2 UNDERSTANDING THE CURRENT AND FUTURE FREIGHT TASK

2.1 Double the volume of freight in 20 years

Freight growth

By 2031, the freight task in NSW is projected to nearly double to 794 million tonnes. This projected increase highlights the need for the NSW Freight and Ports Strategy to ensure that the network keeps pace with growth, and that this growth is sustainable for the long term prosperity of the State.

The volumes of all commodities demanding capacity on the freight network are expected to grow as population and economic activity increase across NSW. Mining represents almost half of the current task. Around 167 million tonnes of coal were produced in NSW in 2011, growing to around 367 million tonnes by 2031.

Coal is expected to remain the single largest freight task in NSW, followed by manufactured products. All other commodities are forecast to grow between two and three per cent per annum. The forecast growth in 17 supply chains is shown in Figure 3. These supply chains were the focus of reference groups consulted during the preparation of this Strategy.

The implications of this growth for ports, road and rail networks, intermodal terminals and freight corridors are significant. Capacity across the freight network varies, but key parts of the network are already under pressure to match demand.

Opportunities exist to shift more freight onto rail and this remains an important priority for the NSW Government. The movement of freight by rail is forecast to increase under the influence of the coal task and the planned increase of containers on rail to and from Port Botany.

Figure 3 Commodity movement volume growth 2011-2031

Projected volume in tonnes of NSW freight task by 2031

Volume (Mtpa)
**Freight movements**

Transport for NSW has identified over 72 different commodities transported in NSW. Industry advice, together with data from State and national sources, has been modelled to establish a picture of movements between origins and destinations across regions in NSW by Statistical Local Area (SLA), including the:

- **Hunter**, where significant volumes of coal are moved to Newcastle Port and several other important commodities are produced.
- **Central West**, where mining and agricultural production (especially grain) dominate the transport network.
- **Sydney metropolitan area**, where export and import products, typically in containers, are transported through Port Botany. Products can range from agricultural exports to imported consumer goods, such as electronics and whitegoods.
- **Illawarra**, where Port Kembla is a major trading port, exporting coal and grain among other products, and importing motor vehicles.
- **South West**, which is a major producer of food, such as fruit, grains, rice and wine. In this region, producers can make a choice between transporting products south to Melbourne or north to Port Kembla or Sydney.

*Figure 4  Top 10 NSW inter regional freight flows 2011*
• North West, which is also a major agricultural production area with products such as grain and cotton. Again, this region can make transport choices between moving north to Brisbane or south to Newcastle or Sydney.

There are also many interregional movements in NSW, particularly around metropolitan Sydney and coal movements to power stations near Lithgow and the Central Coast. See Appendix A for further information on commodity flow by SLA.

The major NSW freight flows in 2011 are shown in Figure 5, with approximately 81 million tonnes moved almost entirely by road. The mode share for the total interstate freight task is 92 per cent by road and eight per cent by rail.

Figure 5 shows how the interstate freight task is distributed, with the largest task between NSW and Victoria at approximately 41 million tonnes of total flow. The majority of interstate flows between NSW and Victoria begin or end in Sydney. Interstate freight accounts for approximately 20 per cent of the total NSW freight task.

Note: Interstate movements make up approximately 20 per cent of the total NSW task.
**Freight Corridors**

Corridor planning underpins our existing and future transport networks. Corridors connect freight activity precincts to meet future demands by enabling the development of new network capacity. Corridor identification is based on forecast demand and informed by land use planning in our urban and regional areas. New corridors can also overcome existing constraints that limit further expansion of existing road and rail networks. Planning for the Western Sydney Freight Line to connect Port Botany with Western Sydney is a good example of where a new corridor will deliver dedicated rail capacity and work to reduce the pressure on Sydney’s motorway network.

In NSW, population and economic growth, together with shifting patterns of business, are generating significant increases in freight volumes and changing movement patterns. To ensure the transport network can adequately respond to these demands, it is essential to identify potential new corridors to meet long term growth in the freight task, while also providing opportunities to deliver communication links and connections for water and power.

Dedicated freight rail corridors are being planned to ensure passenger and freight rail demand can be accommodated. Road corridors, including the proposed WestConnex Motorway and the Hume Highway (M31), will also incorporate access for heavy vehicles as a key component. By identifying parts of the NSW road and rail network with a significant freight corridor function, their capacity can be augmented with priority infrastructure development. This work is underway with heavy vehicle rest areas and overtaking lanes on the Newell Highway (A39), and works to upgrade or replace key bridges in regional NSW to improve access for High Productivity Vehicles (HPV).

