

PORT OF NEWCASTLE

Port Master Plan 2040



*Our Strategic Development
Opportunities to 2040*

**Port of
Newcastle**



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Acknowledgement

The Port of Newcastle acknowledges the Traditional Custodians of the land and waters of Newcastle Harbour, the Awabakal People and pays respect to all Elders past, present and future.

FOREWORD

The Port of Newcastle is a proud working port with a strong history.

The purpose of this long-term Port Master Plan is to communicate our broad and strategic approach by outlining both our current and future development and trade opportunities to 2040.

As a global gateway for New South Wales, the Port of Newcastle (PON) enjoys a significant competitive advantage, with a major seaport and connectivity to a world-class national rail and heavy vehicle road system. With the shipping channel currently only operating at 50% capacity, vacant portside land and market interest, the opportunities are immense.

The Port plays a significant role as an economic driver and a catalyst for growth throughout our region, state and nation. In the Lower Hunter alone, activity within the Port of Newcastle contributes \$1.6 billion and 9,000 jobs per annum. This does not include the significant contribution of associated industries such as mining and agriculture, which contribute many billions more.

The Port of Newcastle's vision is to maintain Newcastle's position as one of the leading and most efficient global-scale ports, and to facilitate continued growth and development of existing and new trades in a sustainable manner. We recognise the responsibility that comes with stewarding an iconic asset for the next 95 years. We are committed to driving collaboration with Government, communities and other stakeholders to agree on the future and deliver the benefits of trade growth.

The Port of Newcastle has embarked on an ambitious diversification strategy. Whilst coal exports provide a stable foundation for our growth, we are driven by the need to grow and diversify our trade base to meet the demands of our customers and the containerisation of some trades.

This Port Master Plan outlines the key strategic development opportunities for the Port and the broader region, including:

- The **Newcastle Container Terminal**;
- The **Newcastle Bulk Terminal**;
- An **Automotive and Ro-Ro Hub**;
- The **Maritime Precinct**;
- The **Newcastle Cruise Terminal**; and
- The continuation and growth of major bulk trades including coal, fuel, fertiliser, wheat and mineral concentrates.

Our success depends on our ability to be an efficient global trade gateway, working in partnership with those who rely on our services, those who regulate our activities, and those who are our neighbours.

We are dedicated to operating a safe, sustainable, environmentally and socially responsible business in partnership with our tenants, port users, community and Government agencies. The Port Master Plan 2040 is reflective of these values, and I commend it to our stakeholders and partners.




Professor Roy Green
Port of Newcastle
Chairman




Craig Carmody
Port of Newcastle
Chief Executive Officer

EXECUTIVE SUMMARY

Australia's ports facilitate the movement of \$1.2 billion worth of trade every day.¹

The Port of Newcastle is the global gateway for the Hunter Region and New South Wales. It is the largest port on the East Coast, and Australia's third largest port by trade volume. It is well-placed to support the predicted doubling of Australian freight over the next 20 years and beyond.

By 2040, the City of Newcastle will be home to 200,000 people, with the population of the Hunter growing to 870,000 and New South Wales to over 10 million people.² The Port, through coal export trade, will continue to provide a stable foundation for our region and state's economy, and our business. Trade volumes of fuels, and dry bulk such as wheat, grains and fertiliser, will continue to grow.

Our trademark for the next twenty years, however, will be our diversification. The Port of Newcastle has abundant capacity to grow trade volumes and establish new, efficient and cost-effective supply chains for buyers and producers. A key driver of diversification and growth of business opportunities for Newcastle and the Hunter will be the development of the Newcastle

Container Terminal. We are the port ready to host the latest technologies, industry innovation and a step change in the way freight is moved in, out and through New South Wales and Australia.

Many Australian ports, including the Port of Newcastle, now operate in a commercial environment, in which port owners and managers are focused on utilising the full capacity of their assets to deliver greater efficiency and shareholder value.

This Port Master Plan provides a broad and strategic approach, identifying future developments and opportunities to 2040. The following goals underpin this approach:

- Promote the capacity of the Port and the supply chain to support the economy.
- Utilise the existing road and rail transport assets to improve freight efficiency.
- Facilitate new trades and supply chains.
- Support the development of new facilities and enabling infrastructure.
- Protect the Port and transport corridors from urban encroachment.

¹ Ports Australia website 2018
² NSW People and Places Dashboard, NSW Planning and Environment website 2017

Our vision is for the Port of Newcastle to become Australia's first-choice East Coast port, able to accommodate, attract and grow a diverse trade base in

an efficient, sustainable, profitable and innovative manner. To achieve this vision, the Port of Newcastle has identified the following goals:



PROMOTE THE CAPACITY OF THE PORT AND THE SUPPLY CHAIN TO SUPPORT THE ECONOMY

The Port of Newcastle, with its central geographic location on the eastern seaboard, existing capacity and supply chain infrastructure, is well-placed to support the New South Wales and Australian economies.

For every dollar spent in the Port of Newcastle, there is a flow-on benefit for the local, state and national economies of between \$0.84 and \$1.32. For every million dollars of output generated by the Port of Newcastle, 5.2 jobs are created.³

The Port handled over 167 million tonnes of trade and 4,700 ship movements in 2017. Modelling of the shipping channel has shown that over 10,000 ship movements per year can be accommodated. This, together with planning approval for additional berths, investment in new port infrastructure, and a significant quantity of available, serviced and zoned port land, provides for future growth.

³ Port of Newcastle Economic Impact Report 2016/17 Econsearch



UTILISE EXISTING ROAD AND RAIL TRANSPORT ASSETS TO IMPROVE FREIGHT EFFICIENCY

Freight in Greater Sydney is expected to double over the next 40 years and increase by 25% in Regional NSW over the same period.⁴ Ports outside of capital cities, together with their road and rail supply chains offer significant capacity to reduce congestion. Ensuring that existing road and rail transport infrastructure are being utilised and optimised to their full capacity is critical to supporting and improving the efficiency of the New South Wales freight task.

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The Port of Newcastle has excellent access and connectivity to the national highway and rail networks that link to capital cities, and the catchment. Both the immediate road network and the broader highway system has capacity to accommodate the current and forecast vehicle growth without the need for major infrastructure upgrades. Similarly, the rail network have capacity to accommodate the contracted coal volume, as well as latent capacity to move non-coal trade, including bulk grain and containers, from regional New South Wales to Newcastle.

⁴ Future Transport 2056 TfNSW 2018



FACILITATE NEW TRADES AND SUPPLY CHAINS

Growing, attracting and facilitating new trade and new supply chains is a key focus for the Port of Newcastle. The introduction of new import and export trades and new supply chains will be what drives innovation, efficiency and value for the Port, its shareholders and the community.

Facilitating infrastructure to support new trades and supply chains can address infrastructure bottlenecks and capacity constraints in capital city ports, and respond to changing technology such as automation, modal shifts and bulk containerisation.

The Port Master Plan 2040 outlines the rationale for the development of a Newcastle Container Terminal, as well as identifying other opportunities such as the establishment of a specialist Automotive and Ro-Ro Hub within the next twenty years.



SUPPORT THE DEVELOPMENT OF NEW FACILITIES AND ENABLING INFRASTRUCTURE

The Port Master Plan 2040 supports the development of new transport infrastructure and logistics facilities such as upcountry intermodals. These facilities can leverage on the proximity to existing and proposed transport corridors.

This includes smaller enabling projects that can utilise, improve and enhance the existing road and rail networks for greater efficiency, productivity and consequence.

Major projects, such as the Inland Rail, will further enhance Newcastle's connectivity, consolidating rail access to an extended area of New South Wales and potentially Southern Queensland and Northern Victoria. This modal shift will provide greater benefit to growers and producers and more efficient use of the transport network, as well as ensuring that the economic benefits are retained in New South Wales.



PROTECT THE PORT AND TRANSPORT CORRIDORS FROM URBAN ENCROACHMENT

Urban encroachment is the potential conflict that can arise between adjoining land uses and freight operations at the Port or along transport corridors. These operations are required to operate on a 24/7 basis to ensure that freight is able to be moved economically, efficiently and sustainably. These activities may, however, have a range of amenity impacts on sensitive land uses and residents.

Protecting the Port and its transport corridors from urban encroachment to safeguard continuous and sustainable port operations, as well as ensure appropriate amenity for nearby communities, is a key goal of this Port Master Plan. Managing the Port's interface with its surrounds focuses on both economic and environmental sustainability and forward planning for the benefit of the Port and community. As both the Port and the Greater Newcastle metropolitan areas grow, the identification and protection of future transport corridors will become increasingly important.



INTRODUCTION

Pictured: Nobbys Headland

The *Port of Newcastle Master Plan 2040* is a statement of our belief that the Port of Newcastle will be the first choice for Australia's East Coast ports.

By 2040 the Australian population will be over 31 million, with the corresponding demand for goods driving the volume of freight to more than double within this timeframe.⁵

The Port Master Plan focuses on demonstrating the connectivity and capacity of the Port and its supporting transport networks to accommodate, attract and grow trade, and assist in addressing the freight task in an efficient, sustainable, profitable and innovative manner.

Through examination of the existing assets in the shipping channel, portside land and connecting road and rail networks, the Port Master Plan builds the case for greater utilisation, optimisation and augmentation to facilitate new trade, establish new supply chains and develop new supporting facilities.

The Port Master Plan provides a broad and strategic approach identifying future development and opportunities, including:

- The **Newcastle Container Terminal** in Mayfield;
- The **Newcastle Bulk Terminal** in Walsh Point;
- A specialised **Automotive and Ro-Ro Hub**;
- Supporting the **Maritime Precinct** in Carrington; and
- Construction of the **Newcastle Cruise Terminal** in Carrington.

Critical to our success will be effective communication and collaboration with our customers and stakeholders.

The National Ports Strategy encourages clear communication at a strategic level on how the development and operation of the Port and the freight corridors serving it will be integrated into the future development of the region or city in which the port is located.⁶

Further, the Port Master Plan will open a clear line of communication with the Government to articulate how the capacity of the Port and the supply chains can support and build both the state and national economies and help meet the needs of the future freight task.

The purpose of the Port Master Plan is to inform the New South Wales Government, Government agencies and the local community of PON's development objectives for the period to 2040.

⁵ Freight Report Card, TfNSW 2017

⁶ National Ports Strategy, Infrastructure Australia, 2012.

A NEW LONG-TERM PLAN

In December 2014, PON published its inaugural Port Development Plan (PDP). The purpose of the plan was to help inform the New South Wales State Government, Government agencies and the local community of PON's development objectives over the five-year period from 2015–2020.

Key developments anticipated by the PDP included the preparation of the former Forgacs site at Carrington for future development, upgrades to existing berth infrastructure to enhance operational, safety and environmental performance, and the facilitation of berth development by tenants.

In July 2017, Thales Australia, together with the NSW Government, announced major investment in a new Maritime Precinct to be developed at the 10-hectare Carrington site. The first phase will include the renewal of the Fitzroy Street shipyard to cater for vessels up to 55 metres long, creating 70 new jobs.

In 2018, Stolthaven will complete construction of a new dedicated bulk liquids berth at Mayfield (M7) to support the expanding bulk liquids precinct. The installation of new unloading infrastructure at K2 by PON will replace ageing equipment and continue to improve environmental outcomes.

The PDP also highlighted the importance of cruise shipping to the local tourism industry, citing PON's commitment to work with major stakeholders to develop a concept for a permanent cruise terminal at the Channel Berth. The commitment of State and Commonwealth funding for additional mooring facilities and the planning for a permanent terminal facility has seen this concept become reality. The Newcastle Cruise Terminal is due for completion in 2019. The terminal building will provide for day visits and home porting facilities to strengthen Newcastle's position as an international cruise destination.

In recognition of the potential limitations of a five-year outlook and transformational projects that are currently being planned by PON, the need to prepare a longer-term plan to outline the future planning and development of the Port was identified. Critical to this was the desire to address the dynamics and detail of PON's business, rapid changes in technological and operating environments, the agility of supply chains and the competitive environment in which the Port now operates.

Like the previous PDP, the Port Master Plan will articulate the Port's vision and provide a licence to grow. Central to a longer-term vision is the effort to create economic value through increased industry and investment confidence by being visible and strategic.

ACHIEVEMENTS OF THE PORT DEVELOPMENT PLAN 2015-2020

- ✓ THALES AUSTRALIA MARITIME PRECINCT UNDER DEVELOPMENT
- ✓ NEWCASTLE CRUISE TERMINAL PLANNING COMMENCED
- ✓ MAYFIELD 7 BULK LIQUIDS BERTH NEARING COMPLETION
- ✓ K2 BERTH SHIP UNLOADER REPLACEMENT COMMENCED

Conversations with our customers and stakeholders have accompanied the drafting of the Port Master Plan. We are seeking to actively contribute to the overall supply chain management by expressing integration, and to ensure the delivery of core port and transport infrastructure, articulating what is needed, where and when.

Environmental protection through the identification of environmental values, a focus on current and future interface issues, and effective communication with the local community is also key.

"If well-designed, the strategic planning process can help to engage main stakeholders, strengthen links with clients and create local goodwill."

**Competitiveness of Port Cities
Synthesis Report, OECD 2013**



HISTORY OF THE PORT OF NEWCASTLE

Since its establishment, the City of Newcastle has been closely linked to its harbour, which provided trading opportunities, the creation of industries and employment and a place to establish a community. The first commercial export of coal left Newcastle for Bengal, India, in the barque *Hunter* in 1799.

Since the early years of the 19th century, the estuary of the Hunter River has been transformed from a series of mudflats and shallow channels to a major deepwater trading port.⁷

Encouraged initially by the area's large coal deposits and then by the establishment of BHP's iron and steelworks in 1911, the Government invested significant amounts of money in reshaping the harbour through dredging, which commenced in 1859. Rock blasting and reclamation work continued to form the extensive Port land of the Dyke at Carrington, Kooragang Island and Walsh Point.

The principle of transformation and innovation to achieve ongoing improvement is one that PON continues to strive for today.

⁷ Harbour from a Creek, Melville, R. 2014.

OVERVIEW OF THE PORT OF NEWCASTLE

"Our vision is to maintain Newcastle's position as one of the leading and most efficient global scale ports and to facilitate continued growth and development of existing and new trades in a sustainable manner."

WHO WE ARE

Port of Newcastle (PON) is the commercial manager of Newcastle Port and has a 98-year lease with the NSW Government, which commenced on 30th May 2014.

A key objective of the lease is to maintain and enhance the Port as a major seaborne trade gateway for New South Wales.

Our shareholders, The Infrastructure Fund (TIF) and China Merchants Ports Holding Company Limited (CMPort), each own 50% and have a strong, global track record in managing large infrastructure assets, including ports.

The Port is recognised as a major strategic asset for the New South Wales economy, and an important trading gateway for Australia. In 2017 the Port of Newcastle handled more than 167 million tonnes with an estimated value of \$24 billion.

The Port of Newcastle generated direct and flow-on benefits of \$1.8 billion to the NSW economy. The estimated total impact on the Hunter economy alone was \$1.6 billion. This was equivalent to approximately 0.35 per cent of New South Wales' gross state product, and nine per cent of gross regional product.⁸

As a business, our core functions include:

- Trade and Port development
- Management of Port land;
- Wharf and berth services.
- Maintenance of major Port assets;
- Vessel scheduling; and
- Dredging and survey services.

MISSION

Our mission is to promote and support the prosperity of the Hunter Region and New South Wales in a sustainable manner.

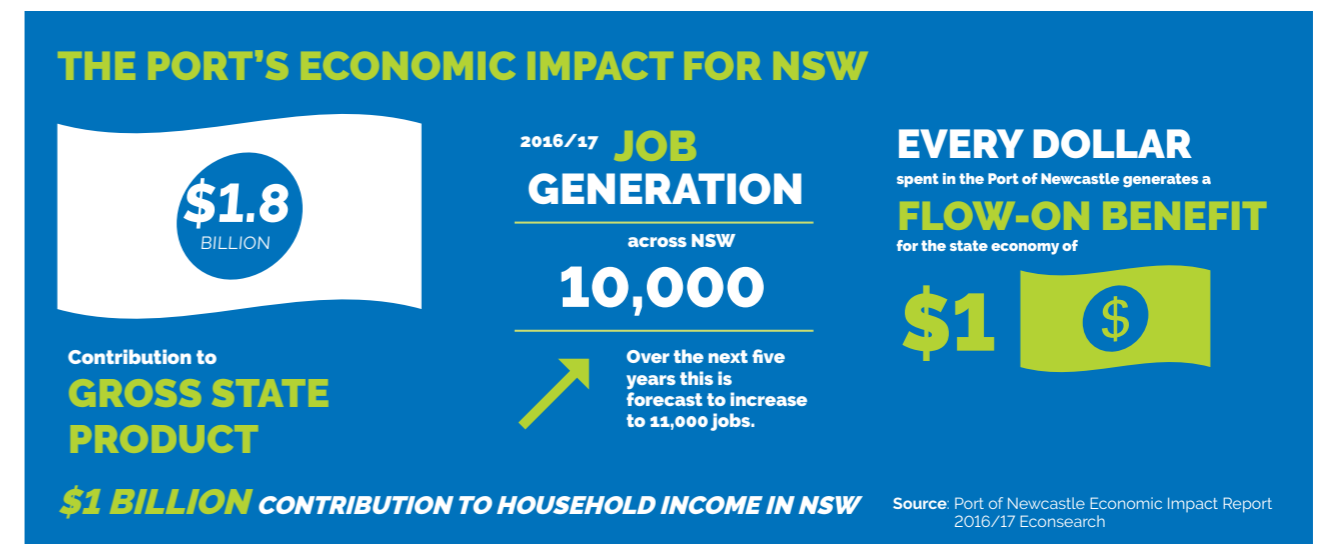
We will:

