



# Gladstone Queensland

Interfacing between infrastructure providers to preserve  
transport corridors for long term growth

IIR Export Infrastructure Conference  
Friday 23 February 2007



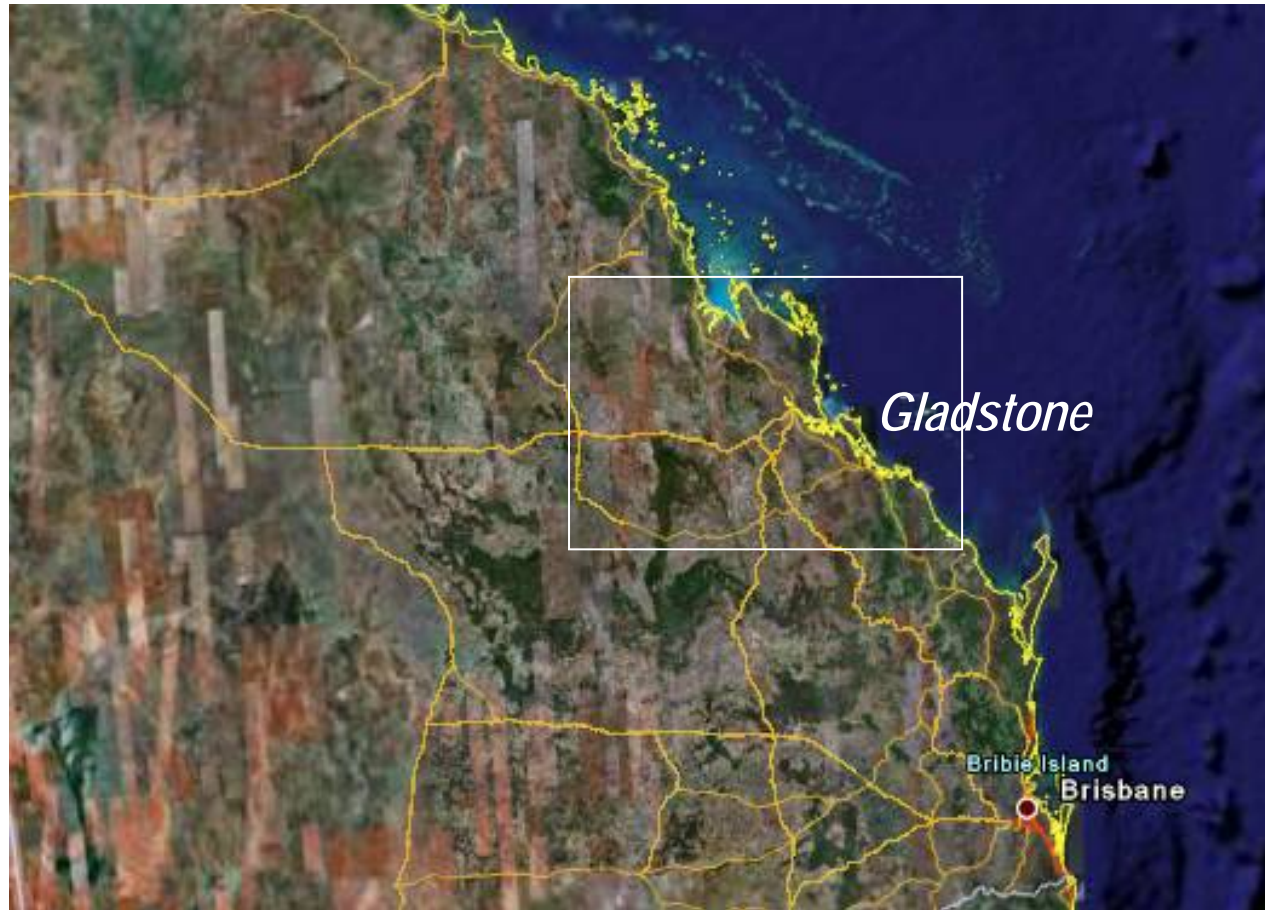
## Gladstone – land, port, rail and road infrastructure

1. The situation and growth opportunities in Gladstone
2. Cooperative brief for long term planning
3. Natural challenges in the regional terrain
4. Consultative approach to forecasts and layouts
5. Important corridors identified for the future
6. Recommendations to ensure infrastructure delivery
7. Key learning for export infrastructure development

Gladstone is a major industrial centre ...