The need for a freight corridor in the Western Sydney Employment Area has been identified.
Moving freight on road

The NSW road network carried 63 per cent of the total freight task in 2011, or around 256 million tonnes of freight. The importance of road transport for most commodities is shown clearly in Figure 6. The role of heavy vehicles in moving freight across NSW is substantial, and will continue to be so for the foreseeable future, as shown in Figure 7. Efforts to improve NSW roads and increase their capacity to handle heavy vehicles are central to this Strategy.

The most frequently used road corridors in NSW are the Pacific (M1) and Hume (M31) Highways, which carry most of the 81 million tonnes of interstate freight between Melbourne, Sydney and Brisbane. Road corridors including the Newell (A39), Sturt (A20) and New England (A15) Highways support primary industries in western NSW.

As the freight task continues to grow, the capacity of existing roads to support this growth, as part of overall traffic demand, is a distinct challenge. Constraints around heavy vehicle use, particularly on local and regional roads, impact on the efficiency of the road freight task.

Road freight is also increasingly subject to capacity constraints and peak hour congestion in Sydney and other regional centres. The significant growth in freight is projected to impact all key NSW road corridors over the next 20 years, as shown in Figure 7. For many roads in Sydney, such as the M4 and M5 Motorways, available capacity is limited in peak periods.
By 2031 the container trade at Port Botany is forecast by Sydney Ports Corporation (Sydney Ports) to reach seven million 20 foot equivalent units (TEU), the target mode share is to double the proportion of containers carried by rail by 2020 (NSW 2021 Goal 19).
The existing throughput of two million Twenty Foot Equivalent Units (TEU) per annum at Port Botany is projected to increase to a total of seven million TEU by 2031.

However, almost tripling the container task is not likely to mean a tripling in the number of trucks serving the port. Currently Port Botany receives approximately 1,700 trucks per day.

The impact of container port traffic on surrounding roads will depend on factors such as the mode share to rail, the rate of modernisation of the truck fleet, the location and capacity of intermodal terminals, the location and size of major retail and warehousing centres and the management of empty containers.

However, even with the targeted increase in rail mode share, early modelling results indicate the M4 and M5 will not be able to accommodate the additional container traffic when combined with background growth from employment and population by 2031.

The hourly throughput of vehicles on the M5 is lower than capacity for many hours of the day due to congestion, low travel speeds and a break down in optimal flow. Accommodating 20 years of growth in this corridor will require a package of solutions to meet the needs of freight and other road users.

Port deliveries are already moving into the off-peak periods to avoid congestion. Although the M5 is at or near capacity for most of the day, there is still capacity for growth very late at night and very early in the morning.

Actions in the NSW Long Term Transport Master Plan focussing on road upgrades and improved rail operations to support a doubling of freight on rail by 2020 are critical to meeting the forecast growth at Port Botany by 2031.
2 UNDERSTANDING THE CURRENT AND FUTURE FREIGHT TASK
Moving freight on rail

NSW has suffered from underinvestment in transport infrastructure, including rail, for the freight task. While a number of rail infrastructure projects have occurred in the last 10 years, the focus has been on coal (driven by concentrated customer demand) and passenger transport (driven by government commitments).

The NSW Government has in place the dual policy objective of increasing the use of rail for the movement of both freight and passengers. In particular, the Sydney metropolitan rail network is an increasingly congested shared network.

During peak commuter periods, regulatory and operational mechanisms require that passenger services are prioritised over freight services. This results in a network that is not performing efficiently and warrants action to improve the performance of the rail freight task.

In 2011, the NSW rail network carried 136 million tonnes of freight (33 per cent of the total State freight task). The movement of coal in the Hunter Valley dominates rail freight activity in NSW. In comparison, other rail corridors carry relatively small freight volumes.

Similar to the road network, significant growth is projected across all key NSW rail corridors over the next 20 years.

In total capacity terms, the rail network has broadly kept pace with growth in freight demand. However, the transport of freight via the shared rail network is limited by the needs of passenger transport, particularly during morning and afternoon passenger peaks.

The dedicated Metropolitan Freight Network (MFN) is currently underutilised, carrying approximately 300,000 TEU compared with the assessed throughput capacity of 1.1 million TEU.

The mode share of rail for containers to and from Port Botany has declined from 25 per cent in 2001 to 14 per cent in 2012.

Despite this, there remains pressure on the rail network, given projected growth in freight demand. A comparison of the capacity of the key rail corridors under a ‘do minimum’ scenario and the projected demand is provided in Figure 10.

