Infrastructure Challenges for New Port Developments

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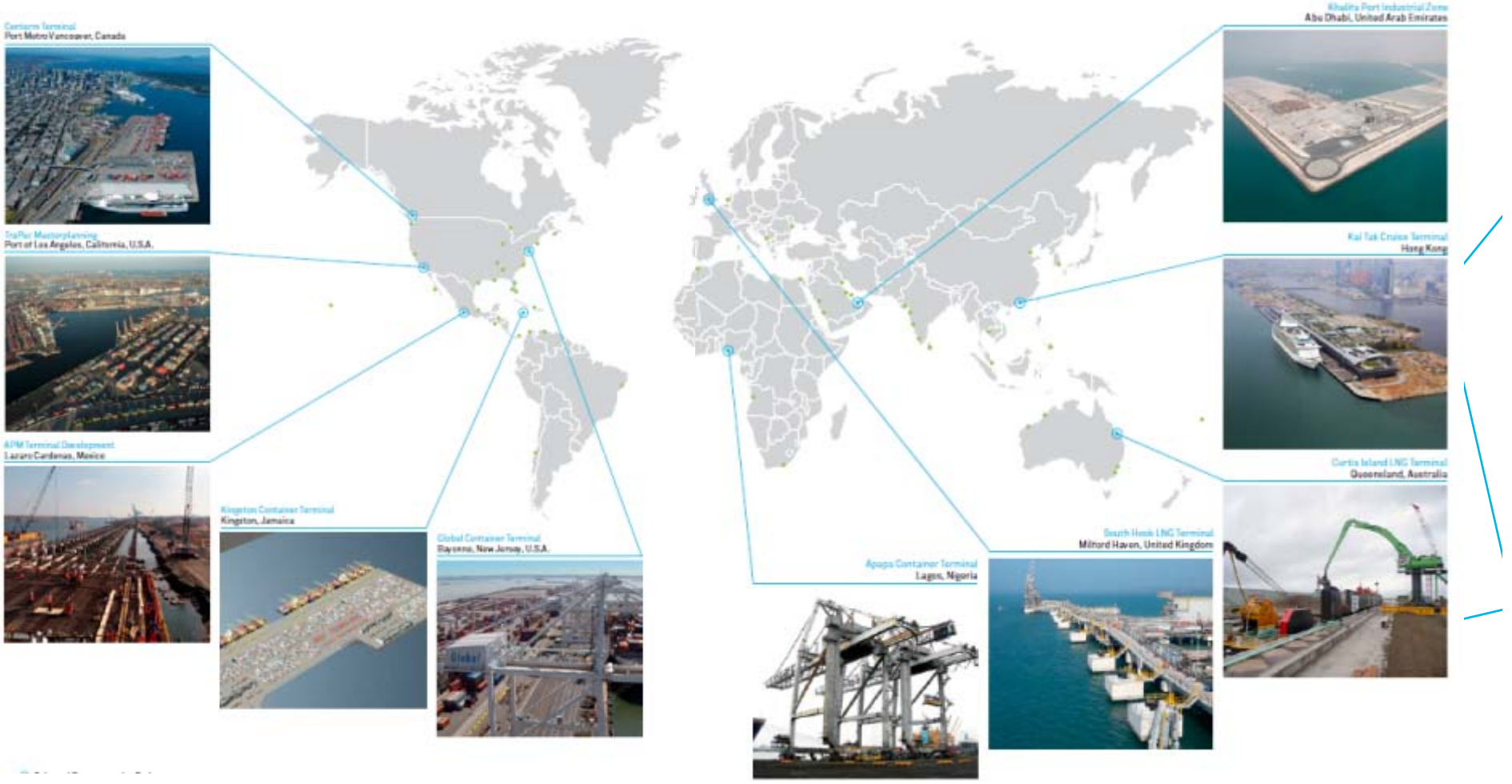
AECOM is a leader in the planning, engineering and construction oversight of port and marine projects worldwide with nearly 70 years of experience.



