Miniports

"Taking the Port to the Product"

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The oceans cover 71% of our planet
but the 29% land area generates almost all of the global pollution

In populated areas road and rail and air transportation cause significant environmental impact and pollution

In remote areas, lack of road and rail infrastructure economically traps resources, hindering regional growth, population spread and economic development

The following Miniport strategy is a bold initiative to create export gateways in remote or regional areas, boost economic growth and encourage population spread in a sustainable and environmentally conscious manner

Miniport Strategy

"Taking the port to the product"

Miniports are common-user shallow draft harbors that can facilitate container, roro and bulk commodity exports from outlying regions, to ports or ships at anchorage, using shallow draft feeder vessels

Advantages of mini ports

- *Small environmental footprint*
- *Significantly lower CAPEX& OPEX than deep-water ports*
- *Allows regional miners 7 farmers a lower cost export chain*
- *Unlocks "stranded" mineral and agricultural resources*
- *Removes trucks from Coastal roads to main ports*
- *Reduces land logistics costs and terminal queues*

Miniport Strategy

"Regional prosperity"

Miniports can generate regional employment and training, at the same time assist in population spread

Regional Security, for emergency response

- *Mini Ports provide a cyclone proof safe haven for military, commercial and recreational vessels*
- *Roro ramps for military equipment including heavy and outsize loads*
- *A base for medical and humanitarian relief efforts*

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The History of Successful Transshipment Ports is a Simple One ……

- A point is established at the intersection of trade routes or shipping lanes
- Small vessels import from larger vessels, and export to larger vessels
- When commercial activity grows, ports are then constructed in the same area
- As ports grew in size, cities form around them…. such as…

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HONG KONG

from a small harbour transhipment centre

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SINGAPORE

from a small harbour transhipment centre

Remote Mini Ports achieve the following

- Export route of economically stranded agricultural or mineral products
- Population spread, regional jobs and training
- Reduction of road transport emissions and costs

Mini Ports proposed for logistics and transhipment have been designed around the world's *Shallowest draft and most maneuverable Feeder vessels*

This ensures the lowest dredge volume and smallest environmental footprint for a Mini Port

Stern Landing Vessel (SLV) vs Tug & Barge
Manoeuvrability data for similar dwt

87m SLV

- Off berth wind speed max 20kts (engines scissored)
- Rate of turn 120 deg/min
- Turn circle1.2L
- Channel beam 50m
- Max speed Bf4 head winds = 12knots
- Mini port Volume 330,000m^3

Tug & Barge

- Tug Draft 0.7m more than SLV
- Rate of turn 25-30 deg/min
- Turn circle 2L of both T&B Length
- Channel Beam 70m
- Max speed Bf4 head winds = 4 knots
- Mini Port Volume 1,100,00m^3

MINI PORT DIMENSIONS

<---------- SLV Data ---------->				Harbour	Minimum		Harbour
Vessel Length metres	Vessel Beam metres	Max draft 'd' metres	Cargo Dwt Tonnes	Channel Width <----- from toes ---->	Harbour diameter	Existing Land level above LAT	Volume m3 to 'd'+10% +20%cont
35	10	2	350	30	49	6.2	38,797
50	13	2.5	800	39	70	6.8	89,547
70	17	3.2	2000	51	98	7.5	203,964
70	*Tug & Barge*	*3.5*	*2200*	*72*	*210*	*7.9*	*648,471*
86	*18*	*3.5*	*3600*	*54*	*120*	*7.9*	*326,265*
86	*Tug & Barge*	*4.2*	*3600*	*80*	*258*	*8.6*	*1,107,627*
110	22	4	6000	66	154	8.4	583,960
125	26	6	15000	78	175	10.6	1,013,295

Note the much greater footprint and excavation volume required for the cheapest transhipment Capex (tug and barge solution) – in red – by 300%

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Remote area berthing using a single pile

- Vessel comes alongside the pile amidships and loops the 1.5m diameter pile with a mooring line
- With the outer starboard engine slow astern, the stern will swing round slowly, irrespective of the tidal flow, to place the SLV ramp on to the shore concrete ramp.
- The vessel will not need engine power to stay on the ramp during cargo operations
- Cargo operations, due to the resultant loads from the current being balanced against the underwater profile CLR