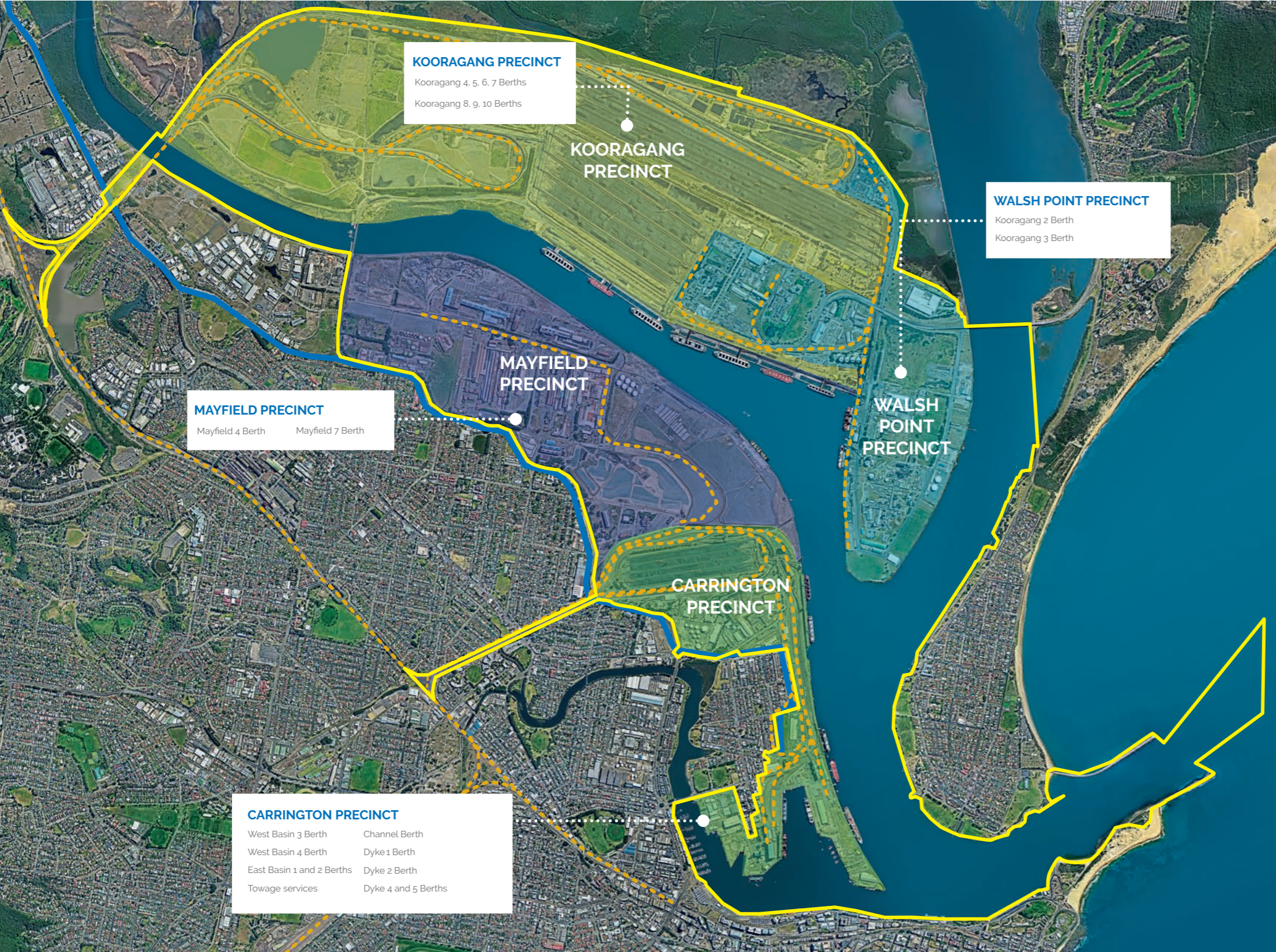
- Provide efficient port infrastructure to facilitate regional, state and national economic growth;
- Maintain a safe and rewarding workplace for all employees;
- Promote and facilitate improvements to supply chain performance;
- Collaborate with stakeholders to deliver the benefits of trade growth, including with surrounding communities;
- Manage environmental impacts of port operations and development;
- Deliver effective commercial outcomes for customers; and
- Undertake sustainable investment and deliver commercial returns for shareholders.

VALUES

Our values are safety, teamwork, initiative, performance, customer service and delivering on our promises.

⁸ Port of Newcastle Economic Impact Report 2016/17 Econsearch





THE CHANNEL

Newcastle Port is situated on the Hunter River with the entrance protected by two breakwalls, the northern and southern, extending into the ocean at Nobbys Head.

The Channel and berths are PON's primary assets. They facilitate the import and export of cargo to the world, define our core business and are a key attraction for the City of Newcastle.

The design depth of the Channel is 15.2 metres, increasing towards the Channel entrance, which assists vessel passage for ocean swell conditions. The Channel depth is maintained through a continuous maintenance dredging program and has undergone continuous expansion since dredging first commenced in 1859.



PORT LAND



Carrington Precinct

Carrington is one of the oldest parts of the Port that is still in operation and includes 100 ha, of waterfront industrial land.

The Carrington Coal Terminal (CCT) was established in 1968 at the northern end of the precinct and incorporates the coal terminal and associated loading berths Dyke 4 and Dyke 5 Berths (D4 and D5).

Newcastle's two major grain terminals are in Carrington and have a combined throughput capability of 4Mtpa. Grain terminals are supported by road and rail receival facilities and state-of-the art ship loader at Dyke 2 Berth (D2) and West Basin 3 Berth (WB3).

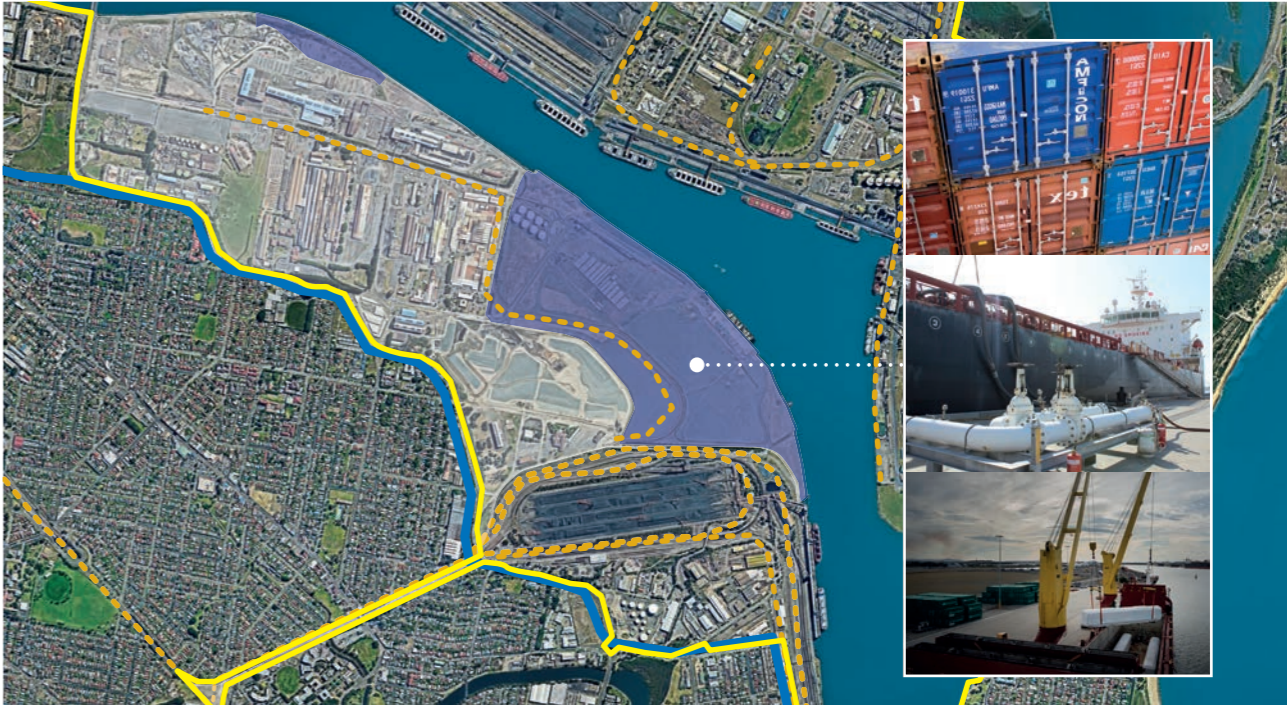
Mineral concentrates including zinc, lead and copper are railed to the Port, stockpiled within a closed storage facility and then loaded through D2. Fuel is imported at the Dyke 1 Berth (D1), which is then piped to a nearby Terminal facility. A range of general cargo and containers, as well as steel, aluminum and timber packs, are handled at the East Basin Distribution Centre (EBDC), using East Basin 1 and 2 Berths (EB1 and EB2).

Concentrated orange juice is imported to a refrigerated storage facility, where it is packaged and distributed by road. West Basin 4 Berth (WB4) handles rolling stock as well as a large range of other cargo.

The Channel Berth services passenger vessels such as cruise ships and is the location of the Newcastle Cruise Terminal. The Carrington Precinct also encompasses critical Port services including two Tug Bases and the Helicopter Base operated by the Port Authority of NSW.

Ship building and maintenance activities have operated at the southern end of Carrington for many years, with a new Maritime Precinct being developed in the south-west of the Precinct fronting Throsby Creek.

Carrington is well-serviced by road and rail infrastructure, including a designated B-double heavy vehicle truck route designed to reduce the potential for land use conflicts with the residential areas of Carrington. Rail access is provided via the Scholey Street Junction.



Mayfield Precinct

The Mayfield Precinct is located between the South Arm of the Hunter River and Industrial Drive, bounded by Tourle Street in the west and Selwyn Street in the east. It contains large areas of freehold land developed for heavy industry, as well as the Port's Mayfield Site.

The Mayfield Site represents the largest vacant Port land site on the eastern seaboard, with direct Channel frontage and potential for deep water berthing, providing a significant opportunity for growth within the Port. Current planning for the site includes the development of a Bulk Liquids Precinct, area dedicated to the storage and distribution for Project Cargo, known as the Mayfield Cargo Storage Facility, with the remaining allocated for the development of container handling facilities.

A dedicated Bulk Liquids Berth, Mayfield 7 Berth (M7), services the bulk liquids terminals and is designed to cater for long-range tanker vessels up to LR1 and LR2.

Stolthaven currently operates a Terminal and Distribution facility with approval for expansion of the tank farm and the import of a variety of fuels including diesel, petroleum products, ethanol and aviation fuel. Koppers Australia import and export high-temperature coal, tar and pitch products, which are piped to processing plant located two kilometres to the west. Further land is available for the development of other bulk liquids facilities.

Mayfield 4 Berth (M4) is a common user berth used as a general cargo berth. A small general cargo handling facility currently operates, providing storage for containers and general cargo.

The Mayfield Precinct is serviced by road and rail infrastructure through direct access to Industrial Drive and rail access via the Scholey Street Junction.

PORT LAND



Kooragang Precinct

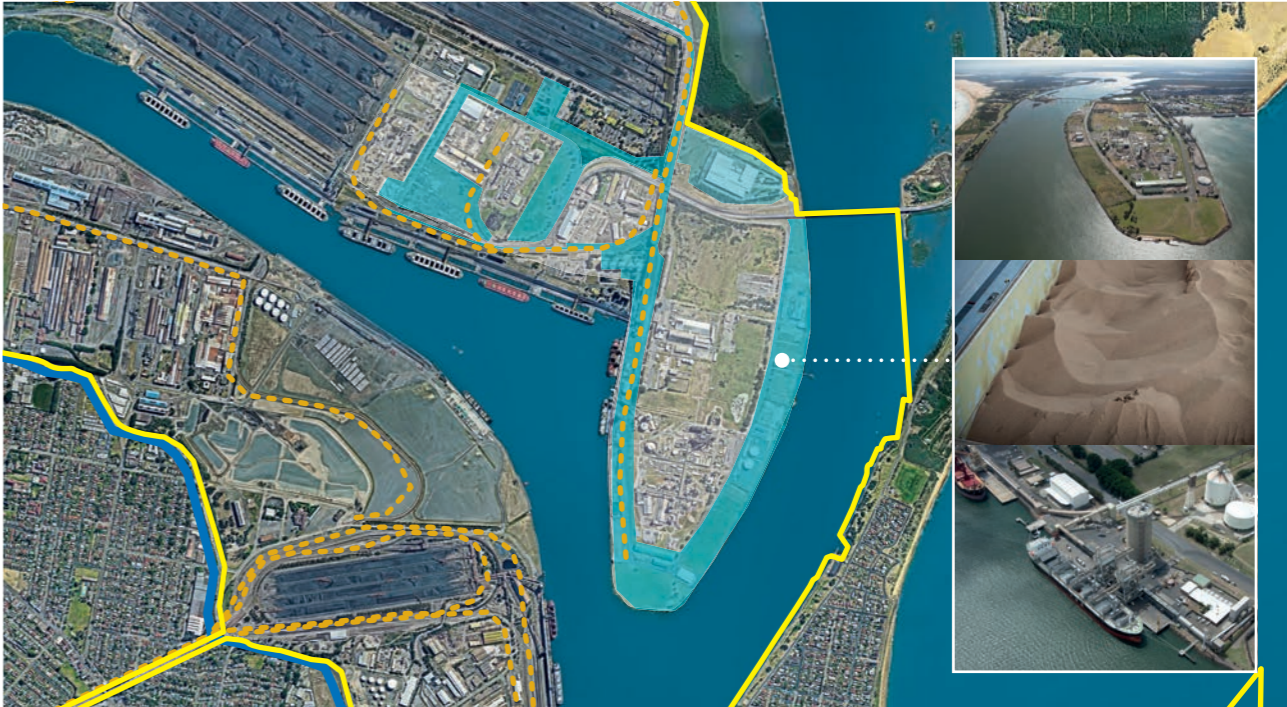
The Kooragang Precinct is located on Kooragang Island on the northern side of the Port. It is the primary coal precinct containing two coal terminals and associated coal loading berths (K4–K10), which are operated by two coal export companies, Port Waratah Coal Services (PWCS) and Newcastle Coal Infrastructure Group (NCIG).

Land in the north-west of the precinct and the north bank of the South Arm has been allocated to the development of a fourth coal export terminal for the Port.

The Kooragang Precinct is supported by rail access via the Kooragang spur line, with all coal transported to the terminals via rail. Road access to Kooragang Island is provided via the Tourle Street and Stockton Bridges.

The western half of the Kooragang Precinct was formerly used as a waste disposal area for heavy industry, known as the Kooragang Island Waste Emplacement Facility (KIWEF).

KIWEF is in the process of being remediated and cannot be developed until appropriate environmental closure is complete. Adjoining the Kooragang Precinct to the north and west is the Hunter Wetlands National Park and Ramsar Wetlands.



Walsh Point Precinct

The Walsh Point Precinct is located on the eastern side of the Port with frontage to both the South and North Arms of the Hunter River. PON's land is currently used for the import, export and storage of bulk products, as well as a variety of small-scale industrial uses such as metal recycling. Kooragang 2 and Kooragang 3 Berths (K2 and K3) have the highest utilisation of all common user berths within the Port. These berths also support customer and tenant distribution infrastructure, which have been co-located within the precinct to facilitate cargo handling.

Products imported and exported across K2 and K3 include dry bulk products such as cement, fertiliser, petroleum coke, magnetite, sands, anhydrous ammonia, scrap metal, alumina, and bulk liquids including fuel, acids and vegetable oil. The Precinct incorporates significant back-up land for portside storage, particularly on the eastern side of Walsh Point, which consists of several undeveloped lots.

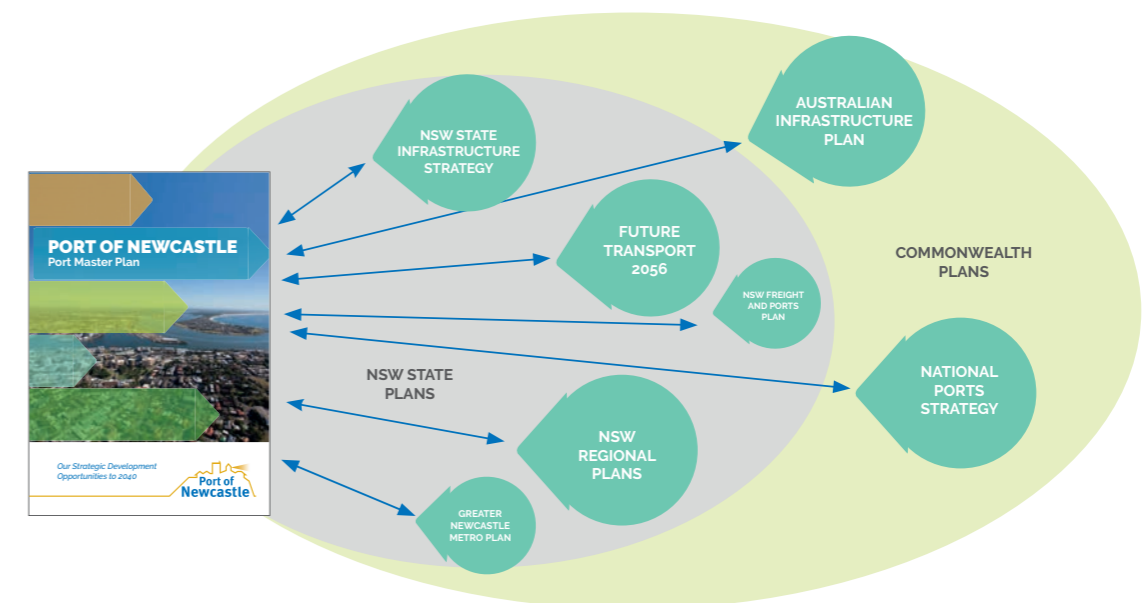
The centre of Walsh Point is occupied by heavy industry, including fertiliser manufacturer Incitec Pivot and mining industry chemical supplier Orica. These facilities are on freehold land and export products such as ammonia through the Port.

Rail access is via the Kooragang spur and a level crossing over Cormorant Road.

STRATEGIC CONTEXT

Pictured: The Basin, Carrington

There are a range of national and state strategies, policies and regulations that deliver, plan and manage infrastructure, transport and land use planning. The Port Master Plan has been prepared cognisant of these, but also reflective of the commercial environment in which the Port now operates.



Infrastructure planning, funding and delivery by Governments ensures that Australia continues to invest in infrastructure to support its economic growth and prosperity for all citizens. Infrastructure Australia independently assesses projects and initiatives for inclusion on the national Infrastructure Priority List. The Infrastructure Plan and Priority List is a prioritised list of nationally significant investments. It provides decision-makers with advice and guidance on specific infrastructure investments that will underpin Australia's continued prosperity.

Similarly, the NSW State Infrastructure Strategy facilitates and allocates resources for projects of state significance including Fixing Country Rail, Bridges for the Bush and Regional Road Freight Corridor improvements.

In the context of a growing Australia and the need for a freight system that boosts the nation's prosperity and meets community expectations for safety, security and environmental amenity, both the Commonwealth and New South Wales Governments are developing a comprehensive suite of transport, freight and port strategies. Transport for New South Wales (TfNSW) is the lead agency, preparing the Future Transport 2056 and NSW Freight and Ports Plan.

There has been a growing emphasis on regional planning across NSW to support long-term community needs. Given that the Port's catchment area extends west to Parkes and north to Moree, taking in Dubbo, Tamworth, Armidale, Narromine and Walgett, critical alignment with the Central West and Orana, New England North West and North Coast Regional Plans, as well as the Hunter Regional Plan, has been considered in the preparation of the Port Master Plan. These Regional Plans note the connectivity of the regions to the Port of Newcastle as the global gateway, and the need to leverage these connections.

The Hunter Regional Plan and the Greater Newcastle Metropolitan Plan identify the Port as a global gateway providing international freight connections and a catalyst for the growth and diversification of trade and contribution to the economy.

The Port Master Plan provides for the commencement of two-way dialogue with Government and will be an important communication tool when working with agencies tasked with delivery of long-term plans and infrastructure. It will help inform policy frameworks and establish infrastructure priorities for the benefit of New South Wales and Australia, as well as ensuring that the needs of PON, as the commercial operator of the Port, are met.