Outline

- Importance of ports
- Infrastructure - what do we mean by infrastructure
- Challenges
  - Responsibilities
  - Funding & Financing
  - Timing
- Importance of a Port Master Plan
- Case study
  - Port Kembla, Port Botany & WestConnex

Importance of ports - global trade perspective

- Maritime transport plays a major role in facilitating global trade (80% by volume is carried by sea)
- Efficient and competitive ports help to drive the economic development of countries
- Efficient ports can contribute to development of the hinterland by attracting industry and investment
- Inefficient ports limit the volume of trade and/or have a negative impact on the total cost of moving goods

Infrastructure - what do we mean by infrastructure?

Port infrastructure - Internal

- marine access channel dimensions (widths, depths)
- breakwaters
- manoeuvring area (turning circle diam and depth)
- available berth lengths
- depths alongside the berths
- entrance/exit gates
- storage areas
- offices/workshops

Port infrastructure – External / Hinterland

- road access
- rail access/rail yards
- inland water access
- power/water/lighting systems

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Infrastructure: lack of capacity – consequences

Port infrastructure

No two ports in the world are the same – either physically or organisationally.

The physical aspects are determined by the setting – eg coastal, river, landform, geology

The supply chain is only as strong as its weakest link

In developing a port a large number of infrastructure studies are needed, determining the type and amount of infrastructure need

Infrastructure - hinterland road

The roads need to be of the required standard – safety & environment

Can the goods get to and away from the port quickly, without sitting unproductively on congested roads.

Sources: Sydney Ports, Malay Post

Infrastructure - hinterland rail

Block trains

New rail terminals

Dedicated freight rail tracks

Conflict with passenger trains

Solution does not lie in the hands of ports

Effort from port community to lobby for change.

Port infrastructure funding

Traditionally, port authorities have planned and maintained port infrastructure by using public funds to finance the construction of new port infrastructure.

The idea is that the public sector should own these assets to avoid the risk of monopolization by private parties.

The current global trend, however, is toward increasing participation of private capital in port investments.

A significant part of the investment should be made by concessionaires for which an appropriate procurement strategy should be applied by the port authority.

Port infrastructure benefits

Benefit of port investments to national welfare

- Direct - cost savings which affect consumer and producer surplus. Related to (new) users and operators of the port.
- Indirect - benefits that are passed on to others in society via the pricing mechanism, including multiplier effects
- External – benefits passed on to others in society beyond the pricing mechanism such as environmental impacts and efficiency in transport networks.

Fundamental economic effect of investments in (large-scale) infrastructure is the improvement of transport conditions, particularly accessibility, which affects location decisions of households and industries.

Challenges - Context

Landside connections to the hinterland are one of the most important issues for the port industry.

- Technical complexity of creating new road or rail corridors or upgrading existing routes,
- construction costs

Generally investment in this infrastructure is the responsibility of government and there is no guarantee that this investment would follow at the same pace as port infrastructure

- Congestion problems
- loss of port competitiveness

Challenges - Responsibilities

The strong interdependence between the port and its transport links is in most cases not in line with the responsibilities.

Ports are managed by private or public operators or a combination

Transport links fall under the responsibility of local, regional and/or national entities.

Development and investment decisions for roads, railway tracks or waterways are very often taken far away from the port.

The infrastructure depends on regional or national or increasingly also on private funding.