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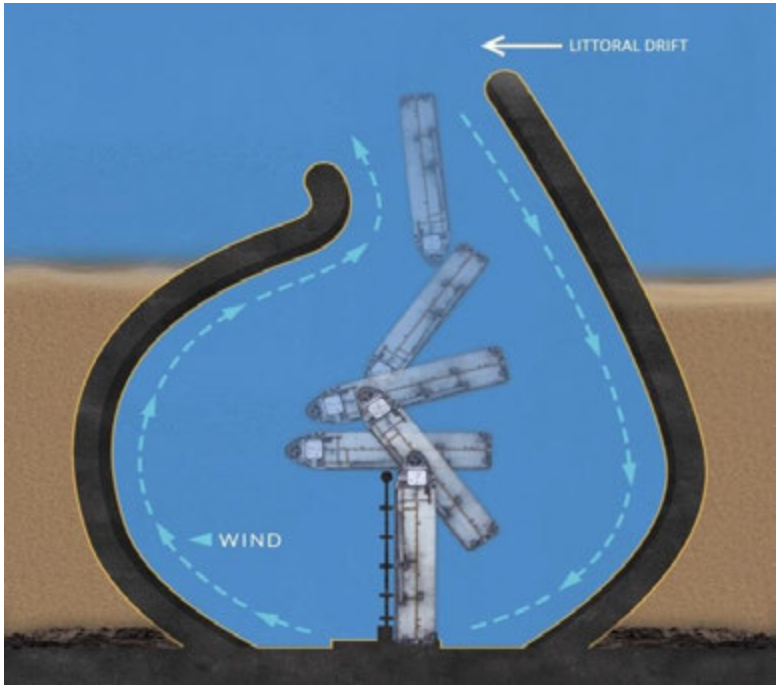
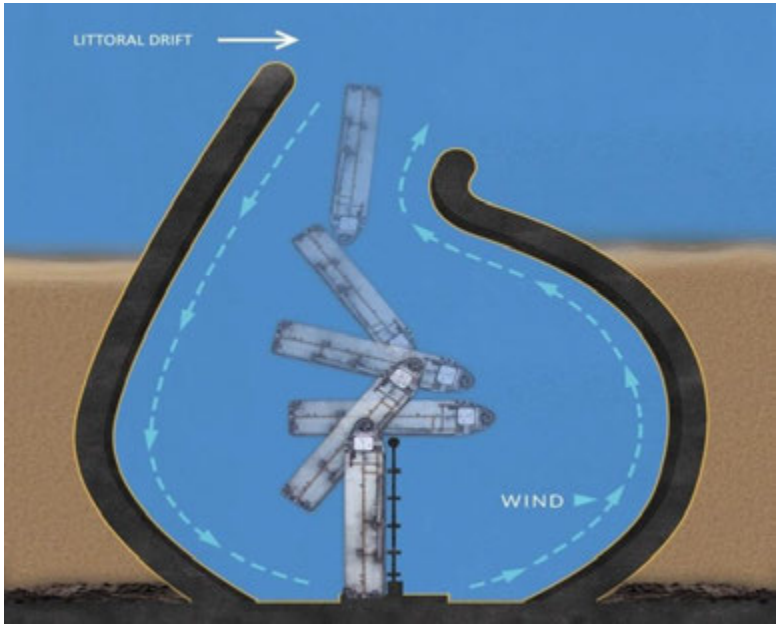