By 2031, all key corridors will struggle to meet demand unless action is taken. In particular, by 2031 the MFN will need to carry around two million TEU, which will equate to approximately 25,000 additional train movements each year on that part of the network alone.
Currently rail is used for 14 per cent of the container movement task to and from Port Botany. The Metropolitan Freight Network is currently underutilised, with less than 30 per cent of available capacity used for the movement of containers. The reasons for the low mode share relate to reliability, available intermodal terminal capacity, time taken and cost. Infrastructure and operational constraints compound the poor performance of rail to and from Port Botany.
Freight terminal movements
An efficient transport network is characterised by seamless transhipment between modes. The largest and arguably most visible transhipment task occurs in NSW ports.

In 2010-11, NSW ports handled around 179 million tonnes of freight (44 per cent of the total NSW freight task). The Port of Newcastle recorded the greatest volume of seaborne exports, as a result of the dominance of coal in the NSW freight task. Port Botany also accounted for a significant share of the freight task, and is the primary NSW container port, as shown in Figure 11.

The rate of growth in exports through NSW ports has increased by around four per cent in each of the last five years. This increase has been driven by strong growth in coal exports as well as rapid sustained growth in container movements, which has averaged seven per cent growth annually over the last 15 years.
Pressure on port capacity is increasing, particularly at the Port of Newcastle, although the timing of future capacity constraints will depend in part on movements in global coal prices. Recent softening in coal prices has reduced pressure on coal handling services in the short term.

While there is currently significant spare capacity, constraints on container movements at Port Botany will depend on the rate of growth of containers, as well as the productivity levels that can be achieved by the stevedores and overall optimisation of the port. Depending on the rate of growth, from a planning perspective it appears reasonable to expect that Port Botany might approach its natural capacity between 2030 and 2040. New port infrastructure at Port Botany and/or Port Kembla may be required to help relieve these pressures, and will need to be supported by significant land freight network improvements, as discussed in Sections 4.1 and 4.2.
Ports are the trade gateways to the world. They are economic hubs which facilitate the movement of goods between the landside and the seaside. Planning for the future of ports is essential to ensure they remain competitive and have the capacity to handle the growing trade task.
NSW Transport Network Defence and National Security Requirements

NSW is home to a number of major Australian Defence Forces (ADF) bases hosting both combat, logistic support and maintenance capabilities. Defence bases in NSW include: Royal Australian Navy Fleet Base East at Garden Island in Port Jackson, Defence National Storage and Distribution Centre (DNSDC) at Moorebank, Royal Australian Air Force bases at Richmond and Williamtown, ammunition storage facilities at Orchard Hills, Myambat, Mangalore, Mulwala, and Marrangaroo, and the fleet munitions wharf and storage facility at Eden on the Far South Coast.

Supporting these facilities and capabilities with a productive transport network will ensure national security and contribute to the economy of NSW through enabling and complementary Defence industry, procurement opportunities, employment and Defence personnel and their families forming part of the wider community.

Transport for NSW will work with the Australian Defence Force Joint Logistics Command to incorporate the needs of Defence into the development and operation of the NSW transport network. Particular areas of focus will include the unique Defence transport network requirements such as:

- Enhancing the capacity of NSW-based Defence industry to support ADF operations, maintenance and sustainment
- Port access and landside requirements for naval vessels and commercial charter vessels, including the range of vessels that will be home ported at Garden Island and HMAS Waterhen in Port Jackson

Fleet Base East at Garden Island is primarily used for ship maintenance and repair and incorporates the Captain Cook Graving Dock. Garden Island is one of only two primary Navy repair locations in Australia. Significant Navy future plans for Fleet Base East and Garden Island include initial home-porting with associated System Program Offices (SPO) of three new Air Warfare Destroyers (AWD) and two new Landing Helicopter Dock amphibious vessels (LHD). Sustainment expenditure on the AWDs and LHDs is estimated to be worth up to almost $1B per year for the 35 to 40 year life of these vessels.
DEFENCE NATIONAL STORAGE AND DISTRIBUTION CENTRE

Defence National Storage and Distribution Centre (DNSDC) at Moorebank is the centre of defence joint logistics, providing warehousing, distribution and maintenance services to the Australian Defence Force on a regional and national level. Planning for the relocation of this facility to nearby Holsworthy is underway. The relocation of military facilities from Moorebank to nearby Holsworthy will allow the redevelopment of the Moorebank precinct into an intermodal and warehousing precinct. The Moorebank precinct will provide much needed freight transport network capacity and employment opportunities in South West Sydney.