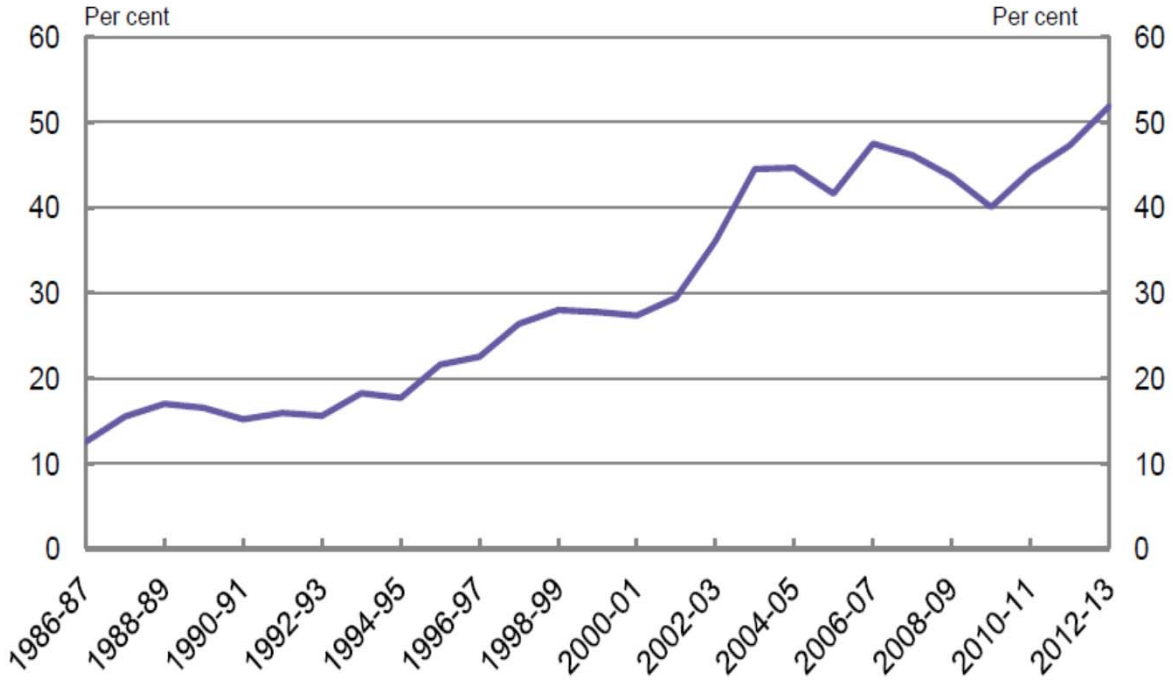
Challenges – Funding & financing

The focus on upgrading port infrastructure needs to be balanced with the requirement to develop supporting infrastructure so goods can be transported. This will lead to more investment into rail, roads and pipelines.