The feeder vessel in light condition …always berths with the stern to the wind

Mini Port Seawall is “Hooked” in The direction of the littoral drift



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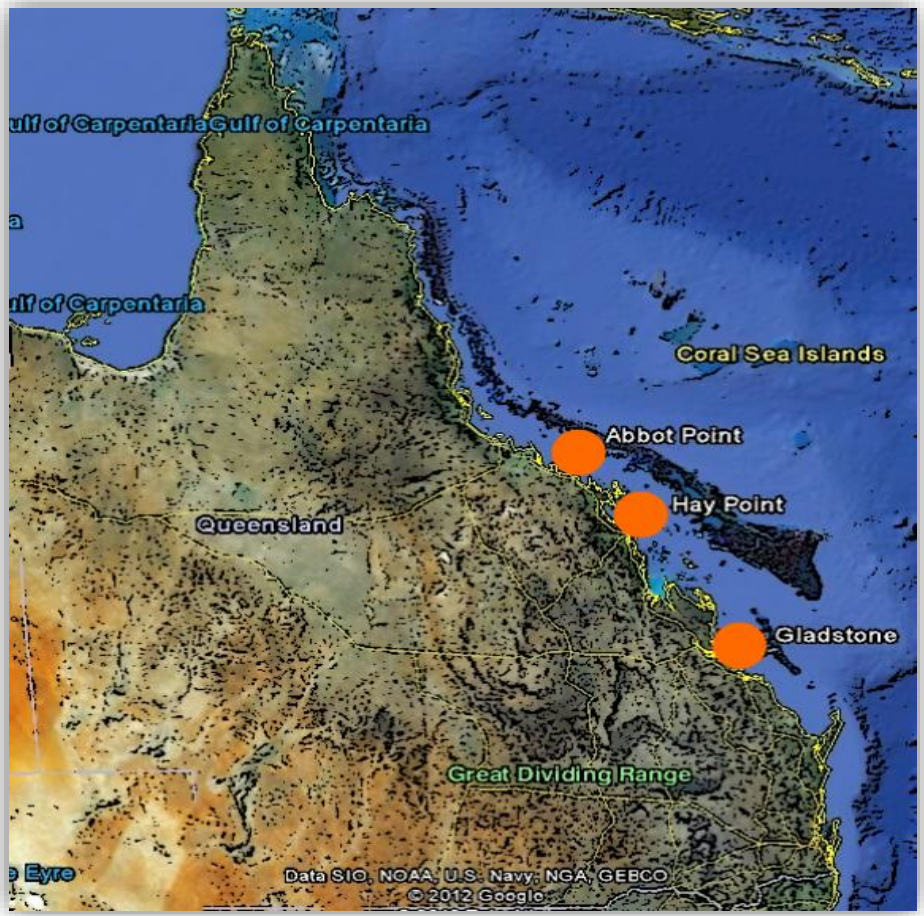
PORT INFRASTRUCTURES

Queensland For Instance, Only Has 3 Ports For Cape Size Ships (For 6,973km), And 7 Other Trading Ports
In Effect One Trading Port Every 1,000 Km On Average:

- **Abbot Point**
- **Hay Point**
- **Gladstone**

These 3 Cape Ports Are Constrained By Tide and Cape Size Ships Cannot Access Asia From These Ports Via The Shortest Route Through Torres Strait.



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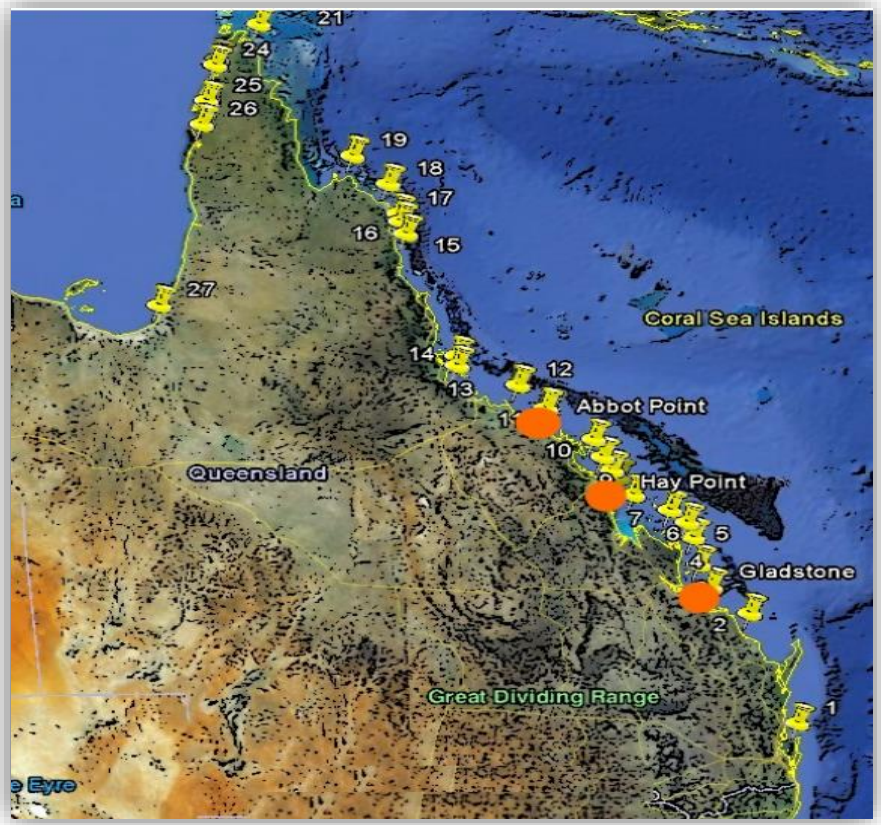
USING THE BOLD NEW MINIPORT STRATEGY