OUR STAKEHOLDERS AND ENVIRONMENT

Pictured: Collaborative tree planting day 2017

Our stakeholders include our customers, our community, our partners and our people working together within our unique Port environment.

OUR CUSTOMERS

Central to the success of our business is the success of our customers. Our customers include not only those who have a direct dealing with PON, but also the buyers and producers who interact with the entire supply chain. PON works closely with local councils, business chambers and regional development advisors that represent farmers, manufacturers and producers.

Our focus is on knowing and understanding our customers and the markets in which they operate. Strategic alignment between our vision and long-term plans, and those of our customers, will strengthen relations and ensure we are co-creating efficiencies. Ongoing customer engagement will help to grow the Port, facilitate trade and transform the economy.

Planning for a 20-year vision is a challenging exercise, especially given rapid technological change and industry innovation. PON is intentional about speaking with our customers, stakeholders and partners. Our customers have said that some of their greatest concerns are the potential impact of urban encroachment and the redevelopment of land that adjoins the Port in a way that may hinder their current or future operations.

Another area highlighted by customers was ensuring that the delivery of Port services and Port infrastructure matches the anticipated growth in trade. The utilisation and optimisation of the Port's Channel, land and transport corridors, and the corresponding increase in the number of vessels, trucks and trains that service the Port, is part of PON's ongoing dialogue with service providers.

Other customers identified the Port's rail connectivity as a future opportunity to reconfigure the current modal split for the transport of cargo, providing the impetus to investigate the greater use of rail for cargoes such as fuel.

As our trade base diversifies, we will foster new relationships with a broader range of customers, particularly those who import or export containerised freight. These include the advanced manufacturing, food and agribusiness and alternative energy industries.

Conversations with existing and future customers will shape how PON plans and develops the Port over the next twenty-year horizon, with an emphasis on being responsive, agile and customer-focused. These conversations will also inform our future advocacy and engagement with Governments and infrastructure providers.

OUR PORT COMMUNITY

The Port is an iconic part of the City of Newcastle's identity. PON recognises the importance of the Port to the Newcastle community and strives to develop and maintain strong relationships with all our stakeholders.

It is also acknowledged that there are a range of expectations and views within the community regarding the Port and its activities. Key to PON's commitment is engagement and active communication. The PON Community Liaison Group comprises representatives of the community, business, industry and Government. The Community Liaison Group is an opportunity for the community to engage with the Port, learn about its operations and provide feedback.

PON also partners with the community and industry to assist local community groups that invest in our region's future and make a measurable difference to the lives of its people. Since the Port Lease commenced in May 2014, PON has awarded more than \$500,000 to community projects spanning education, the environment, youth leadership and development, and community health and well-being.

PON also contributes at least \$1 million annually to the Newcastle Port Community Contribution (NPCC) Fund. The NPCC Fund supports suitable projects that enhance or maintain landside infrastructure and community amenity around the Port.

Port of Newcastle INVESTS

more than

\$1.2 million

per annum in

COMMUNITY SPONSORSHIPS & GRANTS

in support of educational, environmental, welfare, and arts and cultural projects.





OUR PARTNERS

PON works with a number of Government agencies, regulators and enterprises that manage various aspects of the freight supply chain and delivery of Port services, including the management of shipping, transport and land.

Shipping

The Port Authority of New South Wales is a state-owned corporation that manages the navigation and marine safety needs of commercial shipping. The Harbour Master is responsible for the safe navigation of the harbour. The Port of Newcastle is a compulsory pilotage port with a helicopter transfer service used to embark and disembark pilots.

The Vessel Traffic Information Centre (VTIC), operated by the Port Authority of New South Wales, provides a single point of contact for emergency reporting within the Port limits and ensures compliance with procedures and regulations. Other functions include dangerous goods regulation in the Port areas, and oil and pollution incident response management.

The Port is supported by towage and linesman services, including eight tugs provided by a private tug operator. The NSW Roads and Maritime Services (RMS) is the owner of the maritime areas of Newcastle Harbour and provides access rights for PON to use, maintain and develop maritime facilities and the shipping channel.

Transport

The Commonwealth-owned Australian Rail Track Corporation (ARTC) manages, maintains and invests in the two networks that link the Port of Newcastle: the Hunter Valley and Interstate Rail Networks. ARTC is an integral partner in the success of the Port, providing connectivity and capacity to service the rail freight task.

Transport for NSW (TfNSW) operates the Sydney Metropolitan Rail Network, including the Main North Line between Newcastle and Sydney. The focus of this network is to support growth in the passenger task, balanced with the need to move greater volumes of freight by rail within the Greater Sydney metropolitan area.

The above rail operators are also important stakeholders, as they are the purchasers of rail paths from network operators. They influence the optimisation of rail by determining the length of trains, the number of locomotives used and the introduction of new fleet with technological advancements.

RMS, the National Heavy Vehicle Regulator (NHVR) and road transport and logistics companies are important stakeholders in the delivery of road infrastructure, transport, and the safe and efficient management of traffic and congestion.

Land

Commonwealth biosecurity and border control services operate within the Port to ensure that Australia's biophysical resources and security objectives are met and protected.

Environmental regulators are responsible for regulating a wide range of activities at the Port and monitoring compliance with environmental legislation. The New



South Wales Environment Protection Authority (EPA) manages issues such as air emissions, water quality, noise, contaminated sites, transportation of dangerous goods outside of the Port area, and waste.

The Commonwealth Department for the Environment manages matters of national significance, including nationally significant threatened species and the disposal of dredged material from the Channel.

The NSW Department of Planning and Environment (DPE) is responsible for regional planning and the assessment of Port and state significant development. It is important that adequate resources and a high standard of expertise are given to the task of supporting planning for the Port.

The Port straddles the boundary between the local Government areas of Newcastle City Council and Port Stephens. In developing their local planning strategies and in assessing development proposals, Councils can assist the Port through awareness of urban encroachment issues and by preventing poor development outcomes.

The majority of PON's land holdings are leased to a range of third-party operators who own and manage their own facilities, including the coal terminals, bulk fuel terminals, Maritime Precinct and bulk storage facilities. These operators are responsible for their own logistics, construction and management of their facilities.

Port service providers are companies who access the Port for commercial purposes but do not lease land. These include stevedores, transport companies, shipping agents, provedores and marine services contractors.

OUR PEOPLE

We are a local team of diverse professionals led by an experienced executive team.

Our team tells us they work with great people who are knowledgeable and professional, and have a strong belief in the organisation's values and purpose. The scale and diversity of the Port's trade means our people enjoy stimulating and challenging work in an environment that drives innovation. We are committed to performance and improvement as demonstrated through our actions and behaviours, with safety as a core value.

Through the delivery and implementation of the Port Master Plan and the expertise of our people, PON will continue to collaborate with stakeholders to deliver the benefits of trade growth, both to Newcastle and to the surrounding communities.



Pictured: Hydraulic Engine House at Carrington Source: State Library of Victoria

OUR ENVIRONMENT

The Port of Newcastle is surrounded by important ecological and cultural heritage sites.

Bounding the Port to the north is the Hunter Wetlands National Park. The park is the largest single-estuary wetland reserve in New South Wales and contains the internationally significant Ramsar Wetlands. This site provides feeding and roosting sites for shorebirds and transient migrant birds, as well as habitat for nationally threatened species, such as the green and golden bell frog.

The Port has a multi-faceted and extraordinarily rich history. Within the Port, there are a number of heritage items that have been recognised as being of significance to both the local community and the State of New South Wales. These include buildings such as Carrington Hydraulic Engine House, shipwrecks, marine structures and relics. PON actively manages these assets to support conservation outcomes within an operational context.

PON recognises its responsibility to manage the Port in a way that minimises its impacts on the local environment and is committed to adopting sustainable practices. PON works hard to limit the impact of Port operations on surrounding areas and has identified four key themes guiding its approach:



OUR SYSTEMS
AND SUPPORT

Our systems and support enable compliance, commerciality and efficiency within a culture of mutual respect.



COMMITTED
STEWARDS

We are proud to be the custodian for the NSW Government and the people of NSW.



MANAGING OUR
ENVIRONMENTAL
FOOTPRINT

We are committed to managing our environmental impacts and developing the Port in a sustainable manner.



BEYOND OUR
BOUNDARIES

We are supporters and contributors to the management of environmental initiatives beyond the Port.



PORT CAPACITY

PROMOTE THE CAPACITY OF THE PORT AND
SUPPLY CHAIN TO SUPPORT ECONOMY



PORT CAPACITY

The connectivity and capacity of the Port and supporting supply chain infrastructure means that the Port of Newcastle is well-placed to support Australia's growing freight task and promote the regional and national economy.

A port is not a terminus, but part of a continuous linear supply chain where connected transport networks facilitate the efficient movement of goods.

In addition to articulating transport linkages, PON has sought to:

- Quantify the capacity of the shipping channel in terms of the spectrum of vessel types and the number of ship movements that can be accommodated.
- Understand and identify facilitating infrastructure for storage and product handling, and the supply of vacant developable land to accommodate future Port growth.

The Australian Infrastructure Audit found that without action, Australia's productivity and quality of life will be tested, with population and economic growth set to cause increasing congestion and bottlenecks. The Newcastle Container Terminal as a global gateway for the import and export of containerised freight will help meet the future logistic and freight task for NSW. The connectivity and capacity of the Port can provide a solution to potential congestion, as part of a broader integrated system of ports and transport networks.

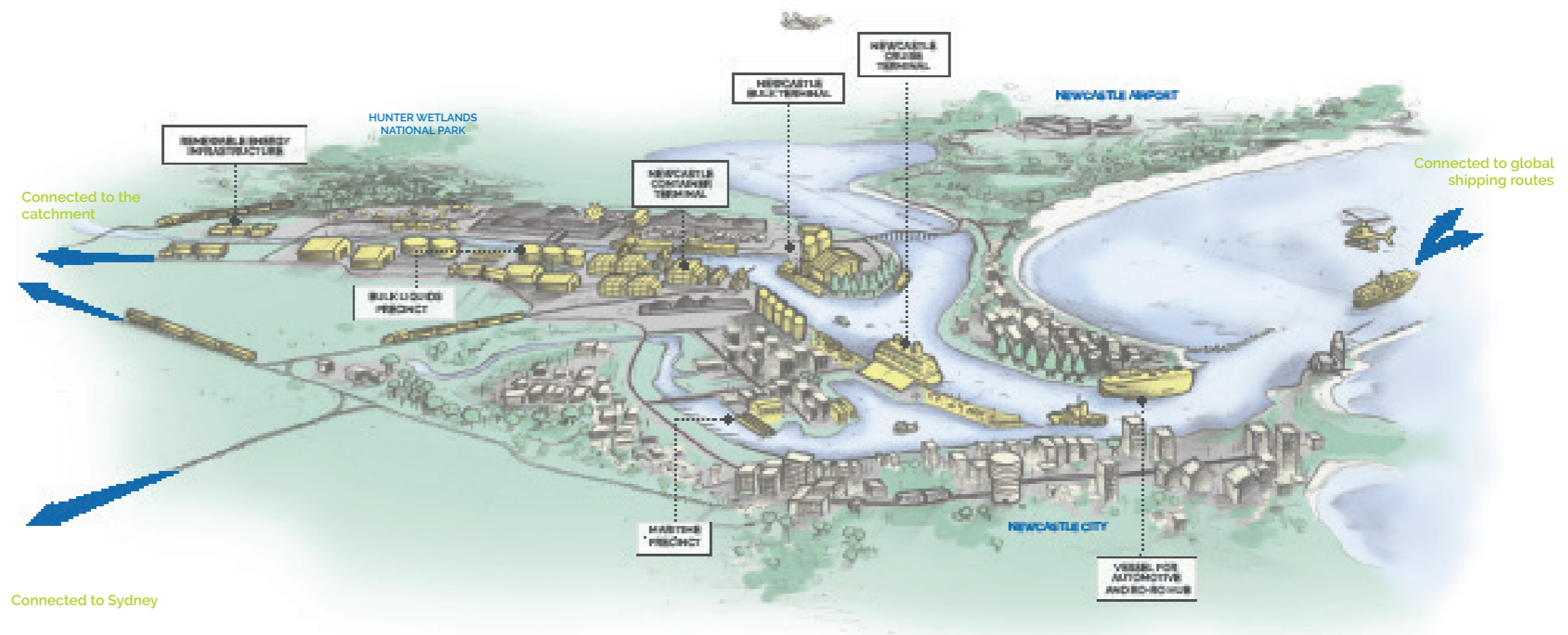
By 2056, the New South Wales government estimates that the state's population will grow to more than 11 million people, with freight volumes expected to double in the Greater Sydney area and grow by a quarter in regional New South Wales.⁹ The physical corridors of road and rail infrastructure, and the transport operators that use them, serve as the Port's arteries supplying outbound freight, and in turn carry inbound freight to distribution centres for dissemination to businesses and consumers.

The connectivity and capacity of the transport assets that support the Port of Newcastle and its road and rail supply chains offer considerable value to New South Wales.

⁹ Future Transport 2056, Transport for NSW 2018.

"The more efficient the transport network, the better our economy performs, allowing new businesses to reach new markets, attracting new investment and catalysing new job and training opportunities for our people."

Future Transport 2056



The Port of Newcastle is a nationally significant global gateway.



PORT CAPACITY

OUR CHANNEL AND BERTHS

The Channel is 12 kilometres in length over two sections.

The main Channel is nine kilometres from the Port entrance to the most western berth (K10) and has a depth of 15.2 metres. A secondary section of the Channel is three kilometres in length, providing access to the Basin berths. It has a design depth of 12.8 metres. Supporting the Channel is a network of 20 berths, with nine berths used exclusively for coal and 11 provided as common user berths for general and bulk cargoes.

The Port operates 24 hours a day, seven days a week and 365 days of the year. The navigation of vessels from the Channel entrance to a designated berth is undertaken by pilots from the Port Authority of New South Wales. Tug services are available in the Port for ship assist and vessel berthing. Lines services are also available for mooring activities.

Currently, the Channel can facilitate a range of vessel sizes and types, with 4,700 vessel movements undertaken in 2017. The capacity of the Channel is determined by the number and type of vessels that can be safely navigated between the Port entrance and a designated berth.

The safe handling criteria for vessel movements is set out in the Ship Handling Safety Guidelines. This guideline is published by the Port Authority of New South Wales, with the safety of vessel movements within the Port regulated by the Harbour Master.

The configuration of the Channel, combined with local environmental factors, the receiving berth, the destination port and navigational constraints, can limit the size of vessels entering and departing the Port. The types of constraints to be considered include:

- Under-keel clearance (distance between the lowest point of the ship's hull and the Channel bottom);
- Channel clearance (distance from ship's hull to Channel boundary);
- Channel geometry;
- Ship's manoeuvrability when changes in direction are required;
- Navigation aids (pilot visibility of beacons, leads or buoys from bridge of ship);
- Ship interaction (speed limitations for vessels passing berthed ships);
- Berth box (capability of berth box to accommodate vessel through environmental conditions);
- Environmental factors; and
- The compatibility of the dimensions with the Port destination.

TYPE OF VESSEL	CARGO	LOA LIMIT (M)	BEAM LIMIT (M)	
Bulk Handymax Panamax Cape Class	Bulk and General (coal, wheat, fertiliser)	300	50	
Tanker Medium-Range and Long-Range: LR1 and LR2	Bulk liquids (fuel, vegetable oil)	245	43	
Container	3,500 TEU	250	32	
Passenger	4,000 passengers	320	50	
Ro-Ro	4,000 vehicles plus machinery	265	35	

Future Channel Capacity

PON has developed a Port Traffic Simulation Model to assess development scenarios that increase or alter the number and size of vessels using the Channel. Outputs from the model that are used to assess the impact of changes to the Channel and terminal efficiency include vessel time at berth, Port time, terminal throughput, Port entry vessel queues and berth utilisation.

Other measures to be assessed with development proposals are ship interaction (forces and motions resulting from ships passing berthed vessels), Channel availability (tidal restrictions) for deep-drafted vessels, and operational resources, such as marine pilots, tugs and linespeople. The navigation aspects for development proposals are assessed by the Harbour Master.

An assessment undertaken to evaluate the capacity of the Port has demonstrated that the Channel can accommodate the safe movement of over 10,000 vessels per annum. The vessel movements in 2017 indicate that the Channel is currently operating at less than 50% of its capacity.

The nature of global shipping is changing, with rapid growth in the size of vessels. Future trade opportunities are also expected to result in an increased demand for larger loaded inbound vessels. In anticipation of

accommodating future vessels, PON has undertaken investigations to evaluate the infrastructure improvements required for future container vessels.

The investigations include:

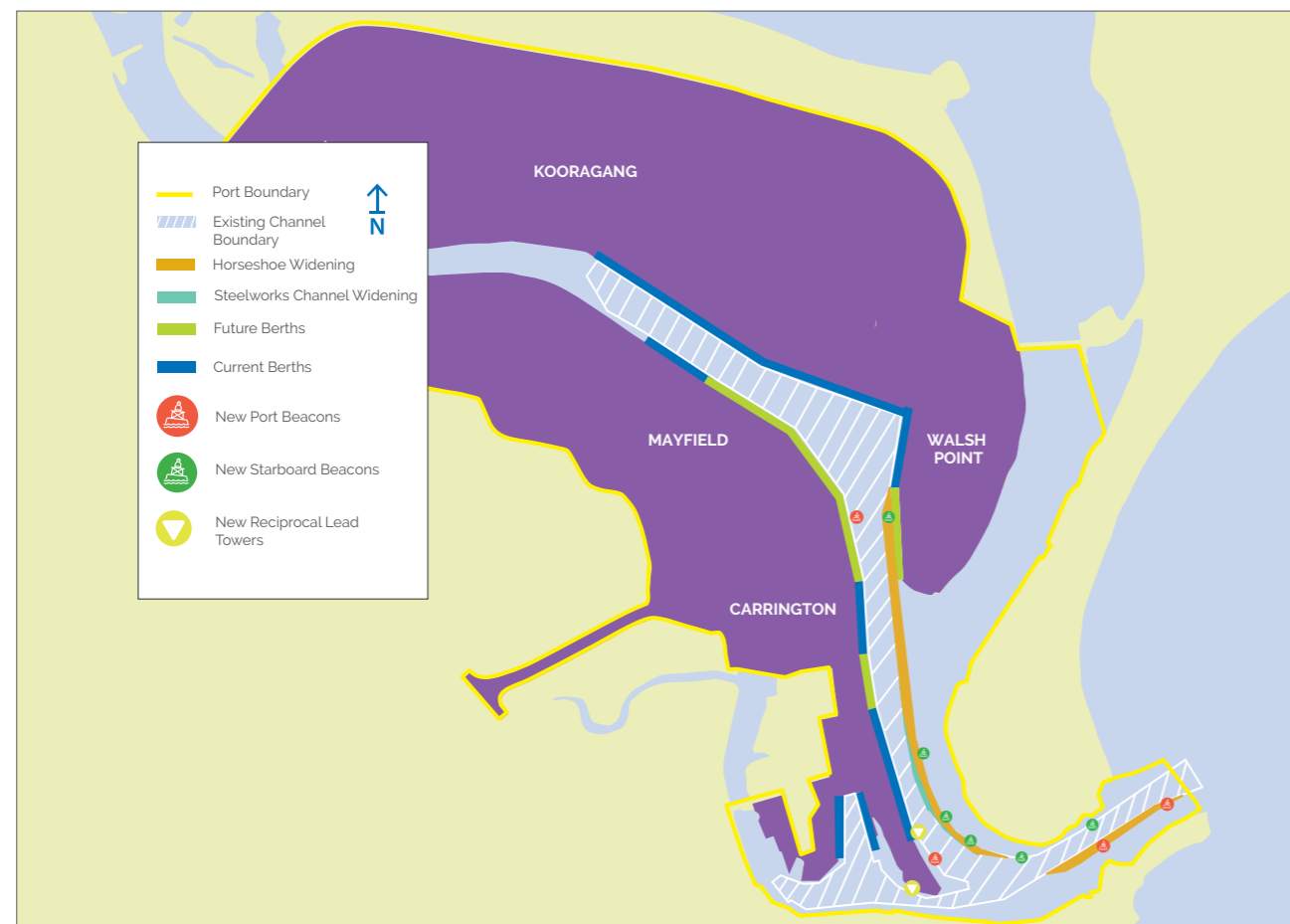
- Port Traffic Simulation Modelling to assess the impact of increased vessel traffic from proposed development scenarios against existing conditions;
- Simulations to identify the navigation and manoeuvrability requirements for vessels entering the Port, transiting the Channel and passing berthed vessels;
- Ship Interaction Studies to assess the safe passing speeds for vessels passing berthed ships; and
- Physical Channel constraint analysis, to evaluate the Channel geometry and navigation infrastructure required to address the issues raised from simulations and studies.