Explosive growth in the developing world is putting heavy pressure on ports. Governments want to help, but are hampered by deficits.

Challenges – Funding & financing

Private sector share of infrastructure investment - Australia



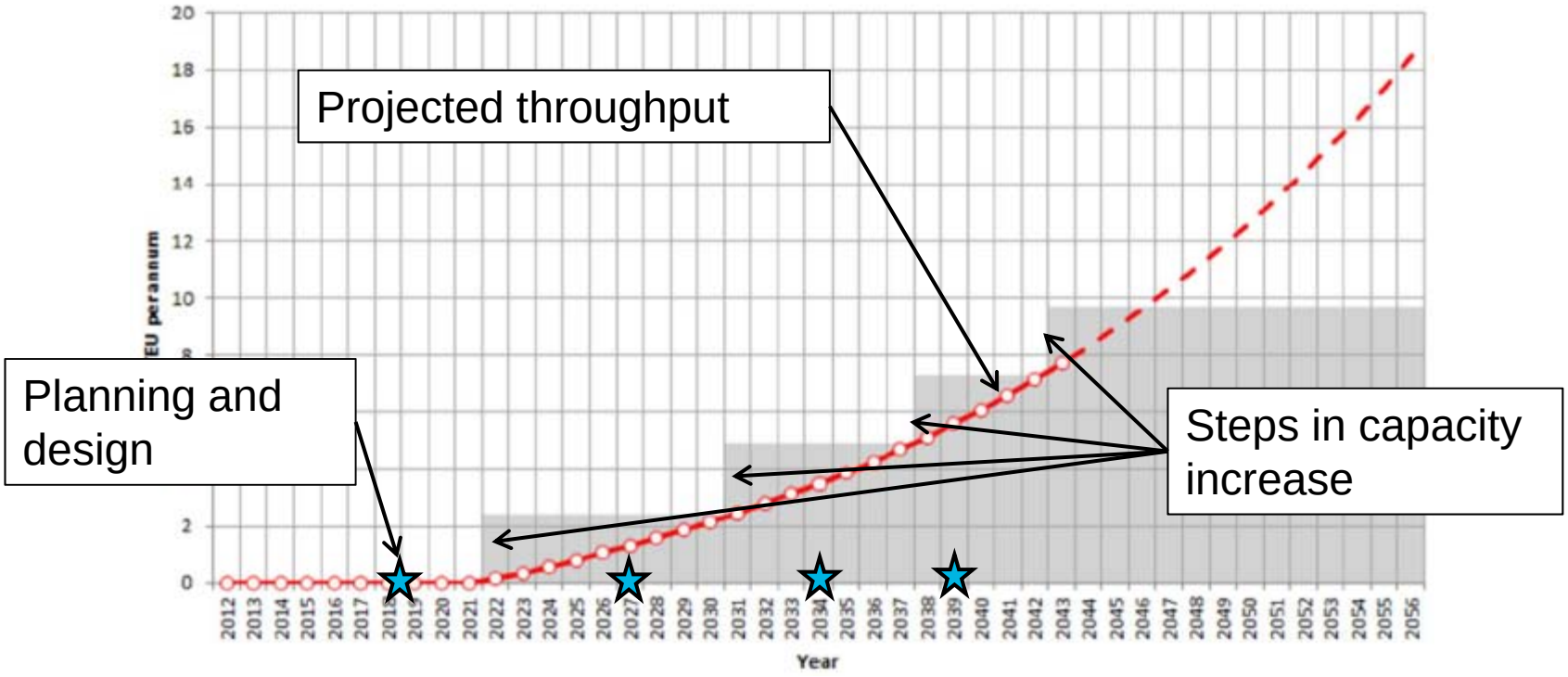
Source: ABS cat. no. 5204.0, 8762.0 and BCA.