- Cape Size FHT's can safely work and sail Capes around the clock at these 27 locations
- This then averages a trading port every 258km (UK has a port every 65km)
- Including sites on the western side of Cape York, the shorter route to Asia



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Potential Miniports – Australia

- Advanced
- Feasibility Study
- Preliminary
- Transhipment Vessels
- Cape-size Ports

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BING BONG PORT, NORTHERN TERRITORY AUSTRALIA

Port and transhipment vessel designed by Sea Transport in 1988, still operating successfully exporting lead zinc

This Mini Port exported >$10.5bn of cargo in 27 years and the Government received >$550m in royalties !

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LUCKY BAY, SOUTH AUSTRALIA (320hA)

Grain Export Facility, a common user miniport with space for 2 other exporters / importers

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ENVIRONMENTAL EXCELLENCE FOR MINERALS EXPORTS

For minerals export, attached to the mini port is a negative pressure shed which the feeder vessel backs into, and is loaded. The feeder has a roller hatch preventing any dust blowing or any rainfall affecting the transportable moisture limit of the cargo being exported

- Shed throughput matches mine or farm output, to minimize waterfront infrastructure
- Each shed can throughput 5 – 25 Mtpa
- Each 3m draft feeder vessel can transfer 3.5Mtpa and each 6m draft feeder can transfer 12Mtpa

The former waterfront storage of bulk cargoes is replaced with a small footprint Transfer shed, with little or no dredging requirement.

SELF PROPELLED SELF DISCHARGING (SPSD) BULK CARRIERS

The purpose design vessels are

- materials specific for a trade with lower volumes in sheltered areas
- They are multi-screw for redundancy coverage
- The cargo is in a covered well deck, above waterline, to reduce the lift height during transshipping

Advantages of these vessels

- EPA compliant - No dust or cargo spillage
- Crew can operate cargo gear, also easy to maintain in well deck
- High load out rates from 2,000 - 7,000 TPH

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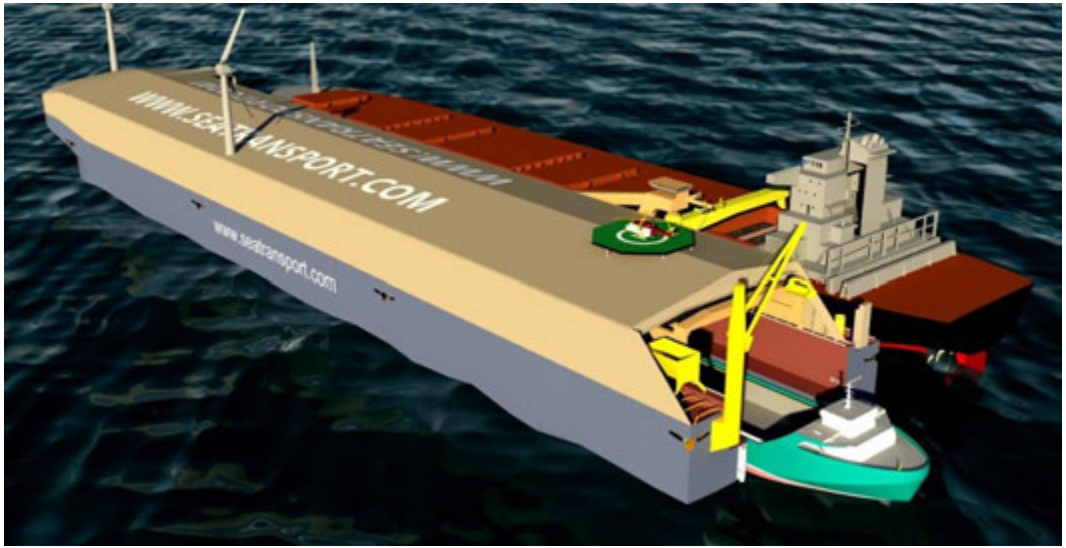
FLOATING HARBOUR TRANSHIPPERS (FHT's)

