Market analysis to identify opportunities to attract project cargo (either break bulk or containerised) for short-term storage and rail transfer. • Lobby government for dedicated freight rail paths including intermodal in order to improve cost effectiveness to/from the Port. • Improve regulatory arrangements to improve road access to BMT from the wharves for Oversize-Overmass (OSOM). • Support policy efforts and industry initiatives that increase the viability of domestic coastal shipping between Australian ports. • Collaborating with other ports to explore coastal shipping opportunities.
LONG-TERM (6+ years)	• Accommodate BMT/Rail infrastructure expansion as required for an increased mode share for rail in meeting the PBPL freight task.

Gas Pipeline infrastructure loading at the BMT – **Port of Brisbane**

CRUISE SHIPPING

Brisbane currently has one dedicated cruise terminal located at Hamilton. However, vessels drawing greater than 9.1m in depth are limited in access upstream of Lytton Rocks. Vessels are also limited in air draft passing under the Sir Leo Hielscher (Gateway) Bridges whilst vessels greater than 270m in length cannot physically swing further upstream than Fisherman Islands.

Given these restrictions the Port Lease requires that facilities for the berthing of these mega cruise ships are maintained and made available. These vessels are presently catered for at the Fisherman Islands Grain Wharf and processed through the Multi-User Terminal (MUT).

The mixing of cruise vessels and their associated passengers and transport in the main industrial and trade precinct at Fisherman Islands is not considered ideal.

Accordingly, PBPL has recently pursued, and had approved, a Market-led Proposal with the State Government in relation to the development of the new purpose built Brisbane International Cruise Terminal (BICT) on a 14.22Ha dry and 6.43Ha wet area at Luggage Point. The BICT has an anticipated delivery date of 2020 and will:

- Provide deep water access and a swing basin for all cruise vessels including mega cruise ships greater than 270 metres in length, with a height of up to 73.5 metres (above water) within close proximity to Brisbane Airport.
- Avoid the up-river height and draft restrictions imposed by the Sir Leo Hielscher Bridges and the Lytton Rocks cutting.
- Avoid pressures from urban encroachment.
- Have the capacity to accommodate the largest ships in the world (day and base port calls) at a dedicated cruise facility without the need for dredging.
- Ensure the cruise terminal is a common-user terminal.

OVER THE NEXT 20 YEARS, BRISBANE'S CRUISE INDUSTRY HAS THE POTENTIAL TO TRIPLE, SUPPORTING:

~1.8million
PASSENGERS OVER THE FIRST FIVE YEARS

~1,100
VESSEL CALLS EXPECTED IN BRISBANE IN THE FIRST FIVE YEARS, 2,400 VESSEL CALLS OVER THE SUBSEQUENT FIVE YEARS.

~3,750
JOBS

~766,000
INTERNATIONAL AND DOMESTIC CRUISE VISITORS ANNUALLY TO BRISBANE AND QUEENSLAND

CONTRIBUTING
~$1 billion
IN GROSS OUTPUT TO QUEENSLAND'S ECONOMY EACH YEAR

Cruise vessel entering the Port of Brisbane

Key PBPL strategies relating to the cruise trade can be noted to include:

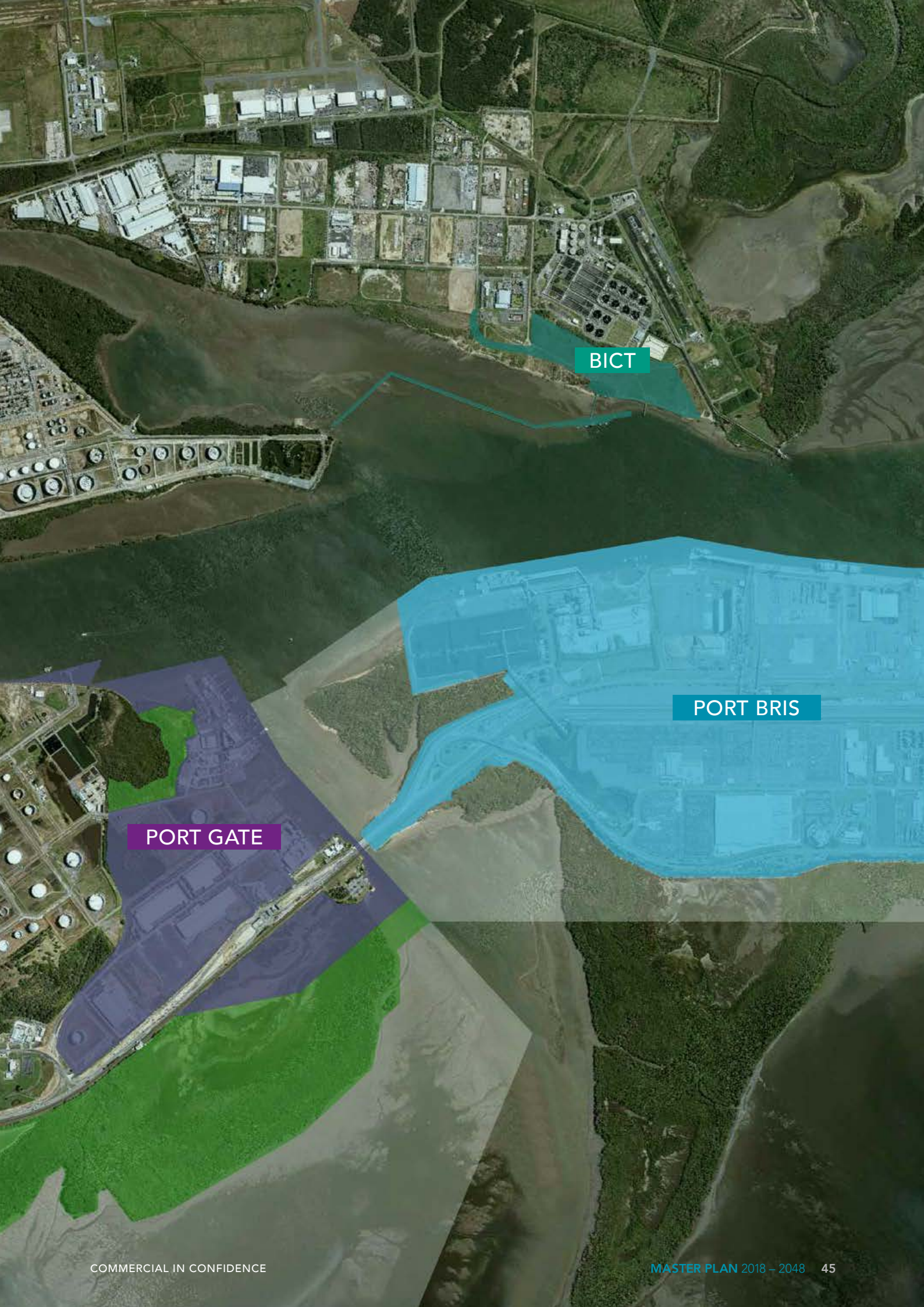
CRUISE SHIP STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Commission detailed design of the wharf, terminal, infrastructure, landscaping, QUU amenity requirements etc. • Secure final development approvals for the development of the site. • Establish and implement systems and resources for the management of the new facility and the optimisation of cruise visitation (in partnership with key industry stakeholders).
SHORT-TERM (1-2 years)	• Finalise land improvement, site filling and drainage works throughout the Port North estate and at the BICT site. • Developing the wet and dry areas required for the cruise facilities at Luggage Point.
MEDIUM-TERM (3-5 years)	• Refine operations of BICT to service the largest cruise ships in the world.
LONG-TERM (6+ years)	• Monitor cruise industry demand and the performance of the cruise wharf and terminal and, where deemed economically, operationally and environmentally viable, investigate and pursue the development of a second cruise berth at Luggage point and/or the development of complementary industrial uses.

The Brisbane International Cruise Terminal – artist impression

PROPERTY STRATEGY

COMMERCIAL IN CONFIDENCE


BICT
PORT BRIS
PORT GATE

Property Strategies

The Port of Brisbane has been strategically created into a number of specialised precincts to efficiently service the requirements of different commodities and to market the development of each precinct. This approach enables the integration of related and complementary activities.

The Port's existing precincts are located in a number of different land holdings within the Port of Brisbane including Port Bris and Port Central (Fisherman Islands), Port Gate (Whyte Island), Port West (Lytton) and Port North (including Pinkenba and Bulwer Island). PBPL also holds some non-strategic port land at Colmslie, while other port related activities at Hamilton continue.

STRATEGIC LAND

The Port currently holds significant parcels of wet and dry land in each of its precincts. Whilst utilisation of this land is a priority, strategic acquisitions to strengthen the portfolio and the port's supply chain network will also be considered subjectively and strategically.

In a broader strategic sense, PBPL may also consider procuring, investing in and/or supporting land uses that benefit PBPL's business. Such initiatives may include securing additional buffer areas to preserve the port's industrial amenity and/or offset future port development, and the development of sites that may offer logistic and supply chain benefits to PBPL (e.g. future disposal sites for dredged material and in-land freight hubs).

The following is a general summary of PBPL's existing precincts, their preferred uses and development strategies.

PORT BRIS AND PORT CENTRAL (FISHERMAN ISLANDS)

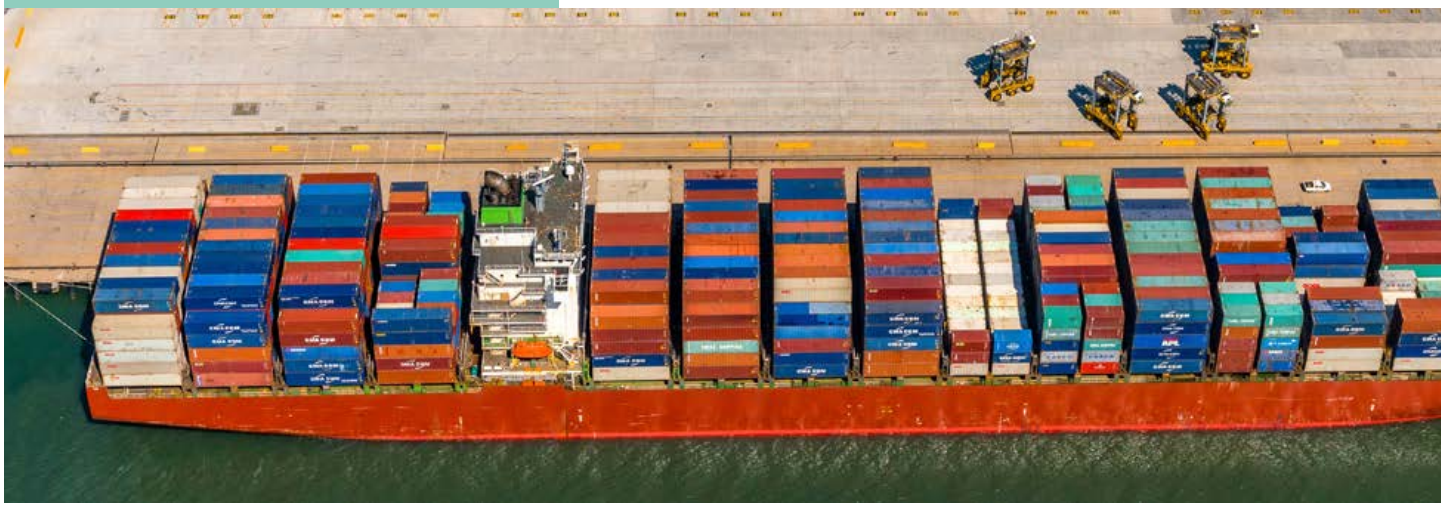
The Port Bris and Port Central precincts (Fisherman Islands), on the southern side of the Brisbane River mouth, are the primary location of port operations and PBPL's major land holding.

PROPERTY RELATING TO THE CONTAINER TRADE

In order to effectively facilitate container trade growth, the Container Trade Property Strategy (Container Strategy) considers the land required to support the cargo handling facilities along the quayline. This strategy is based upon integrated supply chain logistics that enables highly productive and efficient operations which will improve the Port of Brisbane's competitive position and attract cargo from other ports to Brisbane. The components in this logistics chain comprise:

- wharves and adjacent marine terminals (including truck receival and dispatch facilities).
- empty container parks for handling, storage, cleaning and maintenance of containers.
- warehousing and distribution (pack/unpack).
- transport infrastructure connecting these (road, rail and BMT).

Container wharf and terminal – **Port of Brisbane**



MOTOR VEHICLES

In order to support the growth forecasts for motor vehicles in the long-term a land allocation strategy has been developed which:

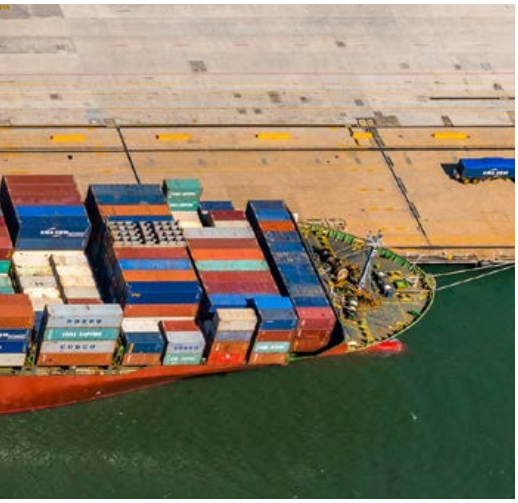
- aims to monitor the amount of land available on Fisherman Islands to meet short-term requirements, and allocate land in other locations at the port to cater for longer term growth.
- considers longer-term options for multi-Level car parking as land value/scarcity increase to a level that makes this option commercially viable.
- includes the provision of land for short-term/casual use to cater for spikes in demand resulting from surges in car sales and resultant fluctuations in car 'dwell times' as inventory levels respond.
- accommodates growth in motor vehicle storage on Fisherman Islands until ~2030.

BULK PRECINCT

The Port Bris bulk precinct caters for exporting coal, cereals and woodchips as well as importing crude oil and bitumen and materials for the manufacture of cement. This precinct is located at the upstream end of Fisherman Islands.

The balance of dry bulk trades handled in Brisbane have sufficient capacity. Fisherman Islands can cater for expected growth in the other dry bulk commodities over the life of this plan.

Motor vehicles storage – **Port of Brisbane**



Dry bulk storage – **Port of Brisbane**

COAL

The volume of coal handled through the port is primarily limited by rail capacity, along with fluctuations in currency, commodity prices and local mine production. Some enhancements to the existing rail network and investment in new rolling stock are considered capable of supporting throughput volumes of up to 15Mt at the port.

To accommodate a 15Mt target in the shorter term, additional stock-piling footprint would be required for the coal industry. The existing coal facilities (i.e. stockpile, ship loader, wharf etc.) at Queensland Bulk Handling (QBH) on Fisherman Islands have the capacity to handle ~12Mtpa. Export volumes beyond this will, in addition to the need for a dedicated/segregated freight rail corridor to the port, require expanded or secondary storage facilities.

OTHER DRY BULK (GRAIN, WOODCHIP & CEMENT)

The port's dry-bulk facilities (predominantly at Fisherman Islands and Pinkenba) have flexible operational arrangements, with some fully dedicated to a particular user and others sharing wharf facilities with other bulk and non-bulk trades.

All wharves owned by PBPL currently have multi-use and common-user capabilities in order to maximise utilisation, affordability and reduce the duplication of infrastructure. It is PBPL's intent that these precincts will remain a focus for the consolidation of dry bulk trade streams. While PBPL's preference will be to optimise the efficiency and capacity of these areas, the development of new dry bulk facilities in such locations as Port West and downstream of Fisherman Islands Wharf 13, may also be viable.

It is considered that the capacity available within the property leases for woodchips, grain and cement are adequate for their growth prospects for the life of this plan.

SHORT-TERM USE OF VACANT LAND

Due to short-term variability in trade volumes caused by seasonal and project specific variables, land is often required on a short-term basis to accommodate temporary surges in volume. Some land is preserved for this short-term casual use and is occupied under short-term permits, for example short-term storage at the wharf overflow, grain pad and the General Purpose Terminal areas and other vacant lots which, as yet, are not leased on a long-term basis.

OTHER LAND USES – PORT CENTRAL, OPEN SPACE, BUFFER AREAS

There are considerable other land uses at Fisherman Islands including the Port Central Office Park and open space/buffer areas, which provide valuable separation between developments and the residential community of Wynnum, in addition to amenity for people employed at the Port.

Open space and buffer areas are designed to preserve environmentally significant and sensitive areas, promote biodiversity and provide separation between nearby communities and port operations. PBPL has also invested considerably in the development and maintenance of common, open space areas and their landscaping. As the workforce on Fisherman Islands (and other port estates) grows, further consideration will be given to the provision of additional landscaping, recreational amenity and the augmentation of natural/man-made habitats for buffering and environmental offset purposes.

PBPL – **Port Office**

PORT BRISBANE/PORT CENTRAL PROPERTY STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitor the operating systems and technology adopted by stevedores and container storage facilities with regard to the consequential demand for additional land associated with the accommodation of such uses. • Develop land in the FPE for future terminals and back up areas as per the Container Strategy. • Allocate and construct sufficient supporting container facilities to service growth in the areas allocated on Fisherman Islands. • Develop warehousing/distribution centres and motor vehicle storage areas on Fisherman Islands (as demand requires). • Develop future port expansion plans to accommodate ongoing dredged material placement and container growth and capacity demand by as early as 2040 plus additional areas for the storage of motor vehicles, break bulk, bulk and project cargo. • Hold the Heavy Transport Corridor (HTC) in reserve while allowing for the temporary/short-medium term use of this area for hard-stand storage. • Monitoring demand for additional coal storage areas (potentially allowing for short-term storage in these areas where longer-term coal storage potential is not compromised).
SHORT-TERM (1-2 years)	• Targeting local competition in the vehicle storage/PDI market with a view to expanding such uses at Port Bris. • Master planning and providing improved urban design, amenity and recreational opportunities within Port Bris for the 'on-island' workforce. • Leasing of short term car storage areas.
LONG-TERM (6+ years)	• Reviewing the longer-term viability (cost/benefits, opportunity-costs etc) of developing multi-level car storage at Port Bris • Reserving the Port Central precinct for long-term commercial development while accommodating temporary, hardstand-based storage that will not 'build-out' higher order uses in this area. • Developing and implementing long term plans for the management of dredged material including but not limited to the placement of appropriate material at Mud Island, the commercial use of dredged material (where viable) and/or the strategic expansion of Fisherman Islands following the appropriate investigations and obtaining of government approvals.