## In Queensland



## The hub of the southern Bowen Basin coal chain



## A major industrial zone and transport hub



## Already the site of significant development



## Built around one of Australia's major coal ports



## The situation

- Gladstone is already a major industrial centre combining export infrastructure and heavy industry
- Major growth opportunities in exports including coal, and new regional industrial developments
- Fine natural harbour with development land available, but some significant geographic constraints
- History of growth planning by the agencies involved, including creation of State Development Areas
- Desire from all stakeholders for an integrated, long term plan to ensure growth potential is achieved

## Major industries and exports

### Existing industries

- Alumina refining
- Aluminium smelting
- Cement production
- Explosives and chemicals

### Future potential

- Nickel refining
- Oil shale

### Land based flows

- Major north-south links
- Regional transport hub
- Intra-regional goods
- Commuter

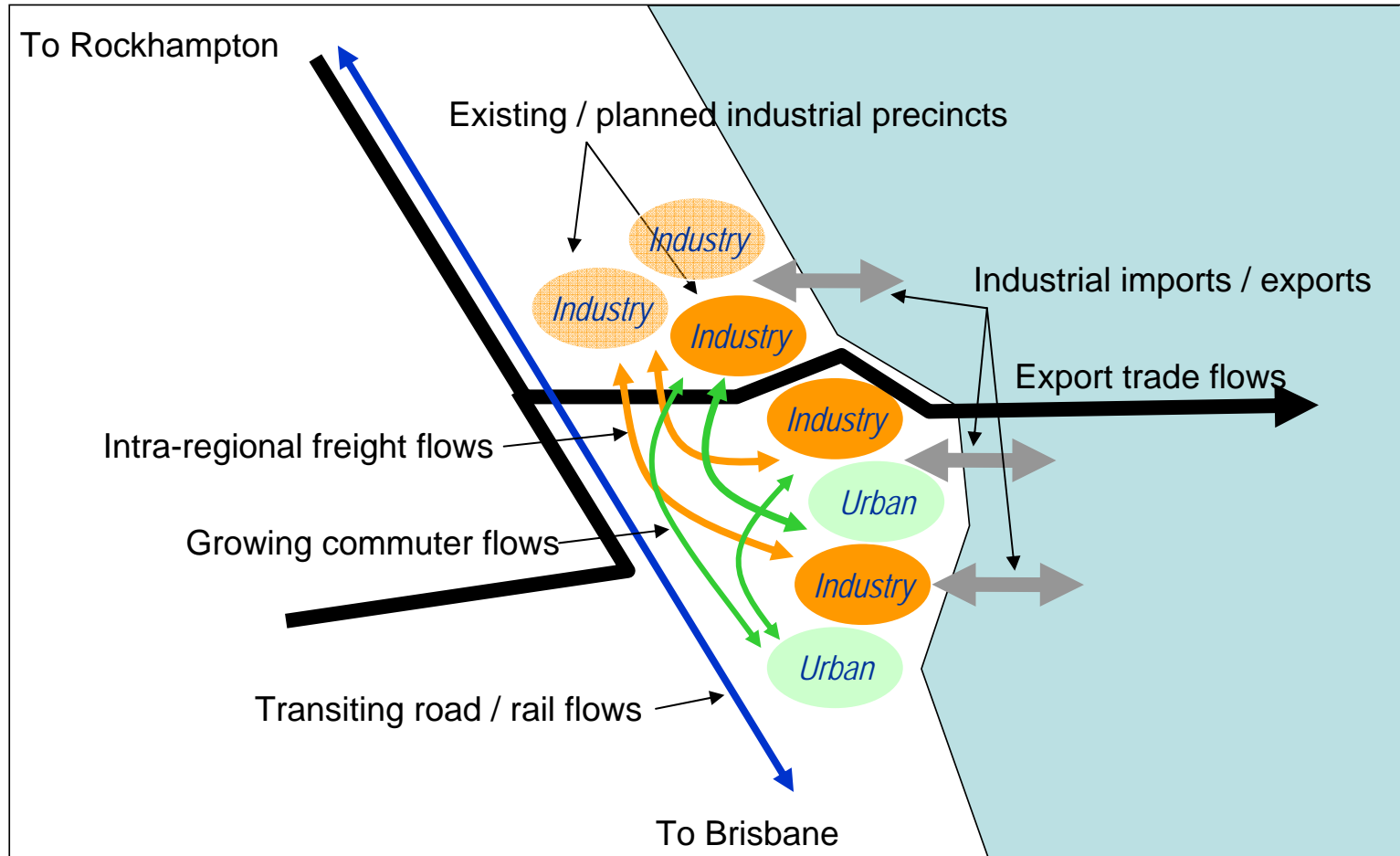
### Seaborne trades

- Coal
- Magnesia
- Bauxite / alumina
- Grain

### Future potential

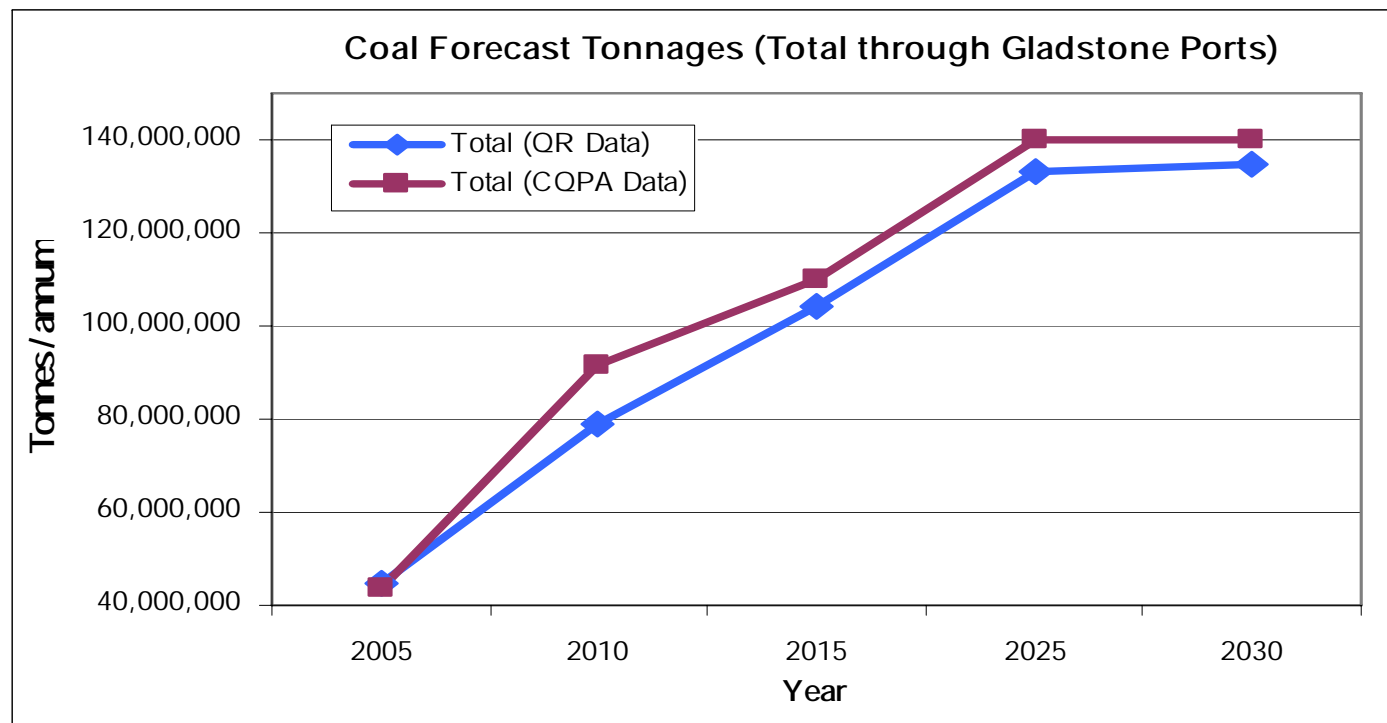
- Nickel ores
- Hydrocarbons

## Complex web of freight and people flows



## Infrastructure required for coal export growth

- Coal export growth projections vary but all are high
- CQPA / QR developing Wiggins Island Coal Terminal



## Cooperative brief

- Multiple development agencies:
  - QCG – Queensland Coordinator General
  - CQPA – Central Queensland Ports Authority
  - QR – Queensland Rail
  - QT – Queensland Transport
  - DMR – Department of Main Roads
- Multiple stakeholders – Councils, Industries etc
- Single brief to prepare a long term (30 year) infrastructure plan to support the development of the region

## The scope

Building on Connell Wagner history of engineering industrial developments and transport facilities in Gladstone, including the Wiggins Island project with Connell Hatch:

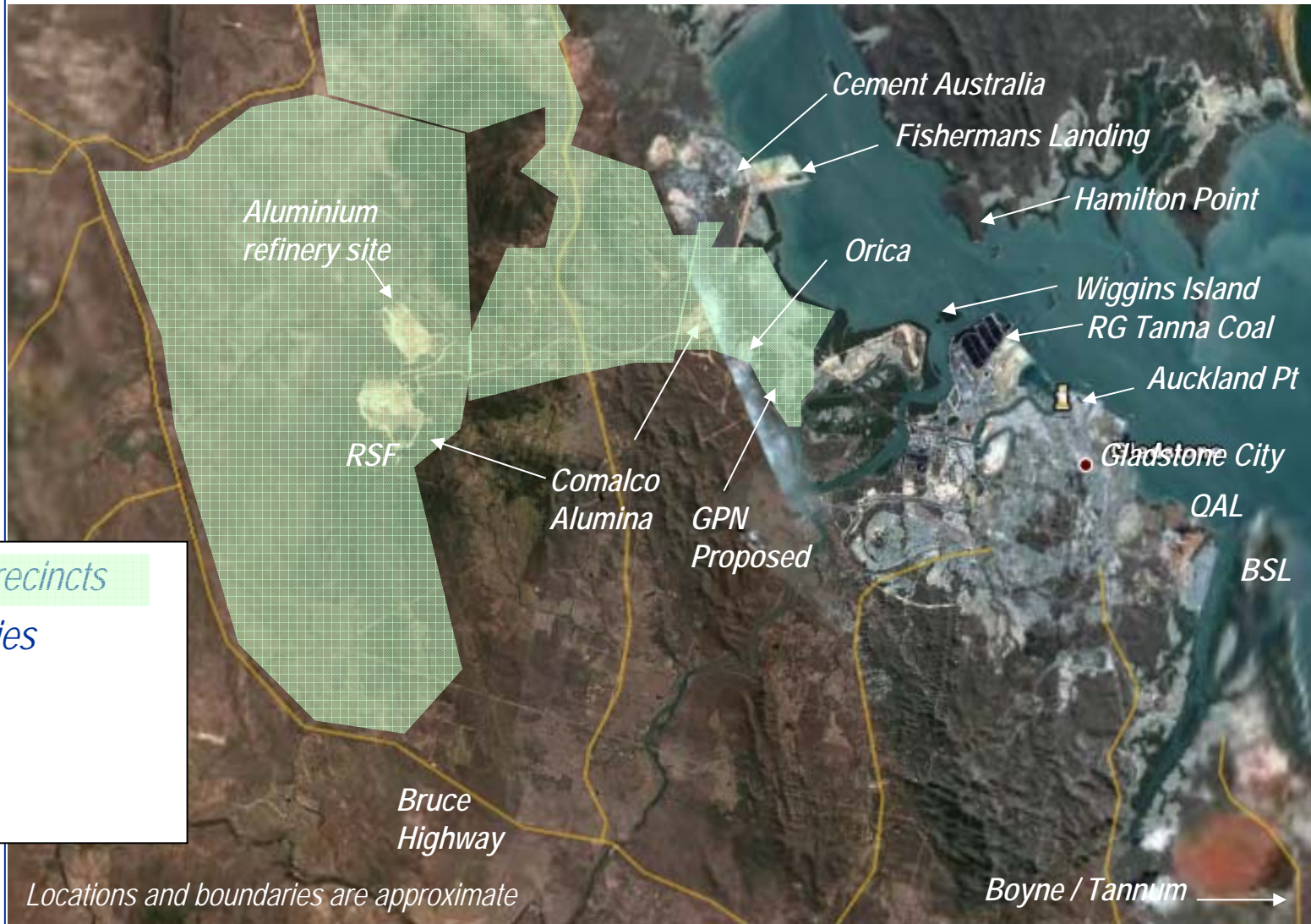
1. Review current trade and industry flows
2. Develop projections for trade and industry flows
3. Identify land transport options & spatial needs
4. Specify the infrastructure and spatial requirements
5. Identify opportunities to build on existing infrastructure
6. Identify synergies between infrastructure providers
7. Develop a program for short, medium and long term

## Growth poses both opportunities and challenges



- QCG has set aside State Development Areas (SDAs) for industrial growth;
- CQPA is developing Wiggins Island (Coal), Fishermans Landing (bulks) and potentially Hamilton Point (bulks)
- QR is upgrading its rail network and yards for growth in coal exports and through and originating general freight
- DMR and councils are upgrading the road network for commuter, intercity and local freight vehicular flows
- Multiple industry proponents are seeking access to large tracts of suitable land for developments