When volume increases, ungeared feeders can deliver cargo to the patented Floating Harbour Transhipper (FHT) docking stern first into the aft end, and the feeder cargo is discharged into the FHT or directly into an export vessel if one is alongside, at rates of up to 8,000 tph

Advantages of these vessels

- The FHT eliminates the need for shore storage, resulting in the smallest environmental footprint for the miniport
- EPA compliant - No dust or cargo spillage
- Crew can operate cargo gear, which is
- easy to maintain in well deck
- High load out rates up to 8,000 TPH
- FHT's vary in capacity from 35,000 to
- 250,000 tonnes depending on cargo
- and sea conditions
- Tank tested to 5m significant wave heights



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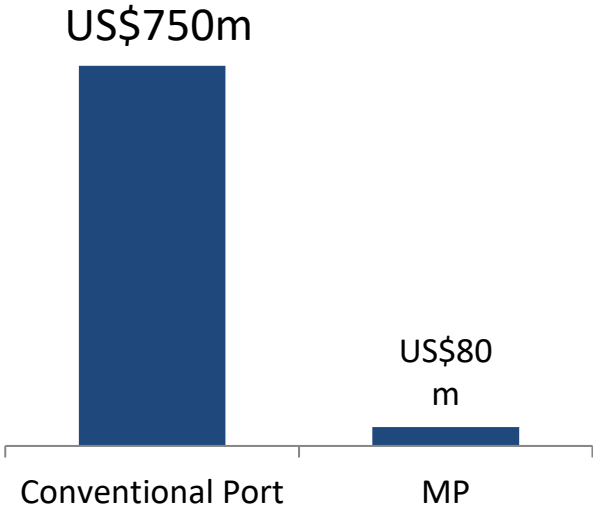
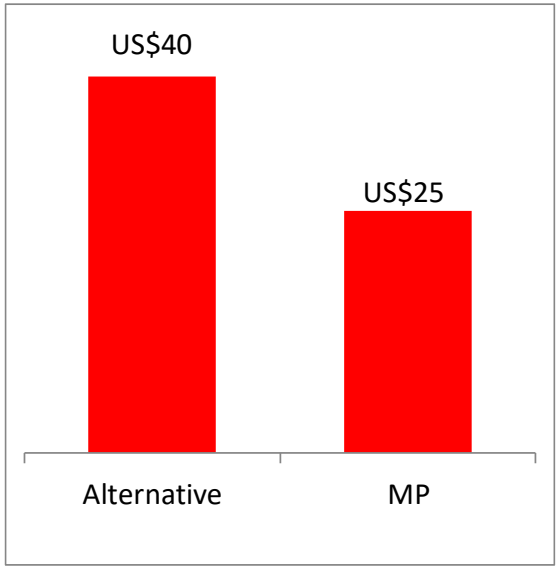
Miniports - Low Capital & Operating Cost