2 UNDERSTANDING THE CURRENT AND FUTURE FREIGHT TASK

2.1 Defining the freight task

Defence National Storage and Distribution Centre (DNSDC) at Moorebank is the centre of defence joint logistics, providing warehousing, distribution and maintenance services to the Australian Defence Force on a regional and national level. Planning for the relocation of this facility to nearby Holsworthy is underway. The relocation of military facilities from Moorebank to nearby Holsworthy will allow the redevelopment of the Moorebank precinct into an intermodal and warehousing precinct. The Moorebank precinct will provide much needed freight transport network capacity and employment opportunities in South West Sydney.

- HML access for ADF logistics and combat vehicles to the NSW road network particularly in areas of NSW where it may not be required by industry
- ADF requirements for the movement of oversize overmass (OSOM) vehicles and equipment on the NSW road network through the Defence Road Transport Exemption Framework
- Vehicle and equipment lay down and assembly areas as part of national mobilisation movement plans
- Consideration in road design and construction for OSOM and emergency or expedient aircraft landing areas on NSW State roads
- Movement by rail of ADF vehicles and equipment on the NSW rail network particularly for maintenance and sustainment tasks
- Connection of the ADF freight activity precincts to the State network (Moorebank, Holsworthy, Orchard Hills, Richmond, Williamtown, and Eden)
- The carriage and storage of dangerous goods including incorporating ADF requirements for locations of rest areas for vehicles carrying dangerous goods through NSW.

Development of Surplus Defence Estate Land

Changes in the current disposition of the Defence estate in NSW may provide opportunities for development of the NSW transport network. NSW will engage with the Australian Government to explore opportunities to utilise surplus Defence estate land to enhance the efficiency and capacity of the NSW transport network.
The WesTrac purpose built facility at Tomago serves the Hunter Valley coal sector, the 23 hectare site was completed in July 2012 and employs over 400 people on site. The facility includes a parts distribution centre, truck servicing centre, component rebuild centre and supporting administration and amenity facilities. Linking the facility to the NSW transport network with HPV access and OSOM routes ensures that the coal mining sector can be supported efficiently.
2.2 The importance of regional freight movement in NSW

Economic growth in regional NSW relies on the movement of goods through efficient and effective transport networks. The ability of NSW producers to move agriculture, industrial products and natural resources to domestic and export markets in a timely and efficient manner directly impacts on productivity and competitiveness – and hence the economic performance of regional NSW.

Regional freight volumes

NSW regions play a critical role in the production and movement of goods in the NSW economy. Approximately 260 million tonnes of goods originate from NSW regions with destinations in other NSW regions, metropolitan Sydney, interstate or internationally. This represents around 65 per cent of the total NSW freight task by volume. This compares with the Sydney metropolitan and interstate locations, which generate 15 per cent and 20 per cent, respectively, of the total freight task across NSW.

The largest product category hauled from NSW regions is mining products. Mining products, which almost exclusively comprise coal, account for 60 per cent of the total regional freight task by volume.

Figure 13 Major commodity groups by volume in statistical division in regional NSW
Agricultural products (livestock, grain, cotton, meat, wine, forestry) and other products (manufactured items, fuel, chemicals, building and construction products) account for 20 per cent, respectively, of the total regional freight task by volume.

The most significant regions from a freight perspective are the Hunter Valley and Illawarra. Taken together, these regions underpin two thirds of all regional freight volumes in NSW. The Hunter Valley freight task is predominantly characterised by the haulage of coal, which makes up 85 per cent of all freight flows from the region. Since coal is extracted in the region it creates critical value added to the Hunter regional economy in terms of investment, employment and income.

In the Illawarra region, mining and building and construction products underpin freight movements. These products constitute 80 per cent of Illawarra regional freight flows.

Regional freight values

The criticality of regional freight flows to NSW on a ‘value of product moved’ basis is more moderate, albeit still significant, than on a ‘volume’ basis. For example, approximately 40 per cent of the gross value of all goods moved in NSW is generated from regional NSW. This compares with a regional share of 65 per cent of the NSW freight volume task. The regional share of the total value of goods moved (40 per cent) matches the Sydney metropolitan share (40 per cent) of the total value of goods moved across...
The gap between regional freight volumes and values is attributable to the fact that mining and agricultural products tend to have lower unit values than manufactured products (like whitegoods and passenger motor vehicles). This can be seen in mining and agricultural freight flows, which constitute 15 per cent and 30 per cent respectively of the total value of goods moved in NSW regions. The other 55 per cent of the total value of goods moved in regions is captured by manufactured items. This trend is particularly apparent in the Hunter Valley and Illawarra regions. In the Hunter Valley, coal flows account for 85 per cent of the total freight task in the region, but coal only makes up around 25 per cent of the total value of goods moved in the region.