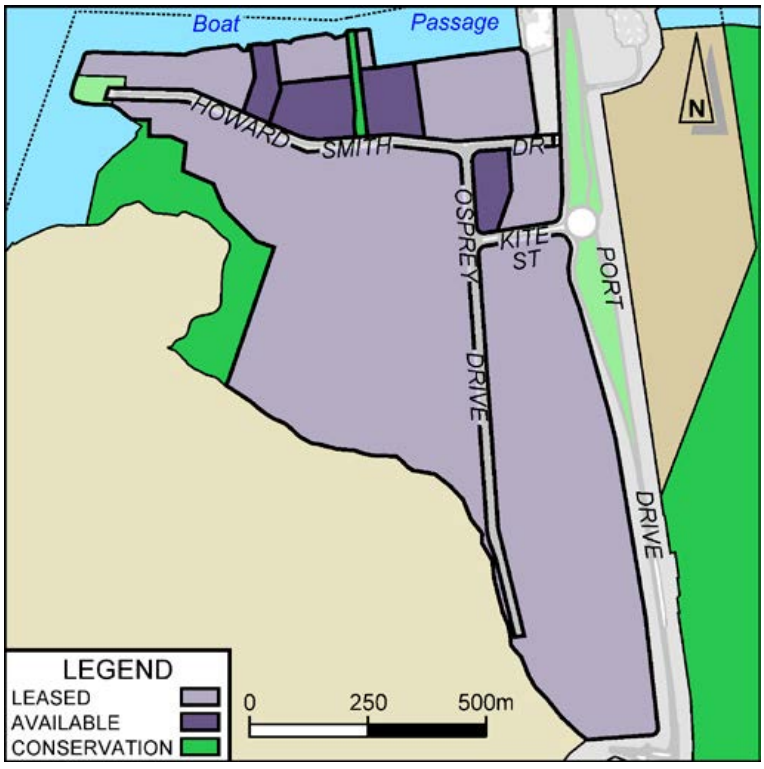
Port Central – **Port Office**

PORT GATE

Port Gate is located adjacent to the Fisherman Islands' precinct with 85Ha of dry land and 40Ha of wet land fronting the boat passage. The development of this precinct is well advanced, with land used for port operational activities as well as commercial enterprises and support services. The existing tenants within the precinct include PBPL's Operations Base, emergency services providers, the tug base, a barge service to Moreton Island, truck stop, Caltex tank storage, general and dangerous goods warehousing. The Queensland Water Police also have freehold tenure over a portion of land fronting the Boat Passage. There is also a public boat ramp which is maintained by PBPL.

With the exception of around 3Ha of vacant dry land in this precinct, the remainder is currently leased or used for PBPL operations. This remaining land is expected to be leased in the short-term for port related warehousing, logistics and marine related development.

On the south eastern side of Port Drive and the rail corridor is 470Ha of land which is currently a significant buffer between the residential community of Wynnum North and the operations of the Port. Depending on objective environmental assessments and subsequent approvals (noting the incorporation of this site in the Moreton Bay Marine Park), some of this area may provide an alternative site for dredged material handling or port development in the longer term.




Port Gate Precinct

Port Gate and Boat Passage

WAREHOUSING AND LOGISTICS

The types of warehousing activities currently being undertaken in this precinct are port related and benefit from proximity to the port. The 'Special Industry' designation at the upstream end of Osprey Drive is the only port area on the south side of the Brisbane River where special industries (up to and including Major Hazard Facilities such as the existing Toll Chemical facility) can be accommodated, subject to State regulatory requirements.

WET BULK

Caltex has recently exercised its option to extend its refinery lease to 2023 (with a further two 10-year extension options) on approximately 17Ha of land that currently stores crude oil.

Caltex may maintain their refinery functions in Brisbane and increase their operations to make up for the closure of their Kurnell terminal. This would result in demand for additional storage requirements which would be met initially by land owned by Caltex. Further demand could be met by PBPL, given the availability of adjacent land at Port Gate and Port West or via improved pipeline connectivity at Port North.

If volumes do increase, this may bring forward channel deepening infrastructure works and the need for additional dredged material handling and/or disposal options.

WATERFRONT RECONFIGURATION - PORT GATE/HOWARD SMITH DRIVE COMMERCIAL LEASING STRATEGY

PBPL is presently pursuing a strategy of rationalising existing lease areas fronting the boat passage at Port Gate where individual sites are larger than current tenant requirements, with a view to accommodating additional development that is consistent with the LUP.

Collectively, property strategies for Port Gate include:

PORT GATE PROPERTY STRATEGIES

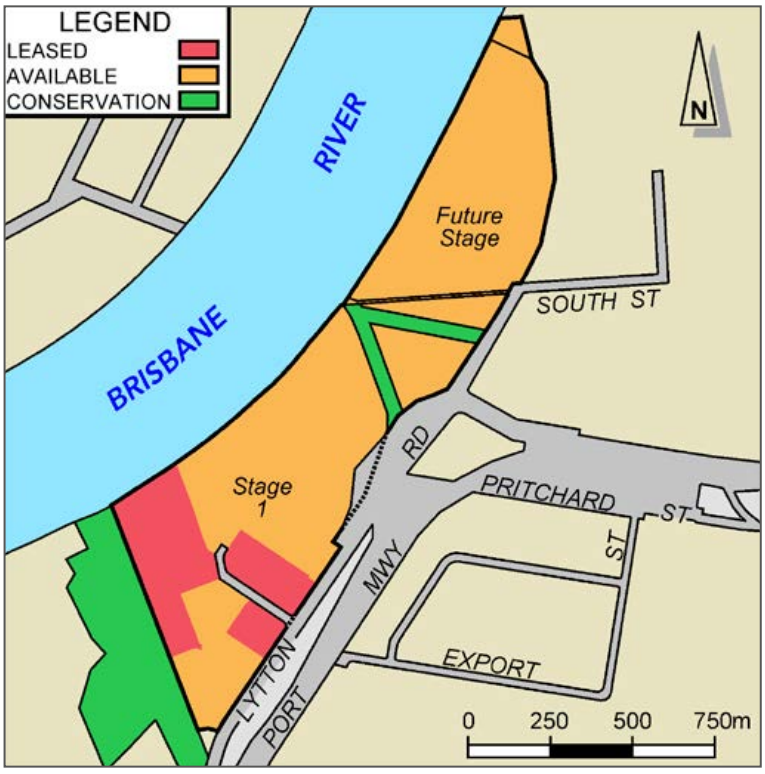
TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitor the operating systems and technology adopted by container storage facilities in order to ascertain how such changes may impact upon future demand for new port land. • Develop warehousing/distribution centres and/or water-front industries at Port Gate (as demand requires). • Monitor the future status of Caltex's refining operations with a view to developing property strategies in the event that this facility transitions to a storage terminal (only).
SHORT-TERM (1-2 years)	• Work with Monash to progressively develop warehouses 9-14 at the Port Gate estate. • Reserve an area for the possible, future linkage of Osprey Drive and points east 'upstream' of the Monash development of Warehouses 9-14. • Complete the upgrade of Port Drive including the linkage of Osprey Drive to Tanker Street and improved access to the public boat ramp facility. • Finalise LUP amendments to include environmental buffers and wharf/transport/pipeline corridor areas as Brisbane Core Port Land and seek tenure accordingly. • Progress negotiations with existing tenants that front the 'boat passage' regarding the rationalisation of their sites, thereby freeing-up additional areas for development (including at the end of Howard Smith Drive). • Completing water-front development adjoining the boat passage at Port Gate. • Instigate objective/independent environmental and engineering investigations into the ecological values and physical properties of the buffer/investigation area to the east of the rail line at Port Gate.
MEDIUM-TERM (3-5 years)	• (Re)develop the existing Port Gate Truck Stop and the vacant land that adjoins it to provide improved retail offerings, vehicle parking and customer amenities.
LONG-TERM (6+ years)	• Seek to accommodate rail marshalling areas if and when deemed necessary to effectively service larger/more frequent freight train access to the port. • Where deemed ecologically sustainable and economically viable, pursue development and/or environmental rehabilitation options for the areas to the east of the rail line at port gate. Such uses may include an additional dredged material handling area, environmental offsets or port industry.

Entrance to Port West

PORT WEST

Port West is an area of approximately 85Ha of largely vacant port land located along the riverfront at Lytton, approximately 6km by road from Fisherman Islands and adjacent to the Fort Lytton National Park – a site of noted historic and cultural value in the area. The estate is divided by a drain into two areas, the upstream (Stage 1) and downstream (Stage 2) areas of approximately 50Ha and 35Ha respectively. The upstream half of Stage 1 is available for leasing immediately, while the downstream half of Stage 1 will be ready within three years. Remaining parcels of land will be developed in the medium term in stages.

The site is anticipated to be used by a mixture of trade-related warehousing and distribution centres, primarily in the upstream area, as well as flexibility for general port industry, transport terminals, manufacturing and warehousing in the downstream area.



MARKET COMPETITION

Considering that the primary target market for land take-up at Port West is general warehousing and distribution centres, it is important that the competitive advantages of Port West are articulated, understood and capitalised upon.

The precinct has a prime location given its close proximity to the Port and the major transport networks of the Brisbane road system, including the current upgrades to the Port of Brisbane Motorway (PoBM) linking into the Gateway Motorway only 5km away. The precinct can cater for large scale building formats such as warehouses and distribution centres. Given the site's infrastructure is currently undeveloped, certain customer requirements can be catered for.

Sites which could conceivably compete with Port West include the Dexus site adjoining Port West and the Goodman estates at Export Street (Lytton) and Rochedale. There are a number of sites north of the river, including Trade Coast Central and the Brisbane Airport, but the river still acts as a natural barrier to competition.

WATERFRONT ACTIVITIES

As noted above, the advantage of water frontage and the ability for shallower-draft wharf infrastructure to be developed on site, has meant that the downstream end of Port West could also be used for the development of smaller waterfront developments. While this is not a requirement in the short to medium term, in the longer term it should not be discounted. As Stage 2 of the site is not expected to be developed until ~2022, the flexibility to develop waterfront facilities at this location should be preserved.

PORT WEST PROPERTY STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitor the operating systems and technology adopted by container storage facilities in order to ascertain how such changes may impact upon future demand for new port land. • Develop warehousing/distribution centres, container storage, freight stations and/or niche water-front/processing industries at port west (as demand requires) along with ancillary amenities (e.g. local food and beverage vendors and waterfront open space) and back-up motor vehicle/general purpose hard-stand storage facilities.
SHORT-TERM (1-2 years)	• Continue land improvement, site filling and drainage works throughout the estate. • Lobby the State Government and BCC to ensure that roads between Port West and Fisherman Islands are designed and designated to cater for higher productivity vehicles. • Undertake feasibility analysis regarding the establishment of sub-precincts/clusters for specialist uses (e.g. food/cold-storage, transport depots etc) at Port West. • Finalise LUP amendments to include wharf/pipeline corridor areas as Brisbane Core Port Land and seek tenure accordingly.
MEDIUM-TERM (3-5 years)	• Extend Radar Street to progressively service a larger percentage of this estate (as demand dictates).
LONG-TERM (6+ years)	• Facilitating waterfront access to niche customers where trade and infrastructure opportunities arise/align.

PORT NORTH

Port North comprises the land holdings of PBPL north of the river, including the bulk precincts of Bulwer Island and Pinkenba. The area is made up of 69Ha of BCPL, of which ~30Ha remains vacant, and 14Ha of wet land which fronts the river and houses several privately owned wharves. A range of industries are currently located in the area including warehousing, bulk and break-bulk storage, assembly operations and manufacturing.

The Pinkenba Common User Wharf is also located at Port North, which is a common user wharf mainly used for some cereals, silica sand, clinker, general cargo, wet bulk and fertiliser.

In 2015, BP Australia closed its refinery and has since moved to direct import and purchasing from Caltex.

WET BULK

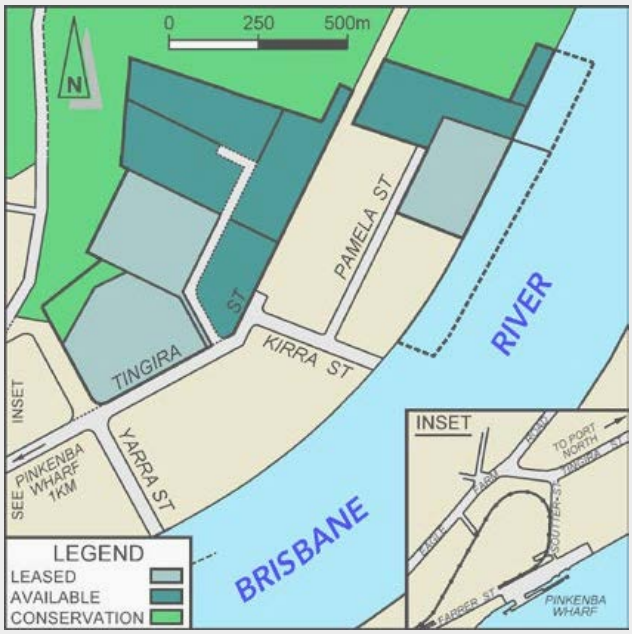
Most of the port's wet bulk facilities are located on the north side of the river, with the majority of the wet bulk wharves owned and operated by private companies.

OTHER COMMODITY TRADES

In addition to accommodating wet bulk facilities, Port North's existing dry land and wet-lease tenants include cement products, gas and bulk grain.

Future property development in this area will focus on trade based industries that best fit with the Special Industry and Terminals (Bulk, General Purpose) designations of the LUP and where shipping requirements:

- Are such that longer-term trades can be accommodated via the use of smaller vessels drawing less than the -9.1mLAT restrictions imposed by the Lytton Rocks; and/or
- Where access to deeper water berths can be facilitated via improved pipeline connectivity.



CRUISE

As noted in the Trade Strategy, PBPL is actively pursuing the development of a new, purpose-built, deep-water cruise wharf and terminal at Luggage Point to cater for increasingly larger cruise vessels. Currently, 62% of vessels in the Australian market are over 270m in length that cannot access the Portside Cruise Wharf at Hamilton due to height and draft restrictions. The footprint for the new development includes an additional ~8.6Ha of dry land and ~6.76Ha of wet area. Collectively these areas are envisaged to accommodate:

- A terminal building including passenger check-in facilities, Customs and AQIS services, baggage transfer infrastructure, small-scale tourism booking/retail/hospitality offerings and amenities.
- Ancillary access roads, car/bus parking, public transport points, vessel provisioning facilities and landscaping.
- A new cruise berth and associated vessel mooring and (un)loading equipment.

To accommodate this development, PBPL has recently amended its LUP to include a number of additional sites that may be included in PBPL's suite of BCPL. In the longer term, the growth of the cruise industry (20% p.a. compounding over the past decade) may justify the development of:

- A second wharf at this site (as supported by the recent LUP amendments).
- Complementary industrial uses that would support the cruise industry.

- The possible development of local transport infrastructure to facilitate movement of passengers to and from the cruise facility (e.g. bus stations, a ferry stop, car parking stations etc.)

Property strategies for Port North are summarised as follows:

PORT NORTH PROPERTY STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Develop wet bulk, dry bulk, special industries (potentially including dangerous goods storage, processing industries), freight stations and cruise facilities at Port North (as demand requires). • Continue consultations with industry and government stakeholders regarding the improvement of wet bulk access to deep-water wharf facilities at Port North. • Manage and augment environmental buffer areas for ecological improvement and future development offsetting. • Monitor demand for additional industry (particularly wet bulk) on the 'north side' with a view to further investigating/potentially acquiring additional sites. • Develop wet bulk, dry bulk, special industries (potentially including dangerous goods storage, processing industries), freight stations and cruise facilities at Port North (as demand requires).
SHORT-TERM (1-2 years)	• Continue land improvement, site filling and drainage works throughout the Port North estate and at the Luggage Point Cruise site. • Finalise pipeline connectivity solutions to support property development strategies for existing and potential wet bulk customers. • Finalise development of the wet and dry areas required for the cruise facilities at Luggage Point.
MEDIUM-TERM (3-5 years)	• Implement additional pipeline solutions to optimise the potential of the Pinkenba Common User wharf and the Port North Common User Berth 1.
LONG-TERM (6+ years)	• Monitor cruise industry demand and the performance of the cruise wharf and terminal and, where deemed economically, operationally and environmentally viable, investigate and pursue the development of a second cruise berth at Luggage Point and/or the development of complementary industrial uses (e.g. cruise-related providoring, food storage, fuel storage and dispensing etc).

Cruise Vessel departing Brisbane

OTHER SITES

COLMSLIE

Colmslie is located upriver of the Sir Leo Hielscher Bridges across from Hamilton. This site was historically developed and progressively sold by the Port of Brisbane Corporation. Under the terms of the Port lease, the remaining lots at Colmslie are managed by PBPL as 'Balance Port Land'.

The area comprises two parcels of undeveloped land and a site leased to Brisbane Slipways and Engineering, and presents PBPL with a number of development opportunities requiring assessment under BCC's Assessment Manager Jurisdiction.

HAMILTON

Hamilton is also located upriver of the Sir Leo Hielscher Bridges (on the north side of the River). This ~80Ha site formerly accommodated numerous port-related land use activities that was progressively relocated to Fisherman Islands as part of a port relocation and urban renewal project. This was instigated by the Port of Brisbane Corporation prior to this land being divested to the Urban Land Development Authority (ULDA) – now part of Economic Development Queensland (EDQ).

At the time of PBPL's privatisation, there were a number of trade related tenants whose leases were transferred to the ULDA, with a concurrent lease to PBPL. These tenants will not renew their leases once they expire and as such the concurrent leases will also expire. At this time, the land in question will be handed back to the State.

AREAS OF STRATEGIC INTEREST

Within the Master Plan footprint (i.e. beyond existing Brisbane Core Port Land) there are a number of sites that exhibit particular synergy with port operations, buffering and/or infrastructure connectivity. These sites are included in recent LUP amendments and/or are identified for further strategic investigation. They include:

- The MSQ site at Pinkenba which provides a strategic waterfront extension to existing port land on the north side of the river.
- Wet bulk storage facilities at Eagle Farm which in the longer-term may be forced to relocate due to the pressures of urban encroachment.
- Additional industrial land at Myrtletown and/or the former BP refinery which could complement the waterfront development of wet bulk and Cruise facilities at Port North.
- The Caltex refinery site (or part thereof) in the event that Caltex decides to cease refining operations in Brisbane.
- Longer-term options for future dredged material handling (i.e. at and/or adjoining the end of Fisherman Islands and/or within the buffer/investigation areas of Port Gate) to facilitate ongoing maintenance dredging obligations and the future optimisation of shipping channels, berths and swing basins.
- The widening of existing pipeline river crossing corridors to accommodate pipeline maintenance/augmentation.
- Extensions to the Lytton buffer corridor to further segregate port and industrial uses to the north of the Port of Brisbane Motorway from the residential areas to the south.
- A new 19ha marine conservation buffer at Bulwer Island to segregate the BP terminal from the balance of the existing Port North estate while enhancing ecological assets as a future offset.

Further afield, and in the longer-term, PBPL may choose to investigate the potential of developing or supporting the establishment of in-land freight hubs.

These sites/opportunities are explored in more detail below:

STRATEGIC INVESTIGATION AREAS (SIA)

The purpose of these designations is to highlight particular issues which are intended to be investigated during the life of this plan. These investigations are envisaged to influence the content of future or amended land use plans.