CAPEX Cost



OPEX Cost / Tonne



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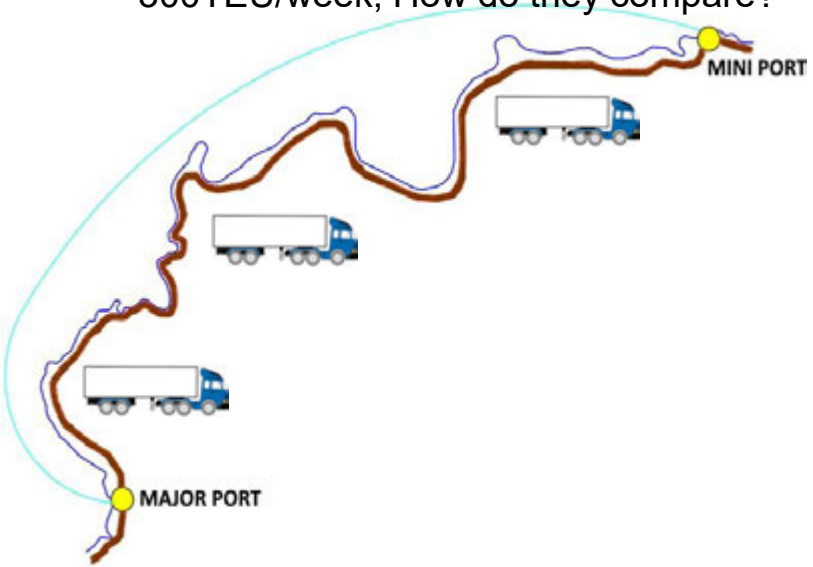
SEA vs ROAD

COASTAL SHIP ROUTE 50nm

COASTAL ROAD (TRUCK ROUTE) 100kms

300TEU/week, How do they compare?

TRANSPORT COST	$150 Per Container Return Trip & only requires 3 days per week to carry same volume as Trucks
REPAIR & MAINTENANCE	Zero
NOISE POLLUTION	Zero
FATALITIES	Zero
SERIOUS INJURIES	Zero
EMMISSIONS IMPACT	Only 4% of Trucks
TRAFFIC CONGESTION	Zero
DEMURRAGE	Zero



TRANSPORT COST	$450 Per Container Return trip
REPAIR & MAINTENANCE	Road: $14k per km/P.a. - $14m P.a.
NOISE POLLUTION	95 dBa per truck passing through pristine coastal villages
NATIONAL FATALITIES	1,200 in 2019
SERIOUS INJURIES	18,000 in 2019
EMMISSIONS IMPACT	588 kg CO2 for a Truck & Dog
TRAFFIC CONGESTION	Heavy, especially around Main Port
TRUCK DEMURRAGE	Est. $1M P.a.

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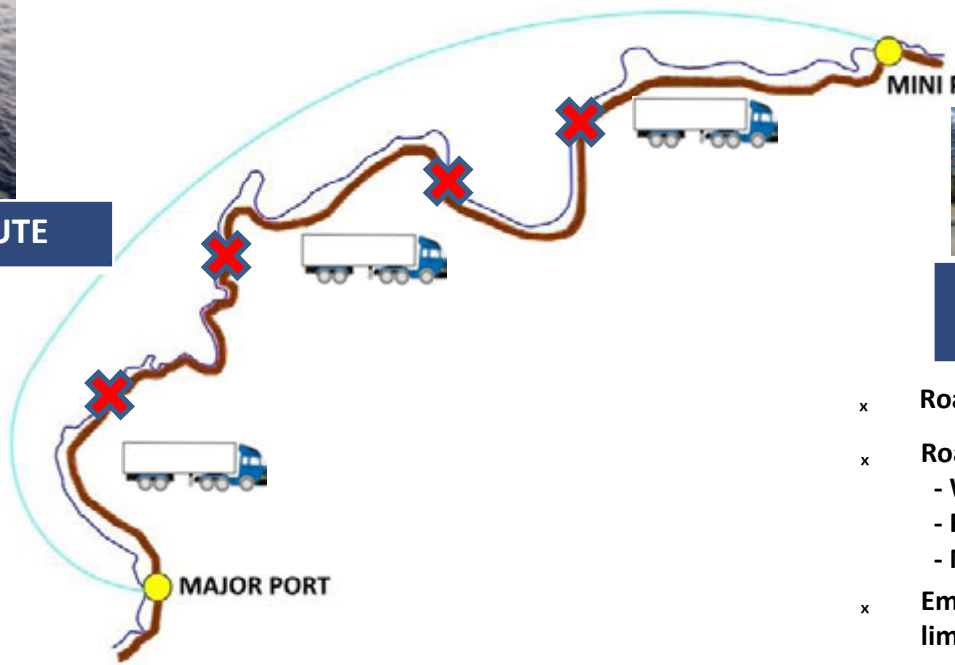
SEA VS ROAD

Emergency Response Event (Cyclone Or Tsunami)

COASTAL SHIP ROUTE

- ✓ Access to Entire Region by Mini Ports
- ✓ Emergency Response by Ocean
- ✓ Provide Significant Disaster Relief by Sea , vehicles, bulldozers, medical units etc.