Other:

- Asian Infrastructure Investment Bank
- WB, ADB

Challenges - Timing

Plan design and build the infrastructure in advance of the need



Port Master Planning

Port Master Plan

- guides a port's planning, development and management of infrastructure and facilities, with the goal of accommodating future growth and supporting the regional economy.

Must have reliable forecast of throughput.
We don't want the port to be underutilised or even unused.

Traffic forecasting

- Port infrastructure - Internal
- Port infrastructure - hinterland

Must also address hinterland accessibility and connectivity

Port Master Planning

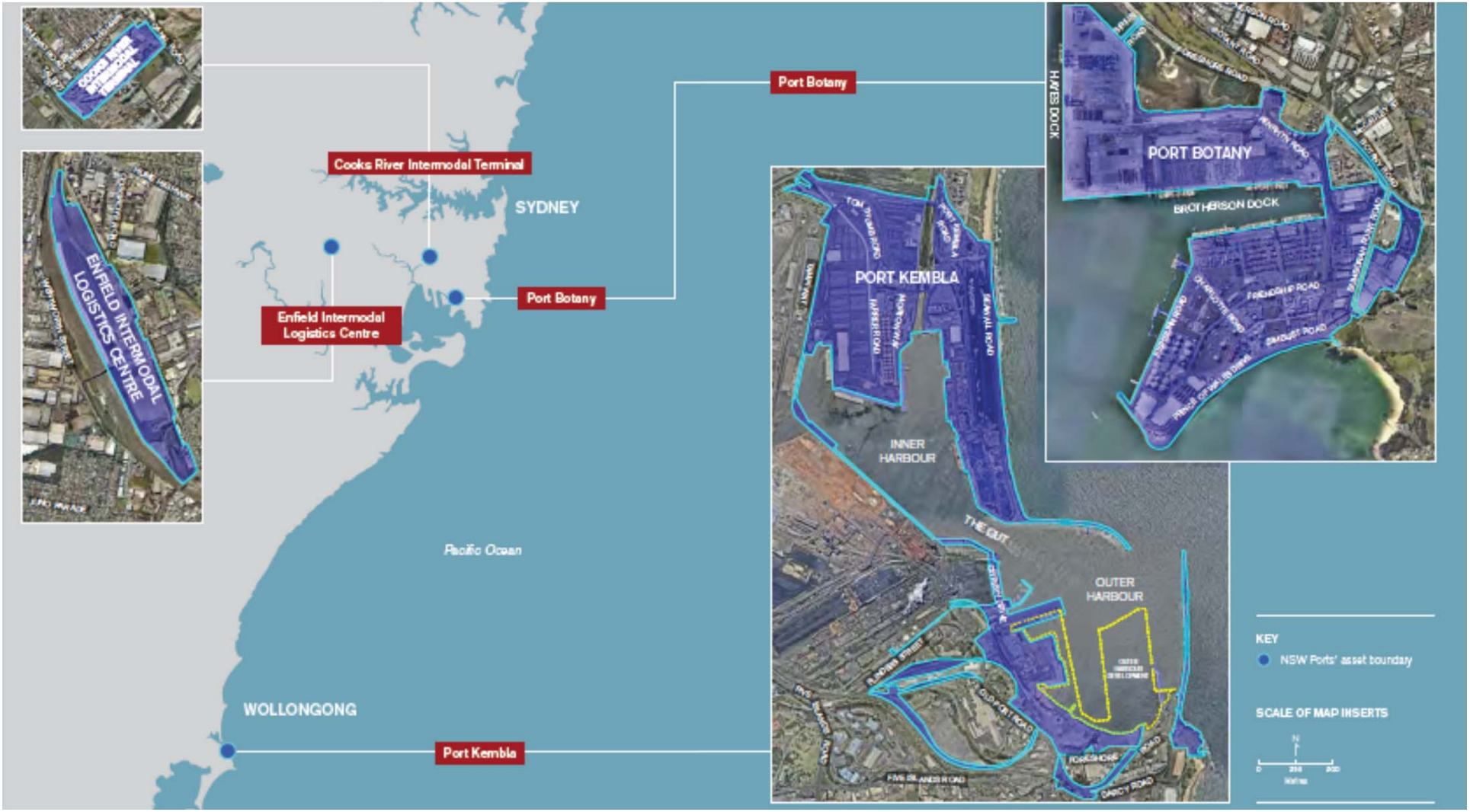
Need for major infrastructure improvements needs to be identified at the initial planning and site selection stage, since it can affect the overall feasibility of a project.

Can have an enormous cost or be prohibitive due to adverse environmental impacts.

The potential infrastructure issues for port projects are wide ranging and highly site specific. Important issues include:

- Capacity of existing road and railway networks
- New construction or repairs & upgrades to existing facilities
- Ability to adequately handle the projected increases in traffic, as well as structural capacity issues
- Available excess power on the electricity supply network

Case Study – Port Botany, Port Kembla & WestConnex



Source: NSW Ports

Case Study – Port Botany, Port Kembla & WestConnex

Port Botany

Completed in 2012 Port Botany underwent a major expansion of its container port facilities to cater for long term trade growth.

The expansion was one of the largest port projects to be undertaken in Australia in the last 30 years