SIA #1 – EASTERN END OF FISHERMAN ISLANDS

This area of Brisbane Core Port Land, located at the eastern end of Fisherman Islands, has been identified as a potential site for longer-term port operational needs. This area adjoins the FPE where the progressive placement of dredged material (as previously approved by the State) and the related management/treatment of reclamation tail-waters is accommodated.

While no additional development of this area has been planned in detail at this point (and conscious of the present restrictions of the Moreton Bay Marine Park) this area has been flagged as a possible future location for the placement/treatment of dredged material beyond the ~2055 life of the FPE (potentially, and subject to the relevant investigations and government approvals, within an additional expansion of the FPE area).

Further investigations/environmental impact assessments will be required to explore this potential or any alternative port operational uses in this area.

SIA #2 – PORT GATE DREDGED MATERIAL HANDLING AREA

This area, located to the east of Port Drive in the Port Gate area (nominated as Buffer/Investigation), may potentially be investigated for a dredged material handling and/or re-handling facility, although that type of facility is not anticipated to be required at this location for 10-15 years.

As for SIA #1, this area has previously been identified as a possible option to accommodate the eventual, likely need for alternative dredged material handling facilities once capacity has been reached for current approved reclamation and dredged materials disposal areas. This location could also (subject to objective environmental investigation, infrastructure upgrades and the procurement of all relevant approvals) accommodate improved road/rail transport infrastructure linkages to the port.

It is recognised that, although much of the intertidal habitat in this area appears to be degraded, it is within the Moreton Bay Marine Park and specific approvals for any alternative use would be required following more robust analysis of the site's environmental values.

Note well: SIA#1 and SIA#2 investigations will also need to factor in the ongoing use of Mud Island for some dredged material placement and (potentially) the development of an economically/environmentally viable use of dredged material for commercial ends.

SIA #3 – PORT NORTH PRECINCT PLANNING

The development of core port infrastructure (including the storage and distribution of wet bulk products) within PBPL's existing Port North estate is anticipated in the life of this Master Plan.

The pursuit of ancillary, strategic port development on the north side of the river (i.e. in areas not presently included within PBPL's suite of Brisbane Core Port Land) has also been flagged for further investigation. Subject to all relevant approvals and tenure procurement, such areas may include sites at Luggage Point (including the wet/dry footprint for cruise facility development flagged in the most recent LUP amendments), Myrtletown and Pinkenba.

Development in these areas is likely to require additional investigations regarding matters including:

- Strategies to avoid, mitigate and/or managing potentially adverse impacts of air, noise and odour emissions on the nearby Pinkenba residential community and other sensitive uses in the area.
- Issues of 'reverse amenity' where existing uses in the area may have a potentially adverse impact on any new developments proposed by PBPL on existing or new Brisbane Core Port Land.
- Required infrastructure investment (e.g. stormwater, water, sewerage, roads, electricity and pipeline connectivity) in the area to effectively service any future development.
- An objective assessment and ground-truthing of site contamination, ecological, Cultural Heritage and/or geotechnical values/characteristics to establish mitigation/remediation measures and the true costs of land development in this area.

Any future procurement of additional Brisbane Core Port Land in these areas would also be subject to commercial analyses of supply and demand/ opportunity-costs within a detailed business case.

SIA# 4 – FISHERMAN ISLANDS QUAYLINE

The development of additional quayline and terminal capacity at Fisherman Islands (i.e. beyond Berth 12) will be reviewed in the light of:

- How trade demand for containerised, bulk products, break bulk and general/project cargo (including cruise/defence facilities) evolves;
- What impact the technologies employed/ efficiencies gained by the port's stevedores have with respect to optimising the productivity of their existing land holdings (i.e. focusing on optimisation of trade throughput per quayline metre rather than unnecessarily duplicating wharf and terminal development).
- Strategies to optimise quayline connectivity to the supporting port industries/services that adjoin same. This review is likely to include an analysis of the future road/driveway connections to the terminals, the future status/viability of the HTC, improving linkages to the BMT and the ultimate configuration of smaller access/service roads within the FPE area.

In this regard, the scheduling/nature of future development of waterfront land beyond Berth 12 will be regularly examined to determine the optimal mix of land and infrastructure to meet demand for a range of trades and services.

SIA'S #5, #6 AND #7 – BULK, WAREHOUSING AND MOTOR VEHICLE CAPACITY

The existing supply of/demand for land at Port Bris, Port Gate and Port West is being reviewed in an attempt to proactively accommodate increasing demand for the storage and handling of additional bulk products, motor vehicle storage/processing and warehouse distribution facilities.

The costs and benefits of developing additional land for such uses within these areas will be examined with a view to:

- Optimising the use of existing storage and handling capacity.
- Minimising the unnecessary duplication of infrastructure and resources.
- Accounting for the commercial dynamics of port customers.
- Meeting the challenge of competitors in the industrial property market.
- Exploring, and where viable, developing the potential of renewable energy on PBPL land.

SIA'S #8 AND #9 – PORT CONNECTIVITY

PBPL will continue to pursue various strategic investigations in relation to the improvement/optimisation of port connectivity. In keeping with the State's Master Planning approach for ports, transport and supply chain connections beyond Brisbane Core Port Land, are considered essential to ensuring the future productivity and sustainability of ports and the regions they serve.

Of particular interest in this area are the:

- The finalisation of technical studies regarding the optimisation of the port's shipping channels, berth pockets and swing basins to progressively accommodate larger cargo and cruise vessels. It is anticipated that such studies will inform future applications to government for the targeted widening/deepening of maritime assets in the Brisbane River and Moreton Bay and the related placement of dredged material. Such approvals will be required to allow PBPL to proactively cater for the continuing trend among international shipping lines to use larger ships.
- The ongoing work with government agencies and industry partners (including ARTC, IA, QR, DSDMIP, DES and BCC) regarding the identification, investigation, reservation and development of corridors for a dedicated/segregated freight rail connection to the port that avoids conflict with Brisbane's passenger rail network and links to the Melbourne-Brisbane Inland Rail project. The identification, testing, securing and development of a preferred/viable corridor to the port is considered vital to not only PBPL's future efficiency but the liveability of South East Queensland (re: efforts to reduce congestion, greenhouse emissions, compromised road safety, road maintenance etc. while optimising inner-city residential amenity and public transport efficiency).

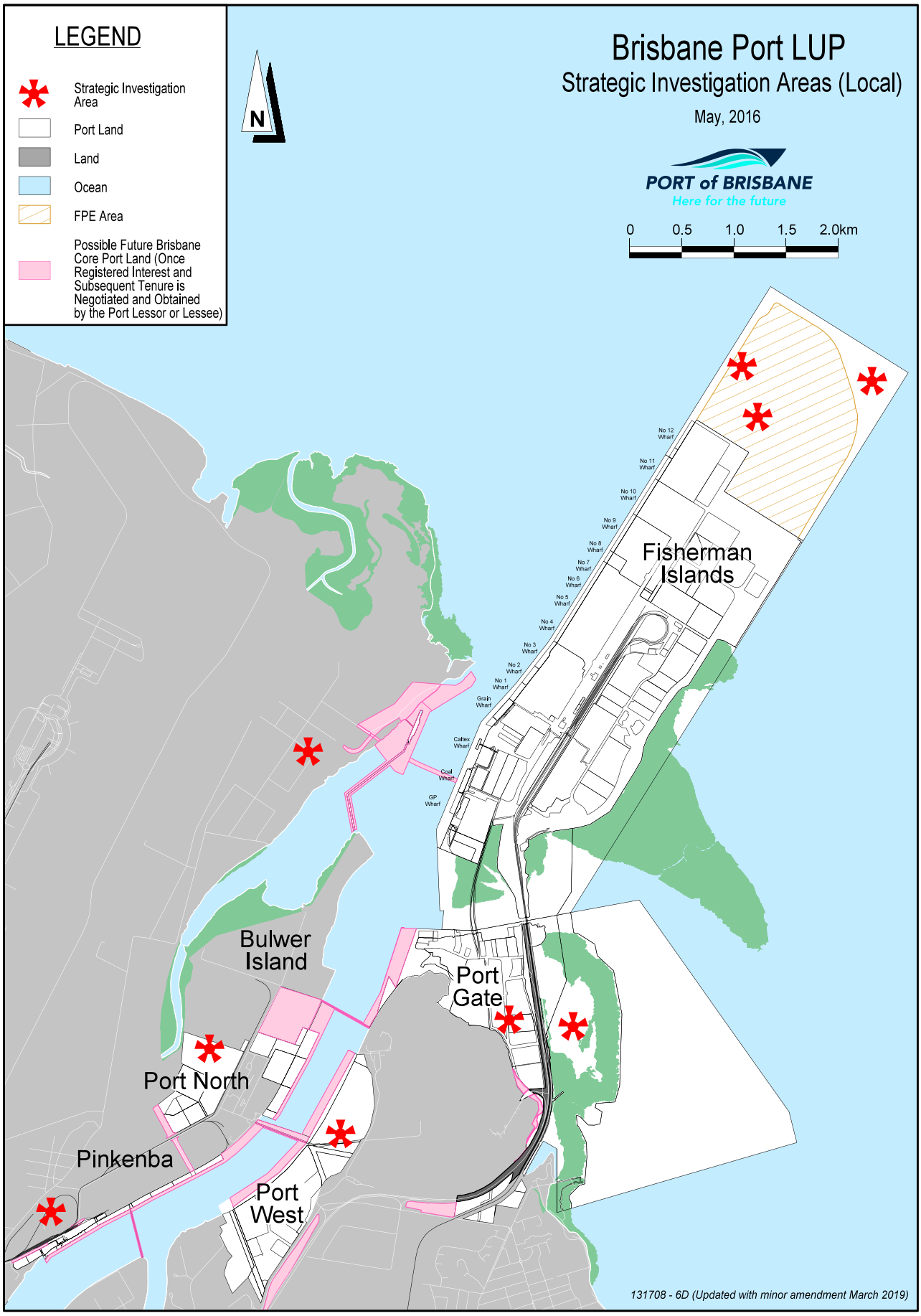
Various improvement to key road bottlenecks (beyond the port's boundaries) will also be addressed via PBPL's infrastructure engagement with the State and BCC.

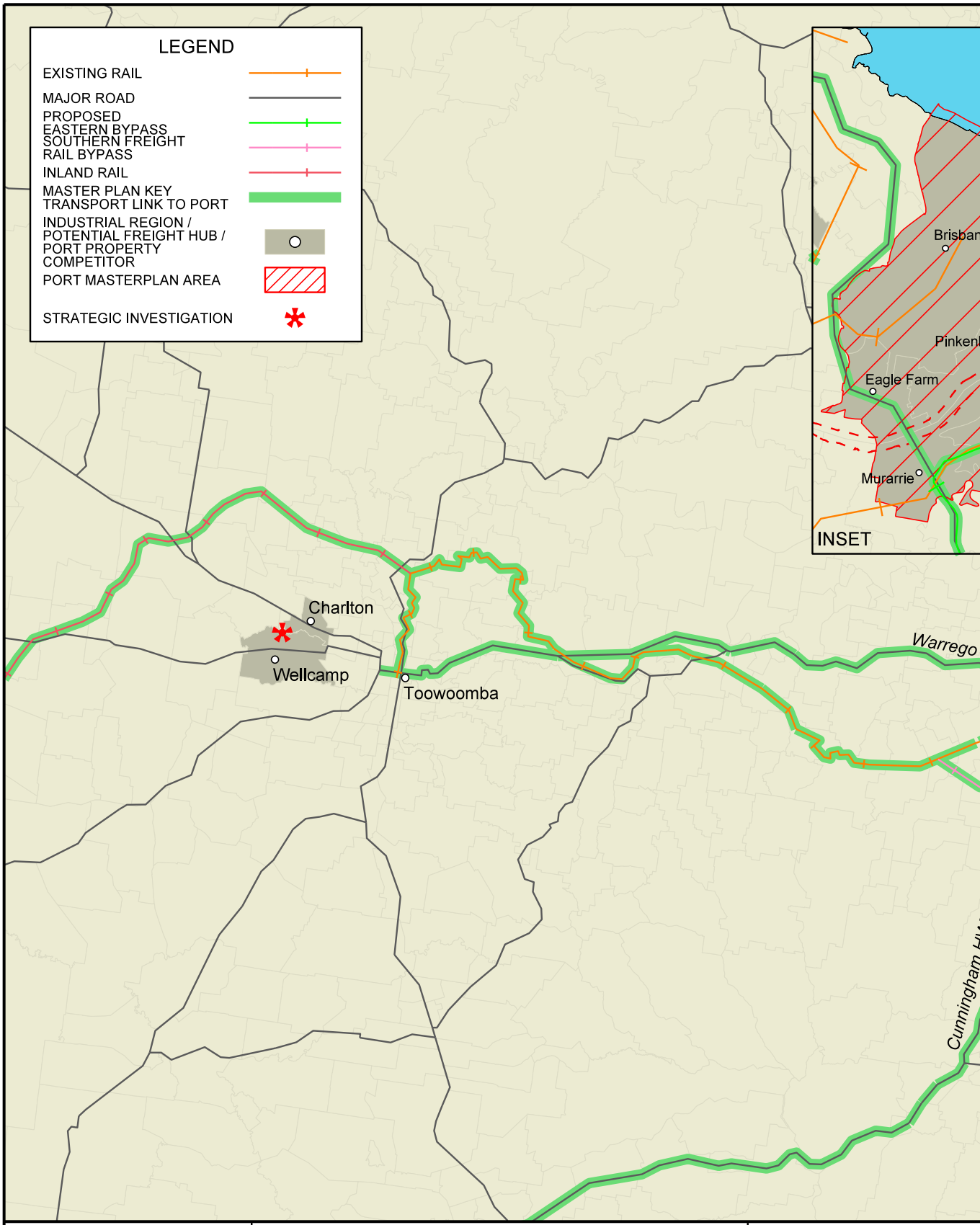
SIA'S #10 – REGIONAL INDUSTRIAL AND LOGISTICS NETWORKS

In association with regular reviews of PBPL's IMEX Origin/Destination analyses, a review of SEQ's regional transport and industrial networks is proposed as a means of identifying, examining and quantifying:

- Where industrial areas in SEQ provide notable competition to (and/or logistical synergies with) PBPL in the property market and trade area.
- Where and how the origin and destination of the port's trade is expected to evolve over the life of the Master Plan.
- Where likely transport infrastructure/supply chain bottlenecks are likely to emerge in coming decades (based on trade origin-destination analyse) and how these scenarios can best and proactively be avoided.

In the context of securing dedicated/segregated freight rail connectivity to the port, PBPL may leverage some commercial/logistical advantages from the development of inland port hub facilities


LEGEND
Strategic Investigation Area
Port Land
Land
Ocean
FPE Area
Possible Future Brisbane Core Port Land (Once Registered Interest and Subsequent Tenure is Negotiated and Obtained by the Port Lessor or Lessee)
N
Brisbane Port LUP
Strategic Investigation Areas (Local)
May, 2016
PORT of BRISBANE
Here for the future
0 0.5 1.0 1.5 2.0km
Fisherman Islands
Bulwer Island
Port Gate
Port North
Pinkenba
Port West
131708 - 6D (Updated with minor amendment March 2019)


LEGEND
EXISTING RAIL
MAJOR ROAD
PROPOSED EASTERN BYPASS SOUTHERN FREIGHT RAIL BYPASS
INLAND RAIL
MASTER PLAN KEY TRANSPORT LINK TO PORT
INDUSTRIAL REGION / POTENTIAL FREIGHT HUB / PORT PROPERTY COMPETITOR
PORT MASTERPLAN AREA
STRATEGIC INVESTIGATION
INSET
Brisbane
Pinkenba
Eagle Farm
Murarrie
Charlton
Wellcamp
Toowoomba
Warrego
Cunningham
PORT OF BRISBANE PTY LTD 2016
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Approved By: ..... / /
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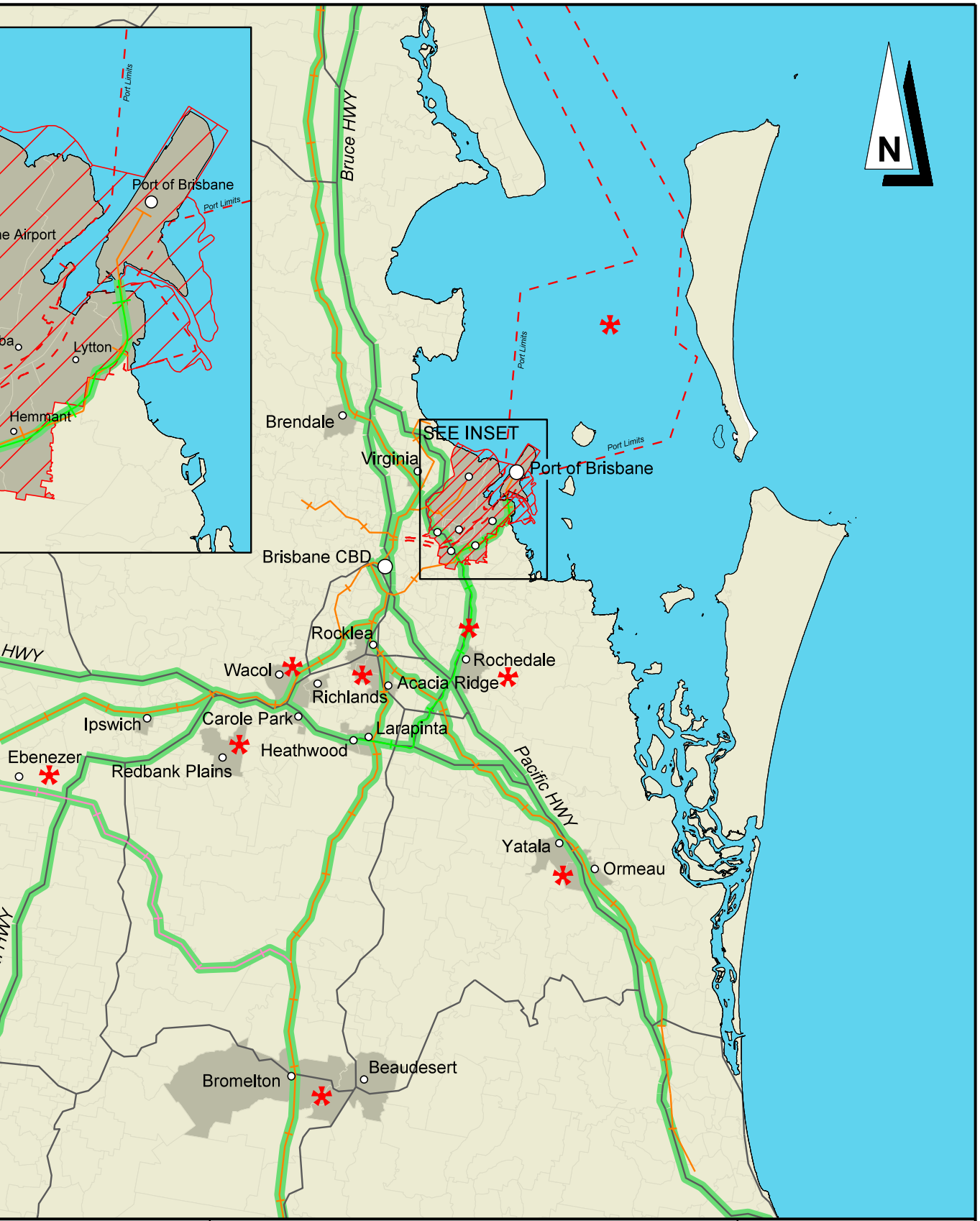

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STRATEGIC INVESTIGATION AREAS (REGIONAL)

PORT OF BRISBANE

PORT of BRISBANE
Here for the future

PLAN NUMBER 133073 - 4 A

PROPERTY STRATEGIES - GENERAL/MISCELLANEOUS

TIMEFRAME	PROPOSED ACTION
ONGOING	• In partnership with PBPL's Trade and Infrastructure and Environment teams monitor future demand for port land and the infrastructure required to service same; adjusting PBPL Planning Framework where and when necessary. • Monitor the SEQ industrial and Australian ports' property markets to identify development opportunities that support PBPL's business and trade growth. • Monitor and adjust property marketing and development strategies to identify development opportunities in trade-related industrial development benefiting the port. • Maintaining constructive relationships with government entities involved in the future growth of the port and infrastructure interface. • Support and champion sustainable development and urban design initiatives (including the development of renewable energy facilities) throughout the port.
SHORT-TERM (1-2 years)	• Identify and examine in detail the 'Property' cost/benefits and opportunity-costs of the Strategic Investigations Areas nominated in the Master Plan. • Finalise strategies for the development and/or divestment of the Colmsie land.
MEDIUM-TERM (3-5 years)	• Seek amendments to the LUP as deemed necessary.
LONG-TERM (6+ years)	• Strategic land acquisitions where a business case can establish viability.