COASTAL ROAD (TRUCK ROUTE)

- x Roads Washed Away
- x Roads blocked by:
  - Water
  - Fallen Trees or Telegraph Poles
  - Mudslides / Land erosion
- x Emergency Response by Road is limited or unlikely

Marks hazards on coastal road

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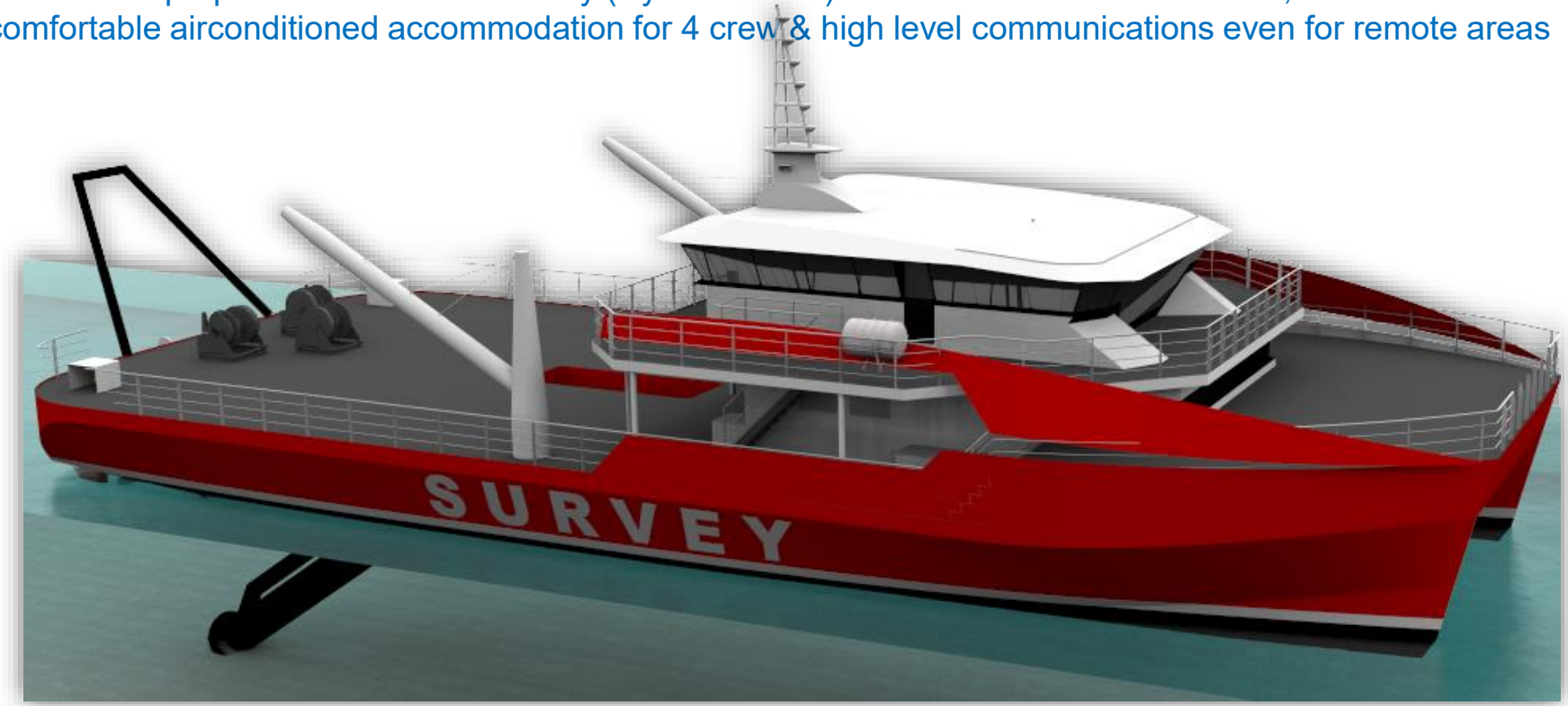
Conventional Port Transactions - Australia