## The regional growth picture



## Geographic challenges – example

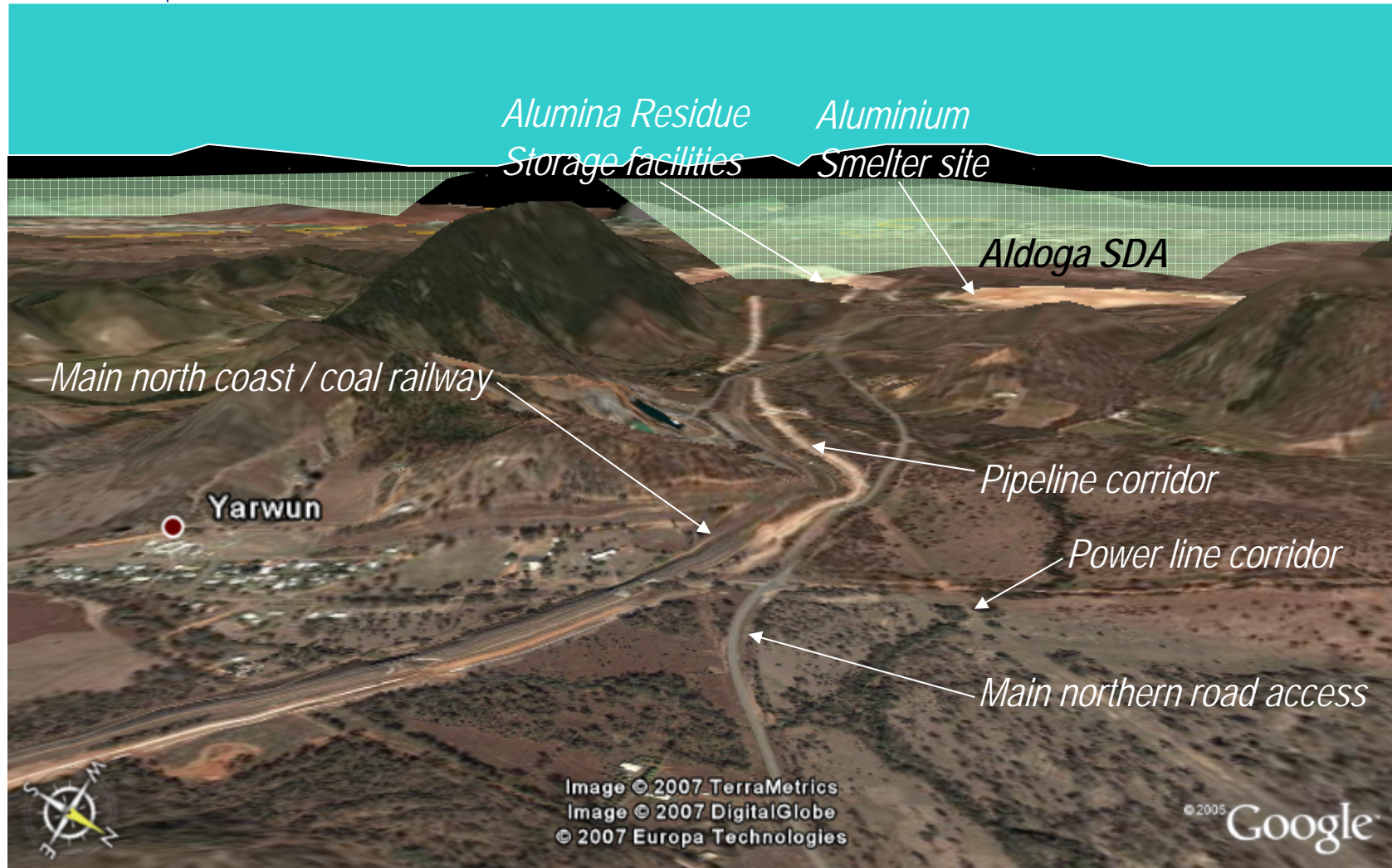


Image looking west past Yarwun, using 2:1 vertical exaggeration

## Planning challenges

- There is ample land in the SDAs, but every industry proponent wants a large, flat, easily developed land parcel next to the port, with good transport access.
- The challenge is to preserve transport corridors that make the whole SDA attractive by providing for:
  - efficient bulk material flows to and from the port
  - efficient road freight and workforce access to site
  - access to the rail network where required
  - access to water / gas pipelines where required

while preserving corridors with growth capacity for the major export and through flows.

## Demand forecasts

- Transport demand forecasts were developed consultatively with stakeholders;
  - Forecasts of material / worker flows for existing and planned industries – generally <10 years out
  - Forecasts of export trade and regional road / rail traffic growth – generally longer term
- Developing 20 year + views of traffic required a different approach:
  - Notional allocation of industry types to sub-precincts
  - Identification of major material and people movements
  - Definition of mode and scale of access to sub-precincts