The Port of Brisbane

INFRASTRUCTURE

Infrastructure and Industrial Networks

The Port of Brisbane is fundamentally an infrastructure asset. Some of its greatest strategic advantages over other ports are its relatively new, well maintained and efficient wharves, bridges, roads and services together with the ability to expand these assets to create port land to meet increased demand.

It is essential that infrastructure is provided in a timely and sustainable manner to match the requirements of trade growth and land development, which would otherwise inhibit port development, result in congestion and inefficiencies or trade being diverted to alternative ports. Historically, PBPL has developed land and funded 'local' infrastructure in consultation with lead government agencies with regard to the interface of port systems of roads, water, sewer, stormwater, electricity and communications with the 'non-port trunk' systems to which the same connect. To assist in this regard, PBPL has recently formalised the Port of Brisbane Priority Infrastructure Interface Plan (PIIP) as a TIA required addendum to the LUP.

On a broader scale, PBPL's productivity is intrinsically linked to the efficiency and capacity of the transport connections (road, rail and sea) that characterise port access. In this regard, PBPL will continue to engage with State and Federal authorities to optimise the supply chain connectivity between the port and its markets.

What follows is a summary of:

- Port Access (i.e. the broader regional road, rail and sea transport infrastructure linkages that provide safe and efficient trade growth in the longer term, by optimising access to and within the port via existing and potential future freight corridors.
- Port Infrastructure and Utilities (i.e. the provision of water/sewer, stormwater, electricity and communications within the port and how the interface with adjoining trunk infrastructure is managed via the Priority Infrastructure Interface Plan (PIIP)).
- Efforts to optimise port flexibility and connectivity via future wharf and pipeline development.
- PBPL's ongoing dredging and land reclamation programs including an overview of the strategies associated with PBPL's Future Port Expansion area and the options available beyond the 'life' of this facility for dredged material placement.

PORT ACCESS

BACKGROUND

Given the anticipated growth in SEQ's population and PBPL's trade, securing efficient freight connectivity to the port will be vital to PBPL's business and the region's economy and liveability. Key among the challenges in this regard are:

- Proactively developing/improving port road infrastructure to address regional road transport 'pinch points', supporting industry stakeholders to better manage heavy vehicle access to the port and accommodate for, and embrace, the adoption of vehicle automation technologies (e.g. vehicle platooning, autonomous vehicles etc.) in managing PBPL's freight challenges.
- Improving rail's mode share of Brisbane's freight task. The status quo, where only <2.5% of the port's cargo is moved by rail, is not considered sustainable in the medium to longer-term as trade and population growth place far higher demands on the region's road networks. Improved freight rail infrastructure and services will be a necessity.
- Ensuring that Brisbane's shipping channels, berths and swing basins are designed, optimised and maintained to secure the safe passage of the future generations of cargo and cruise vessels that are already being introduced to the shipping routes of the region.

ROAD ACCESS

More than 97% of the port's container trade is presently handled by road, making this form of transport a key consideration in the development of current and future land use. Road transport within SEQ presently remains the most effective and cost efficient mode of transporting export and import containers to and from the port. That said, given that road congestion in SEQ is predicted to increase in the short to medium term, rail's mode share must increase (particularly where improved rail freight infrastructure and services are provided).

EXISTING EXTERNAL ROADS

The Port of Brisbane Motorway (PoBM) is the key road corridor connecting the port to the National Highway system. This recently completed road is motorway standard with two lanes in each direction and is managed by the Department of Transport and Main

Roads (DTMR) using sophisticated computer systems to monitor traffic. It connects the Gateway Motorway to Port Drive and also services a number of other adjacent industrial areas.

The DTMR-managed Port of Brisbane Motorway (PoBM) is the key road transport linkage for the port and is vital for trade. With its connection to the recently upgraded Gateway Motorway and the motorway network beyond, improved road transport linkages are available to most of the major industrial areas in Brisbane and to the Port's hinterland.

In accordance with its lease requirements (yet several years ahead of demand) and a Road Franchise Agreement (RFA) with DTMR, PBPL has recently completed linking the second stage of the PoBM to Fisherman Islands via the funding, development and management of an upgrade to Port Drive.

This project includes:

- An upgrade of Kite Street and Port Drive intersection including grade separation.
- An upgrade of Port Drive to four lanes including installation of a separation barrier on Port Drive.
- A new connection between Tanker Street and Osprey Drive.
- A shared bicycle path from the existing path to Kite Street.
- Drainage works/street lighting/infrastructure upgrades and various landscaping/urban design elements

FUTURE EXTERNAL ROADS

Based on projections for container trade alone (see Section 3), considerable growth in truck movements to and from the port are expected over the life of this plan. Notwithstanding improvements to regional road networks, changes in trucking technology and/or mode shifts to rail and coastal shipping, such growth is likely to result in very heavy road traffic congestion.

While the recently completed PoBM, and soon to be delivered Port Drive upgrade, will provide significant benefits to the port and its supply chain, road capacity will need to be monitored and maintained to accommodate longer-term demand and avoid projected traffic congestion.

Port Drive upgrade under construction 2018

Brisbane Multi-Modal Terminal

EXISTING (INTERNAL) PORT ROAD NETWORK

Key strategic features of the existing DTMR/BCC-compliant road network on port land include:

- the longitudinal arterial road corridors of Port and Lucinda Drives on Fisherman Islands.
- PBPL being responsible for the maintenance and upgrades of Port Drive (from near Pritchard Street to the Captain Bishop Bridge) under a RFA with the state.
- The need for integrated and efficient connectivity between container terminals and the BMT. A 30m wide reserve has been established incorporating Curlew Street and extending through to the BMT, for the possible development of a Heavy Transit Corridor (HTC). Conceptually, the HTC could provide connectivity between port container terminals, the BMT and associated logistics facilities areas. The preference is for the HTC to be a non-road registered vehicle access road, but the number of level crossings and the inefficiencies this will bring to road traffic and the number of non-road registered road trains servicing the BMT would hinder free flowing traffic movements. An at-grade solution is not considered viable and an elevated design will be investigated in the medium to long-term to separate the traffic flows. Studies have concluded similarly and form the basis of this strategy. Further investigations will be required as to the scope, necessity and timing of this project. Alternatively, PBPL is also considering the use of automated and High Mass Limits (HML) vehicles where an 'at-grade' solution may be viable.
- The provision of access to:
  - The Port Gate estate via the port owned roads – Kite Street, Osprey and Howard Smith Drives. These roads are designed to cater for Higher Productivity Vehicles such as Super B-doubles and other similar vehicles. Noting, that the section of Port drive between the Captain Bishop Bridge and the Kite Street roundabout is a franchised road.
  - The Port West estate via Radar Street off a signalised intersection with Lytton Road. Radar Street and future extensions to this estate's roads are also designed to cater for Higher Productivity Vehicles.

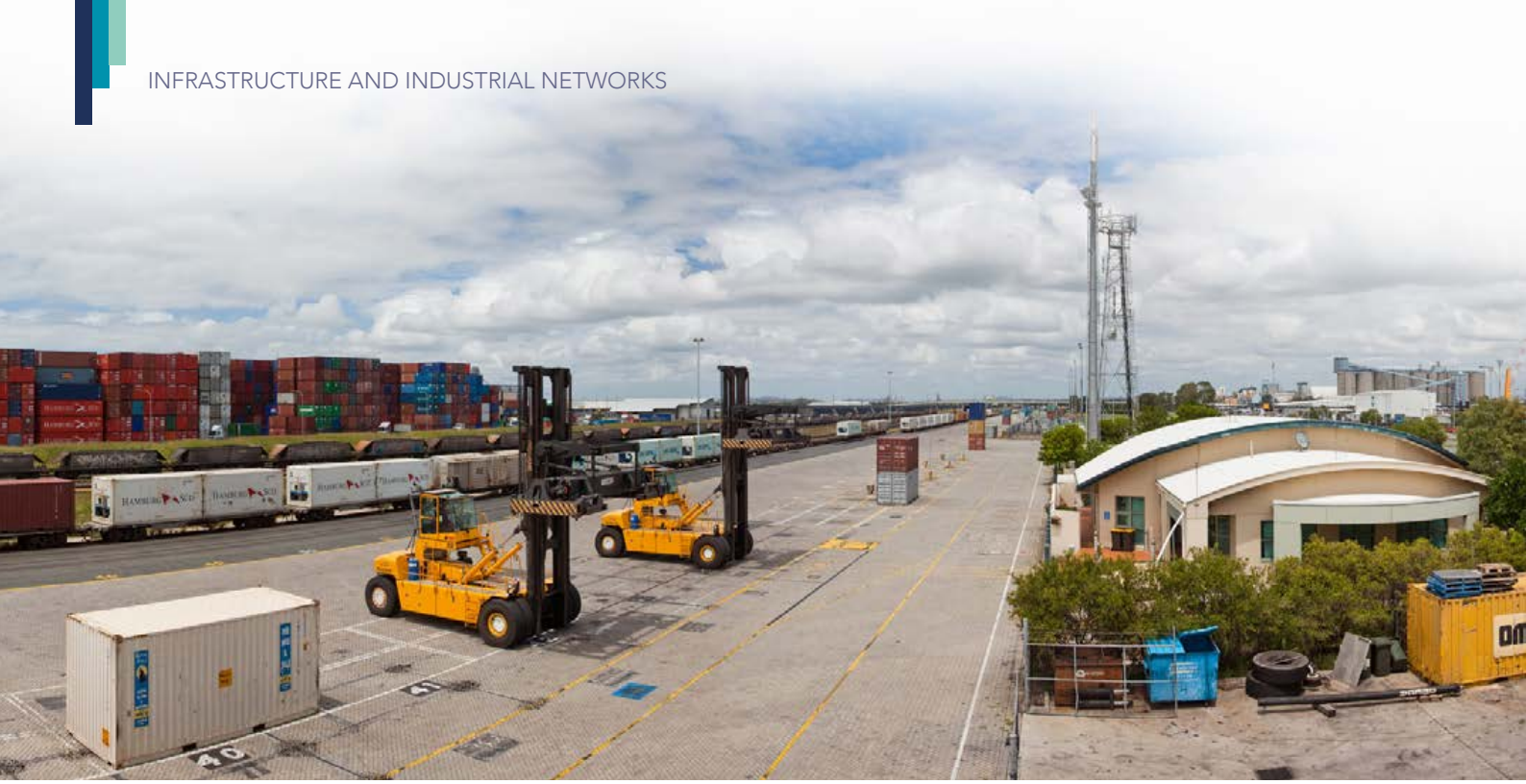
FUTURE PORT ROAD NETWORK

PBPL is finalising the construction of an upgrade to Port Drive at Port Gate, the section of Port Drive, managed via the RFA.

Works on these upgrades have commenced and are anticipated that works will be completed in 2018.

Ultimately, it is intended that Lucinda Drive will become the main thoroughfare for port traffic, with Port Drive only providing access as far as the DP World terminal (including bridge upgrades that will allow the weight restrictions on this overpass to be lifted).

Lucinda Drive has been extended north (beyond Bishop Drive) to link to Peregrine Drive, providing new access for the Brisbane Container Terminal (BCT) development of Terminals 11 and 12.



Anticipated roadwork within the life of this Master Plan will include the aforementioned upgrading of Port Drive (to the Captain Bishop Bridge including the Port Drive/Kite Street Intersection) to a four-lane standard and the similar upgrading of the Lucinda Drive overpass. PBPL has the obligation to upgrade this portion of Port Drive as and when required under the RFA.

IMPROVING EFFICIENCY OF ROAD ACCESS (INTERNAL AND EXTERNAL)

Port Bris (Fisherman Islands) is effectively a cul-de-sac. The ability to avoid congestion on port roads is largely a function of how well truck inflows to each facility are controlled, including during peak periods, and how well the facilities cope with unforeseen events.

While road access at the port is currently unconstrained and congestion is rare, trade and truck growth over time will likely impose constraints through:

- The capacity of existing facilities to handle an increasing volume of trucks, especially in peak periods.
- Notable spikes in truck volumes that correspond with particularly productive grain seasons.
- Increasing congestion on the major (road) freight routes servicing the port, as a function of SEQ's population growth and the projected doubling of the region's freight task over the next 30 years.
- Significant gaps/weaknesses in the region's road freight infrastructure (e.g. lack of capacity or the deterioration of road conditions on major freight routes).
- The vulnerability of port access routes to disconnection, especially Port Drive and the Port Motorway, resulting from accidents and natural disasters where alternative routes are not available

To address these constraints, PBPL strongly pursues/encourages:

- A policy requiring all new developments to maximise the amount of on-site truck queuing to reduce on road truck queuing.
- Greater utilisation of after-hours and weekend visitation to the port (i.e. moving additional visitation to non-peak traffic periods).
- Better control of truck access to facilities through the adoption of Vehicle Booking Systems.
- Planning for the provision of additional truck parking and/or marshalling facilities and potentially to allowing/supporting the breaking down/shuttling of en route to the port.
- State investment in the identification, preservation, dedication, development and upgrading of truck freight routes throughout the region.
- Initiatives to improve truck utilisation (e.g. two-way loading).
- Improvements to rail freight capacity and efficiency as a means of increasing the proportion of freight moved to/from the port on trains rather than trucks.

RAIL ACCESS AND CAPACITY

Freight through the Port of Brisbane is growing. By 2040, the port is expected to be handling up to 4 million containers. Without a dedicated freight rail access to the Port, pressure will increase on existing landside infrastructure, including the broader road and rail network. At the same time growing demands on the Brisbane passenger rail network place further pressure on rail freight flows to the port.

The current freight line to the port shares the same corridor as a number of Brisbane's metropolitan passenger rail services. The potential to maintain and/or grow rail freight using this line is constrained as a result of the increasing frequency of passenger rail services. Without significant improvements to the existing line and/or the development of a new dedicated freight rail corridor, productivity and liveability will decline due to increased road congestion, transport costs will increase and these factors could potentially constrain trade growth through the Port of Brisbane.

PBPL strongly supports the preservation of a dedicated/segregated freight rail corridor to the port which should link with the Federal Government's Inland Rail project; a 1700km dedicated freight network linking Melbourne to Brisbane that is presently being planned for development over the next decade by the Australian Rail Track Corporation (ARTC).

The Port of Brisbane requires dedicated freight rail infrastructure to handle increasing numbers of containers but also to service the growth potential of the key agriculture and resource sectors throughout regional Queensland and New South Wales. Once complete, a dedicated freight rail connection to the Port of Brisbane can link to a national freight rail network, providing greater access and modal choice between Australia's ports. Ultimately, these projects will transform freight transport on Australia's East Coast.

Presently key rail constraints include:

- Passenger volume growth in, and conflicts with, the Brisbane metropolitan rail network especially the impact of reduced headway passenger timetables (passenger trains are given priority over freight under State Government Legislation).
- Restrictive axle-loading limits that reduce freight train load capacity/payload.
- Restrictions on freight train lengths limiting efficient train design and use.
- Tight outline gauge limiting the type of rolling stock which can access the port (limiting larger locomotives and the inability to carry 9'6" 'high cube' containers on the western line).
- Rail operators' de-investment in rolling stock assets in response to seasonal demand fluctuations for agribulk rail services (e.g. reductions in grain train sets).
- Limited train path availability.
- The competitive prices and flexibility to move cargo via road as opposed to rail potentially stifling modal shift.
- Rolling upgrades of road infrastructure alone are not seen as providing a long-term solution for the region's freight transport challenges due to:
  - The capital and higher maintenance cost of road infrastructure.
  - The negative environmental impacts of road transport.
  - Increased overall logistics costs associated with road usage (particularly when the true costs of road usage are factored in).
  - Safety issues of increasing freight on road.
  - Increasing congestion at pinch-points even with continual system expansion.

In line with global transport trends:

- SEQ must plan for a more balanced modal share for its landside logistics functions (noting the existing transport network does not have the capacity to meet the long-term freight task).
- PBPL has detailed pre-feasibility studies to investigate the need and priority for a DFRC connecting the port, SEQ and the regions to support growth and remain domestically and internationally competitive. Preserving a corridor for the DFRC will also be an important of element linking to the Nation Building Inland Rail project.
- PBPL presently advocate for the preservation/ development of a corridor that will accommodate a dedicated freight rail connection to the port that directly bypasses the CBD and separates freight from passenger rail and is complemented by upgrades to the Western Line, west of Toowoomba.

Pursued independently, or as phase one of the broader Inland Rail project, the DFRC:

- Reduces growing congestion problems in SEQ by dealing with the growing freight task which ultimately enables better long-term planning in Brisbane that will also deliver improved road safety, reduced road capital and maintenance costs, reduced greenhouse emissions and the potential to provide better inner-city residential amenity and passenger train services by removing freight rail traffic from inner-city areas.
- Creates the viable, efficient, long-term route to market that the region's agricultural industry needs to compete successfully in the future global markets as demand for Australia's food exports increase.
- Unlocks the significant potential for thermal coal exports as well as providing a significant funding source for the development of the DFRC.
- Enables the development of the Melbourne to Brisbane Inland Rail to create a truly national rail freight network with the ability to improve the efficiency of container movements on the Eastern Seaboard by solving a key freight bottleneck for containers travelling to or through Brisbane while increasing competition between ports.