A range of future vessel types that have potential to service the Port is shown below. This is an aspirational range to fully utilise the capacity of the Port. The simulations and studies to support the future vessels will include the investigations mentioned above. Supplementary investigations may be required by the Harbour Master.

TYPE OF VESSEL	CARGO	LOA LIMIT (M)	BEAM LIMIT (M)	
Bulk	Bulk and General (coal, wheat, fertiliser)	330	55	
Container	18,000 TEU	400	60	
Tanker	Liquefied Natural Gas	345	54	



PORT CAPACITY



Future Channel Improvements

Beyond the current available physical capacity of the Channel and berths, there is potential to undertake capital improvements to provide for a greater diversity of vessel types, sizes and level of service. These include Channel improvements, navigation aid upgrades and construction of additional berths.

Channel improvements required to improve vessel diversity include capital dredging and widening the Steelworks Channel, Horseshoe area and Channel Entrance. These improvements would allow for longer and wider vessels to safely enter and navigate the Channel.

As the number and size of vessels increases, terminal berthing, Channel widening, navigation aid upgrades and navigation resources (i.e. marine pilots, tugs, lines service) will need to be considered as part of any

development scenario analysis. For example, inbound tankers and container vessels will require escort tugs to increase the operational conditions for entry to the Channel.

PON will continue to work with the Harbour Master to review the infrastructure required for the future vessel sizes. It is expected that marine pilot services and navigational resources such as tugs and lines services will keep pace with the rate of growth in vessel traffic numbers and the changing nature of the vessels as the Port diversifies.



Pictured: Impression of 18,000 TEU Container vessel entering Newcastle Harbour

Future Berths

In addition to the existing berths, PON holds a planning approval for the capital dredging of additional berth pockets within the South Arm of the Hunter River. Approved berth pockets proposed alongside the Mayfield Site would support the potential development of over 1500 metres of continuous quayline for the development of container terminals.

Four berths are proposed on the South Arm to increase berthing capacity at Walsh Point. There is adjoining land to support mooring and unloading infrastructure in this location.

One berth is proposed in Carrington which could be developed as a standby berth to assist with vessel movements, if required.

Into the future, there will be growing landside implications that challenge ports in discharging cargo, especially as vessels increase in size and greater efficiencies are demanded. Other ports around Australia are required to create additional land through land reclamation. These processes have significant economic costs and impacts on the environment. In contrast, PON has vacant portside land accessible by deepwater channel. This means greater efficiencies in land use, lower costs for consumers and lower environmental impacts can be achieved.



PORT CAPACITY

OUR LAND

The Port's land footprint includes the berths, the Port's road network and rail sidings, land for Port facilities such as terminals and storage facilities, as well as general industrial development.

PON's transport networks include the Port access roads and various rail sidings operated by PON and private rail infrastructure managers. The PON Kooragang road network is accessible by all businesses on the island, including freehold land owners.

The majority of Port land is used for Port facilities. These include coal terminals; fuel storage and distribution facilities; silos for the storage of wheat, grains, cement and alumina; storage facilities and sheds for loose bulk cargo such as mineral concentrates, fertiliser and magnetite; and open-air storage facilities for project and general cargo. Some of this land is leased for between 10 and 30 years, with the facilities owned and managed by the operator. PON also has land available for both short-term and long-term licences.

Additionally, there is land allocated to general industrial uses and the development of ancillary support services such as service stations.

There is over 100 ha. of vacant portside land that is zoned, serviced and 'shovel ready', offering substantial opportunities to support the diversification of trade.

There is no requirement for land reclamation within the Port to support future development or provide additional land for Port facilities or infrastructure.

Into the future, there will be growing landside implications that challenge ports in discharging cargo, especially as vessels increase in size and greater efficiencies are demanded. Other ports around Australia are required to create additional land through land reclamation. These processes have significant

economic costs and impacts on the environment. In contrast, PON has vacant portside land accessible by deepwater channel. This means greater efficiencies in land use, lower costs for consumers and lower environmental impacts can be achieved.

Planning in the Port

The Port of Newcastle is recognised as a State Significant Precinct due to its importance to the New South Wales economy. This significance is demonstrated through a separate land use planning and approvals regime that applies to Port land and supporting transport connections. The State Environmental Planning Policy (Three Ports) 2013 (the 'Ports SEPP') ensures consistent planning controls protects the Port from incompatible land use, and stipulates zoning to accommodate a broad range of Port uses that support diversification.

There are a range of approval pathways set out in the Ports SEPP, with Port infrastructure able to access a streamlined approval process, to ensure the Port can operate efficiently. Minor development for Port infrastructure is able to be undertaken or constructed without planning approval.

Port infrastructure that complies with predetermined development standards can be assessed by private certifiers, allowing development to proceed in a timely manner. This includes large-scale port-related buildings, wharves and berthing infrastructure. PON has dedicated in-house resources to facilitate development and seek the best outcome for all stakeholders.

PON is committed to setting a world-class benchmark and making a significant investment in the handling of cargo.

Ongoing renewal and replacement of Port infrastructure, as well as the repurposing of land from former industrial uses to land ready for redevelopment, will meet the needs of our customers now and into the future.

Newcastle Bulk Terminal

The Walsh Point Precinct facilitates the import, export and storage of bulk cargo through the Newcastle Bulk Terminal (K2 and K3 Berths). These berths are some of the busiest in the Port, with current demand from customers putting pressure on future growth. The current unloading equipment has also reached the end of its working life.

In response, PON are developing a new integrated bulk cargo facility that combines highly efficient cargo handling equipment with modern safety and environmental standards. The vision for the Newcastle Bulk Terminal is to operate the most efficient bulk terminal on the Australian east coast. The project involves the replacement of 50-year-old ship unloading equipment at K2 and the centralisation of management and services. Along with safety and environmental improvements, the project will deliver greater efficiency for customers, allowing them to grow their cargo volumes.



Pictured: Kooragang 3 and 2 Berths at Newcastle Bulk Terminal

18 Ha.
Operational
Land



532 Ha.
Port
Facilities



48 Ha.
Transport





PORT CAPACITY



Infrastructure Servicing

PON is focused on continuous environmental improvements and timely renewal of infrastructure to ensure best practice in safety, whilst driving efficiency and growth. PON also has an extensive program to service vacant land to meet the needs of future development.

Carrington is currently serviced with adequate water and electrical supply for current operations; however, as it is the oldest part of the Port, PON is undertaking forward planning for the renewal of sewer and water infrastructure in the Precinct. Investment by public utility providers, such as the new Ausgrid zone substation in Tighes Hill, will replace the 50-year-old Carrington Zone substation, and provide additional network capacity. In the future, the development of new facilities in Carrington may require the augmentation of the Ausgrid 11kV transmission infrastructure and PON's private electrical network, including ageing cables and local substations.

Since the closure of the former BHP Steelworks in 1999, the Mayfield Site has been progressively remediated and readied for development of new Port facilities, including a container terminal. The Mayfield Utilities Infrastructure Plan provides a framework for the review of anticipated utility demand requirements of the site and identifies strategies to provide utilities services. The PON Mayfield Switching Station will provide 14.75MVA

and will be constructed by 2020 to augment the current power supply. This will be sufficient to supply future development opportunities, including a container terminal. PON has also implemented a reticulation strategy for the Mayfield Site to provide individual water connections for Port facility operators.

PON has also made significant investment in the Walsh Point Precinct to renew utilities infrastructure. The K2 electrical substation, constructed in 1967 to service the wharf infrastructure and unloaders, has reached the end of its serviceable life. The replacement of this existing electrical infrastructure will service the new ship unloader as part of the Newcastle Bulk Terminal.

Vacant land along Greenleaf Road is serviced with utilities, water and a 33kV electricity network. This is expected to meet future land use requirements.

PON has developed a sewer strategy for Kooragang Island including Walsh Point, and is working with Hunter Water to progress the strategy. PON will also continue to investigate renewable energy sources such as solar to offset energy supply requirements for Port operations.

There are no current plans for the development of any Port infrastructure projects, as defined in the Ports and Maritimes Administration Act 1995 Part 5, Division 6A, for which PON will impose an infrastructure charge.



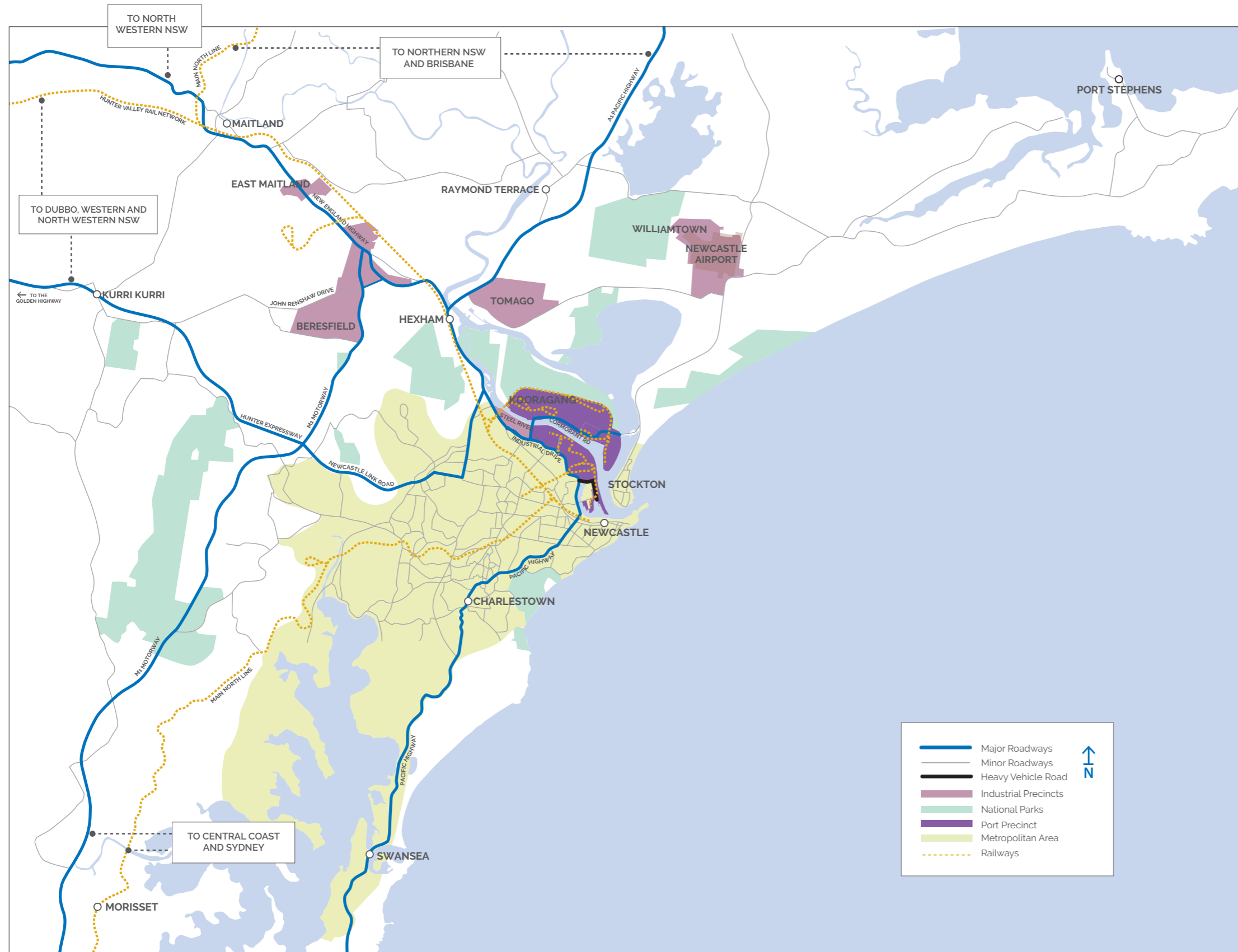
TRANSPORT CONNECTIVITY

UTILISE EXISTING ROAD AND RAIL TRANSPORT ASSETS TO IMPROVE FREIGHT EFFICIENCY





TRANSPORT CONNECTIVITY



The Port of Newcastle has excellent access and connectivity to the national highway and rail networks linking to capital cities and hinterland.

Ensuring that existing road and rail transport infrastructure are being utilised and optimised to their full capacity is critical to supporting and improving the efficiency of the New South Wales freight task. The effectiveness of the transport network can be measured by its level of direct connectivity; that is, the distance between the Port and its inland origin or destination, and the capacity, being the volume of freight, it can carry.

OUR ROAD NETWORK

The NSW Future Transport Strategy 2056 notes that the New South Wales road network is the state's largest asset and carries the majority of the state's passengers and freight.

Located on the periphery of the Newcastle metropolitan area, the Port has direct access to the national heavy vehicle road network and dangerous goods route via Industrial Drive, providing interstate connectivity and links to major regions across New South Wales. This access limits the need to interact with the Newcastle metropolitan road network and removes road-based freight from local roads.

The broader network of national highways is accessible from the M1 Pacific Motorway (M1). The Hunter Expressway between the M1 and Golden Highway provides an east-west 40-kilometre dual carriageway freeway connection to link the Central West and Orana region including Dubbo and Parkes, and the Port. The New England Highway provides access to the New England North West region including Tamworth, Narrabri and Moree. The A1 Pacific Highway to the north provides access to the North Coast and is the major highway link to Brisbane.

To the south the M1 provides road connectivity between Sydney, the Central Coast and Newcastle and existing freight distribution centre hubs that service the north and north-west Sydney and Central Coast markets. The completion of NorthConnex will further improve the connection of the Port to southern and western Sydney, by providing a comparatively signal-free motorway connection from the Port gate to the M7.



TRANSPORT CONNECTIVITY

Road Capacity

Within the Port boundary, PON operates 13 kilometres of private road network maintained to Australian Standards and approved as a 25m B-double route. This network enables customers to unload freight direct from ship to truck for transport to storage facilities located within the Port, without having to access the RMS road network.

The Carrington and Mayfield Precincts directly access Industrial Drive, with the Kooragang and Walsh Point Precincts accessing Industrial Drive via Cormorant Road and Tourle Street. Industrial Drive is a major four-lane classified road and is the principal east-west route providing connection between the Port and the M1 at Hexham, with Cabbage Tree Road/Tomago Road/Nelson Bay Road providing a secondary route for access to the Port and Newcastle

The Port of Newcastle supports the New South Wales Government's goal of creating a more efficient transport network, recognising that this improves the global competitiveness of Australian producers, including farmers. Incorporating the Port of Newcastle and its road supply chain in the planning for New South Wales future transport strategy will contribute to a more efficient State-wide supply chain.

Continuous investment in new infrastructure is not the only solution to congestion in capital cities. The growth in container movements in NSW will put increasing pressure on Sydney, which is already facing continuous congestion issues. This raises the potential for ports outside of Sydney to play a role in servicing their local market and reducing pressure on Port Botany and Sydney more broadly.¹⁰ The extensive capacity of the road network servicing the Port of Newcastle offers considerable value to New South Wales.

Within PON's Port road network there is ample capacity to both accommodate and manage future volumes of Port traffic.

PON's precincts have direct access to the arterial road network, which does not transverse the urban area. Road access to and from the Port of Newcastle is suitable for high-productivity heavy vehicles with less need for 'staging' of containers.

The arterial road network connecting the Port and the National Highway is the most critical link in the road system. The capacity of the key intersections and link

roads that service the Port are currently operating well within the acceptable levels of service. The completed Tourle Street and Cormorant Road duplication will meet short-term demand from forecast traffic growth requirements to 2040.

Newcastle's proximity to Dubbo, Narrabri and Tamworth means that trucks can run economical return legs in one shift in compliance with Fatigue and Mass Management legislation. For example, a B-Double Dubbo-to-Newcastle return is a total of 770km with a drive time of 10.5 hours. In comparison, the Dubbo-to-Sydney return B-Double journey is 750km with a drive time of 12.5 hours. This makes no additional allowance for traffic congestion in Sydney, which would further push out cycle times.

HEAVY VEHICLE ROAD REFORM

There is a need to not only improve the efficient provision and use of road services, but also to reform road investment and charging arrangements. The heavy vehicle reforms recognise the challenges of ageing road infrastructure coupled with the growing freight task. To meet demand and remain competitive, Australian Governments are currently investigating ways to turn freight transport into an economic market-driven service as a way to increase the productivity, efficiency, capability and safety of freight transport.

This would see a market established that links the needs of heavy vehicle users with the level of service they receive, the charges they pay, and the investment of those charges back into road services. Heavy vehicle road reform will provide a basis for comparing road and rail freight pricing.

The proposed reforms could further assist in attracting additional containerised cargo to the Port of Newcastle, especially where the distance to and from the container origin and destination to the Port of Newcastle is less than the distance to competing ports.

¹⁰ NSW Container and Port Policy, Deloitte Access Economics, 2018

MAJOR NSW FREIGHT HUB	PORT OF NEWCASTLE (KM & HOURS)		PORT OF BRISBANE (KM & HOURS)		PORT BOTANY (KM & HOURS)	
Parkes	481	6.38			363	5.21
Dubbo	384	5.14			423	6.11
Bathurst	334	4.28			217	3.11
Blayney	372	5.02			255	3.44
Narrabri	411	6.04	608	7.39	546	7.25
Tamworth	280	4.05	600	8.17	415	5.26
Moree	524	7.22	519	6.33	659	8.44
Griffith	725	8.48			570	7.06
Acacia Ridge			38	0.32		
Toowoomba			155	2.02		

Table 1 B-Double Travel Time

Future Capacity

Looking forward to 2040, there will be substantial growth in vehicle traffic across the road network in and around the Port. It is important to note that much of this growth will be the result of residential development to the north of the Port, and the densification of existing urban areas to the south.