Source: NSW Ports

Case Study – Port Botany, Port Kembla & WestConnex

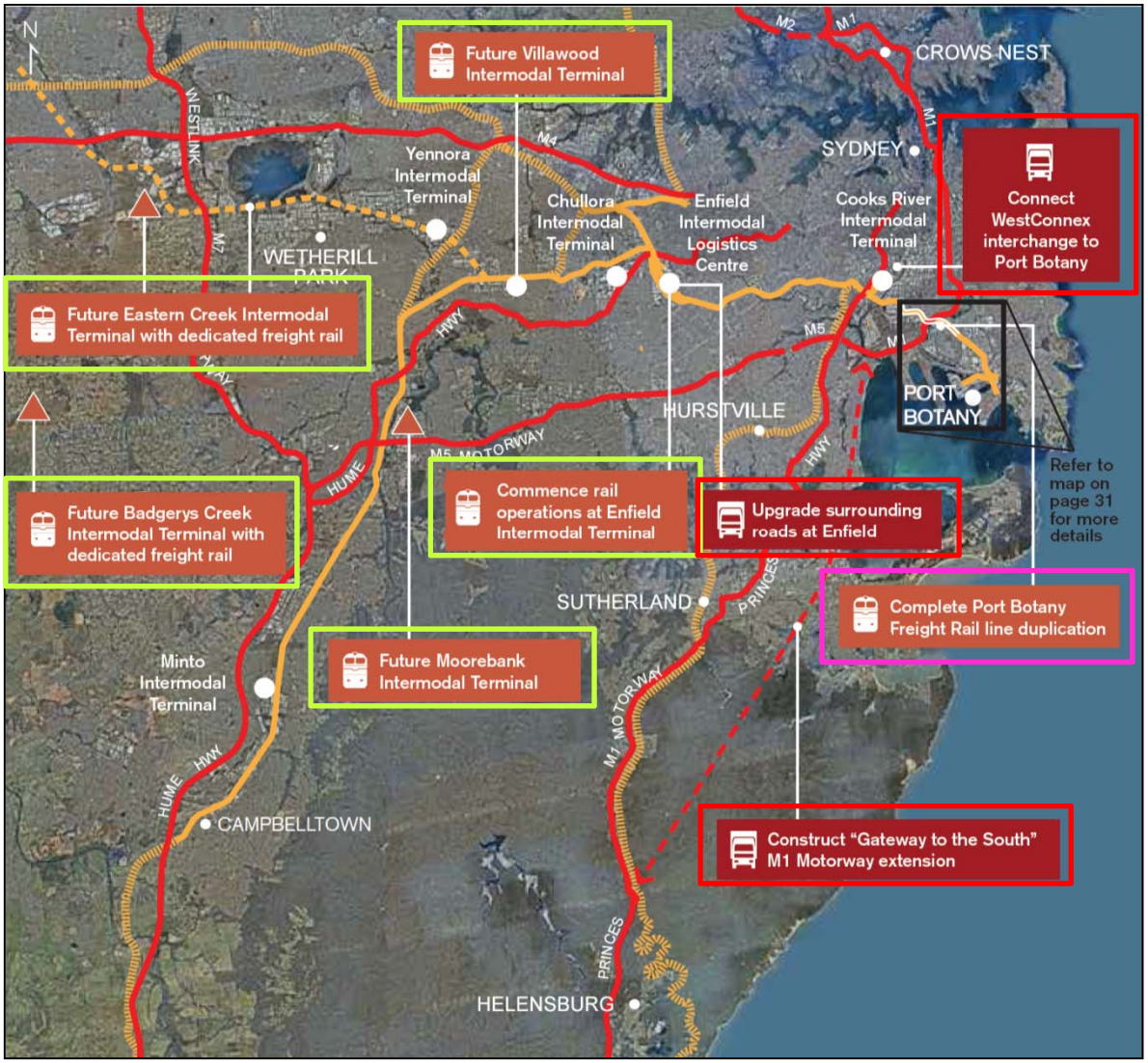
Source: NSW Ports

Port Botany

Estimated that truck traffic at the port will grow by approximately 400% in coming years, making freight movements very inefficient, increasing transport costs and congestion on major roads.

The movement of trucks in and out of Port Botany contributes to traffic congestion on Sydney's roads generally. The congestion problems go well beyond the stevedores' facilities—they also affect the wider metropolitan road network, when trucks share the roads with commuters at peak times.