Based on prefeasibility investigations Infrastructure Australia (IA) has included the project on the Priority Nation Building 'Project List'. PBPL has also negotiated a Cooperation Agreement with the ARTC in regards to the detailed investigation of a possible new freight rail port connection which enabled PBPL to provide the Australian Government with the substantial body of work in exchange for:

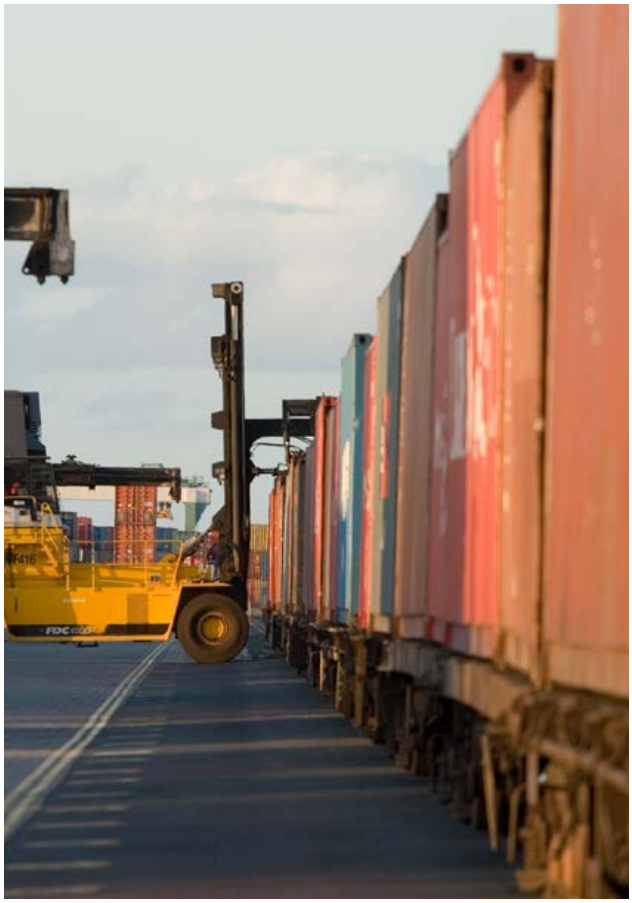
- continued government funding of the detailed investigation into the most appropriate corridor option for a new dedicated freight rail corridor to service the port.
- ensure PBPL is directly involved with the ongoing investigations.

PBPL remain open to considering all options more broadly identified by government agencies and industry to achieve dedicated freight rail access to the port.

As part of the Inland Rail study due consideration of future intermodal sites is also underway. The existing terminal at Acacia Ridge is included as are potential new inland terminals at Bromelton, Ebenezer and/or Charlton-Wellcamp as sites with the appropriate land use zoning, land size and good road/rail access. These sites have been adopted as potential medium to long-term options in the operational modelling for Inland Rail and the port connection.

The potential major rail capacity boost and delivery of new and/or upgraded below rail infrastructure would require supporting upgrades to rail on Fisherman Islands and the BMT if the increased commodity demand profiles modelled for coal, agriculture and intermodal are realised.

PBPL's on-island rail facility, the BMT, aims to provide rail facilities that deliver an efficient link for transporting containerised and bulk cargo to/from the port.



BRISBANE MULTI-MODAL TERMINAL (BMT)

The advantages of using the BMT single rail head (as opposed to developing multiple spur lines within the port) include the ability to rationalise land allocated for intermodal activity, avoiding costs associated with shunting, breaking and multiple stops, avoiding on-terminal congestion and providing efficient train turnarounds, which improve rolling stock and locomotive utilisation. Based on the current conditions at the BMT, PBPL has identified:

- there is sufficient capacity in the current facility to meet the needs of the port until there is significantly increased rail capacity and therefore increased services.
- there is 4Ha of land located adjacent to the BMT which could be developed to cater for additional demand if required.
- the BMT has the ability to accommodate 900m trains without breaking up and up to 1,800m trains by breaking and shunting or 1200m trains with infrastructure changes.
- The existing rail loop is the smallest gauge rail loop in Queensland and requires a higher level of maintenance because of its size. A maximum rail loop of 180m radius is achievable when required and there is land reserved for an expanded rail loop.
- Should coal exports increase substantially, additional rail infrastructure (e.g. rail marshalling sidings and additional unloading facilities) may be required. The marshalling provision cannot be accommodated on Fisherman Islands however it is possible that a single additional rail line could be accommodated on the bay side of the existing rail corridor (from the Boat Passage through to Pritchard Street).

An additional unloading facility could be accommodated on Fisherman Islands in the vicinity of the current BMT facility. Consideration would need to be given to the associated rail sidings on either end of the facility to handle the trains as they discharge coal, including the requirement for another rail bridge over the Boat Passage to avoid blocking existing lines to/from the Port. The additional land requirements for these strategies would involve undergrounding some existing stormwater within the car precinct. This would then allow room for the extra sidings and reconfiguration of car precinct leases adjacent to the rail corridor, also utilisation of the land formerly used as a stormwater retention pond for the additional unloading facility.

Extensive consultation with track managers, rail operators on general track arrangements, and personnel and vehicular access requirements would be required prior to the plans being progressed.

Container loading at the BMT

LANDSIDE FREIGHT STRATEGIES

TIMEFRAME	PROPOSED ACTION
GENERAL	
ONGOING	• Identify and lobby to preserve future road/rail corridors and locations for future freight growth. • Provide feedback to BCC, DTMR and the Commonwealth on future road and rail infrastructure and interface. • Work with the established Infrastructure working groups and relevant government agencies to address land transport infrastructure development and connectivity. • Maintaining policies requiring all new development to maximise the amount of on-site truck queuing that can be accommodated to address future truck queuing requirements. • Manage freight congestion on Fisherman Islands, Port Gate and Port West. • Pursuing the improvement of existing and future rail freight capacity as a means of increasing the proportion of freight moved to/from the port on trains rather than trucks. Such efforts should include extracting additional capacity from the existing freight rail network (e.g. supporting additional passing loops, tunnel height lifting and bridge capacity improvements) and efforts to develop a segregated/dedicated freight rail service to the port.
ROADS	
SHORT-TERM (1-2 years)	• Work with local government and industry to identify and resolve first and last mile road access issues and promoted Demand management measures, which could include encouragement of more freight traffic to travel at night and the introduction of ramp metering of light vehicles (cars) at critical interchanges, to discourage these vehicles from using the motorway at peak times. • Support efforts to allow for the use of new freight efficient and Higher Productivity Vehicles (HPVs) within, and to visitation to, port precincts. • Support government efforts to pursue those road improvement initiatives. • Confirm the classification of port roads for Performance Based Standard (PBS) and for Over Dimensional (OD) vehicles. • Work with DTMR and BCC to get road access to Port West on the same basis as Fisherman Islands.
MEDIUM-TERM (3-5 years)	• Work with industry/government to identify access requirements to support higher productivity heavy vehicle access to key places for freight such as ports and major industrial precincts and regions • Investigate further road widening. • Complete the balance of Port West roads. • Support and lobby DTMR to upgrade the PoBMW interchange with the gateway motorway (south) • Review feasibility of developing truck marshalling areas servicing the port to assist in the alleviation of on-street truck/trailer parking. Where appropriate/viable, sites could be identified and reserved for the accommodation of such facilities. • Supporting industry to more widely adopt vehicle booking systems. • Supporting state investment in the securing and upgrading of dedicated truck freight routes throughout the region. • Improve road access to Port North. • The extension of the fisherman islands road network including new DTMR Type E industrial roads running parallel to Peregrine Drive to provide access to the FPE.
LONG-TERM (6+ years)	• The progressive upgrading of Lucinda Drive to 4 lanes. • The possible development of the Heavy Transit Corridor as new Quayline development requires (where deemed viable/necessary). • Monitor the longer-term performance of the PoBM with a view to proactively pursuing upgrade ahead of capacity constraints.

LANDSIDE FREIGHT STRATEGIES (CONT)

TIMEFRAME	PROPOSED ACTION
RAIL	
SHORT-TERM (1-2 years)	• Lobby and support government investigations into Melbourne-Brisbane Inland Rail (specifically the DFRC). Preserving the DFRC corridor is the most important element of this effort. • Review and clarify the intent of rail passenger priority (among other SEQ Rail Strategy initiatives) and its impacts on freight.
MEDIUM-TERM (3-5 years)	• Work with industry to establish a rail shuttle to support a greater portion of container movements between Acacia Ridge and the port.
LONG-TERM (6+ years)	• Identify with industry opportunities for rail to support container movements between the Toowoomba/Bromelton/north side of Brisbane and the port.

CHANNEL ACCESS

CARGO SHIPPING

Maintaining deep-water access to the port via the channels in Moreton Bay is required to safely accommodate future trade. Over the next 30 years, shipping traffic into Brisbane will increase and new vessels are expected to increase in size and capacity. These factors make it essential that PBPL provides appropriate channel width and depth, berth and swing-basin arrangements as part of its Port Access Strategy. As part of this strategy it is proposed to:

- Additionally dredge a limited number of shallower sections of the 90km navigational shipping channel extending from the Brisbane River mouth to the northern tip of Bribie Island and realign the Spitfire Channel to shorten the overall length of the channel and remove two sharp turns.
- Modify/realign the North West Channel to better accommodate vessel manoeuvring and to both optimise natural depth and dredging requirements.
- Progressively accommodate larger vessels entering and exiting the Port on commercially viable tidal windows via some truncation of the corners and relatively minor adjustments in the North West Channel, the deepening of the Bar Cutting and Fisherman Islands' existing Swing Basin (currently declared at 14m) and some selective channel deepening (beyond existing 15m declared depths).
- Develop a new Swing Basin (adjacent to Berth 10).

These initiatives will be pursued in combination with the PBPL/DHI-developed Nonlinear Channel Optimisation Simulator (NCOS) system – a world-leading software platform that provides a seven-day detailed forecast of vessels' under keel clearances and environmental conditions, allowing for dynamic vessel scheduling. This system is now being used via new operational rules set by the Harbour Master.

PBPL will be applying NCOS to build port capacity and unlock supply chain value for its customers.

The timing of any deepening work will in part be dependent on the demand for larger vessels servicing Australia. This demand is expected to come primarily from larger container vessels but may also result from coal and wet bulk ships.

In a MSQ Report (2008), utilisation of the existing channel was estimated to be at between 20-30%, with ~2,500 movements per annum. Currently the port still has around 2,400 port calls per annum. Albeit that container ships are getting larger, the level of shipping movements is still expected to grow. This anticipated growth is expected to be accommodated within the existing shipping channel over the next 30 years, which means that there is more than adequate capacity for at least the next 30 years before the port could anticipate any channel congestion impeding efficient port access.

Other initiatives include investigations to incrementally deepen river channels by targeting high points at the Lytton Rocks precinct using PBPL's *Ken Harvey* grab dredger. The objective of these investigations is to obtain greater under keel clearance in the river channels if possible.

A critical aspect of maintaining Port access is maintaining a dredge material disposal area for material dredged from channel maintenance, channel deepening and development of new berths.

CHANNEL OPTIMISATION STRATEGY

TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitor demand for various vessel classes seeking access to the Port of Brisbane's channels (both cargo and cruise).
SHORT-TERM (1-2 years)	• Over the next 2 years PBPL will construct the second swing basin.
MEDIUM-TERM (3-5 years)	• Undertake minor capital dredging to optimise channel alignment/capacity where deemed necessary.
LONG-TERM (6+ years)	• Respond to demand for larger vessel navigation as identified in long term market analysis and channel monitoring.

MARINE SERVICES

PBPL currently operates and maintains two dredgers and a bed leveller unit which undertake both maintenance and capital dredging. The *TSHD Brisbane* is an ocean going trailing arm suction hopper dredger and the *Ken Harvey* is a grab bucket dredger mounted on a dumb barge.

PBPL has obligations under its 99-year head lease to maintain the channel and berth depths at the port. In addition, the *TSHD Brisbane* is contracted to provide dredging services throughout Queensland's Northern Ports, the Port of Melbourne and for non-PBPL berths at Hamilton (including the Portside wharf).

PBPL is also obliged to provide certain information, in particular in relation to channel depths, to Maritime Safety Queensland (MSQ – the Regional Harbour Master's office within DTMR) to enable depths to be declared by that office. Associated with the activity of dredging is the hydrographic surveying capability that PBPL maintains.

BED LEVELLING

As the berth pockets and channel have expanded capacity both within Port of Brisbane and the Northern Ports, there will be an increasing exposure to the sedimentation of channels during *the Brisbane's* Northern Ports program.

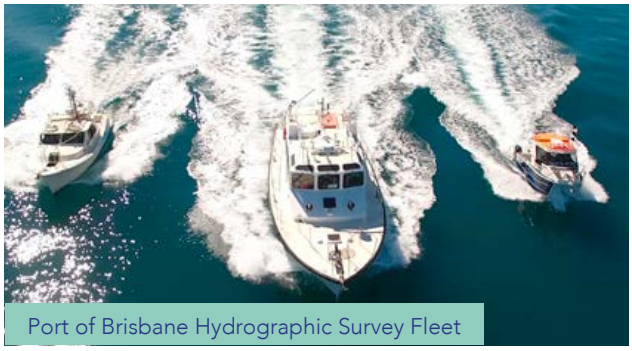
This is currently managed by the bed levelling unit and will continue to be resourced appropriately to manage the risk. A new twin screw tug has been acquired to enable additional capacity to manage broader bay bed levelling and seasonal peaks in shoaling.

HYDROGRAPHIC SURVEYS

PBPL's Survey team undertakes all of the monitoring of channel, reaches and berth depths for the Port of Brisbane. In addition to supporting internal dredging operations, surveyed depth data is provided to port pilots and the Regional Harbour Master in accordance with the Data Sharing Deed agreed with MSQ.

The Survey team offers a survey to chart service using well established software and reliable in-house quality assurance processes, resulting in accurate and reliable outputs and service. Data presentation can be in many formats ranging from digital datasets, 2D/3D charts, draped mapping and imagery, through to 3D movie fly throughs.

These capabilities are respected and well recognised as market leading and are accordingly offered to the market for external survey work. External clients include Ports, local Councils, consultants and contractors engaged in marine based engineering projects.



Port of Brisbane Hydrographic Survey Fleet

MARINE SERVICES STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• The *TSHD Brisbane* will be managed to maximise existing capacity and achieve highest financial returns from utilisation, the following strategies are being implemented: - plan *TSHD Brisbane* capital to ensure optimal allocation between PBPL and external works; selling remaining capacity to market. - engage northern ports during the sunset period of the contracts to extend term and revise pricing towards market. - Improve operational efficiencies yearly. - Investigate more efficient pump ashore operations. - seek to deflate maintenance costs relative to revenue. • The *Ken Harvey* continues to benefit the business strategically via the implementation of the following: - deflate maintenance costs annually. - source external contract work to increase utilisation. Survey Strategies: - to ensure Survey increases the contribution towards the overall company vitals, the section will: - actively seek additional external work. - incrementally increase pricing to achieve increased median external contract prices annually. - streamline operating systems to simplify processing reducing production time. - develop a system or source out equipment to assist with mandatory berth pile inspections in accordance with World Association for Waterborne Transport Infrastructure (PIANC) recommendations.
SHORT-TERM (1-2 years)	• Replace dredging/hydrographic survey plant, equipment and fleet as deemed appropriate.

PORT INFRASTRUCTURE AND UTILITIES

Beyond optimising the port's road, rail and sea access, port efficiency and development potential is a strategic consideration largely based on the availability of civil infrastructure and its capacity to accommodate future growth. PBPL seeks within its strategic planning and development assessment suite to:

- Develop and implement a framework, broadly aligned to ISO5000, to efficiently and effectively manage Port Assets.
- Maximise the efficiency, safety and profitability of future port development via the optimisation of port water, stormwater, sewerage, electricity, communications services and pipeline connectivity (along with road, rail and channel access).
- Apply the principles of sustainable development within its development codes as a means of ensuring that individual development projects provide, and make the most efficient use possible of available/approved infrastructure (e.g. the development of energy efficient buildings and lighting systems, the harvesting and use of stormwater, water sensitive urban design, renewable energy etc).
- Establish cost recovery mechanisms from port users from the development of new infrastructure, potentially through the revision of the Port Access Charge (PAC) as infrastructure costs are incurred.

What follows is a summary of the far more detailed infrastructure analysis provided in PBPL's PIIP.

WATER AND SEWER NETWORKS

WATER – EXISTING SYSTEM

Water is supplied to the Port of Brisbane via the trunk water main network controlled by Queensland Urban Utilities (QUU). For Fisherman Islands and Whyte Island, the QUU network delivers water at a connection on Port Drive (adjacent Port Gate) from a trunk main running from the Wellers Hill Reservoir. For Port West land, the QUU network delivers water at a connection on Lytton Road (adjacent Radar Street) from a trunk main again running from the Wellers Hill Reservoir. PBPL is the registered water service provider for port lands and is responsible for the operation and management of the distribution network from this connection point.

A Water Supply Network Master Plan is to be developed for port land. This will allow strategies to be developed to manage risk (leaks, poor quality/quantity, etc.) and inform future development/upgrades of the system.

WATER – FUTURE WORKS OVER THE NEXT 30 YEARS

Currently, pressures in the mains at the port are around 600-800 KPa, compared to the normal standard of 225kpa. While this high pressure indicates supply volumes are likely to be adequate for many years to come, it also means that the level of leakage in the network may be higher than it would be with a lower pressure. Consequently, PBPL's System Leakage Management Plan (SLMP) includes a further investigation into the potential to install a pressure reducing valve on the incoming supply. It is to be noted that the legal requirement for PBPL to have a SLMP was removed from legislation in May 2014. As the existing road network is extended beyond Peregrine Drive and into the FPE, the water supply network will also be extended into this area.

SEWER NETWORKS

SEWER – EXISTING SYSTEM

Sewage from port lands is discharged into the Cross River Sewerage Link (CRSL) which runs from Fisherman Islands to the QUU Luggage Point Wastewater Treatment Plant. As the registered water service provider for sewerage services on port lands, PBPL has negotiated a Service Agreement with QUU to cover the provision of maintenance and retailing services. Upstream of the connection point, sewerage services are provided to port tenants within the service area via PBPL's reticulation network.

In total, the network consists of four company operated pumping stations and 15km of mains.

SEWER – FUTURE WORKS OVER THE NEXT 30 YEARS

Since the Port was developed there have been a number of different sewer systems installed. For new systems, the preferred option is to provide individual properties with their own small sewerage pumping systems to discharge into a larger pumping station, operated by PBPL, which then discharges into the trunk rising main.