While currently there is ample capacity in the immediate supporting road network, applying a standard rate of growth over the life of the Port Master Plan, it is likely that the roads would be operating at or above capacity approaching 2040. This is particularly relevant for Industrial Drive as a key strategic corridor servicing the Carrington and Mayfield Precincts.

Key intersections onto Industrial Drive are forecast to operate within acceptable levels of service to 2024. However, the development of the Newcastle Container Terminal, together with the Freight and Logistics Precinct in Mayfield, will require the upgrade of these existing intersections. This anticipated growth in vehicle traffic and the need for corresponding intersection upgrades have been anticipated in the Mayfield Concept Plan. The preparation of a comprehensive Transport Infrastructure Strategy for the Mayfield Precinct will provide a proactive basis on which to utilise and leverage the existing road networks' connectivity and capacity.

PON will also look at broader opportunities to utilise existing intersections to create one-way entry and egress flows for the Mayfield Site, using Bull Street and Selwyn Street. Consultation with adjoining land owners to ensure cumulative assessment of potential traffic generation will also be strong aspect of the Mayfield Transport Infrastructure Strategy.



TRANSPORT CONNECTIVITY

Future Projects

Improvement programs and projects to key highways will provide efficiencies to the movement of bulk and containerised freight by road, and support access to the Port from existing and emerging customers in the Sydney Metropolitan Area, Central West and Northern New South Wales.

Golden Highway Corridor Strategy and Improvements

The Golden Highway operates as a critical freight route by enabling access for high-productivity vehicles across the Great Dividing Range from western New South Wales, mainly Dubbo but also Parkes, to the Port.¹¹ Improving the Golden Highway will allow journey times to the Port from the Central West region to be reduced and enhance the region's ability to increase cargo exports.

New England Highway Improvements

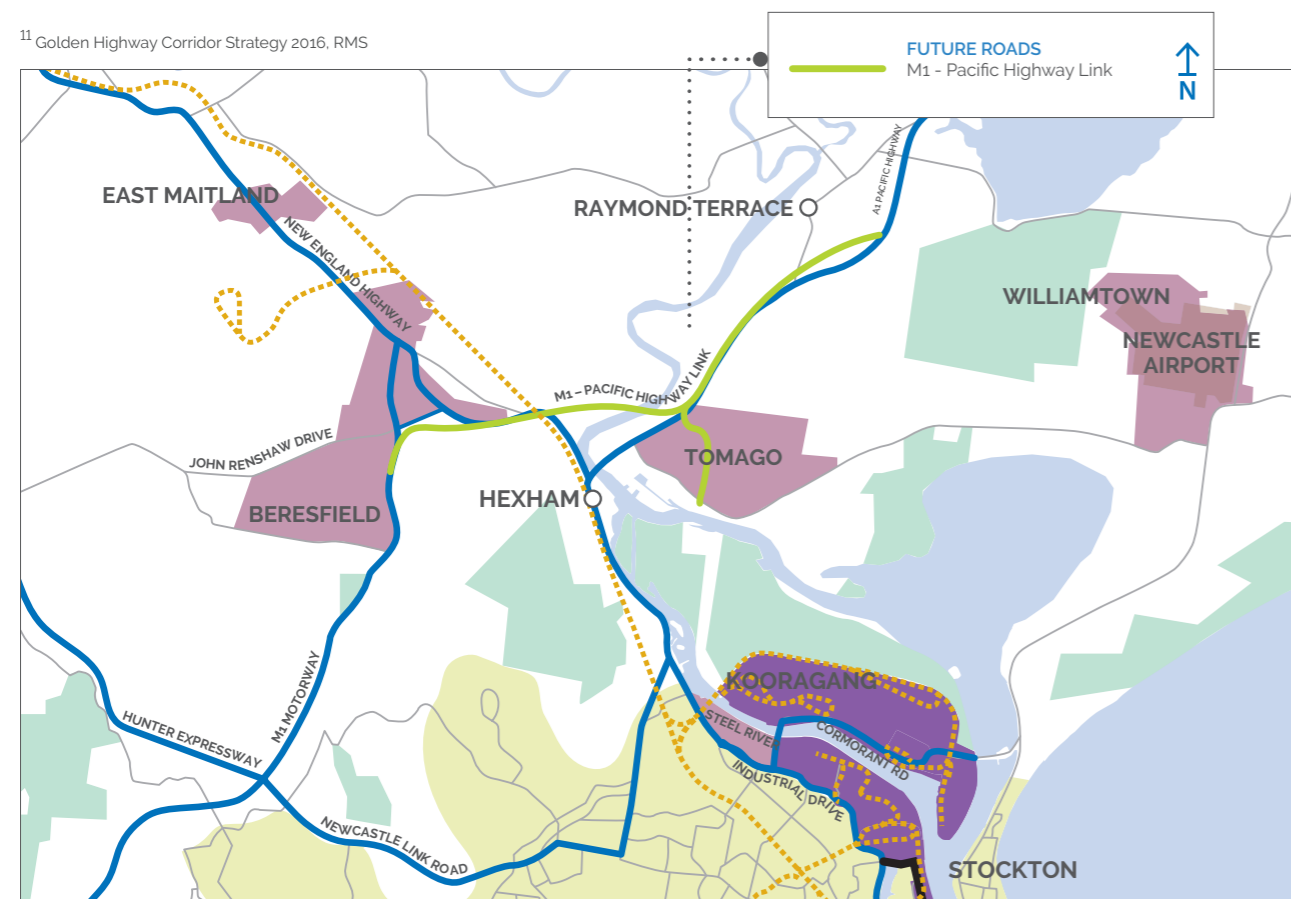
The integration of the New England and Golden Highways will improve freight movements and support high-capacity freight networks that contribute to productivity and competitiveness. Strengthening these connections will attract investment and business and support regional economic development.

M1 Pacific Motorway to Raymond Terrace Link

The M1 Pacific Motorway Extension to Raymond Terrace will connect the M1 directly to the A1 northbound, to alleviate congestion at the M1 intersection with John Renshaw Drive.

This is a key connecting point from the Port to both the Pacific Highway (north and southbound) and the New England Highway (east and westbound). By alleviating congestion travel time, the timeframes for freight vehicles travelling to or from the Port will also be reduced.

¹¹ Golden Highway Corridor Strategy 2016, RMS



OUR RAIL NETWORK

Rail is one of the most efficient and cost-effective forms of transport for freight, particularly over longer distances. Moving goods on rail, either as bulk cargo or in containers, generates less pollution, improves fuel efficiency and places less trucks on the roads, meaning fewer accidents.

The 2015 Australian Infrastructure Audit found that freight rail will need to play a growing role in the movement of goods between ports and inland freight terminals, and in the movement of containerised and general freight over longer distances.

The Port is serviced by the North South Rail Corridor connecting Brisbane, Sydney and Melbourne (called the Main North Line between Sydney and Newcastle) and

the Hunter Valley Rail Network connecting the Port, the Hunter Valley and Western New South Wales. The Hunter Valley Rail Network is at least, double-track to Muswellbrook where it branches north and west in single tracks with passing loops. The Western Branch line through Ulan connects to the country regional network via Merrygoen, to Dubbo. From there it connects to Parkes and can act as a link to the grain networks of southern and central New South Wales. The northern branch through Werris Creek connects to Tamworth and North Star in northern New South Wales.

This network will also connect to the Inland Rail, consolidating rail access to an extended area of New South Wales and potentially Southern Queensland and Northern Victoria.





TRANSPORT CONNECTIVITY



Pictured: Kooragang Spur Line and Hunter Wetlands National Park.

Within the Port, the Carrington and Mayfield Precincts are serviced by the Port Waratah and Bullock Island lines accessed via the Scholey Street Junction and Morandoo yards. West Basin 4 Berth in the Carrington Precinct is the only berth on Australia's eastern seaboard with direct rail access at the berth face and connection to the national rail network.

The Kooragang and Walsh Point Precincts are serviced by the Kooragang spur line, one of the busiest rail networks in the world, providing rail access to the individual rail loops for the two coal terminals. The grade separated entry to the NCIG terminal allows the capacity of trains through Kooragang Junction to reach an eight-minute headway (separation distance between trains), providing for additional capacity on this line.

Within the networks servicing the Port, there is sufficient capacity to accommodate the contracted coal volume as well as non-coal trade including bulk grain and containers. The ARTC 2017-2026 Hunter Valley Corridor Capacity Strategy is a rolling 10-year strategy to demonstrate that there is sufficient capacity to meet contracted volumes based on the principles of the ARTC Hunter Valley Access Undertaking. It also identifies those projects that would be required to accommodate prospective volumes that have not yet been the subject of a contractual commitment. The current strategy states that the contracted tonnage numbers can be met by the existing infrastructure. Maintenance activities and capital projects are focused on achieving increased efficiencies through signalling improvements and improved network management systems.

The take-up of capacity in the Hunter Valley network for non-coal trade, including bulk grain, mineral concentrates and steel, has had relatively low utilisation to date.

The Main North Line between Sydney and Newcastle is one of the busiest passenger services on the Sydney Trains network, accommodating local, intercity and interstate passenger services. There are significant challenges in mixing freight and passenger services, given their different modes of operation. Passenger trains can accelerate and brake quicker but stop more frequently, requiring freight trains to keep pace with a constantly changing slot.

There are four guaranteed train paths available per peak for freight. These are generally utilised by the 1500m super freighters running between Brisbane and Sydney. Other paths are utilised by containerised freight originating within Newcastle's catchment. For example, cotton from the New England region is railed directly to Sydney, bypassing Newcastle, the closest port, and taking up valuable train paths, which adds to the congested Sydney rail network.

Planning for the separation of freight from passenger services on key shared networks to optimise performance for both services must be a key focus of the Government's transport planning activities.

"Rail access to and within the Concept Plan site shall be configured and operated to facilitate increased rail mode share to and from the site."
Mayfield Concept Plan Approval 2012

Future Capacity

Like the opportunity for improved efficiencies on the road network, there is also opportunity to utilise and optimise the existing rail network.

Newcastle is the closest port to the diverse agriculture and resource-rich areas of North Western New South Wales, with Tamworth, Narrabri and Moree all connected to the Port via the Hunter Valley network. Growth in outbound containerised freight, such as grain and meat products from the New England region, will necessitate new intermodal terminals and supporting rail infrastructure.¹² The existing connectivity and capacity of the rail networks serving Newcastle provides the logical solution for the future freight task.

Further south, while the rail connection between Dubbo and Parkes and Newcastle is a marginally longer distance than the rail connection to Port Botany, it is an attractive alternative to the Blue Mountains route. The Dubbo-to-Newcastle section of the network via Ulan has a lower ruling grade than the current Blue Mountains route, which means fewer locomotives are required and more wagons could be hauled, providing savings to exporters in terms of transport costs. Whilst this is a shorter distance to Sydney, extended transit times through the metropolitan area and longer turnaround times at Port Botany mean that any time efficiencies gained are eroded.

LOCATION	PORT OF NEWCASTLE (KM)	PORT BOTANY (KM)	PORT BRISBANE (KM)
Tamworth	293	465	825
Narrabri	410	582	655
Narromine	514	504	935
Moree	506	678	558
Dubbo	478	468	970
Parkes	623	455	1042
Goondiwindi	640	812	425

New Rail Facilities

Within the Port itself there is land available to expand rail infrastructure with new rail sidings and receipt facilities to accommodate and support growth in rail freight within the Mayfield and Walsh Point Precincts.

The Mayfield Site presents a unique opportunity to design and build the most efficient rail terminal for the loading and unloading of container trains, and the management of train cycles. This is an aspiration of the approved Concept Plan for the site which is designed to support, at minimum, an 80:20 road rail modal split for containers.

The greatest efficiencies are gained by running the longest trains possible. The length of train is determined by the length of siding at the origin and destination, the maximum ruling grade and axle load limit of the network, and the length of passing loops where there is only single-track. The first phase of development of the Mayfield Site could accommodate 640 metre long sidings, providing for the trains of 1500m-long trains. This could potentially facilitate over 1 million containers per annum and support a 50:50 modal split between rail and road.

In addition to train length, one of the factors affecting capacity is the occupation time of trains at a terminal. The goal is to try and cycle trains out of the terminal as soon as they are finished working, and replace them with the next train. Timing the arrival of the next train is very hard operationally. The most effective method is to develop a series of holding roads, so that the next train has already arrived and is holding near the Terminal to access it as soon as it is clear to do so.

New holding roads within the Morandoo Yard and Scholey Street would allow trains to be stored for facilities in both Mayfield and Carrington. PON holds a concept approval for the reconfiguration of the Morandoo Yard to provide additional rail sidings to hold Port trains outside of the site.

¹² New England Regional Plan , Department of Planning and Environment 2017



TRANSPORT CONNECTIVITY



Rail connectivity within the Mayfield Precinct also provides the opportunity to investigate rail transport options for other cargoes, including bulk fuels, into the future.

Rail access to Walsh Point is via the Kooragang Island Spur. Given that the island now has an eight-minute headway there are paths available for other trades to access Walsh Point without disturbing coal exports. The Walsh Point Precinct contains several large parcels of land owned by PON and private landholders that are connected by rail, where a bulk rail terminal incorporating a rail loop and unloading/loading infrastructure could potentially be developed. Development of such facilities would support PON's investment in new bulk ship unloading infrastructure at K2.

Future Projects and Corridors

PON is supportive of projects that will improve network access and capacity for freight trains, especially between Newcastle and Sydney, and Newcastle and regional New South Wales as an alternate east-west connection to the Blue Mountains route.

Projects include:

Northern Sydney Freight Corridor (Stage 2)

The Northern Sydney Freight Corridor (NCFC) Program aims to improve freight train capacity and reliability between Strathfield and Broadmeadow (Newcastle Junction).

This project would significantly improve freight rail capacity on the Main North line, resulting in full separation of freight and passenger trains from the Hawkesbury River to Flemington Yards, which is a substantial portion of the route. This could provide an additional freight train to the timetable in each hour of service outside the peaks, which equates to approximately six services in each direction each day.

PON also supports future investment in initiatives and projects that focus on faster rail connections between Newcastle and Sydney. Whilst they may be focused on improved passenger services, improvements in rail infrastructure, such as track straightening and signalling improvements, will maximise the operational capabilities of both freight and passenger services.

Lower Hunter Freight Corridor

The Regional NSW Services and Infrastructure Plan identifies corridor protection for the Lower Hunter Freight Corridor (LHFC) as an initiative for investigation in the 10-to 20-year period. The LHFC will link the Main North Line between Hexham and Fassifern, providing a bypass of the Newcastle metropolitan area. Importantly, it will alleviate current urban amenity issues in Newcastle and allow separation of passenger and freight trains for a small portion of the route.

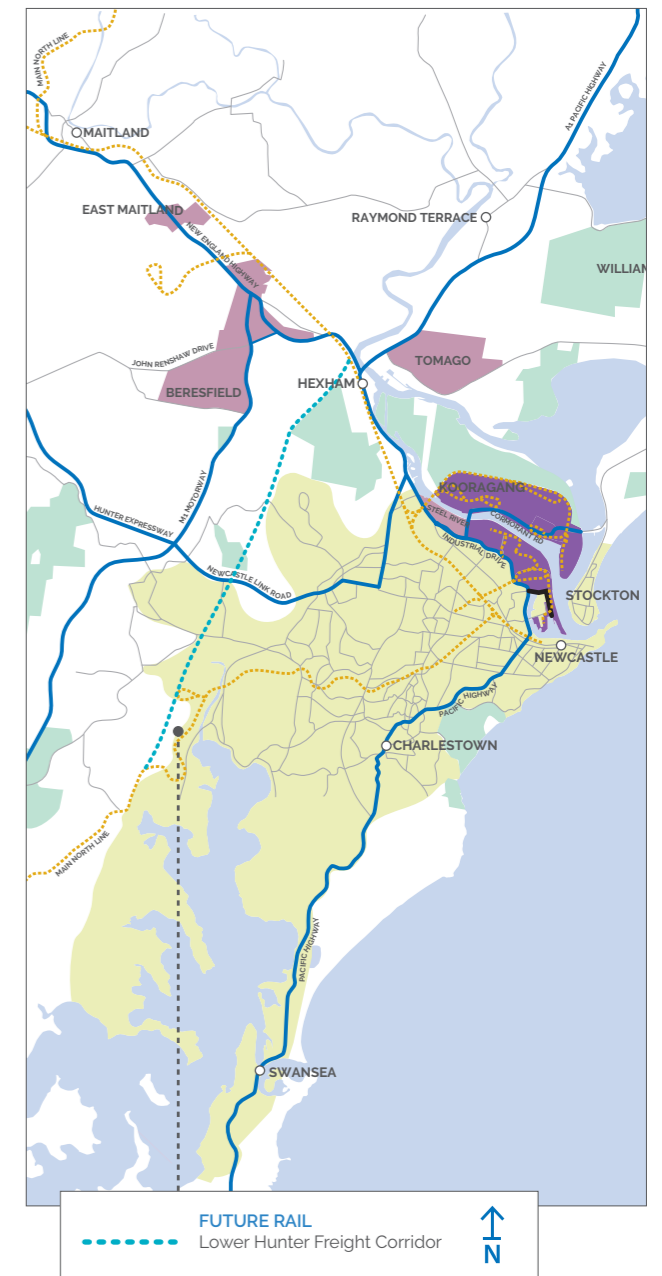
It is noted that on its own this project does not create additional capacity for the Main North Line, other than potential coal paths to existing coal mines and existing power stations. Incremental improvements in capacity on parts of the network do have overall positive impacts in terms of network efficiency. Port of Newcastle supports this initiative of the New South Wales Government.

Rail Improvement Projects

ARTC has developed a range of rail infrastructure enhancement projects that will eliminate connectivity constraints on the regional rail network, and reduce the cost to market for regional businesses.

In order to fully capture the benefits of investment in the country rail network, the establishment of a new supply chain between the export catchment area and Newcastle, as the closest port, is pivotal. The development of the Newcastle Container Terminal will drive network efficiency across the New South Wales rail network and bolster cost benefits to growers and cargo owners.

PON supports ARTC's strategy to implement projects that will link the broader New South Wales rail network to Newcastle, in particular those projects that will increase axle loads from 21TAL to 23TAL or 25TAL, or extend passing loops to allow heavier, longer trains and improve whole-of-supply-chain costs.





GROWING TRADE

FACILITATE NEW TRADES
AND SUPPLY CHAINS



Pictured: NCIG Coal Terminal, Kooragang
Image source: Newcastle Coal Infrastructure Group

Our core trades include bulk commodities such as coal, fuel, grains and fertiliser, as well as breakbulk and project cargo. Containers, Ro-Ro and passenger ships are a key aspects of PON's diversification strategy.