## Mapping industries to sub-precincts

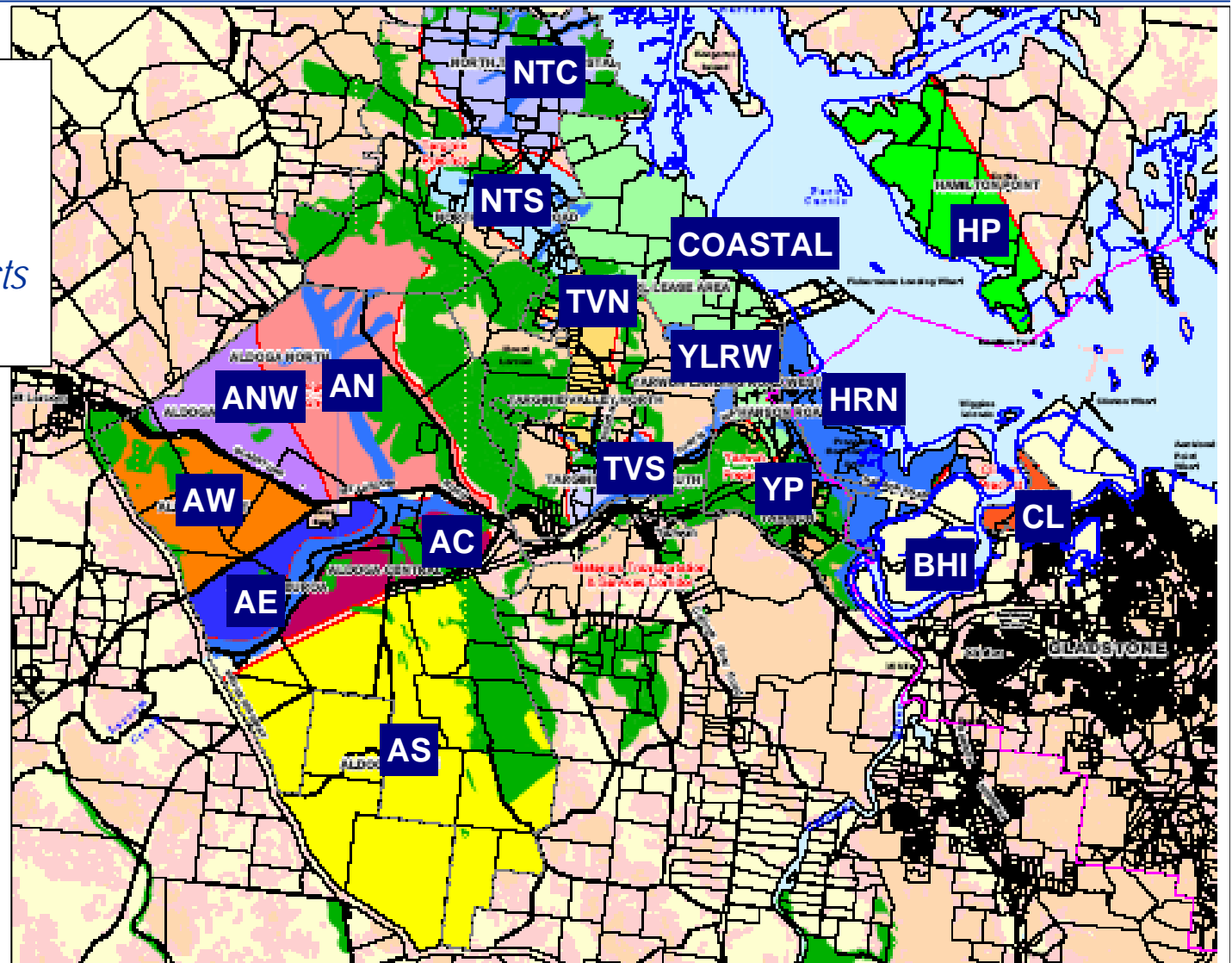
*Define industry types*

*Define typical needs*

*Define sub-precincts*

*Characterize sub-precincts*

*Map industries*

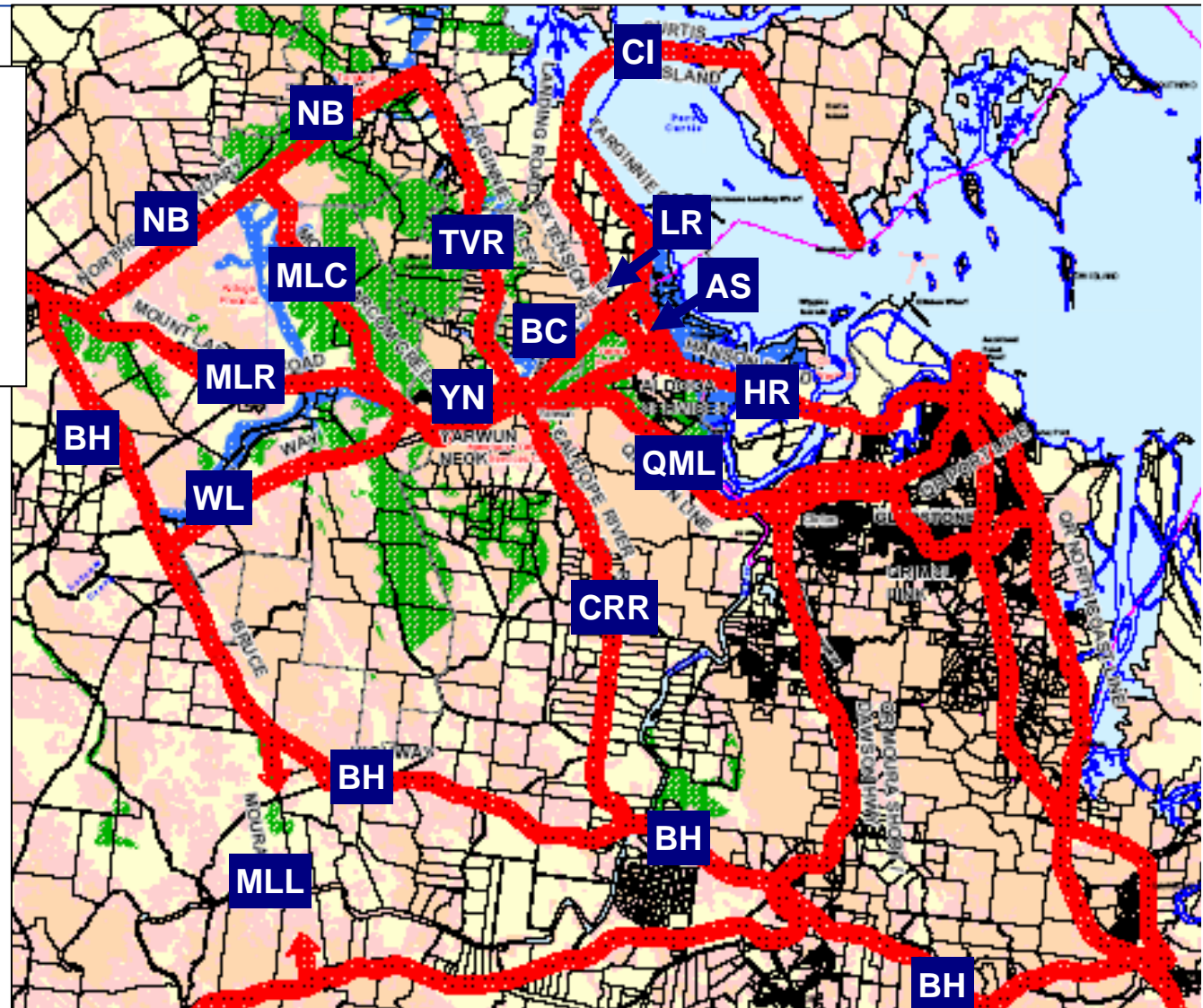


## Export and through flows

- Access for appropriate transport modes to:
  - Port Central (Auckland Pt, Barney Point)
  - Coal Port (RG Tanna, Wiggins Island)
  - Fishermans Landing (Primary non-coal bulk port)
  - Hamilton Point (potential for multiple uses)
- Accommodating rail growth:
  - Coal export flows must be efficient and cater for the service and queuing needs of rail operations;
  - Through traffic flows generally need to be segregated from coal flows to avoid congestion for both.

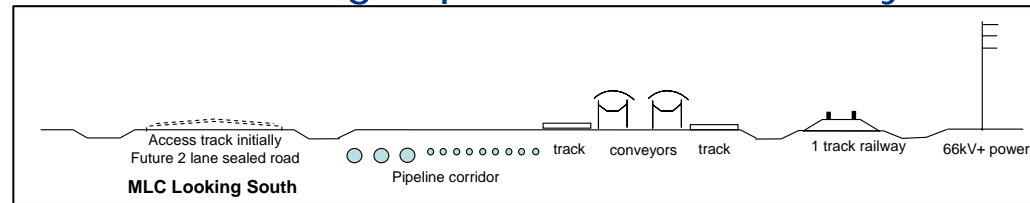
## Planning transport corridors

*Working around constraints*  
*Existing and new rail links*  