The existing system adequately provides sewerage services to areas currently serviced and no specific augmentation of this system is required. No upgrade of the CRSL is expected to be required within the 30-year strategic planning horizon of this plan.

ELECTRICITY NETWORK

The electrical supply network on port lands is owned and operated by Energex Ltd. The network into the port area is designed to provide as reliable a supply as possible. To this end, the main feeders to Fisherman Islands are connected to Powerlink's Murarrie Bulk Supply Station, via a double-circuit (largely) overhead transmission line, designed to provide as high a protection as possible against lightning strikes. This line is presently energised to 33kV, however in the future it can be energised to 110kV. This line is routed via Energex's Lytton Bulk Supply Substation, which forms the only other connection into the line from the Murarrie bulk supply point. It therefore provides a high degree of reliability against power outages.

Currently, at Fisherman Islands the incoming supply is fed into 33kV-11kV Energex substations. A network of 11kV underground mains radiate from this substation to service individual consumers. The majority of these mains are located in road corridors, although there are some which are within individual lease areas. Energex has established ring main connectivity on some sections of this network to ensure a higher degree of reliability. Virtually every property is fed via an 11kV supply, with 11kV-415/240V Padmount Transformer substations within each property, with lessees of individual properties having supply contracts in place with the retailer of their choice.

ELECTRICITY NETWORK IMPROVEMENTS

Energex have recently completed significant improvements to its distribution network to ensure there is adequate capacity and reliability of supply as the port develops. The improvement includes:

1. The recent completion of the 110kV-33kV Bulk Supply Substation on Lucinda Drive adjacent to the rail overpass. The incoming feeders to Fisherman Islands are now in place and will be energised to their ultimately designed 110kV voltage, with the 'downstream' connection to the Port Drive Zone Substation remaining at 33kV. This project is now operational and has been undertaken as part of other works on Fisherman Islands. The site is not presently energised to 110kV. The ultimate expansion of the system to 110kV will be managed by Energex as demand requires.
2. The establishment of a second Zone Substation (33-11kV) at the northern end of Fisherman Islands. This substation will be supplied from the future 110-33kV Bulk Supply Substation on Lucinda Drive via an underground 33kV feeder along Lucinda and Peregrine Drives. An expanded network of 11kV underground lines will radiate from this substation, with appropriate connectivity into the existing 11kV network supplied from the Port Drive Zone Substation. This improvement is expected to be developed in line with demand for power and likely to be towards the end of this strategic planning period.

PBPL is also committed to exploring in detail the viability of developing and operating large-scale renewable energy systems in the near to medium term. For example, detailed investigations into the commercial capture, use and sale of solar energy are presently underway. Under similar arrangements to PBPL's tenure over the water supply network on Fisherman Islands, notable advantages in the development of solar energy are available where the electricity network is under PBPL control.

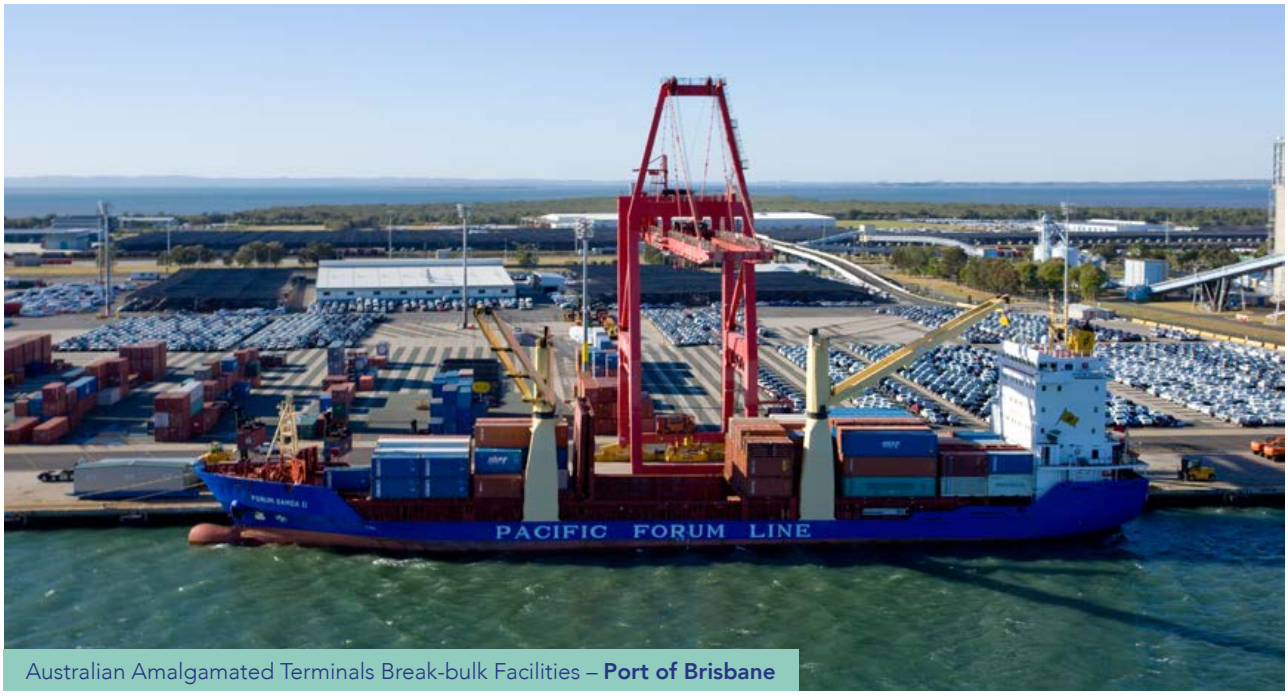
COMMUNICATIONS NETWORK

The main communications network at the port is owned by Telstra. The Telstra network includes cabling (the majority of which are located in road corridors), a small telephone exchange and mobile phone tower installation adjacent to the BMT. One other service provider also has a mobile phone base station on Fisherman Islands. If additional providers, including the National Broadband Network Company, do decide to develop a fixed network there is sufficient space within the road corridors to allow these networks to be placed there, albeit with some restrictions. Land for the phone exchange and the mobile phone towers within the port area are leased to the relevant provider. There is a PBPL Facility Access Agreement in place which gives carriers access rights to cable routes as the Telecommunications Act 1997, subject to appropriate notification procedures.

PBPL has its own connection into the general communications network via dedicated fibre optic links of PortNet and a two-way radio network for its vessel and vehicle fleets and for survey/security purposes. As Fisherman Islands is developed the PBPL fibre optic network will be extended along road corridors to provide connectivity to future sites.

PORT INFRASTRUCTURE AND UTILITIES STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitor, maintain and extend water supply to Fisherman Islands and Future Port Expansion (FPE), Port Gate and Port West. • Monitor, maintain and extend sewerage service to Fisherman Islands and Future Port Expansion (FPE) and Port West. • Monitor, maintain and extend power supply to Fisherman Islands and Future Port Expansion (FPE), Port West and Port North. • Upgrade Port West stormwater drainage systems. • Monitor and upgrade port telecommunications infrastructure as required. • Pursue opportunities associated with the improvement of pipeline connectivity between the port's wet bulk facilities and existing/new quayline. • Exploring the potential for large scale renewable energy facilities on port land.
SHORT-TERM (1-2 years)	• Establish a formal infrastructure working group with BCC, QUU, DTMR, Energex, Telco's etc. to address the implementation and review of the PIIP.
MEDIUM-TERM (3-5 years)	• Implement upgrades to existing sewerage network including a pumped sewerage system at Port West. • Establish infrastructure and service agreements for the roll-out of large scale solar (and other renewable) energy production at the port. • Pursue medium-term infrastructure priorities as defined in the PIIP. • Developing renewable energy infrastructure on port land where deemed viable.
LONG-TERM (6+ years)	• Pursue longer-term infrastructure priorities as defined in the PIIP.



Australian Amalgamated Terminals Break-bulk Facilities – **Port of Brisbane**

DREDGING AND LAND RECLAMATION

Currently, material dredged during maintenance of the port's channels in the Brisbane River (including the Bar Cutting) is used as the initial filling layers in the FPE to create new land which will be used in the future for port related development. The river frontage of the FPE will ultimately be developed as shipping terminals and new berths will be dredged along this frontage. The exact timing for such uses will depend on demand as trade growth continues.

MUD ISLAND

In addition, PBPL currently possesses conditional approvals to place dredge material at the Mud Island disposal site until 2023 – namely, Marine Park Permits (MPW2013/MBMP0036) and an additional Environmental Authority (EPPR00604113) for Environmentally Relevant Activity (ERA) – 16 (dredging).

Under these approvals all dredged material must be sampled and tested in accordance with the 2009 National Assessment Guidelines for Dredging (NAGD) and only material determined to be suitable for ocean disposal is placed at Mud Island in accordance with these conditions. The purpose of these approvals is to accommodate for the Mud Island placement of low risk material thereby maintaining the FPE for material unsuitable for ocean disposal in accordance with the NAGD (either contaminated or not yet tested – i.e. flood material).

Mud Island disposal arrangements are important for PBPL's longer-term planning for sustainable dredged material placement and emergency response to flood events and as such highlights the importance of this arrangement being secured permanently (i.e. beyond 2023).

THE FUTURE PORT EXPANSION (FPE) AREA

The FPE is divided into a series of paddocks that:

- Require the construction of internal walls within the outer rock wall formations.
- Are progressively filled and surcharged to create areas that will eventually be used for port-related development.
- Primarily use material sourced from capital and maintenance dredging in the Brisbane River and Moreton Bay.

The time taken from the commencement of dredged material placement in a paddock, to have land in a geotechnical state capable of supporting port-related industrial development, can vary from 10-20 years depending on particular geotechnical conditions.

PBPL has developed a reclamation and land development model to take into account various drivers and provide an estimate of the life of the FPE based on the numerous factors discussed. Its primary function is to guide the shorter term reclamation and ground improvement activities and inform longer term planning. It is reviewed annually and updated taking into account actual reclamation and ground improvement activities completed during the year.

PBPL's port reclamation modelling takes into account factors including:

- The anticipated volumes of river material to be dredged (i.e. ~450,000m^3 per annum (accounting for flooding events) until 2026 then reducing notably due to fulfilment of dredging obligations upstream of Pinkenba).
- The anticipated volume of material to be dredged by deepening the main shipping channel.
- The receiving capacity of each FPE paddock (including surcharge requirements, ground improvement timings and the requirements for channel deepening).
- Obtaining relevant approvals to place suitable material (i.e. select maintenance material, capital material from the bar cutting and future berth pockets), at the Mud Island Placement Area.
- The requirements for future channel deepening and berth development (e.g. Berths 13-16 at Fisherman Islands).

Based on the factors above, it is anticipated that the FPE could be managed to enable it to receive dredged material from port operations until at least ~2055. Despite this capacity, a critical issue for the port remains the ongoing need to have a site for disposing/handling of the maintenance dredge material from the river. In this regard, strategies are currently being investigated to prolong the life of the FPE as a dredged material placement site, while accommodating envisaged demand for additional port land. These strategies include raising the level of the land as much as possible and maximising the capacity of approved offshore disposal locations (e.g. the site at Mud Island).

Another factor feeding into the reclamation strategy is the timing of demand for port land to service the anticipated growth in trade volumes. Although accelerated demand needs to be considered relative to the competing need to preserve/optimise dredged material disposal capacity.

Should the timing for development of additional infrastructure, such as berths 13-16 and channel deepening change, and/or approvals for placing dredged berth material at Mud Island not be renewed beyond 2023, then the capacity of the FPE could be consumed at a much faster rate.

POST COMPLETION OF THE FPE

To mitigate a key strategic risk, various strategies have been identified for the disposal/handling of material once the FPE can no longer be used for this purpose. Final conclusions on this issue will not be determined for some time, as implementation of a deliberate strategy is some years away and future environmental management requirements are presently unknown. Subject to these limitations, possible dredged material disposal strategies are noted to include:

- Drying of the material in a designated site at the port before removal to a suitable land fill site remote from the port.
- Placement of material offshore.
- The development of an additional dredged material placement and handling site(s).
- Other beneficial reuse option(s).

As the current placement strategies are expected to meet the needs of the port for the medium term, PBPL in consultation with Government will continue to develop and refine strategies for material placement beyond this time in accordance with our general obligations under the lease from the State of Queensland and required environmental assessments/approvals. Such investigations will consider the options outlined above in addition to monitoring the emergence of new technologies and commercial opportunities associated with the use of dredged materials.

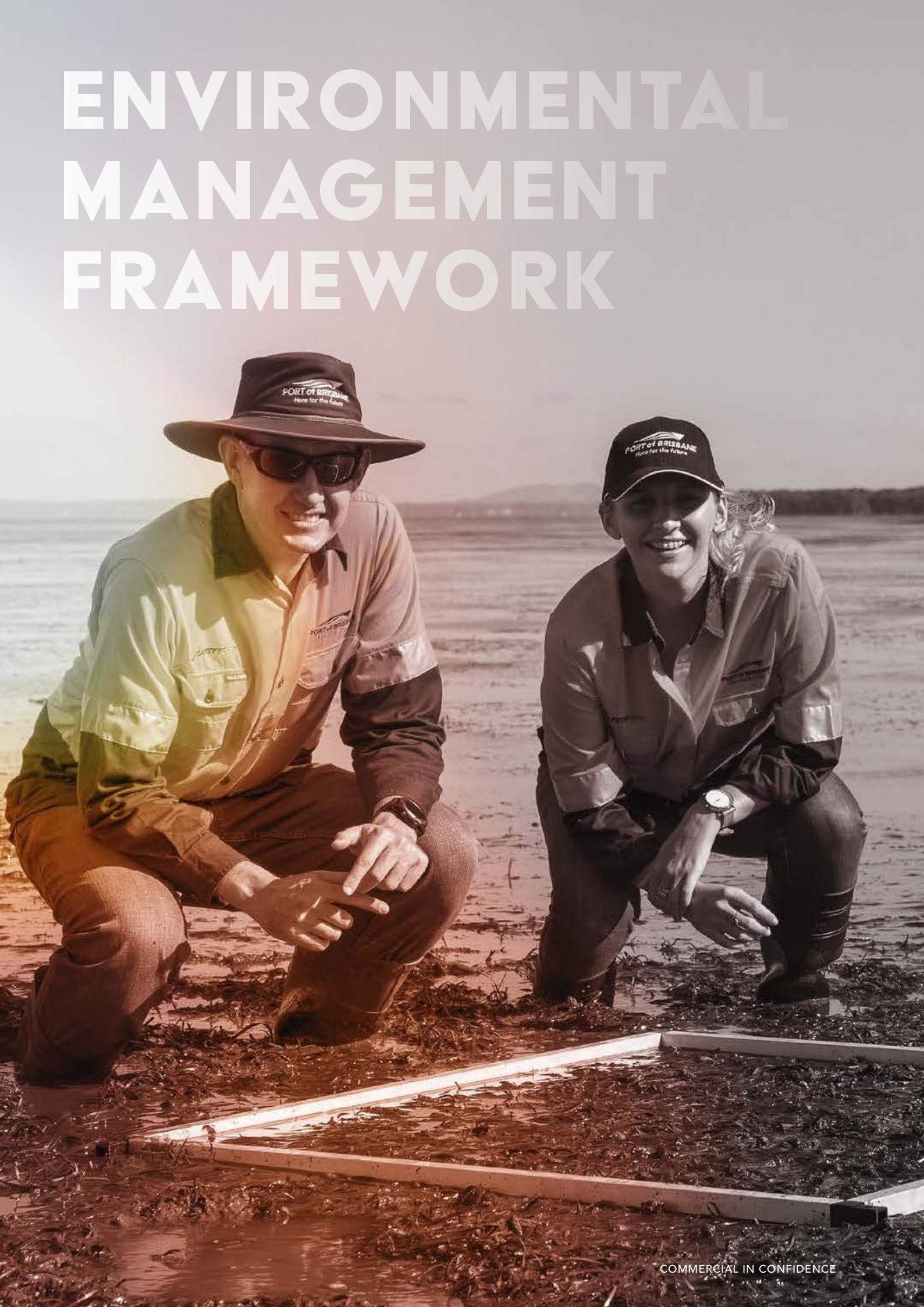
Managing the FPE reclamation – **Port of Brisbane**

DREDGING AND RECLAMATION STRATEGIES

TIMEFRAME	PROPOSED ACTION
ONGOING	• Monitoring dredging/reclamation requirements and (where necessary) adjusting strategies to accommodate future channel optimisation, berthing requirements, a 2nd swing basin and demands for bringing on additional port land. • Monitoring environmental impacts of dredging and reclamation (including the capture and containment of tail waters in the FPE area. • The selective use of new technology to optimise the timing, safety, cost-effectiveness of reclaiming land and delivering ground improvements (if and when needed) to meet the demands of the business. • Responding to future flooding events with emergency dredging strategies (as and when required) and adjusting reclamation modelling and broader business strategies accordingly. • Identify future fleet/plant and equipment maintenance and replacement requirements for PBPL's marine and reclamation asset management/budgeting programs.
SHORT-TERM (1-2 years)	• Seeking additional approvals for dredging works as identified in the channel optimisation investigations presently being undertaken.
MEDIUM-TERM (3-5 years)	• Commission additional investigations into the engineering, cost/benefits and opportunity costs of the various options identified for the management of dredged material post the completion of FPE filling. • Commence additional channel/berth optimisation and swing basin augmentation to meet the demands of next generation shipping likely to call Brisbane in coming years (both cargo and cruise vessels). • Seek approval extensions from State and Federal authorities regarding the ongoing placement of dredged material in Moreton Bay. • Pursuing additional research (including those projects identified under PBPL's partnership agreement with the University of Queensland) in relation to dredging, dredged material handling.
LONG-TERM (6+ years)	• Replace *TSHD Brisbane*. • Renew State approvals for the placement of dredged material at Mud Island. • Commence new dredged material handling strategies following the filling of the FPE area.

Future Port Expansion Reclaimation works – **Port of Brisbane**

ENVIRONMENTAL MANAGEMENT FRAMEWORK



Port Environs: Physical Setting

The Port of Brisbane is located at the mouth of the Brisbane River in Moreton Bay. The Port is directly adjacent to a number environmentally sensitive areas including the multi-use Moreton Bay Marine Park and internationally recognised Ramsar wetlands. These areas are of particular environmental importance and have additional regulatory protection to ensure their conservation.

The Port of Brisbane itself includes a number of sensitive environmental communities and provides habitat for various flora and fauna. Approximately one third of the Port of Brisbane is defined as open space or conservation, making it one of the most 'green-space' rich ports in the world. A number of the ecological communities and associated flora and fauna observed at the port are of high conservation value and subsequently protected by international, national and state regulation.

The Port of Brisbane operates within the wider Brisbane region with close ties to the residential communities of Wynnum and Manly to the south of the Port and Pinkenba to the north. The Port of Brisbane has significant buffer areas between the Port and the neighbouring sensitive receptors which mitigate any potential impacts. There is still a strong interaction with local communities and measures are implemented to further minimise any potential impacts.