The introduction of new import and export trades and new supply chains will be what drives innovation, efficiency and value for the Port, its shareholders and the community.

Facilitating the establishment of new trades and supply chains can address infrastructure bottlenecks and capacity constraints in capital city ports, and respond to changing technology such as automation, modal shifts and bulk containerisation.

The Port Master Plan identifies trade growth scenarios and demonstrates how growth can be accommodated with existing port capacity (Channel and land) and supply chains (road and rail), without the need for substantial investment or additional infrastructure.

Port services and other support services such as towage, pilotage, providedores, Border Force and Customs, utilities and land transport, together with core Port infrastructure, will continue to be provided by the responsible agencies, private sector providers and PON. It is expected that these services will keep pace with the rate of growth of various trades.

In 2016/17 each
SHIP VISIT
contributed nearly:





GROWING TRADE



Pictured: NCIG and PWCS Coal Terminals, Kooragang

Coal

Since the first coal export from the Hunter River in 1799, coal has been central to the development of the Port, the City of the Newcastle and the Hunter Valley.

In the last 10 years, coal exports from the Port have doubled, increasing from 80Mtpa to 160Mtpa. The growth in exports has been underpinned by increased demand for coal from South East Asia.

The Hunter Valley Coal Chain (HVCC) is the largest and most significant supply chain for the Port. The HVCC is one of the world's most efficient non-vertically integrated bulk commodity logistic supply chains. Each coal producer enters into:

- Take or Pay contracts for terminal capacity from the coal terminals under Capacity Framework Agreement (CFA), authorised by the Australian Competition and Consumer Commission (ACCC);
- Take or Pay contracts for track capacity under a monopoly arrangement from ARTC, underpinned by an ACCC-approved Access Undertaking; and
- Contracts for coal haulage capacity from train operators through open competition.

The Hunter Valley Coal Chain Coordinator (HVCCC) oversees the day-to-day coordination, long-term planning and capacity alignment of the Coal Chain on behalf of its coal producers and service provider members. Through these agreements, there is a clear

pathway to develop additional coal terminal and below-rail track capacity, as and when required by coal producers.

Land allocated for the existing coal terminals located at Carrington (T1) and Kooragang (T2 and T3) will continue to facilitate coal export activities within the Port. The coal terminal operators have a combined terminal capacity of 211Mtpa. This is 52 million tonnes above the 2017 coal export volume of 159 million tonnes.

Each terminal operator has dedicated optimisation and expansion programs for their existing terminals to meet customers' needs. For example, new ship loaders were recently installed at the Carrington Coal Terminal D4 and D5 Berths as part of Port Waratah Coal Services' (PWCS) investment in the reliability, safety and performance of its operations.

In conjunction with Government, rail providers and coal producers, PWCS secured approval for a fourth coal terminal (T4), to ensure there is an efficient system in place to meet future coal demands. T4 has been approved with a throughput capacity of capacity of 70Mtpa. In May 2018 PWCS announced it would not be pursuing the development of T4 as it had consulted with coal producers and formed a view that the existing terminals could handle the foreseeable coal export task.¹³ PON will now review its strategy for this site.

¹³ <http://www.pwcs.com.au/news>



Pictured: Bulk liquids unloading at Mayfield

Fuel

Regional NSW consumes about 40% of the fuel used in New South Wales, with large volumes required for machinery operating in mining and agricultural industries, and the transport of exports to the Port.¹⁴ The balance of demand in the region is from the general industry and domestic transport sectors.

The closure of fuel refineries in Sydney and Brisbane created the opportunity for a new supply chain where refined fuel can be shipped to the port closest to the customer. Fuel imports at the Port of Newcastle started in April 2009 and have grown significantly since then. Fuel imports are now the Port's second largest trade, with fuel imports totalling 2,680 ML in 2017.

Fuel imports are forecast to increase to 4,100 ML by 2040. Demand from the coal industry is expected to grow roughly in line with coal export volumes. Additional demand will also result from the increased transport distances from new mines being developed in the Gunnedah Basin and Ulan region. Growth in domestic consumption is also expected to increase, driven by population growth, but will be moderated by the improved fuel efficiency of newer vehicles.

The Port has three bulk fuel import terminals: Stolthaven, Park Fuels and ATOM (Australian Terminals Operation Management). The current tankage capacity of the Port's three fuel terminals is 266 ML, with an additional 339 ML approved for construction, to double the current fuel storage capacity.

In addition to the bulk liquids berth at Dyke 1, a second dedicated bulk liquids berth (M7) will support the Bulk Liquids Precinct at Mayfield. This berth will accommodate vessels up to LR2 capacity.

Together with diesel and petrol, the Bulk Liquids Precinct also has approved capability for other fuel imports in the future, such as aviation fuel and ethanol.

TfNSW is undertaking preliminary work to identify route options for a fuel pipeline corridor from the Port to Dubbo. The Central West is an important juncture within the state's transport network, providing North-South and East-West interstate heavy road and rail connectivity.

Currently, all fuel is transported to the region by road, which increases fuel costs and safety risks for other road users and contributes to congestion. A fuel pipeline from Newcastle would address these issues and ensure a reliable supply in significant volumes to the Central West. The Port has sufficient channel, berth and tankage capacity to supply such a pipeline.

¹⁴ <https://www.transport.nsw.gov.au/projects/current-projects/hunter-orana-fuel-pipeline>



GROWING TRADE



Pictured: Grain terminals at Carrington

Grains

Northern and north-western New South Wales are key agricultural production areas. New South Wales' wheat production is typically used first to satisfy domestic demand, which is approximately 38% of production in a typical harvest, but can consume all of a harvest in a poor year.¹⁵ Any surplus wheat is then sold to overseas markets.

Similar dynamics also exist for other grains exported through the Port, such as sorghum and barley, with domestic demand met first. For these crops, any improvement in crop yields will likely be offset by a reduction in planting area.

Due to the inherent annual variability in rainfall and resulting harvests, the size of annual harvests cannot be forecast; rather, forecasts represent the expected long-term average. The average exports per annum for grains is expected to grow from a 20-year average of 1.0Mtpa in 2017, to 1.3Mtpa in 2040.

There are two dedicated bulk grain terminals operated by Graincorp and Newcastle Agri-Terminal (NAT) each with road and rail receipt facilities within the Port. The cumulative bulk storage capacity of these facilities, together with flexible storage and handling options, means that the Port has more than ample infrastructure to handle the future grain export task. No additional land is required for ancillary infrastructure or bulk storage facilities.

¹⁵ NSW Grain Freight Review – Australian Government September 2009

Bulk Cargoes

Historically the Port has handled a range of key bulk cargoes.

These include alumina and petroleum coke imports totalling 1.3Mtpa, mineral concentrates exports and fertiliser imports (around 400-500,000 tonnes respectively), and the import of soybean meal and cement (about 200,000 tonnes respectively).

The long-term forecast for these commodities is for demand to remain steady. Demand for construction materials such as steel, cement and sand will continue as the population grows.



Pictured: Wind Turbine components at Mayfield

Project Cargo

Various industries, such as construction, energy, transport and mining, are often required to import or export large pieces of equipment or machinery known as 'project cargo'.

Project cargo is used to broadly describe large, heavy, high-value or critical (to the project they are intended for) pieces of equipment. The Port has always had a steady volume of project cargo imports, which have been consistently above 150,000Mt since 2014.

Historically, the Port's proximity to the extensive network of mines located in the Hunter Valley has made Newcastle a natural destination for the import of project cargo. With the continuing operation of the mining sector, there will be an ongoing need for the import of mining-related machinery and equipment. Future opportunities see the Port of Newcastle well-positioned to receive project cargo imports for mineral mines planned in Central Western New South Wales.

Rolling stock imports have included locomotives; passenger cars; light rail; coal and grain wagons; and flat-top, intermodal, aggregate and track-cleaning machinery. The import of rolling stock through the West Basin berth with its berthside rail connections to the national rail network has provided a steady volume of imports. Destinations as far away as Victoria and South Australia have received rolling stock imported through the Port of Newcastle.

To future-proof the state's road and transport networks, the New South Wales Government will be investing in the roll-out of an extensive pipeline of passenger rail car replacements and network expansions. This forms part of the New South Wales Government's \$1.5 billion 'More Trains, More Services' program and includes fleet delivery of new suburban, intercity and regional trains.

PROJECT CARGO PORT FACILITIES

To handle this type of cargo, a port requires:

- ✓ Access to a deep water channel and berth and access to a berth with landside design capacities to manage large and heavy loads;
- ✓ Access to an open berth unconstrained by existing overhead loading or unloading infrastructure, such as ship loaders or gantry cranes;
- ✓ Nearby storage land and laydown areas with required load capacities; and
- ✓ Connection to the arterial road network to enable land transportation.



GROWING TRADE

Construction Projects

More recently, the New South Wales Government's extensive infrastructure building program and renewable energy agenda has seen increased demand for the import of project cargo such as tunnel boring machines (TBMs), bridge spans, steel and wind turbine components.

This includes numerous road and rail projects, which will require tunnelling and therefore the need for the import of TBMs.

The diameter of a TBM can range from one to 19 metres, so they are often imported in parts, trucked to the construction site and assembled. Upcoming and potential tunnelling projects include Sydney Metro and M5 South West Motorlink Stage 2 – Sydney Harbour Tunnel, Northern Beaches Link Tunnel and the Western Harbour Tunnel. Newcastle is well-placed to receive construction machinery to support these projects.

Renewable Energy Projects

The NSW Renewable Energy Action Plan has been developed to support the achievement of the national target of 20% renewable energy by 2020. There is strong interest in the development of wind energy projects in New South Wales, with wind energy projected to remain the most economical form of large-scale renewable energy over the next decade.¹⁶

The Port of Newcastle has been the port of choice for the import of wind farm components in New South Wales since 2016. The Sapphire Wind Farm, near Inverell, is the largest wind farm in New South Wales and Australia's tallest wind farm. With each blade measuring 63 metres in length, they are the longest to be imported and stored at the Port.

There is a pipeline of planned and approved wind farm projects located within the Port's catchment area to 2020 and beyond. The Port of Newcastle is well-positioned to receive wind turbine imports.

Newcastle, unlike capital city ports, has demonstrated the flexibility, capability, access and infrastructure for heavy lift project cargo operations to occur at West Basin, East Basin and Mayfield 4 Berths. The Mayfield Storage Facility provides hardstand for consolidating and storing cargo. Portside staging allows cargo movement at optimal times and varying frequencies.

Beyond the Port boundary, it is important that there is unencumbered access to the national road network that is free of overhead obstructions or width restrictions. Newcastle is a safe heavy vehicle drive distance to outer Sydney, Brisbane and major New South Wales rural centres. Careful planning in conjunction with the NHVR Oversize and Overmass (OSOM) permit system is an important aspect of ensuring an effective supply chain.

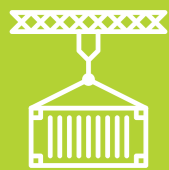
The Port of Newcastle has demonstrated it has both the capacity and expertise to service the needs of project cargo importers through facilitating the delivery of key infrastructure for major projects, including for Sydney. Looking forward, this capacity will continue to be offered, with Port infrastructure including suitable berths and storage land made available. The Port of Newcastle is committed to ensuring that the current supply chain advantages it has for project cargo imports continue to service New South Wales into the future.

¹⁶ NSW Renewable Energy Action Plan NSW Trade and Investment 2013

"The Port of Newcastle's proximity to the site and the ability to store the cargo for after-hours transport when the roads are quiet is an advantage. The storage area allows our technicians to prepare the turbines for road transport and deliver them when the site is ready to receive them."

John Gardner, Vice President of Program Delivery at Goldwind Australia





GROWING TRADE



Pictured: Queen Elizabeth departs Newcastle, February 2016

Cruise Shipping

The Port has hosted cruise ships since 2000. The Australian Cruise Association estimates that the economic benefit of cruise shipping to the Hunter region's business and tourism sectors is \$11 million per annum.¹⁷

The New South Wales Government is committed to continued investment in regional ports to ensure New South Wales captures a larger share of the economic benefits from growth in the cruise market.

There are two types of cruise ship visits:

- A transit call is where Newcastle features as a port on part of a voyage; and
- Home porting, where Newcastle is the start and finish port of a voyage.

Generally, a home port is established based on the catchment area's population as a viable source market, with additional markets sourced from passengers who drive or fly to the destination.

The Newcastle Cruise Terminal has been designed to accommodate cruise line operations, customs and quarantine services required to facilitate home porting, and to grow the market. The natural catchment for the drive cruise market extends to Coffs Harbour, Dubbo and the Central Coast.

Fly cruise opportunities such as Adelaide, Melbourne, and Brisbane to Newcastle are also being explored.

It is anticipated that not only will the number of cruise visits increase, but the size of cruise vessels will also rapidly increase in response to the popularity of cruising. Typical cruise ships making transit calls are likely to have up to 4,000 passengers, home porting up to 2,500 passengers. Newcastle will also continue to attract smaller boutique vessels with lower passenger numbers seeking a more select range of experiences.

The Channel Berth in Carrington is the agreed location for cruise ships within the Port. This site and the Newcastle Cruise Terminal have the capacity to accommodate the current and future land requirements to meet the needs of the cruise industry.

Other infrastructure, such as the improved public transport network and connectivity with the Newcastle City Centre, as identified in the Greater Newcastle Transport Plan, will support the visitor economy. The extension of the Newcastle Transport ferry network, and construction of a new ferry wharf at Dyke Point to facilitate a 'special events' ferry, would provide an alternative method of passenger transit to the city and would leverage the Government's investment in the public transport network to date (Light Rail and Transport Interchange).

¹⁷ Cruise Down Under Annual Report 2014-15, Australian Cruise Association 2016

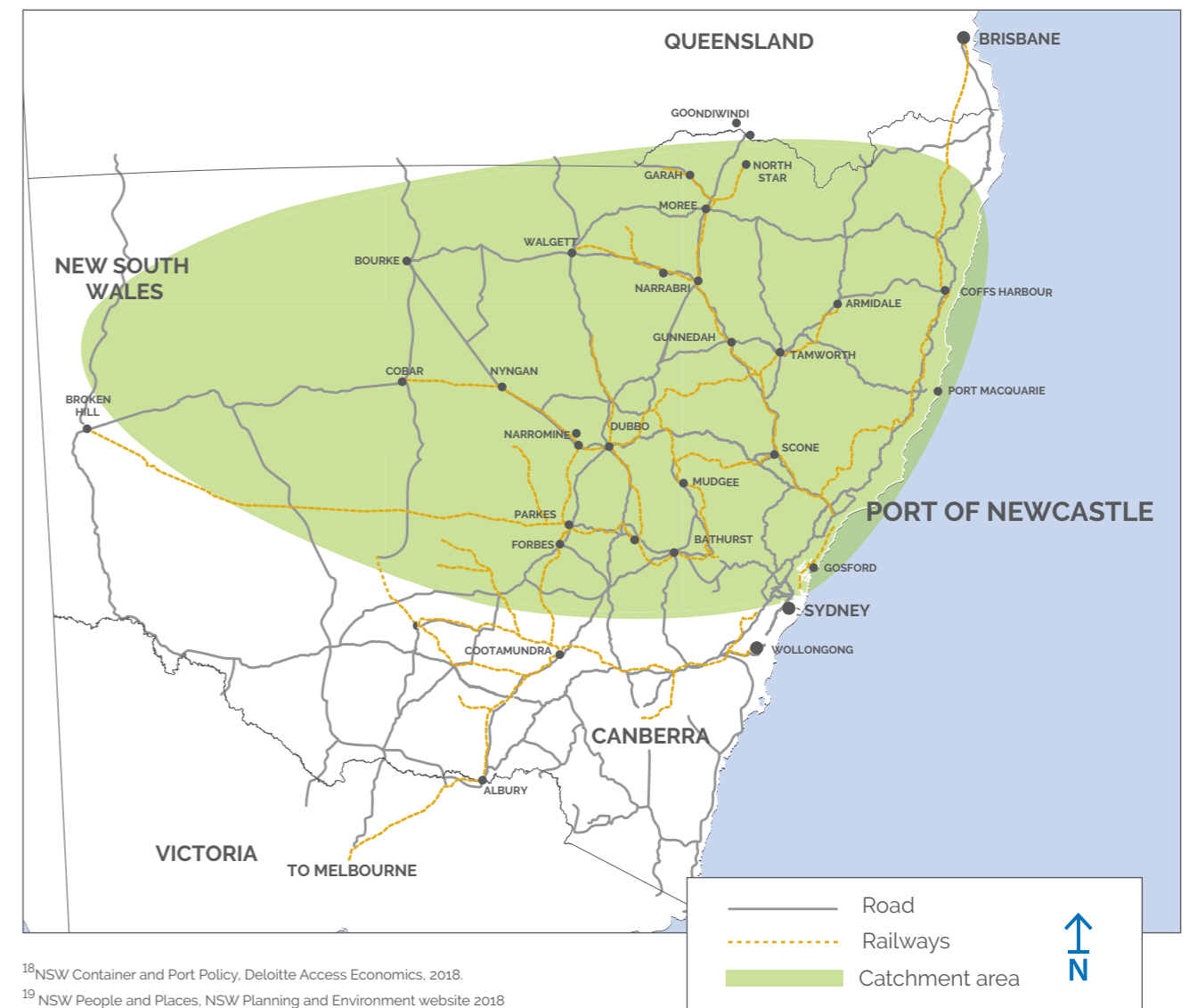
Containers

The Port has always handled containers. To date, container trade is handled by geared vessels in the Carrington Basin and Mayfield 4 Berth.

In the Port Development Plan 2015-2020, this was assumed to continue in its current form, with potential for some gradual and organic growth and fluctuation associated with regional demand. However, forecast growth over the next 20 years is expected to see total container volumes in New South Wales increase from 2.5 million TEU p.a. in 2017 to over 5 million TEU p.a. In

this period, container volumes in the Port's catchment area will increase from 500,000 TEU p.a. to 1.1 million TEU p.a.¹⁸

Newcastle's catchment area is defined as those locations within New South Wales that are closer to Newcastle than to other ports, such as Botany or Brisbane. This includes the Hunter, Central Coast, North Western and Western New South Wales, encompassing the major regional centres of Moree, Narrabri, Tamworth, Dubbo and Parkes. The catchment area is approximately half the land area of New South Wales and sustains more than 25% of the current population.¹⁹



¹⁸ NSW Container and Port Policy, Deloitte Access Economics, 2018.