	Location	Implied EV	Multiple	Comment
2013	Botany	$4.31B	25x	99 year lease
	Kembla	$0.76B		
	Brisbane	$5.24B	27x	26.67% stake
2014	Newcastle	$1.75B	27x	98 year lease
2016	Melbourne	$9.7B	74x	50 year lease

Whereas - Mini Ports are Freehold and strategically positioned for existing and future growth opportunities

Equipment for Miniport Construction and Maintenance

A 37m multi purpose shallow draft Survey (Hydro/benthic) / Seabed maintenance vessel, this vessel includes comfortable airconditioned accommodation for 4 crew & high level communications even for remote areas



Subject to Geotech results, this type of vessel could handle the majority of the miniport construction, and could maintain up to 5 mini ports in the same region

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Mini Port Economics (Example for 2Mtpa)

Basis: US$

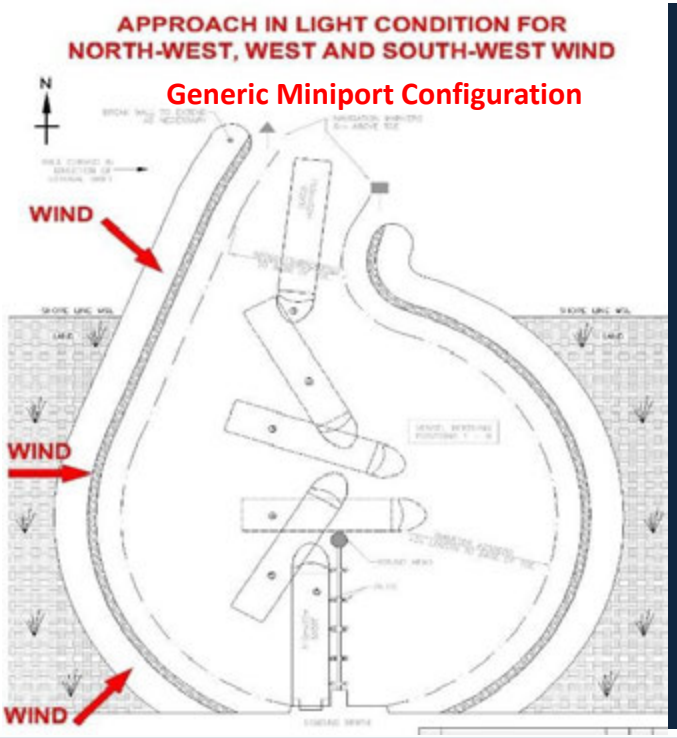
Import/Export Capacity: 2 MTPA (Minimum)
Cargo Type: Bulk / Containerized

Revenue (pa):

Port Fees ($5/t)	*$ 10M*
Transhipment Services ($20/t)	*$ 40M*
TOTAL	*$ 50M*

Capex:

Land Acquisition and permitting	*$ 10M*
Studies / Surveys / Approvals	*$ 5M*
Miniport Design & Construction	*$ 25M*
Storage Facilities	*$ 5M*
Material Handling Systems	*$ 20M*
Transhipment Vessel	*$ 30M*
Sundries	*$ 5M*
TOTAL	*$100M*



Generic Miniport Configuration

Finance:

50% Debt Funding

Equity:

Owner's Sunk Costs & Equity
Private Investors

TOTAL	*$ 50M*

Debt:

Commercial Banks
Debt Investors (Managed Fund)
Senior Debt

TOTAL	*$50M*

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CONCLUSION

Taking the disruptive “Port to the Product” approach

- This paradigm shift allows regional farmers and miners to access Global Markets on a competitive basis, assisting a regional population spread, jobs and training.
- Releases products that are commercially stranded by high land logistics costs and high established port costs
- Relieves congested road and rail networks
- Reduces road and rail maintenance costs
- Provides improved defence and emergency response capabilities
- Makes better use of uncongested waterways with significantly lower
- emissions utilising direct shipping or transhipment solutions

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Miniports

a compelling environmental and operational solution for the 21st century

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