SUMMARY OF KEY ENVIRONMENTAL FEATURES

MARINE ECOSYSTEMS

The Port of Brisbane is surrounded by a number of important marine habitats that support significant flora and fauna. These include seagrass, mangroves, salt marsh and hard substrate habitat. The Fisherman Islands area contains the largest seagrass meadow in western Moreton Bay. These seagrass meadows have high biodiversity and fisheries habitat values, and are also located within an internationally significant wetland (Moreton Bay Ramsar site) and Moreton Bay Marine Park.

The 'river mouth' contains large areas of remnant mangrove forest, most notably along the south-eastern side of Fisherman Islands and on the eastern side of Whyte Island. Parts of the mangrove forest are located within the Moreton Bay Ramsar site, a wetland of international significance.

The construction of the Port of Brisbane at Fisherman Islands has created a significant amount of artificial hard substrate habitat. The FPE was constructed in 2004 and the rock seawall extends a total length of 4.6 kilometres. The FPE seawall, together with other seawalls that currently line the lower Brisbane River, now provide the largest length of contiguous intertidal and subtidal hard substrate habitat within western Moreton Bay.

AVIAN FAUNA

The Port of Brisbane supports a wide diversity of avian fauna including internationally significant populations of migratory waders, water birds, sea birds and birds of prey.

The Port of Brisbane provides important high tide roosting habitat for migratory shorebirds with large numbers of waders using port land as high tide roosting habitat in recent decades. The port's reclamation ponds provide high quality roosting habitat which is relatively free of predators. PBPL has also constructed a permanent, purpose-built 12 hectare artificial roost to provide roosting habitat for migratory shorebirds.

The FPE area and the artificial shorebird roost provide significant roosting habitat for a number of coastal birds, particularly the water birds. 'The Lake' provides a brackish water environment which, whilst providing habitat for some coastal birds, also attracts more diverse species such as the Black Swan and a number of duck species.

MARINE MEGA FAUNA

Moreton Bay provides important habitat for both marine reptiles and mammals (e.g. Loggerhead, Green, Hawksbill, Leatherback, Olive Ridley and Flatback turtles, dugongs, Indo-Pacific Bottlenose and Humpback Dolphins and Humpback, Killer, Southern Right, Sperm, Melon-headed and Minke Whales). Many of the mega fauna that frequent Moreton Bay are considered endangered.

TERRESTRIAL FLORA AND FAUNA

Being in a predominantly coastal environment, there is a lack of any significant terrestrial flora in close proximity to the Port of Brisbane. Buffer areas to the south of Port Gate contain both remnant and regrowth stands of coastal vegetation habitat including low lying Melaleuca wetlands and coastal Eucalypt stands.

These terrestrial vegetation stands, whilst not of high ecological value, represent isolated pockets of historically widespread coastal vegetation in the area and so are of some conservation importance. Over time PBPL and others have undertaken programmed planting in these areas to both remove weed species and improve the quality of the native vegetation.

These pockets of vegetation, while isolated and highly fragmented, play host to a number of fauna species including birds, bats, possums and gliders. Due to much of the vegetation in these areas being regrowth, PBPL has supplemented the area with nest boxes to provide habitat for native fauna. PBPL monitors the nest boxes annually, which have been found to be highly successful in providing habitat for native fauna.

A number of Squirrel Glider (*Petaurus norfolcensis*) colonies have been identified in the Pritchard Street buffer area. Whilst the Squirrel Glider is not a threatened species, it has been recognised as being locally threatened.

SUMMARY OF KEY ENVIRONMENTAL CHARACTERISTICS

AIR QUALITY

Air quality is a measure of the suitability of air for breathing by people, plants and animals in terms of potential health impacts. Air quality in SEQ is generally good with most measurable levels below applicable standards. Brisbane compares favourably with other Australian cities and typically has fewer air quality exceedances than Melbourne and Sydney.

Transport of cargoes into and out of the Port of Brisbane is undertaken by shipping, road and rail.

Shipping is the most efficient mode of transportation of goods with large volumes of cargo able to be moved at a single time. Rail is the most efficient mode of land transportation however rail access to the Port of Brisbane is poor and as a result, percentage of total cargo volumes handled through the port by rail are low.

NOISE AND LIGHT

Noise and light can cause nuisance impacts on the environment and the community. Noise can be generated from a variety of sources including air conditioners, building work, engines and tools and maintenance.

The Port of Brisbane is a 24 hour a day, 365 day a year operation and has the potential to impact on both noise and light levels. Much of the activities at the Port of Brisbane are separated from sensitive residential areas with significant buffer areas to reduce impacts. Sources of noise include traffic, shipping and general operational noise. PBPL has not received any complaints in regards to noise emissions.

Lighting is required for safety purposes and includes street lighting and lighting for operational purposes. PBPL has commenced the use of light emitting diode (LED) street lighting and is investigating LED flood lighting. LED lights direct the light for its operational need and have minimal overspill. This reduces lighting impacts outside of the immediate operational area.

CULTURAL HERITAGE

Sea level change has been a dominant factor in the history of Moreton Bay, producing a series of sedimentary environments, which in turn have controlled sediment deposition throughout the Bay. In its present form, the Bay has only existed for the last 6,500 years with previous geological history suggesting the Bay alternated between a terrestrial plain and a marine embayment.

There are strong indigenous cultural links with Moreton Bay and the wider SEQ region. It is likely that the Aboriginal people occupied the Bay throughout the changes in geomorphology and archaeological sites may exist on the current sea bed. To date, the earliest evidence for human occupation in and around Moreton Bay has been over 20,000 years.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) AND POLICIES

SYSTEMS

PBPL, as owner of the Port of Brisbane, undertakes a key role in the environmental management of port development and operations. Since implementing a certified ISO14001 Environmental Management System (EMS) in 2000, no non-compliances have been identified via regular, independent audits. The EMS incorporates a risk based approach to environmental management and ensures continuous improvement in environmental management through ongoing monitoring and review.

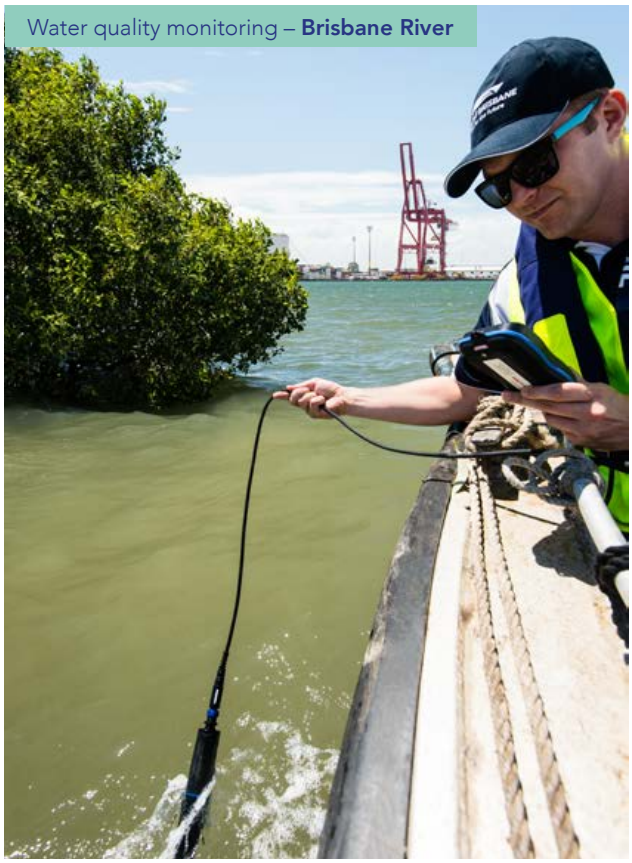
The Environment Policy sets out our high level corporate environmental objectives and is endorsed by senior management. The Environment Policy states PBPL's intentions to achieve environmental performance and empower port employees to be environmentally responsible.

An Environmental Risk Register has been developed to capture all the environmental risks across the different areas of the business. All the activities at each site are reviewed and environmental aspects and impacts are recorded. The risk rating of each of those environmental aspects and impacts are calculated and significant environmental aspects recorded. Significant environmental aspects are listed in the Environmental Management System Management Plan (EMSMP) and recorded on each of the Environmental Site Manuals. The Environmental Risk Register is reviewed annually or as required based on significant incidents or changes to operational parameters. This ensures that the environmental risks of PBPL operations and activities are well understood and remain current.

The EMSMP effectively captures and sets out the management framework to address the significant environmental aspects of the company's activities, products and services.

All high risk activities undertaken at the Port of Brisbane are required to operate under an approved Environmental Management Plan. Construction activities are managed under Construction Environmental Management Plans (CEMP) that are conditioned and approved through the Development Application/Assessment processes. Environmental Site Manuals and Environmental Operating Procedures have been developed for key areas. Operating Procedures are developed for routine activities with high environmental risk.

Water quality monitoring – **Brisbane River**



Monitoring is an important tool to measure the environmental performance of our activities and quantify the associated impacts. The monitoring data provides an accurate record to allow the comparison of results and recognise trends over time to propose improvements or plan future outcomes. A suite of environment monitoring programs measures the environmental aspects of our activities on a regular basis. This suite of environmental monitoring programs and their frequency are reviewed annually.

CORPORATE ENVIRONMENTAL SOCIAL RESPONSIBILITY

The Corporate Environmental Social Responsibility (CESR) program is a cornerstone of PBPL's commitment to best practice operations that account for our community stakeholders and environmental values. PBPL's CESR commitment is an approach to sustainable development that seeks to ethically pursue business growth in a manner that optimises benefits to the community and the port's ecological setting (i.e. creating shared value where ecological improvement and community benefit are pursued as an outcome of business development initiatives).

REGULATORY ENVIRONMENT

There is significant policy and regulation protecting the environment and managing the impacts of activities on the environment in Moreton Bay. Regulations range from international convention protecting wetlands of significance through to State Government legislation regulating high environmental risk activities.

The key regulatory instruments impacting upon the Port of Brisbane includes (however is not limited to):

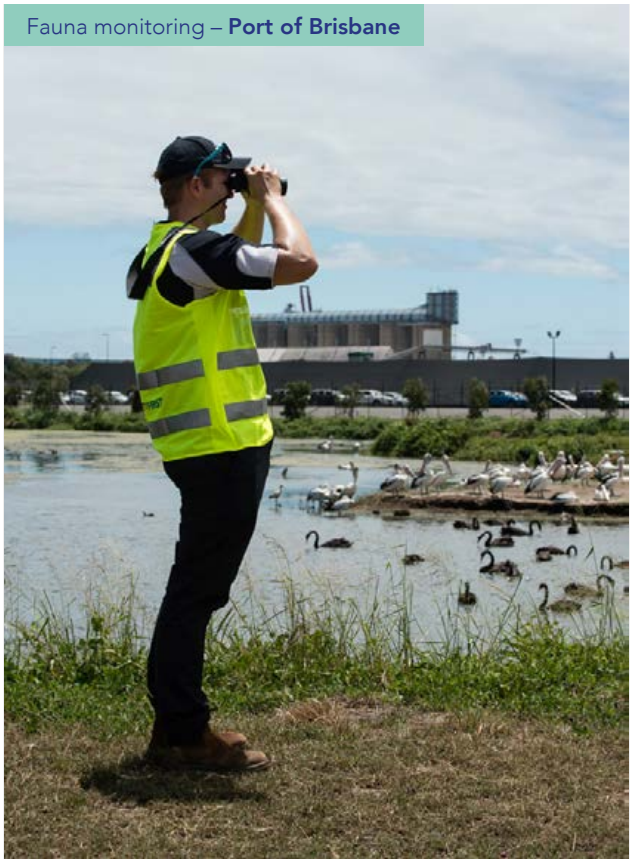
- **International Regulations** such as the Ramsar, Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA) agreements for the protection of wetlands and migratory bird habitats and the International Maritime Organisation's (IMO) conventions for the prevention of marine pollution.
- **Commonwealth regulations** for Matters of National Environmental Significance (MNES), Environmental assessment and approval processes, the listing, protection and management of heritage places, compliance with State environmental and planning legislation and the better delivery of national environmental programs. Such initiatives are tied to a broad spectrum of legislation including the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), the Environmental Protection (Sea Dumping) Act 1981, the National Environment Protection Council Act 1994 and the Protection of the Sea (Prevention of Pollution from Ships) Act 1983.
- State legislation such as the Environmental Protection Act 1994, the Vegetation Management Act 1999, the Nature Conservation Act 1992, the Marine Parks Act 2004, the Fisheries Act 1994, the Coastal Protection and Management Act 1995 and the Transport Operations (Marine Pollution) Act 1995.

KEY ACTIVITIES AND POTENTIAL IMPACTS

PORT DEVELOPMENT

Port development involves the construction and development of land and facilities to ensure the port is efficient and effective in receiving, handling and distributing cargo. There are a number of aspects of port development that can impact on the environment including pile driving, soil compaction, excavation and general construction activities. The impacts of port development include impacts on coastal hydrology and ecology, soil, groundwater and surface water contamination, air quality and noise and vibration

Fauna monitoring – **Port of Brisbane**



DREDGING AND DREDGED MATERIAL DISPOSAL

Dredging is undertaken for the purposes of establishing and maintaining safe access channels, berth and swing basins for ships into ports. Capital and maintenance dredging are critical for safely and sustainably accommodating shipping into the port and for the economy of Queensland. Dredged material disposal is the relocation of dredged material from the dredging site to a designated disposal site. Disposal sites may include ocean or land-based sites. The impacts of dredging and dredged material disposal include:

- Removal of existing habitats including benthic substrate
- Seabed disturbance and water quality impacts.
- Burial and smothering of benthic flora and fauna.
- Changes to hydrodynamics which can affect sensitive areas such as seagrasses and corals.
- Changes to coastal hydrology and processes.
- Injury or mortality to marine wildlife including marine megafauna.

RECLAMATION

Reclamation is the gain of land from the sea for various purposes including industrial land and port development. Land reclamation can have adverse effects on the marine environments and species. Marine habitats are permanently lost where land is reclaimed from the sea. Land reclamation can also have indirect impacts on the environment through changes in current, sediment deposition, increased turbidity and water quality impacts.

SHIPPING

Shipping comprises approximately 90% of world trade by volume, contributing approximately 12% of the total marine pollution arising from human activities on the ocean. The shipping operations and associated port activities that have been identified as having the greatest potential impact on the marine environment are discharge of ballast water, use of antifouling paints, disposal of waste materials, sewage and marine debris, spills of oils/chemicals from routine activities or accidental incidents, physical damage to marine habitats through direct impact (e.g. grounding) and noise and air emissions.

The potential impacts are usually greater for inshore waters and around port areas where complex marine ecosystems exist and there is low water exchange rates. Port areas concentrate shipping activities in a relatively confined coastal location resulting in a great incidence of pollution, spills, waste disposal, exchange of ballast water, noise and air pollution.

MATERIAL AND CARGO HANDLING

Ports handle a variety of cargoes ranging from packaged goods in containers, loose break-bulk cargoes such as motor vehicles, dry bulk cargoes and wet bulk cargoes.

The handling of cargo in ports can result in emissions, often accidentally. Handling of dry bulk cargoes including agricultural products, coal and cement can create dust. Handling of bulk liquids such as petroleum products can result in spillages. There is also potential for the release of atmospheric pollutants from cargo vapour emissions and emissions from cargo handling equipment. Some cargoes may include harmful substances which can be extremely toxic in the marine environment. The severity of any impact will depend upon the nature of the substance and the amount and concentration release into the environment.

Material and cargo handling operations can result in both noise and light impacts. Ports generally operate 24 hours per day, 365 days per year so often activities are undertaken during sensitive periods including at night. Noise and light from cargo handling can impact upon both the natural environment and human receptors.

TRANSPORT

The movement of cargo to and from ports is undertaken by a number of different modal methods, with rail and road predominating. Due the size and geographical distribution of population, transport in Australia can be over much larger distances when compared to other countries. The environmental impacts of transport are significant because it is a major user of energy (i.e. burning petroleum products creates air quality impacts including the emission of particulates, sulphur and nitrous oxides and carbon dioxide). Transport can have additional environmental impacts, such as impacts on biodiversity and wildlife through vehicle strike, stormwater impacts, soil, groundwater and surface water impacts and noise.

Having recognised the potential sources of environmental impact above, PBPL has developed and implemented an ISO 14001 Environmental Management System since 2000. PBPL also employs a broader range of planning and environmental management mechanisms to avoid, minimise and/or manage environmental impacts from the development and operation of the Port.

PBPL also recognises that certain activities, including shipping and transport, are outside of its direct sphere of control. However, we acknowledge that local measures can be taken to influence these activities to minimise impacts. In these instances, PBPL implements actions and controls to ensure that the impacts on the environment from these aspects are well managed and minimised as far as practicable. We also take an active interest in national and international sustainability initiatives to ensure broader effective controls are implemented to reduce impacts on the local environment.

Water quality monitoring – **Port of Brisbane**

MANAGEMENT OBJECTIVES

In order to achieve acceptable outcomes a practice should seek to achieve the best environmental outcome that is practically possible. This should be demonstrated through the application of the hierarchy of 'avoid, mitigate and offset' to reduce environmental impacts. This hierarchy forms a key principle for environmental legislation and policy both internationally and nationally.

Avoidance of impacts is the primary strategy for managing the impacts of an action. Measures to avoid impacts from the outset include spatial or temporal placement of project components in order to completely avoid impacts on environmental values.

Mitigation of impacts involves taking measures to reduce the duration, intensity and/or extent of impacts (including direct, indirect and cumulative impacts) that cannot be completely avoided, as far as is practically feasible.

