The Impact of Increasing Vessels Size and Alliance on Port Operations in Indian Ocean

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10th Indian Ocean Ports & Logistics 2016

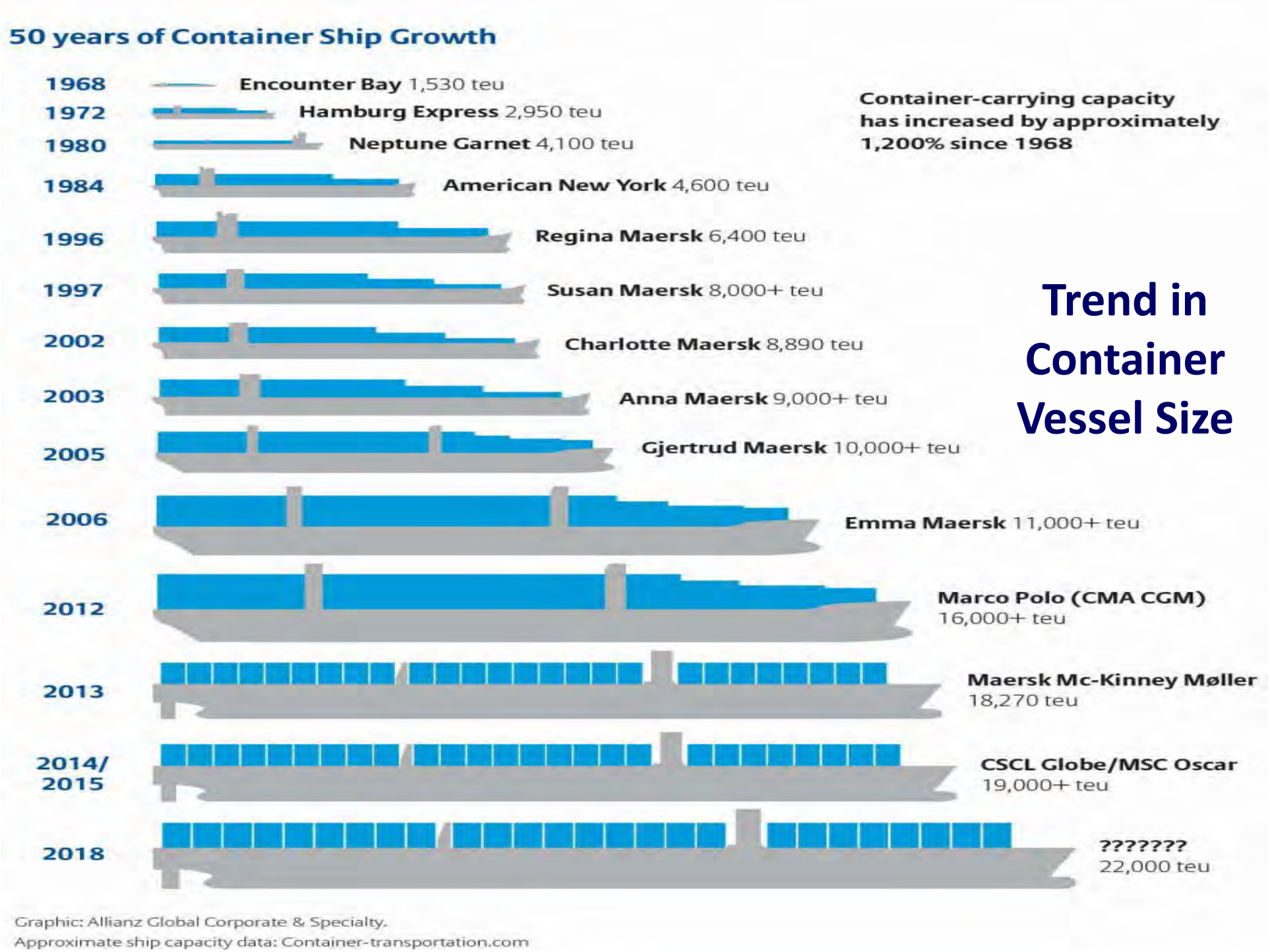
SEM Nordev, Reunion Island

Thursday 28 January 2016

The Chartered Institute of Logistics and Transport Mauritius

Agenda

- Trends in the Size of Vessels
- Impacts and Challenges
- The Case at Port Louis
- Conclusions