¹⁹ NSW People and Places, NSW Planning and Environment website 2018



GROWING TRADE



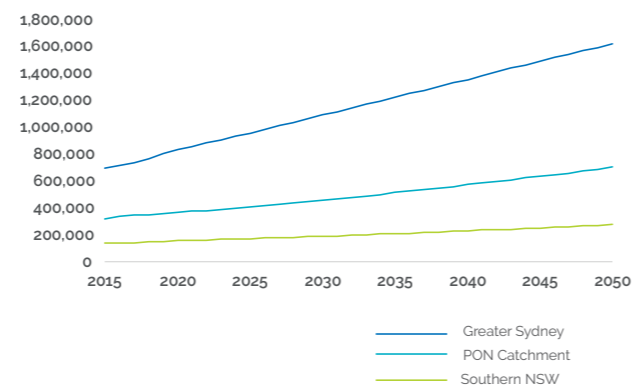
Imports

Container imports destined for the Port's catchment area account for approximately 27% of New South Wales' total imports,²⁰ meeting the population's demand for retail, manufactured products and consumable goods.

Containerised imports also include materials, machinery, equipment and manufactured goods used by the agricultural, manufacturing, mining and construction sectors, including fertiliser, grinding media, fuels, minerals, seeds, cement, timber products and steel products.

As the population of regional New South Wales grows, so will the corresponding demand for containerised imports. In the period to 2050, the demand for containerised imports from within the Port's catchment will grow from 315,000 TEU p.a. to 700,000 TEU p.a.

Forecast Imports (TEU) to 2050



Exports

Unlike imports, export origins do not correlate as strongly with population distribution, but instead reflect the nature of economic activity in each region.

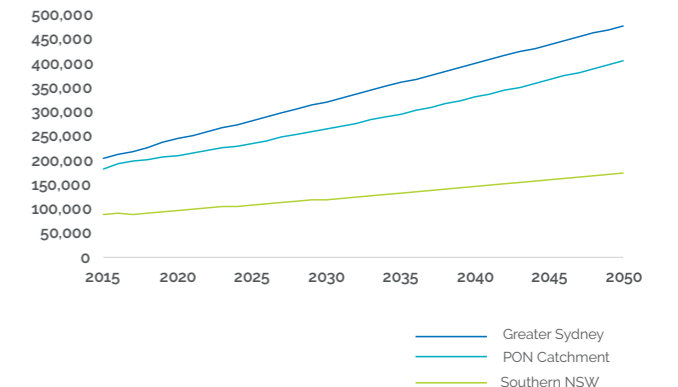
There is also a growing trend towards the containerisation of grains driven by opportunity to lower logistics costs and broaden market options.

High-volume export cargoes originating within the Port's catchment area include cotton from Macquarie Valley, Barwon River, Bourke, Namoi Valley and Gwydir Valley; grain from Narrabri, Tamworth and Moree; meat from Tamworth, Singleton, Dubbo, Wingham, Scone and Wauchope; wool from the New England region; and wine from Mudgee and the Hunter.

Exports account for a third of all container volumes in New South Wales, with 38% of that volume originating from within Newcastle's catchment area.²⁰ The forecast for containerised exports originating from within the Port's catchment is forecast to increase to 404,000 TEU p.a. by 2050.

Given the increasing demand for containerised imports, the existing volume and forecast growth of exports originating within the catchment, and the demonstrated capacity of the Channel, land and road and rail corridors, there is a strong case for significant balanced container import/export volumes through the Port of Newcastle.

Forecast Exports (TEU) to 2050



^{20,21} NSW Container and Port Policy, Deloitte Access Economics 2018



GROWING TRADE

The Mayfield Site

PON's Mayfield Site is a key strategic asset for Australia.

The site has been extensively remediated and now represents the largest parcel of vacant port land on the eastern seaboard of Australia. The 80 ha. site has frontage to the deepwater South Arm shipping channel of the Hunter River and direct connections to rail and the heavy vehicle road network.

The Mayfield Site is the subject of a Concept Plan Approval, which provides for the redevelopment of the site for Port-related activities, including a container terminal and supporting road and rail infrastructure. The Concept Plan Approval establishes the broad parameters and environmental performance criteria for air quality, noise and traffic generation to assess and develop future projects. It also provides a level of certainty for regulators and the local community that the site will be developed in a consistent and environmentally responsible manner.

The Mayfield Site can accommodate a container terminal with the capacity to handle 2 million TEUs per annum. Given the expanse of port-side land and quay line area available, the site could accommodate two container terminal operators simultaneously.



GROWING TRADE



The Newcastle Container Terminal

As demonstrated, Newcastle has natural advantages including large vessel capabilities, developable portside land and existing road and rail infrastructure, which would provide considerable time and cost savings to both import and export customers and the broader supply chain within New South Wales.

This is a significant advantage for importers and consumers for whom congestion in Sydney will become an increasing cost burden. For export goods originating within the Port's catchment, the land transport cost of moving containers by rail to Newcastle is significantly cheaper than land transport costs to other east coast ports.

A container terminal would position the Port of Newcastle and the Hunter region as a major commercial trade hub, feeding the growth of the state and easing congestion in Sydney. It is therefore PON's intention to develop a container terminal at Mayfield in the near term.

As demonstrated, the supporting rail network has sufficient capacity to facilitate a regular and cost-effective rail service to and from the Port, now and in the future. A Newcastle Container Terminal could

accommodate larger regional trains for quick turnaround and generate significant cost savings in land freight transport costs for exporters.

The development of new rail infrastructure within the Newcastle Container Terminal would allow long trains of approximately 1500 metres to be directly railed to the terminal. In contrast, other ports require trains to be broken up before being railed to the port, adding further time and cost. As a major Port with a large export-orientated hinterland, a container terminal could potentially maximise container utilisation, where the majority of import containers can be reused for export cargo, minimising transport costs.

Exporters would benefit from an alternative lower-cost supply chain solution. In some areas, it costs over 30% more to send freight to either Port Botany or the Port of Brisbane. For example, it is nearly 50% cheaper to rail freight from Tamworth to the Port of Newcastle when compared with Port Botany. Cost savings range from 47% cheaper for 640m trains, to 49% cheaper for 900m and 1200m trains, respectively. This freight already travels directly past the Port to Sydney via the Main North Line, competing with passenger services.

Cost savings for exporters via rail

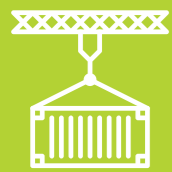
ORIGIN AND DESTINATION	TRAIN LENGTH (M)			
	640m	900m	1200m	1500m
Tamworth - Newcastle	47%	49%	49%	56%
Narrabri - Newcastle	37%	39%	39%	47%
Moree - Newcastle	29%	31%	32%	39%
Dubbo - Newcastle	12%	14%	15%	24%
Newcastle - Central Coast	34%	50%	56%	63%

A lack of competition in container ports creates significant costs for the NSW economy. NSW relies on ports for almost all our international trade, so lack of competition both reduces port efficiency and increases landside costs.

Currently, 87% of containers are transported to intermodals and distribution centres in Greater Sydney for unpacking. However, only 61% of the contents of these containers remain in Sydney. The balance is transported, usually by truck, to its destination in regional New South Wales.

Connectivity to distribution centres within Western Sydney via NorthConnex, and the opportunity to establish new distribution centres within the immediate vicinity of the Port, as well as the Hunter and Central Coast regions, further supports the case for a container terminal at the Port of Newcastle.

A Newcastle Container Terminal could service the import market for northern and central west New South Wales, and Central Coast, as well as Northern and Western Sydney. Cost savings would flow through a substantial increase in imports able to be transported on rail, the ability for longer trains to directly access the Port, and lower congestion for trucks accessing the national highway network.



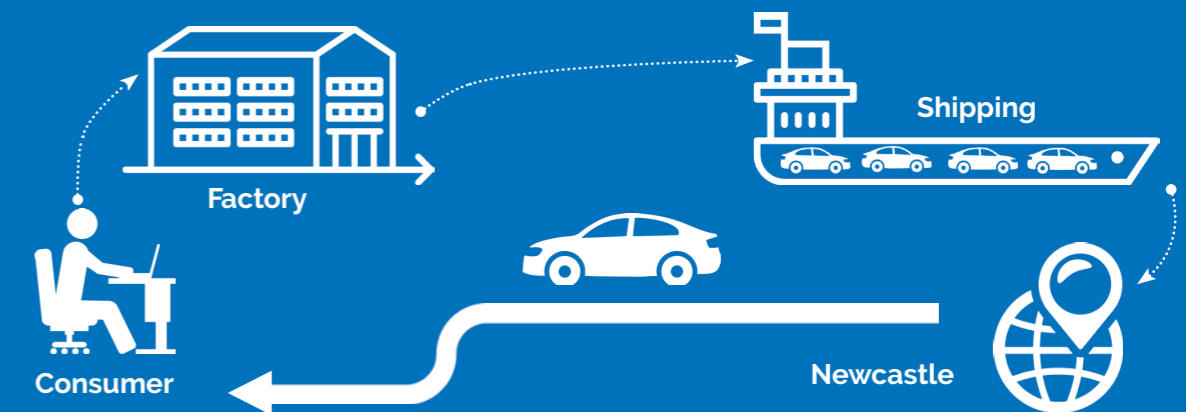
GROWING TRADE



The establishment of a specialised niche automotive and oversized Ro-Ro facility will enable the Newcastle region to be at the forefront of this changing market, allowing importers and exporters to shorten their supply chains.

This can lead to savings in time and money, benefitting the wider economy and leading to reduced congestion in the Greater Sydney area.

REDESIGNING THE AUTOMOTIVE SUPPLY CHAIN



AUTOMOTIVE AND ROLL-ON ROLL-OFF (RO-RO) HUB

In addition to the development of the Newcastle Container Terminal, the Port's connectivity and capacity provides opportunity for the establishment of new supply chains to cater for emerging import industries and innovative technologies.

Whilst the traditional supply chain for the import of domestic and light vehicles into New South Wales is clearly established, existing facilities that service this supply chain will not necessarily cater for newer types of vehicles, such as electric and hydrogen-powered cars or autonomous vehicles. Battery technology is rapidly improving and electric vehicles are becoming cheaper. Major car manufacturers around the world are now moving towards production of electric cars, with Volkswagen, Daimler and BMW Groups committing more than \$75 billion to develop electric cars.²² The rise of China and development of alternate-powered vehicles is another important trend to note.

The Port of Newcastle is well-positioned to serve both traditional and new-wave automotive industries, having adequate land within the Port for the development of dedicated Ro-Ro facilities and the supporting quayside marshalling areas. Additionally, the Greater Newcastle Metropolitan area has a good supply of general industrial land, available for the establishment of traditional

automotive supply chain finishing and processing facilities, such as advanced vehicle testing centres during the industry's formative years. Greater Newcastle has growing capabilities in science, technology, engineering and maths, and the region's excellent telecommunications network will support the requirements of advanced automotive technologies.²³

These locational advantages mean that the Port is ideally placed to leverage these opportunities to develop an alternative operational model for automotive imports and distribution supply chain.

The majority of project cargo received by the Port is shipped in a lift-on lift-off (Lo-Lo) vessel with on-board cranes to load and unload cargo. Ro-Ro cargo is wheeled cargo such as cars, trucks and machinery that is driven rather than lifted off a vessel. Ro-Ro vessel operators have been regular callers to the Port, delivering high and heavy cargoes, mining machinery, construction equipment and rail rolling stock.

Customers with smaller Ro-Ro volumes are sometimes disadvantaged by having their cargo sail past their closest port to an alternate port, with the customer incurring the cost and significant transport times to then be trucked to the end destination. An example is mining machinery imports, which are destined for the Hunter Valley but are currently delivered to other ports and then unnecessarily trucked back through Sydney.

²² The future is electric, NRMA October 2017

²³ Greater Newcastle Metropolitan Plan, Department of Planning 2018



NEW FACILITIES AND INFRASTRUCTURE



NEW FACILITIES AND INFRASTRUCTURE

SUPPORTING DEVELOPMENT OF NEW FACILITIES AND ENABLING INFRASTRUCTURE



The Port Master Plan supports the development of new transport infrastructure and logistics facilities that can leverage proximity to existing and proposed transport corridors.

This includes smaller enabling projects that can utilise, improve and enhance the existing road and rail networks for greater efficiency, productivity and consequence. Strategic land opportunities within the Port and the broader region provide immense opportunity to optimise the Port's capacity and connectivity.

Major projects such as the Inland Rail and the development of new intermodal facilities upcountry from the Port provide opportunity to further enhance connectivity, as well as improve alternatives to road freight, not only for regional NSW but further afield.

STRATEGIC LAND OPPORTUNITIES

The development of the Newcastle Bulk Terminal in Walsh Point will be a catalyst for new facilities and infrastructure. Vacant land within the Walsh Point Precinct represents a strategic opportunity to capitalise on PON's investment in new unloading equipment at K2.

The Walsh Point Precinct contains more than 14 ha. of the Port's development-ready land and is suitable for the construction of bulk storage facilities and warehousing. The average depth of sites is between 100 and 150 metres, with frontage to Greenleaf Road, part of the Port's private road network. This land is serviced by sufficient water and electricity to supply bulk storage facilities.

This land fronts the North Arm of the Hunter River. The North Arm is not a dredged channel and is restricted to vessels with a shallow draft, such as barges. However, the land is a short distance from the Newcastle Bulk Terminal, with potential opportunity to connect via conveyor systems.



NEW FACILITIES AND INFRASTRUCTURE

Supporting Industrial Land

Supply chain efficiencies are gained when there is integration between a port and supporting infrastructure. Fewer handling points for cargoes between different transport modes, mean time and cost savings to consumers. In Newcastle there is industrial land available both within and external to the Port to develop supporting land uses and facilities, such as intermodal facilities and distribution centres.

Freight and Logistics Precinct

Immediately adjoining the Mayfield Site is the 52 ha. Freight and Logistics Precinct. This vacant remediated site fronting Industrial Drive has been earmarked in the Greater Newcastle Metropolitan Plan for the development of freight and logistics and warehousing facilities to complement the Port's global gateway role.

The development of this Precinct will complement and support the adjoining Newcastle Container Terminal. It also offers enormous opportunity for customers to streamline their supply chains.

The Precinct could include direct rail access, dedicated facilities for container unpacking, sorting, warehousing and distribution, temporary container storage and empty container storage parks. A private road network, operating between the Port gates and the terminal and distribution or sorting centres, would allow for the seamless and quick shunting of cargo. Land is also available for required Border Control and quarantine facilities.

Beresfield-Black Hill

The industrial land and employment precinct at Beresfield-Black Hill is at the nexus of the national road and rail trade routes intersecting with an international trade port, and located beyond the Newcastle metropolitan footprint. This provides growth opportunities for freight, logistics and industrial sectors, helping to connect Greater Newcastle and the Hunter to global markets.²⁴

The cluster of freight and logistics industries developing around Beresfield-Black Hill will continue to grow in response to the changing freight demand and new freight tasks. Future expansion of the precinct to the south-west, including the adjoining mine site, internal road network and access points to John Renshaw Drive, will be investigated by local councils in the near term.



²⁴ Greater Newcastle Metropolitan Plan, Department of Planning and Environment 2018



Tomago Employment Lands

Tomago Industrial Precinct, north of the Port, is identified as a major employment catalyst area in the Greater Newcastle Metropolitan Plan 2036.

The proximity of the Port to major employment areas such as this, as well as Newcastle Airport and the emerging defence and aerospace hub at Williamtown, are important to identify and plan for. Synergies between the two global gateways of the Port and Airport will continue to be explored.

Central Coast Employment Lands

A key action of the Central Coast Regional Plan is the locating of large-scale industrial uses, and freight, manufacturing and logistics businesses near freight routes such as the M1 Motorway.

The 744 ha. Wyong Employment Zone provides for a wide range of business and employment opportunities, including industrial, manufacturing, warehousing, storage and research facilities. This zone includes the Warnervale Business Park located between the M1 Motorway-Warnervale interchange and the Main North line. It supports major transport services and distribution centres including the 81,000sqm Woolworths Distribution Centre.

Improved road and rail transport projects, including NorthConnex, M1 Motorway Upgrades, and the Main North Line rail improvements, will continue to support the clustering of freight and logistics businesses, to maximise these locational opportunities. Access between Sydney and the Port of Newcastle is important for business, industry and consumers, allowing freight to move freely in, out and through the Central Coast.

Future Port Growth

It is important to consider where future Port growth can occur beyond the current footprint. Unlike capital city ports, which are constrained and landlocked by existing urban development, there is opportunity for growth in Newcastle. The entire State significant Newcastle Port Precinct is over 1000 ha. with PON managing a large proportion of this land.

Vacant or underutilised private landholdings in the Mayfield, Kooragang and Walsh Point Precincts may provide land needs for future Port growth beyond PON's current footprint. As current industrial uses transition away from older manufacturing processes in the future, this zoned industrial land could be repurposed for Port uses.



NEW FACILITIES AND INFRASTRUCTURE



Inland Rail

Inland Rail is an opportunity to leverage the existing rail network to transform the way goods move from producers to markets through the effective linking of production areas, existing networks and freight hubs.

Once completed, the Inland Rail will become a dedicated freight network linking Melbourne and Brisbane via regional Victoria, New South Wales and Queensland. The track will enable the use of double-stacked, 1,800- metre-long trains with a 21TAL at a maximum speed of 115km/h, allowing for the transit of greater freight volumes. Each train could carry the equivalent volume of 110 B-double trucks.

Newcastle Port is already linked to major inland hubs through the extensive Hunter Valley and Country Rail networks. The Inland Rail, however, will provide the opportunity to link to a broader catchment. For example, grain from regional New South Wales could be railed to the Port instead of trucked to the Port of Brisbane. This modal shift will provide greater benefits to growers and producers by effecting a more efficient use of the transport network and ensuring that the economic benefits are retained in New South Wales.

"A key focus for NSW is to ensure that Inland Rail optimises the movement of freight in Regional NSW through efficient linkages to NSW and the development of economically sustainable freight hubs by the private sector at appropriate locations along the route."

Upcountry Intermodals

The Port's rail connectivity and capacity provides opportunity to connect the Port to the inland container trade and support the development of upcountry intermodals.

Tamworth is directly connected to Newcastle by rail but is not on the Inland Rail route. Plans to develop and expand the intermodal facility in Tamworth to capture freight flows could ultimately utilise the Port of Newcastle for export and import opportunities.

The Central West and Orana Regional Plan has identified the development of Parkes as a natural location for the development of a National Logistics Hub, with supporting infrastructure including roads, rail and air linking Parkes to capital cities and ports. The project will provide the catalyst for more efficient freight transport and a stronger Parkes National Logistics Hub, being a 600 ha. site dedicated to 24/7 multi-modal activity.

NSW Freight and Ports Plan, TfNSW 2018

Pictured: View from Honeysuckle area, Newcastle.



PROTECTING THE PORT

PROTECTING THE PORT FROM URBAN ENCROACHMENT



PROTECTING THE PORT

Pictured: Honeysuckle Foreshore area



Protecting the Port from urban encroachment, proactively managing the Port's interface to focus on economic and environmental sustainability, and forward planning are essential for the benefit of the Port and community.

The Port of Newcastle is the custodian of the Port for the next 95 years, charged with the responsibility to maintain and enhance the Port as a major seaborne gateway for New South Wales.

It is important to protect the Port, and the transport assets that support it, from the impacts of urban encroachment to ensure the ongoing operation and prosperity of the Port. Being forward-thinking about future transport needs through the preservation of corridors will ensure the longevity of the Port into the next century.