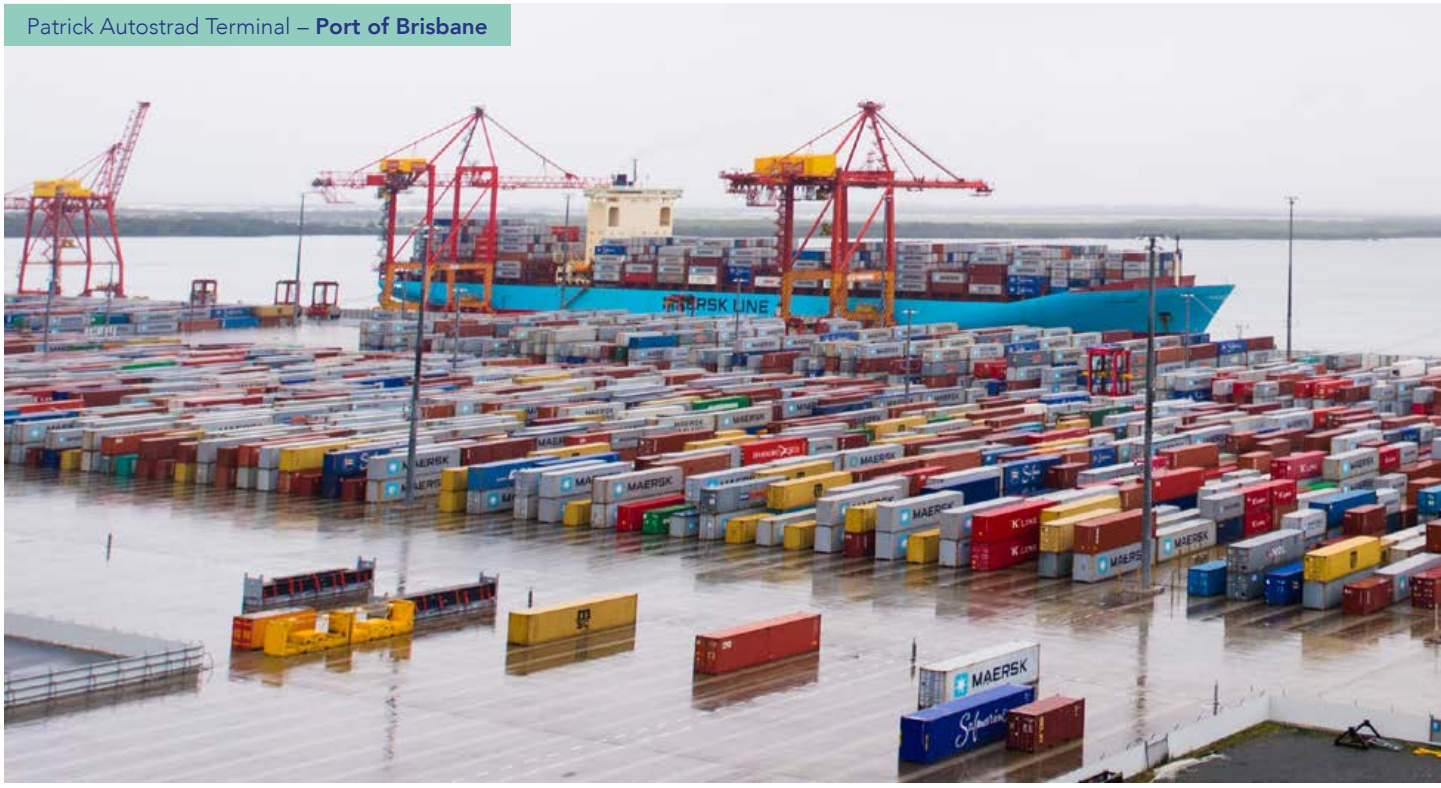
Offsets are measures that compensate for the residual adverse impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after avoidance and mitigation measures. Offsets can take the form of management interventions such as restoration of degraded habitat, weed removal, arrested degradation or averted risk and/or protecting areas where there is imminent or projected loss of biodiversity.

Ongoing adaptive management is a systematic process for continually improving management practices through learning from the outcomes of previous management, facilitates maintenance and enhancement of environmental values over time.

In an effort to ensure best practice environmental management through Port Strategic Planning, PBPL should where reasonable and practicable:

- Preserve, protect and where possible improve marine and terrestrial biodiversity.
- Minimise emissions including air quality pollutants, noise and light from port related development.
- Be well designed, functionally and environmentally.
- Adopt the Sustainable Development principles outlined in PBPL's Technical Guidelines 2016 (including innovative programs such as Offsite Stormwater Management and the development /use of Renewable Energy).
- Be adapted to the impacts of climate change.
- Minimise use of greenfield land.
- Provide high standards of protection for the natural environment.
- Ensure that access to and condition of heritage assets are maintained and improved where necessary.

Patrick Autostrad Terminal – **Port of Brisbane**



Key environmental values at the Port of Brisbane include matters of International, National, State and Local ecological significance. Whilst the development of the port is critical for the facilitation of trade and the support of the local, state and national economy, port development should be undertaken in such a way to minimise environmental impacts and enhance environmental values.

All decision making should be backed by rigorous and defendable scientific data and where there are data gaps, the 'Precautionary Principle' should be applied.

All future development at the Port of Brisbane should incorporate elements of sustainable development to minimise environmental footprints whilst maximising financial and community benefits.

PBPL has in place key systems and procedures to ensure the ongoing protection and management of key environmental values. These documents should be periodically reviewed to ensure they remain current and relevant to any changes in environmental values and scientific understanding.

Mangrove monitoring – **Port of Brisbane**

RISK ANALYSIS

The following risk assessment was undertaken to determine the potential impacts of the Port of Brisbane Master Plan on environmental aspects at the Port of Brisbane.

ENVIRONMENTAL IMPACT	DESCRIPTION	POTENTIAL SOURCES OF IMPACT	MANAGEMENT RESPONSES
WATER QUALITY	Impacts on water quality include turbidity, pollutant contamination and nutrient input. Impacts on water quality may have impacts on other aspects such as light and smothering impacts on seagrass and corals.	• Dredging and dredged material disposal • Erosion and storm water runoff • Spills or leaks of contaminants • Material handling • Reclamation • Shipping movements and activities	• Ambient water quality monitoring program • Dredge material management and monitoring • Marine monitoring programs • DA Process (CEMP/Operational Environmental Management Plan (OEMP))
NOISE	Increased noise (variable and continuous) can impact both sensitive residential communities and/or terrestrial and marine species.	• Traffic (including shipping) • Operation of machinery • Equipment (generators, alarms etc.) • Pile-driving • Dredging	• DA Process (CEMP/OEMP) • Research and implement innovative cost effective noise reduction technology
LIGHT	Increased light can impact both sensitive residential communities and/or terrestrial and marine species.	• Street and flood lighting (particularly HPS lamps with significant overspill) • Ship and navigation lighting	• Install directional LED lighting on all new projects and retrofit where feasible. • Work with tenants to retrofit existing lighting with directional LED lighting. • DA Process (CEMP/OEMP)
AESTHETIC	Port infrastructure and activities may impact on the aesthetic values of an area.	• Design of port infrastructure (height and design of buildings, landscaping etc.) • Location of port and distance to sensitive receptors • Ship and road traffic • Port lighting	• Technical Design Guidelines • Port development factsheets • Responsible land use planning • Investment in port landscaping
AIR QUALITY	Dust from bulk solids and emissions from ships, trains and trucks have the potential to impact on human health and amenity.	• Emissions from construction • Emissions from bulk material loading • Emissions from ships, trains and trucks • Volatile Organic Compounds (VOC) from the unloading of petroleum products • Odours from chemical processing	• Air quality monitoring and modelling studies • DA process (CEMP/OEMP) • Research and implement innovative cost effective emissions reduction technology
COASTAL PROCESSES	Port infrastructure can result in barriers to riverine and estuarine flow, beach erosion and changes to sediment deposition, tidal flow, currents and drainage.	• Construction of sea walls, breakwaters or other barriers • Piles and trestles • Dredging • Reclamation	• Environmental impact assessment of new projects • DA process (CEMP/OEMP) • Improved understanding of flows through hydrodynamic modelling
ECOSYSTEM IMPACTS	Direct impacts on ecosystem functioning and integrity (e.g. direct physical impacts including removal)	• Port development including vegetation clearing • Dredging and dredge material disposal • Reclamation • Habitat removal and fragmentation • Vessel interaction	• DA process (CEMP/OEMP) • Develop Technical Advisory and Consultative Committee (TACC) and implement Long Term Dredged Material Management Plan • Continued support of catchment management projects • Investigate and support innovative research and action projects
INTRODUCED SPECIES	Introduction of exotic species in both marine and terrestrial environments	• Cargo transfer • Ballast water discharge • Biofouling	• Implement IMP surveillance monitoring program • Continue to work with Biosecurity Queensland and the Department of Agriculture and Water Resources on vector control and monitoring

KEY PROTECTION GOALS

ENVIRONMENTAL IMPACT	KEY ASPECTS	REGULATORY PROTECTION	CURRENT MANAGEMENT	PROTECTION GOALS
SEAGRASS	• Fisheries habitat • Marine and avian fauna • Water quality • Coastal protection • Carbon sequestration	• RAMSAR • Aspects of MNES and Matters of State Environmental Significance (MSES)	• Annual monitoring • Targeted research • Targeted support	• High priority protection • Avoid impacts where possible • Enhance values • Offset impacts if unavoidable • Evidence based decision making
MANGROVES	• Fisheries habitat • Marine and avian fauna • Water quality • Coastal protection • Carbon sequestration	• RAMSAR • Aspects of MNES and MSES	• Bi-Annual monitoring • Targeted research • Targeted support • Offset opportunities	• High priority protection • Avoid impacts where possible • Enhance values • Offset impacts if unavoidable • Evidence based decision making
SALTMARSH	• Fisheries habitat • Marine and avian fauna • Water quality • Coastal protection • Carbon sequestration	• Aspects of MNES and MSES	• Bi-Annual monitoring • Targeted research • Targeted support • Offset opportunities	• High priority protection • Avoid impacts where possible • Enhance values • Offset impacts if unavoidable • Evidence based decision making
HARD SUBSTRATE MARINE HABITAT	• Fisheries habitat • Marine fauna • Coastal protection	• Aspects of MNES and MSES	• Annual monitoring • Targeted research • Targeted support	• Moderate priority protection • Enhance values
SHOREBIRDS	• Migratory waders • Habitat	• JAMBA and CAMBA • MNES and MSES	• Monthly counts • Targeted research • Targeted support • Proactive management • Offset opportunities	• High priority protection • Avoid impacts where possible • Enhance values • Offset impacts if unavoidable • Evidence based decision making
AVIAN FAUNA	• Protected species • Endangered species • Habitat	• MNES and MSES	• Monthly counts • Proactive management	• Moderate priority protection • Specific species high priority • Linked to other habitats • Evidence based decision making

ENVIRONMENTAL IMPACT	KEY ASPECTS	REGULATORY PROTECTION	CURRENT MANAGEMENT	PROTECTION GOALS
MARINE MEGA FAUNA	• Protected species • Endangered species • Habitat	• MNES and MSES	• Proactive management	• High priority protection • Avoid impacts where possible • Linked to other habitats • Evidence based decision making
TERRESTRIAL FLORA AND FAUNA	• Habitat • Endangered species • Weeds and pests • Buffer provision • Carbon sequestration • Aesthetics	• MNES and MSES	• Annual monitoring • Targeted research • Targeted support • Proactive management	• Moderate priority protection • Specific species high priority • Enhance values
AIR QUALITY	• Community impacts • Environmental impacts • Operational impacts	• Commonwealth legislation • State legislation • General nuisance provisions	• Real-time monitoring • Proactive management • Targeted research	• No adverse community impacts • No operational impacts • Reduced emissions over time
NOISE AND LIGHT	• Community impacts • Environmental impacts • Operational impacts	• Commonwealth legislation • State legislation • General nuisance provisions	• Proactive management • Targeted research	• No adverse community impacts • No operational impacts • Reduced emissions over time
CULTURAL HERITAGE	• Aboriginal values • European values	• Commonwealth legislation • State legislation	• Proactive management	• High priority protections • Avoid impacts where possible

ENVIRONMENTAL MANAGEMENT FRAMEWORK

TIMEFRAME	PROPOSED ACTION
ONGOING	• Maintain ISO14001 Environmental Management System accreditation including ongoing continual improvement through regular audit and review. • Continued implementation of the PBPL Environmental Monitoring Program in an effort to detect any impacts on port development and operations on the receiving environment. Partner with reputable organisations and research institutions to ensure data collection and reporting is rigorous and defendable. • Protect, and where possible enhance, the key environmental values at the Port of Brisbane through sound decision making processes incorporating recent and defendable science. In the event of a lack of clear scientific understanding, incorporate the use of the precautionary principal in decision making processes. • Minimise environmental impacts through a process of high level assessment and approval and sound environmental management practices. Ensure high risk activities are appropriately assessed and managed to reduce risk as far as reasonably practical. • Incorporate elements of sustainable development into all port development to ensure a minimal environmental impact footprint whilst maximising financial and community benefits. • Research and implement innovative solutions to environmental aspects including sustainable technologies, options for enhancing environmental values and solutions to environmental risks and impacts.
SHORT-TERM (1-2 years)	• Fully implement the PBPL Environment Strategy and Stakeholder Engagement Plan. • Seek to incorporate working with nature philosophies in all major developments to ensure that the environmental benefits of project construction are maximised through smart planning and design. • Research and implement renewable energy technology throughout the port. • Monitor, update and apply sustainable development principles accommodating for improvements and innovation in environmental management and construction technologies.
MEDIUM-TERM (3-5 years)	• Research and adopt technological innovation in the areas of electric and automated vehicles early. • Research and adopt renewable energy and electrical storage technology early.
LONG-TERM (6+ years)	• Implement a Target Zero initiative with the aim of zero landside emissions, zero waste to landfill and zero potable water use.

CONCLUSIONS

Conclusions

The Port of Brisbane has a long and proud history of leading the Australian ports sector in relation to strategic land use planning. Since privatisation, PBPL's Planning Framework has been adapted to meet legislative changes, the dynamism of our business and the requirement under our Head Lease to develop and implement a broader non-statutory 30-year Master Plan.

This revision of the Port of Brisbane Master Plan seeks to:

- Integrate with the planning requirements of Commonwealth, State and Local government addressing trade growth, optimising transport efficiency, delivering supply chain logistics and promoting sustainable environmental management in port development and operations.
- Broadly define the future development of the Port of Brisbane, how the needs of port users will be addressed and how such development will be managed to minimise adverse impacts on the environment and the general amenity of areas surrounding the port.
- Support other elements of PBPL's Planning Framework (e.g. PBPL's Land Use Plan, Priority Infrastructure Interface Plan and Technical Guidelines.

Broadly, the Master Plan is intended to:

- Guide PBPL's vision to be 'Australia's leading port, here for the future'.
- Voluntarily reflect the Queensland Government's Sustainable Ports Act 2015 requirements.
- Address the dynamics and detail of PBPL's business, changing legislative requirements across all tiers of government, stated Executive priorities, key strategic projects and the Port's environmental management framework.

OBJECTIVES

Accordingly, the Port of Brisbane Master Plan 2018-2048 addresses matters including:

- a projection of the type, extent and location of Brisbane's port development over the next 30 years.
- PBPL's trade and property strategies based on future growth projections.
- Infrastructure provision including the identification and protection of existing and future regional transport (road, rail and sea) and supply chain corridors/facilities servicing the port and the identification of options for supporting future port operations/growth.
- The identification of strategic areas within and beyond BCPL requiring additional investigation and consultation with key stakeholders.
- The guiding parameters of an Environmental Management Framework that identifies key environmental values and seeks to manage, minimise and/or mitigate impacts associated with future port growth while pursuing opportunities to create shared value, optimise sustainability and deliver high-quality urban design.

It is envisaged that the Port of Brisbane Master Plan 2018-2048 will build on PBPL's innovative land use planning that extends beyond our compliance requirements. It will be reviewed regularly as a 'working document' and provides the business with a proactive means of sustainably accommodating the future growth of the port and its capacity to deliver for shareholders, and positively contributing to the local/regional economy, community and environment.

Abbreviations

AAT
Australian Amalgamated Terminals

ACCC - Australian Competition and Consumer Commission

AQIS
Australian Quarantine and Inspection Service

ACS
Australian Customs Service

ARTC
Australian Rail Track Corporation

BCC
Brisbane City Council

BCPL
Brisbane core port land

BCT/HPH
Brisbane Container Terminals/ Hutchison Port Holdings

BICT
Brisbane International Cruise Terminal

BMT
Brisbane Multimodal Terminal

CAMBA
China-Australia Migratory Bird Agreement

CBD
Central Business District

CEMP
Construction Environmental Management Plan

CESR
Corporate Environmental Social Responsibility

City Plan 2014
refers to the Brisbane City Council's town planning scheme.

CRSL
Cross River Sewerage Link

CSG
Coal Seam Gas

DA
Development Assessment

DAF
Department of Agriculture and Fisheries (Qld)

DoE
Department of Environment (Commonwealth)

DES
Department of Environment and Science (Qld)

DFRC
Dedicated Freight Rail Corridor

DSDMIP
Department of State Development, Manufacturing, Infrastructure and Planning (Qld)

DTMR
Department of Transport and Main Roads (Qld)

DPW
Dubai Ports World (DP World)

DSD
Department of State Development (Qld)

ECP
Empty Container Park

EDQ
Economic Development Queensland

EMF
Environmental Management Framework

EMS
Environmental Management System

EMSMP
Environmental Management System Management Plan

EPA
Environmental Protection Act 1994 (Qld)

EPBCA
Environmental Protection (Biodiversity Conservation) Act 1999 (C'wealth)

FI
Fisherman Islands

FPE
Future Port Expansion

GSP
Gross State Product

GDP
Gross Domestic Product

HML
High Mass Limits

HTC
Heavy Transit Corridor

HPV
Higher Productivity Vehicles

IA
Infrastructure Australia

JAMBA
Japan-Australia Migratory Bird Agreement

IMEX
Import/Export

IMO
International Maritime Organisation

LAT
Lowest Astronomical Tide

LNG
Liquid Natural Gas

LUP
(PBPL's) Brisbane Port Land Use Plan 2015

MLP
Market Lead Proposal

MNES
Matters of National Environmental Significance

MSES
Matters of State Environmental Significance

MSQ
Maritime Safety Queensland

MUT
Multi User Terminal

NAGD
National Assessment Guidelines for Dredging

NCOS
Nonlinear Channel Optimisation Simulator

NPS
National Ports Strategy

OD
Over Dimension

OEMP
Operational Environmental Management Plan

OSOM
Oversize Overmass

PA
Ports Australia

PAC
Port Access Charge

PIANC
World Association for Waterborne Transport Infrastructure

PNCUB
Port North Common User Berth

POBM
Port of Brisbane Motorway

PBPL
Port of Brisbane Pty Ltd

PBS
Performance Based Standard

PCC
Pure Car Carriers (a class of car carrying vessel)

PDI
Pre-delivery Inspection

PIP
Priority Infrastructure Plan (for BCC).

PIIP
(PBPL's) Priority Infrastructure Interface Plan

QBH
Queensland Bulk Handling

QCA
Queensland Competition Authority

QCE
Queensland Commodity Exports

QPA
Queensland Ports Association

QPS
Queensland Ports Strategy

QUU
Queensland Urban Utilities

QR
Queensland Rail

QTLC
Queensland Transport Logistics Council

RFA
Road Franchise Agreement

SEQ
South East Queensland

SEQRP
South East Queensland Regional Plan

SIA
Strategic Investigation Area

SLMP
System Leakage Management Plan

SPA
the Sustainable Planning Act 2009 (Qld)

SPP
State Planning Policy

TACC
Technical Advisory and Consultative Committee

TEU
Twenty-foot Equivalent Units

TIA
the Transport Infrastructure Act 1994 (Qld)

TSHD
Trailer and Suction Hopper Dredge

ULDA
Urban Land Development Authority

VBS
Vehicle Booking System

VOC
Volatile Organic Compound

2018—2048

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PORT of BRISBANE
Here for the future