Case Study – Port Botany, Port Kembla & WestConnex



Port Botany

Road infrastructure

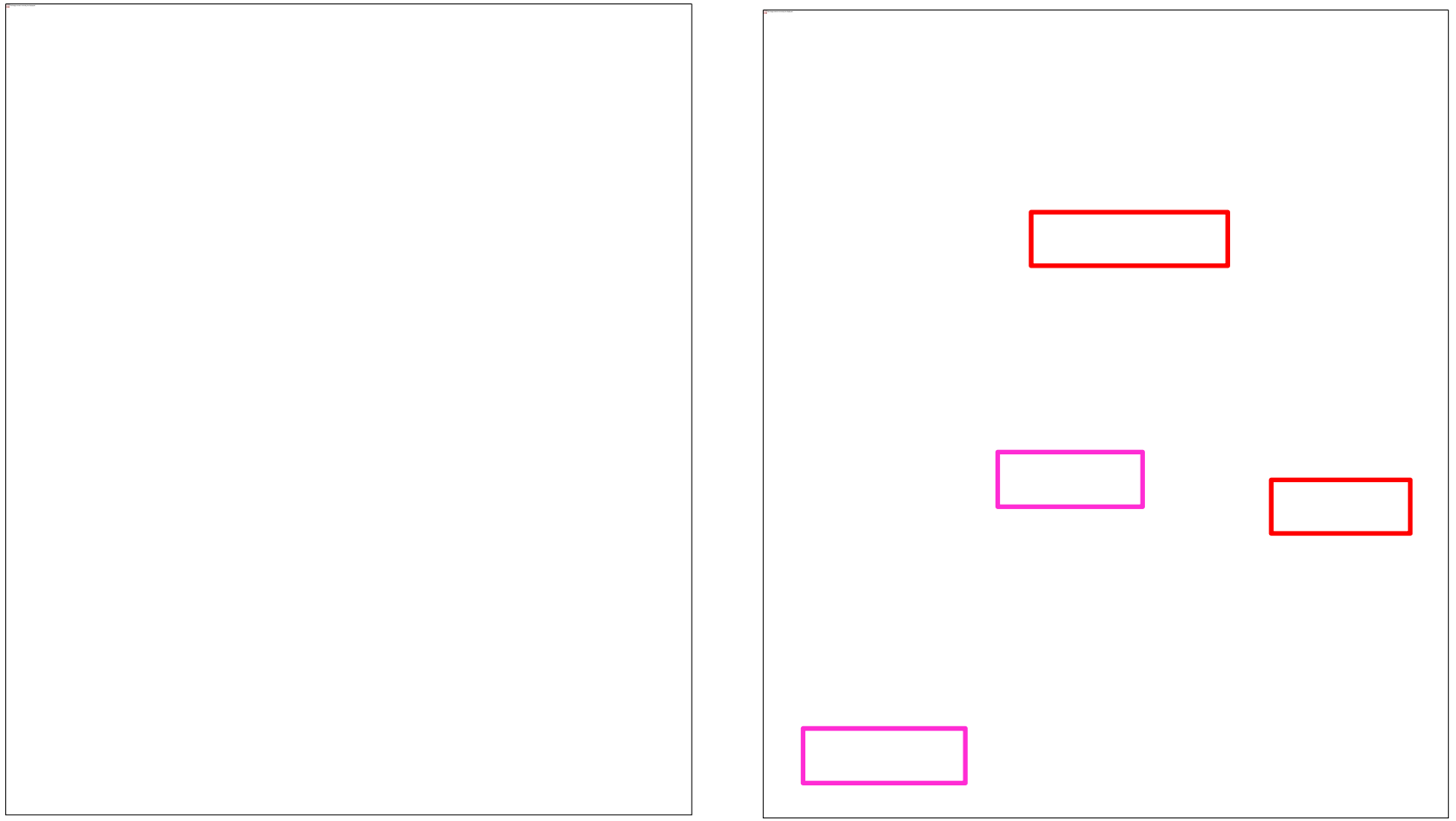
Rail infrastructure

Intermodal terminals

Source: NSW Ports

Case Study – Port Botany, Port Kembla & WestConnex

Port Kembla



Road infrastructure

Rail infrastructure

Source: NSW Ports

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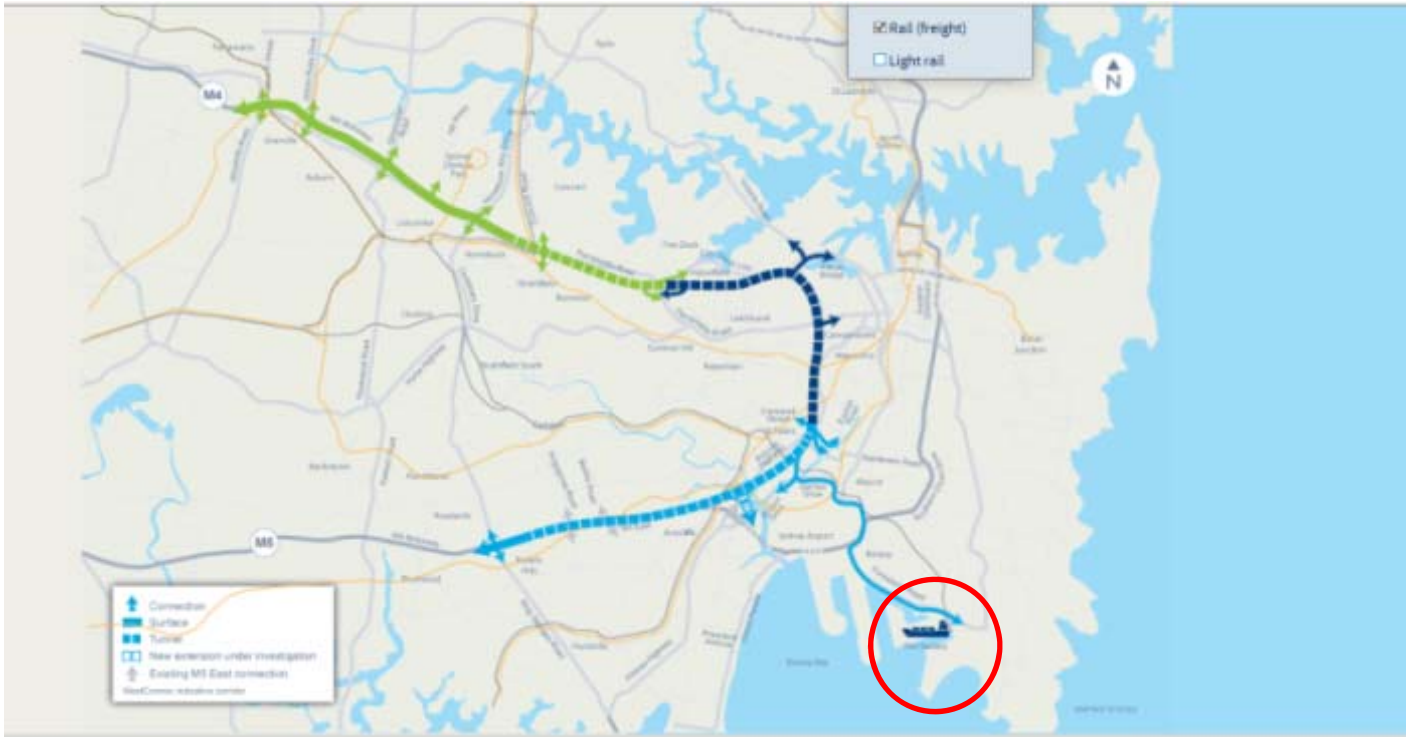
Case Study – Port Botany, Port Kembla & WestConnex



Sydney Motorway Corporation is delivering the WestConnex motorway, one of Australia's largest infrastructure projects, on behalf of the NSW Government

Source: SMC

Case Studies – Port Botany & WestConnex

The international gateways of Port Botany and Sydney Airport will accommodate much of the rapid growth forecast for containerised cargo and air travel over the next 20 years.

Significant planning has taken place to manage additional freight throughput at the port and airport.

Reasons why Sydney needs WestConnex

- Forecast growth in heavy vehicle movements across Sydney
- doubling of passenger and freight movement at Sydney Airport
- increased goods passing through Port Botany and
- population and employment growth along the M5 and M4 corridors

Case Studies – Port Botany & WestConnex

WestConnex is being delivered in three stages, over 10 years

Fit within the financial capacity of the State and Federal Governments, in partnership with the private sector

Optimise user-pays contributions to support funding in a way that is affordable and equitable

The privatisation of Port Botany and Port Kembla will deliver $5.07 billion to the NSW government, to be spent on infrastructure projects including the planned WestConnex motorway (SMH April 2013)

Conclusions

Challenges for port Infrastructure

- importance of a port master plan – establish the blueprint for infrastructure
- within & beyond the port
- various government bodies having responsibility
- cost of creating and enhancing infrastructure
- public funding & private finance
- timing

Thank You

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