*Existing and new road links*  
*Servicing each sub-precinct*  
*Multi-modal corridors*

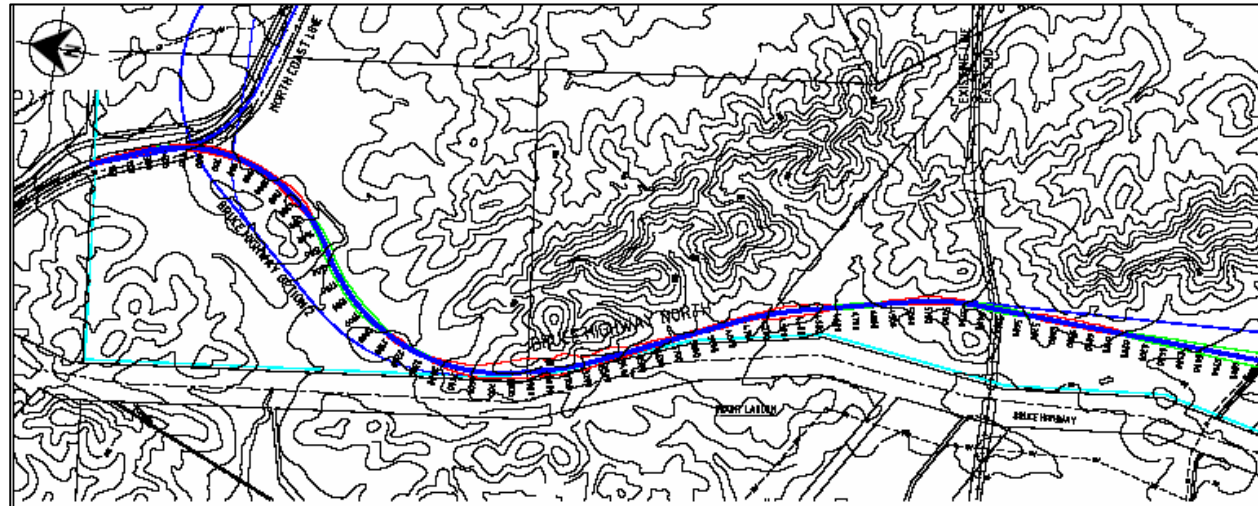


## Specifying each corridor

- Defined existing & potential needs / layout in each corridor



- Defined the alignment and segregation needs – footprint
- Alignments in digital terrain model – feasibility and cost



## Defining synergies

- Synergies at multiple levels:
  - Shared infrastructure – land / corridors / facilities
  - Project development – information & construction
  - Planning & financing
- Key synergy needs and opportunities
  - Information exchange through regional forums
  - Common data repository in the Geographic Information System and Digital Terrain Model
  - Transport Corridor Management Protocol
  - Solution development for critical areas
  - Business Planning for high priority shared infrastructure