Similarly, in the Illawarra region, coal accounts for approximately 10 per cent of the total value of goods moved despite it representing 50 per cent of the regional freight task by volume.

Regional road freight
Given the significant volumes and value of regional commodities moving on the State’s transport network, enhancing road freight productivity is critical. HPV are combinations that can move regional freight more efficiently to meet the regional freight task now and in the future.
However, there are deficiencies in the assessed capacity and condition of sections of the regional road network to meet current demand, particularly for HPV.

Many roads and bridge structures in regional NSW are aged or of inadequate strength to support HPV. For example, rural highways in NSW have historically been constructed as two-lane roads, built to standards that are now superseded. The introduction of B-doubles and other HPV requires a new standard for roads and bridges. Other deficiencies that prevent access for HPV include number of overtaking lanes, intersections that do not provide appropriate turning circles and storage for long vehicles, availability of rest areas and poor road alignment. In recent years a number of regional roads have been severely impacted by flooding as a result of extreme weather events.

Upgrading of local roads and bridges to cater for HPV access requires significant funds which local councils do not have available. Road funding has not traditionally been based on freight priorities. Many local councils are already unable to fund maintenance of their local roads, let alone additional infrastructure upgrades.

Shortfall in funding is particularly evident in regional councils which face a limited ability to generate own source revenue compared to councils in urban areas. Regional councils generally have a smaller population and smaller rates base. They also do not have access to fines, parking fees and land development revenues that many urban councils can generate.

Economic benefits and efficiency gains of HPV do not automatically flow through to councils in terms of increased revenue to address their impact on local roads. Consequently for many councils, there is no direct incentive to invest proactively for heavy vehicle traffic since there is no direct link between heavy vehicle usage and income for road improvements and maintenance.

The NSW Government is committed to opening up improved HPV access for appropriate freight routes that are of strategic importance. The Newell Highway (A39) is an example of a key inland freight route which would benefit from infrastructure upgrades and enhanced HPV access. Currently, restricted access vehicles such as 26 metres B-doubles are permitted the entire length of the Newell Highway. However, access for B-triples, double road trains and AB-triples is restricted to certain sections of the highway due to road conditions.

The Newell Highway is the main inland north-south connection between Queensland and Victoria and passes through 15 local government areas in NSW. Transport for NSW is working to expand the B-triple network to enable modular B-triples to operate on sections of the Newell Highway, specifically between Narrabri and Goondiwindi, which opens up access to key Queensland freight sites. Work is also progressing on the development of a Newell Corridor Strategy to prioritise the necessary road upgrades to enable HPV access on the entire length of the highway.

**Regional rail freight**

There is a natural compatibility between regional commodities (such as coal and agricultural products) and freight rail utilisation. Currently, regional rail freight faces a number of key issues that both directly and indirectly influence the capacity and efficiency of the network. In regional NSW a large number of rail lines are the most financially viable means available for conveying grain to port for export and to distribution centres for local consumption.

The seasonal nature of the grain harvest, however, means that volumes can be inconsistent from year to year. As a result, many regional lines may only move small amounts of grain, or in some instances, no grain is moved at all for a number of years. In real terms, many regional lines can for extended periods have unrealised capacity.

During these periods, maintenance must be continually undertaken irrespective of usage. Cost recovery obtained from users of the grain lines remains low. In many instances the rail access fees paid by rolling stock operators to use the rail network can cover as little as one per cent of the total maintenance costs for such rail lines. The NSW Government is required to fund the majority of the maintenance costs for these low volume lines. This practice is not sustainable.
Therefore, it is now necessary to explore other options where the risk and costs associated with low volume rail lines are more evenly shared between parties. The current Cowra Rail Lines (see Case Study 18) project presents such an opportunity to explore new ways of ensuring the ongoing viability of regional rail freight lines.

Another current and future challenge facing regional freight rail is moving both grain and bulk commodities such as coal through the shared Sydney Trains network where rail infrastructure availability places constraints on the train paths available for regional freight services. Given the continuing pressures to provide additional passenger services on the network, it is expected that regional rail freight services will continue to be affected.

For example, regional freight services moving coal from the mines on the Southern and Western Coalfields of NSW to Port Kembla need to access and traverse the Sydney Trains network. Sydney Trains passenger services operating on the Sydney metropolitan network and the Illawarra Line reduce the train paths available for regional rail freight services. Additionally, when events occur involving passenger trains this can result in further delays for regional rail freight services. On the return journey, regional bound freight services experience the impact of these constraints and remain at risk of missing their scheduled departure times from Port Kembla. Such issues continue to limit the efficiency of regional rail services.