In implementing the developments and projects outlined in the Port Master Plan, it is reasonable to expect that there will be impacts associated with the environment. Actions to proactively manage impacts and issues that may potentially affect the biophysical environment will help achieve environmental sustainability and ameliorate or prevent the impacts of development of the Port on the environment.

PROTECTION FROM URBAN ENCROACHMENT

Urban encroachment is the term used to describe the effect of new urban development changing the character of an area, and the potential conflict and tension between new and established uses at the interface. Infrastructure Australia noted that the pressure from urban encroachment to introduce curfews or otherwise limit the use of corridors is a serious concern for those in the freight and logistics sector.²⁵

The Port lands have been specifically zoned to maximise the use of waterfront areas for Port facilities and those industrial, maritime industrial, freight and bulk storage premises that benefit from being located close to Port facilities. This enables the efficient movement and operation of commercial shipping, provides for the efficient handling and distribution of freight from Port areas through the provision of transport infrastructure, and encourages employment opportunities.

²⁵ Corridor Protection: Planning and Investing for the long term, Infrastructure Australia 2017

It is therefore reasonable to expect that Port land will be developed and used for shipping, Port-related and intensive industrial uses, which may have a range of noise and amenity impacts on nearby residents.

The Port lands provide for development that by its nature or scale, requires separation from residential areas and other sensitive land uses. These include facilities that receive, store or distribute products or materials that may be hazardous or offensive. These products are essential for daily life; for example, the supply of fuel for the domestic market or fertiliser for the agricultural sector.

The consideration of the individual and societal risk implications of sensitive receptors and increased intensification of people in the vicinity of the dangerous goods transport routes is a critical task when rezoning land or permitting the intensification of development near the Port boundary. Planning strategies should ensure that sensitive receptors and residential, recreational or commercial developments are located such that they would not impede expansion of current Port facilities, or restrict facilities in the future.

PON encourages the proactive management of urban interface with the Port and transport corridors to ensure sustainable operations and protection from issues of urban encroachment. Recognition of the Port's economic value and operational requirements in Government land use policy and plans is critical.

Even when the economic importance of freight, ports and logistics is identified in planning strategies, the issues of urban encroachment and land use conflict are often not adequately considered in the planning, design and assessment of individual proposals near the Port.

Impacts of Urban Encroachment

- New residential developments near the Port are not designed with appropriate noise amelioration to mitigate current or future noise sources.
- Potential impacts of new high-rise development on the safe navigation of vessels are not considered i.e. blocking of sightlines to navigation aids.
- Lack of separation or appropriate buffers between Port land and adjoining residential uses.
- Sensitive land uses such as childcare centres, healthcare facilities, aged care facilities or schools located near or adjacent to Port boundary restricts planned expansion or operations.

Education and communication are also keys aspects of ensuring that the Port community is well-informed and accepting of the Port's operational requirements. Incoming residents often have unrealistic expectations of the experience of living near a working port, particularly with regards to views and amenity. PON's Community Liaison Group will continue to be an opportunity for the community to engage with the Port, learn about its operations and provide feedback.

“Urban development pressures around airports, seaports and intermodal facilities need to be carefully managed to prevent these important economic hubs and corridors from being constrained and to reduce their impacts on surrounding communities.”

**Smart Cities Plan,
Australian Government 2016**



PROTECTING THE PORT

CORRIDOR PROTECTION

The 2015 Australian Infrastructure Audit Report maintains that an improved framework is required to protect corridors for transport and other linear infrastructure.

Failure to protect corridors can lead to significantly higher construction costs, making otherwise beneficial projects uneconomic. The Port will grow and its trade base will significantly diversify. This will mean that the transport system that supports the Port will be required to also grow in capacity. Although the Port is well-served by existing corridors now, it is prudent that there is proactive planning for the next 20 years and beyond.

Industrial Drive Corridor Strategy

Industrial Drive is the Port's key access road, providing east-west connection from the Port to the national highway network. It directly links to the Carrington and Mayfield Precincts, and links the Kooragang and Walsh Point Precincts via Cormorant Road and Tourle Street. It also provides an important function servicing the urban populations of Inner Newcastle and Port Stephens.

Key improvements that would assist the future functioning of Industrial Drive would include:

- Localised road widening to alleviate potential queuing at intersections;
- Intersection upgrades along Industrial Drive; and
- Improved flow into and out of the Mayfield Precinct as part of the broader development of the Mayfield Precinct.

The coordination of these improvements should be outlined in an Industrial Drive Corridor Strategy. A key aspect of this strategy would be to identify and preserve any additional land likely to be required for localised widening to accommodate future capacity.

Kooragang Island-Tomago Corridor

The Kooragang Island-Tomago Corridor is an existing transport corridor that links the Port through the western part of Ash Island and crosses the North Arm of the Hunter River to Tomago Road.

This corridor, together with the M1 Pacific Motorway Extension to Raymond Terrace provides opportunity for an alternate access Kooragang Island. Whilst the M1 Pacific Motorway Extension project is focused on



improved connection between the M1 Pacific Motorway and the A1 Pacific Highway, the inclusion of a free flowing interchange at Tomago provides for east-west connection for the Tomago Industrial Area, Newcastle Airport, Defence Employment lands, and potentially Kooragang Island.

The corridor is established by SEPP State Significant Precincts and is reflected in the zoning plans for both Newcastle and Port Stephens Councils. This corridor should be preserved in future planning schemes to provide a valuable link to the strategic road network over the life of the Port Master Plan.

Outer Sydney Orbital

The NSW Freight and Ports Plan has identified the need for longer-term planning for a future freight corridor between Western Sydney and Newcastle, as part of expanding the dedicated rail freight network in New South Wales. PON is supportive of this, including the protection of a corridor for the Outer Sydney Orbital corridor to directly connect Newcastle Port with rail freight intermodal precincts in Western Sydney.



Pictured: Royal Spoonbills, Kooragang Wetlands.
Image source: Chris Gilmore.

IMPACTS ON BIOPHYSICAL ENVIRONMENT

In addressing the environmental sustainability of the Port's operations, PON aims to minimise both direct and indirect impacts on the natural environment. A working port is a 24 hour industrial environment.

Direct impacts can include noise, impacts on flora and fauna from construction, or air pollution through the handling of bulk products. Indirect impacts could include increased traffic congestion, impacts of residential amenity or emissions from trains, trucks and vessels.

PON's activities are subject to a wide range of environmental conditions set through environmental protection licences, planning approvals and lease conditions. New developments or the expansion of existing facilities are assessed, constructed and operated in accordance with relevant environmental legislation. All State Significant proposals are subject to a full, merit-based assessment process by the Department of Planning and Environment.

PON's Environmental Policy outlines its commitment to environmental compliance and the establishment, monitoring and review of environmental objectives, targets and action plans. PON's Environmental Management System enables compliance, commerciality and efficiency within a culture of continual improvement and innovation.

PON also encourages all Port tenants to act in an environmentally responsible manner, requiring the submission of an environmental management plan as part of all new lease arrangements. This supports compliance with relevant Commonwealth, state and local regulations by Port tenants and encourages the adoption of industry best practice and management.

"Land planning and corridor preservation needs to balance the freight requirement against community and traffic amenity."

National Ports Strategy, Infrastructure Australia 2012



PROTECTING THE PORT

Air Quality

PON is conscious of the important local airshed in which it operates.

Ambient air quality and wind data is currently monitored via the Lower Hunter Quality Monitoring Network (LHAQMN). The LHAQMN was introduced in 2015 by the EPA in conjunction with NSW Health and the Office of Environment and Heritage. It is an industry-funded initiative that provides continuous local air quality monitoring with public access to real-time data. PON supports and provides funding to the LHAQMN.

The parameters monitored within the network include fine particulates, combustion gases and wind speed and direction. This set of parameters is able to provide a qualitative assessment of the impact on local air quality from the current activities within and surrounding the Port.

The National Pollution Inventory (NPI) provides the community, industry and Government with information about substance emissions in Australia. PON provides data on its vehicle and plant emissions on an annual basis.

Noise

Noise from the operations of the Port includes noise from vessels and tug boats (ship engines, auxiliary engines and ships horns), cargo loading and unloading operations and landside operations for storage and distribution.

These on-water operations or activities that are conducted in the open air are required to operate on a 24-hour seven days-a-week basis and must conform to international regulations for safety and navigation. This means noise sources cannot be eliminated or easily mitigated by engineering or design solutions.

PON works closely with the EPA, Newcastle City Council, Port Authority of New South Wales and Port tenants to identify, manage and mitigate noise, and provide information and education to help people understand the operational needs of a working harbour.

Water Quality

PON is an active manager of the water that enters into the Hunter River, including monitoring of storm water from key operational sites.

For new projects, there are strict environmental assessment and licensing requirements in place to ensure that potential impact on the Hunter River is avoided, mitigated or managed. This includes any likely impacts relevant to the Hunter Estuary Wetlands.



Pictured: Entrance to Newcastle Harbour, April 2015

CLIMATE CHANGE

Climate change, the increased occurrence and severity of storm events and rising sea levels are critical issues to consider in the planning of the Port. Resilience in dealing with floods is already a key management issue for PON as part of our responsibility to maintain the depth of the Channel.

The Hunter catchment has many river feeder tributaries that continuously bring natural sediments into the harbour bed. Maintenance dredging of the Port is undertaken by PON to remove the build-up of silt from upstream and to keep the Channel operational.

Heavy flooding in the Hunter River, upstream of the Port, often sees a significant amount of floodwater and silt flow into the Channel and berth areas. Additional dredging and resources are deployed by PON during and after the weather event to recover depths and lessen the impact on customers.

Loss of Channel depth equates to a loss of trade, and there is a need for statutory certainty in terms of ongoing maintenance dredging and sea dumping. Maintenance dredging is conducted in accordance with Commonwealth and state regulations. Currently, PON holds a 10-Year Sea Dumping Permit issued by the Department of Environment for the disposal of maintenance dredge material. To secure the ongoing availability of the Channel and protection of this corridor, a perpetual Sea Dumping Permit, subject to ongoing monitoring and reporting, should be considered.

Pictured: In the flood following the April 2015 superstorm, the Channel and berth boxes were affected by an additional 500,000 cubic metres of silt and mud from upstream. In comparison, the normal maintenance dredging volume for a 12-month period is usually around 450,000. That is more than one year's siltation in a single flood event.



IMPLEMENTATION

The Port Master Plan demonstrates the Port's connectivity and capacity to accommodate, attract and grow trade, and assist in addressing the freight task in an efficient, sustainable, profitable and innovative manner to 2040.

The Port Master Plan provides a broad and strategic approach to future opportunities and developments within the context of expected market conditions.

For our customers, the Port Master Plan articulates the strategic alignment between our vision and long-term plans, and those of our customers. The Port Master Plan will be part of our ongoing conversation with our customers, partners and Government. Key projects include:

- the **Newcastle Container Terminal**;
- the **Newcastle Bulk Terminal**;
- an **Automotive and Ro-Ro Hub**;
- the **Maritime Precinct**; and
- the **Newcastle Cruise Terminal**.

Within the timeframe of the plan, it is recognised that there will be changes in technology, processes and priorities that are not yet known. For this reason, the Port Master Plan is not considered to be a static document. As PON implements its strategy to diversify its trade base, there will be continual refinement of our long-term plans.

Our five goals will underpin and drive our key strategic development opportunities:

- Promote the capacity of the Port and the supply chain to support the economy.
- Utilise the existing road and rail transport assets to improve freight efficiency.
- Facilitate new trades and supply chains.
- Support the development of new facilities and enabling infrastructure.
- Protect the Port and transport corridors from urban encroachment

PON will actively review the Port Master Plan on a five-yearly basis to ensure that the goals underpinning the plan are relevant and continue to be met.

As the custodians of the Port into the next century, we are committed to working with the New South Wales Government, our partners and the community to ensure that the Port can continue to grow its diverse trade base, deliver sustainable port development and provide economic benefits to the Hunter Region, New South Wales and Australia.

GOALS

KEY PROJECTS

THE NEXT FIVE YEARS



PROMOTE THE CAPACITY OF THE PORT AND THE SUPPLY CHAIN TO SUPPORT THE ECONOMY

The connectivity and capacity of the Port and supporting supply chain infrastructure means that the Port of Newcastle is well-placed to support Australia's growing freight task and promote the regional and national economy.

- The **Newcastle Bulk Terminal** will leverage the Port's existing channel, berth and land capacity.
- The **Newcastle Cruise Terminal** and **Maritime Precinct** will contribute to the economy through investment in infrastructure and creation of jobs.

COMPLETE **Newcastle Bulk Terminal** to service mining, agriculture and construction sectors in NSW.

COMPLETE **Newcastle Cruise Terminal** to support growth in tourism in the Hunter and NSW.

CONTINUE supporting the expansion of the **Maritime Precinct**.



UTILISE EXISTING ROAD AND RAIL TRANSPORT ASSETS TO IMPROVE FREIGHT EFFICIENCY

Improved utilisation of existing transport networks will accommodate the current and future freight task. Key projects that will enhance and support the existing networks include:

- Golden Highway and New England

- Highway upgrades; M1 to Pacific Highway at Raymond Terrace;
- Northern Sydney Freight Corridor Stage 2;
- Lower Hunter Freight Corridor; and
- Fixing Country Rail and Fixing Country Roads Programs.

CONTINUE to work with transport agencies to advocate for **road and rail projects** that align with the Infrastructure Australia Priority List and the NSW Government's State Infrastructure Strategy, Future Transport 2056, and the Freight and Ports Plan.



FACILITATE NEW TRADES AND SUPPLY CHAINS

Facilitating the establishment of new trades and supply chains will address capacity constraints and respond to change. Port of Newcastle will:

- Establish the **Newcastle Container Terminal** to service containerised exports

- from the catchment and containerised imports for the Sydney and NSW market; and
- Attract and develop a specialised **Automotive and Ro-Ro Hub** to meet the needs of a changing market.

COMPLETE first stage of the **Newcastle Container Terminal** and commence operations.

WORKING TOWARDS an **Automotive and Ro-Ro Hub** concept that responds to changing markets and technologies.



SUPPORT THE DEVELOPMENT OF NEW FACILITIES AND ENABLING INFRASTRUCTURE

Enabling projects can utilise, improve and enhance the existing road and rail networks for greater efficiencies and productivity. Port of Newcastle supports the development of the following key sites and projects:

- Development of the **Mayfield Freight and Logistics Precinct** for an integrated multi-modal freight and logistics hub to

- complement the Newcastle Container Terminal;
- Development of industrial land for warehousing and logistics activities within the Port, the Hunter and the Central Coast; and
- Development of Inland Rail and Upcountry Intermodals.

COMPLETE first stage of the **Freight and Logistics Precinct** in conjunction with the Newcastle Container Terminal.

CONTINUE to actively support the establishment of **warehousing and logistics facilities** within the Port of Newcastle catchment.



PROTECT THE PORT AND TRANSPORT CORRIDORS FROM URBAN ENCROACHMENT

Port of Newcastle proactively manages the Port's interface to focus on economic, social and environmental sustainability. This includes:

- Supporting the efficient development and protection of Port land and transport corridors from the impacts of urban encroachment;

- Identifying and supporting the preservation of corridors including Industrial Drive Corridor and Kooragang Island-Tomago Corridor, and the long-term planning for the Outer Sydney Orbital; and
- Improving environmental outcomes to manage the Port's interface with the surrounding biophysical environment.

CONTINUE to work collaboratively with **community and industry** to facilitate port development and operations in a way that reduces impact on residents.

GLOSSARY	
Axle load	The axle load is related to the strength of the track, which is determined by weight of rails, density of sleepers and fixtures, train speeds, amount of ballast, and strength of bridges.
B-double	A truck and trailer combination consisting of a prime mover coupled to two trailers.
Cape Class	Largest size dry bulk cargo vessel with 100,000– 170,000 deadweight tonnage.
Common User Berth	Berths owned and managed by PON, with stevedores and terminals allowed access on a common user basis.
Commonwealth	Commonwealth Government of Australia.
Concept Approval	Planning approval granted for an overall concept plan under the Environmental Planning and Assessment Act 1979.
Core Port Infrastructure	Facilities used or intended for use in connection with operation of the Port, such as berths and berth boxes, unloading facilities, conveyors and pipelines, hardstand areas, road and rail infrastructure and storage facilities.
DPE	NSW Department of Planning and Environment – agency responsible for regional planning, revitalising urban areas, policy development to guide planning activities and assessment of major projects.
EBDC	The Eastern Basin Distribution Centre storage and distribution facility in the Carrington Precinct.
EPA	NSW Environment Protection Authority - agency responsible for environmental regulation in NSW.
ha	Hectare.
Handymax	Vessel with 40,000 to 50,000 deadweight tonnage.
HML	Higher Mass Limits – a scheme allowing heavier vehicles enrolled in the Intelligent Access Program to be loaded above General Mass Limits.
HVCC	Hunter Valley Coal Chain.
HVCCC	Hunter Valley Coal Chain Coordinator.
KIWEF	Kooragang Island Waste Emplacement Facility.
LOA	Length overall – the maximum length of a vessel's hull measured parallel to the waterline.
m	Metres.
ML	Megalitre.
Mt	Mass tonnes.
Mtpa	Million tonnes per annum – unit of measurement for annual bulk freight volumes.
NCIG	Newcastle Coal Infrastructure Group.
NHVR	National Heavy Vehicle Regulator - responsible for administration of national heavy vehicle regulations.
NSFC	Northern Sydney Freight Corridor – Program to support the separation of freight and passenger trains to increase freight capacity between Sydney and the Central Coast.
NSW	New South Wales.
OSOM	Oversize and Overmass vehicle is a heavy vehicle that is carrying, or specially designed to carry, a large indivisible item.
Panamax	Vessel with 60,000–100,000 deadweight tonnage that can travel through the Panama Canal.

GLOSSARY	
Planning Approval	Consent to a development application or State Significant Development application pursuant to the NSW Environmental Planning and Assessment Act 1979.
PON	Port of Newcastle – the private operator of the Port.
Port area	Area defined by SEPP (Three Ports) as the Port of Newcastle.
Port Lease	Head Lease with Port of Newcastle Lessor Pty Limited - the NSW State entity that owns the Port land.
Port Services	Facilities used or intended for use in connection with operation of the Port, such as services related to safety, security, dredging and administration.
Ports Australia	Australia's peak body representing port businesses through advocacy and engagement with public policy and regulatory issues.
Project Cargo	Large oversized cargo such as wind turbines, heavy plant machinery, transformers, mining equipment.
SEPP	NSW State Environmental Planning Policy.
TAL	Tonne axle load - measure of weight in relation to the permitted axle load of a length of track.
TEU	Twenty-foot Equivalent Unit – The international unit of measure used for standardising container throughput numbers.
TfNSW	Transport for New South Wales – agency responsible for the development of safe, integrated and efficient transport systems in New South Wales.
VTIC	Vessel Traffic Information Centre provides long-term planning, reviews vessel bookings and coordinates vessel movements in Newcastle Harbour.

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