## Recommendations

- Preservation of defined corridor network
- Refinement of SDA land usage plans
- Regime and protocols for land allocation
- Resolution of complex layout issues / bottlenecks
- Event triggered program of infrastructure works
- Business Plans for major common user infrastructure works to address demand, layout, scope, impacts, timing, planning and financing

## Layout planning priorities

- Rail yard location and development (in progress)
- Wiggins Island rail / conveyor layouts (in progress)
- Project Assembly Module (PAMs) routes (in progress)
- Residue storage facility (RSF) locations (in progress)
- Concept layout of the multi-mode corridor from the Aldoga SDA to the port
- Finalization of intermodal transfer locations
- Concepts for development of Hamilton Pt and links

# Outline program and costs

Corridor	Work Item	Term	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Callalope River Road South	Callalope River Road South	Medium term works (years 10-20)																						
	Callalope River Road North	Medium term works (years 10-20)																						
Moura Link Line (MLL)	Construction of double track railway	Short to Medium Term																						
Bruce Highway (BH1)	Construction of 2 lane sealed road	Medium to Long Term																						
Bruce Highway (BH2)	Potential subaqueous rail alignment	Short to Medium Term																						
Bruce Highway (BH3)	Road expansion from 2 to 4 lanes	2027 - 2036																						
Bruce Highway (BH4)	Road expansion from 2 to 4 lanes	2027 - 2036																						
Bruce Highway (BH5)	Road expansion from 2 to 4 lanes	2027 - 2036																						
Northern Boundary West (NBW)	Access track	Short to Medium Term																						
Northern Boundary East (NBE)	Construction of 2 lane sealed road	Medium to Long Term																						
Mount Larcom Road West (MLRW)	Construction of 2 lane sealed road	Medium to Long Term																						
Larcom Creek (LC)	Access track	Short to Medium Term																						
	Future 2 lane sealed road	Medium to Long Term																						
	Future single track railway	Medium to Long Term																						
West Link (WL)	Potential 2 lane sealed road	Medium to Long Term																						
	Formed corridor for pipelines / conveyors	Short to Medium Term																						
West Link Yard (WLY)	Rail sidings and facilities	2010																						
Targinie Valley Road (TVR)	Future 2 lane sealed road	Medium to Long Term																						
	Formed corridor for pipelines	Medium to Long Term																						
	Potential rail expansion to 3 <sup>rd</sup> track	2010																						
	Potential rail realignment	2010 - Medium Term																						
	Formed corridor for pipelines / conveyors	Short - Medium Term																						
Yarwun Neck (YN)	Potential dedicated haul / PAMS road	Short - Medium Term																						
	Road expansion from 2 to 4 lanes	Medium - Long Term																						
	Re-alignment of Targinie Valley Road	Medium - Long Term																						
	Re-development of 4 way road junction	Medium - Long Term																						
	Formed corridor for pipelines / conveyors	Short - Medium Term																						
Boat Creek (BC)	Potential dedicated haul / PAMS road	Short - Medium Term																						
	Road expansion from 2 to 4 lanes	Medium - Long Term																						
	Future 2 track railway	Medium - Long Term																						
	Possible intermodal terminal	Medium - Long Term																						
	Potential PAMS haulage road	Short to Medium Term																						
	Potential dedicated haulage road	Short to Medium Term																						
	Future duplication of the railway	Medium to Long Term																						
	Potential widening of formation	Long Term or >30 years																						
Landing Mt / Larcom Rd / Hanson Rd Jn	Concept design	Short Term																						
	Potential re-alignment around OERL pit	> 30 years																						
Landing Road (LR)	Potential PAMS haulage road	Short to Medium Term																						
	Potential dedicated haulage road	Short to Medium Term																						
Aldoga Services West (ASW)	Future duplication of the railway	> 30 years																						
	Option 1	Long term																						
	2 lane sealed road	Long term																						
	Single track railway	Long term																						
	Formed corridor for pipelines	Long term																						
	Option 2	Long term																						
	2 lane sealed road	Long term																						
	Formed corridor for pipelines / conveyors	Long term																						
Hanson Road North (HRN)	Road expansion from 2 to 4 lanes	2027 - 2036																						
Hanson Road South (HRS)	Road expansion from 2 to 4 lanes	2027 - 2036																						
QR Main Line (QML)	Expansion from 2 to 3 tracks	2010																						
Callamondah to Yarwun	Expansion from 3 to 4 tracks	Medium term																						

- Each major project in each corridor has been:
  - linked to trigger events and / or growth trend-lines;
  - timed as short / medium / long term;
  - cost estimated to order of magnitude level.

## What was learnt about export infrastructure?

- Coordination with local industrial development is essential to provide for both sets of needs
- Cooperation between Government and infrastructure providers allows all parties to take the long view
- This cooperation can yield valuable synergies in the shared use of land and in construction and planning
- The identification, preservation and management of land use is vital to effective development, requiring:
  - a long term, information centric approach
  - disciplined coordination of land use allocation