50 years of Container Ship Growth
1968
Encounter Bay 1,530 teu
1972
Hamburg Express 2,950 teu
1980
Neptune Garnet 4,100 teu
Container-carrying capacity has increased by approximately 1,200% since 1968
1984
American New York 4,600 teu
1996
Regina Maersk 6,400 teu
1997
Susan Maersk 8,000+ teu
2002
Charlotte Maersk 8,890 teu
2003
Anna Maersk 9,000+ teu
2005
Gjertrud Maersk 10,000+ teu
Trend in Container Vessel Size
2006
Emma Maersk 11,000+ teu
2012
Marco Polo (CMA CGM) 16,000+ teu
2013
Maersk Mc-Kinney Møller 18,270 teu
2014/ 2015
CSCL Globe/MSC Oscar 19,000+ teu
2018
??????? 22,000 teu
Graphic: Allianz Global Corporate & Specialty.
Approximate ship capacity data: Container-transportation.com

Containership Market in 2016

- Increasingly overcapacity of 10% in 2016
- Last time overcapacity during the global financial crisis in 2009
- Results:
  - Delay deliveries of some ships in order books,
  - A small number of orders could be cancelled altogether.
  - Sagging demand will force owners to de-commission elderly ships
  - Average age of ships sent for breaking is expected to be rather low

Source: www.joc.com/maritime-news

Cellular Fleet Delivery

- **Vessel deliveries: 1.35 Mteu in 2016 (record of 1. 72 Mteu in 2015)**

	2016 deliveries		2017 deliveries		2018 deliveries		2019 deliveries	
TEU nominal	ships	teu	ships	teu	ships	teu	ships	teu
18000-21000	13	250 830	25	504 288	29	555 808	7	130 300
13300-17999 *	21	304 036	19	267 000	14	196 850	2	28 000
10000-13299	27	293 950	27	306 680	16	202 400	2	23 600
7500-9999	33	306 405	2	18 800				
5100-7499	1	6 882	6	35 210	6	31 770	2	10 590
4000-5099	2	8 000	4	16 000				
3000-3999	7	25 178	11	40 400	6	22 400		
2000-2999	33	79 621	30	77 753	18	49 936	3	8 400
1500-1999	33	58 049	20	36 048	17	30 228		
1000-1499	19	20 947	20	24 200	7	9 420		
500-999	2	1 143						
100-499								
TOTAL	191	1 355 041	164	1 326 379	113	1 098 812	16	200 890

Source: Alphaliner Jan 2016

Existing Fleet

- Current idle container ship fleet: 1.35 M TEUs (6.8 % of the total fleet) requiring a few more years before the supply-demand imbalance recedes
- 2016 order book represents 20% of existing fleet

CELLULAR	01 January 2016 - Existing					01 January 2016 - Orderbook					
Size ranges	All		Of which chartered fm NOO			All		Of which chartered fm NOO			O / E
TEU	ships	teu	ships	teu	% Cht	ships	teu	ships	teu	% Cht	
18000-20000	35	656 524	6	115 344	17,6%	74	1 441 226	31	587 568	40,8%	219,5%
13300-17999	109	1 572 072	40	579 347	36,9%	56	795 886	36	507 428	63,8%	50,6%
10000-13300	193	2 278 542	83	985 824	43,3%	75	859 630	38	407 530	47,4%	37,7%
7500-9999	454	3 985 032	218	1 910 205	47,9%	35	325 205	30	278 205	85,5%	8,2%
5100-7499	510	3 148 660	262	1 614 985	51,3%	15	84 452	15	84 452	100,0%	2,7%
4000-5099	735	3 335 118	405	1 838 308	55,1%	6	24 000	2	8 000	33,3%	0,7%
3000-3999	262	908 010	151	527 372	58,1%	24	87 978	6	22 042	25,1%	9,7%
2000-2999	648	1 639 599	476	1 205 262	73,5%	84	215 710	38	94 014	43,6%	13,2%
1500-1999	581	992 755	304	521 711	52,6%	70	124 325	49	87 450	70,3%	12,5%
1000-1499	696	807 604	412	482 817	59,8%	46	54 567	23	30 911	56,6%	6,8%
500-999	748	556 171	429	326 681	58,7%	2	1 143	0	0	0,0%	0,2%
100-499	182	57 978	38	12 690	21,9%	0	0	0	0		
TOTAL	5 153	19 938 065	2 824	10 120 546	50,8%	487	4 014 122	268	2 107 600	52,5%	20,1%

Source: Alphaliner Jan 2016

Perspectives of 2016

- Demand side - traditional surge in volumes before Chinese New Year yet to happen
- 2016 will have lower rates on average than 2015.
- Price crude $110 a barrel in 2012 slumped to under $48 in Oct 2015
- The rush to order ever-larger ships slowing because they can't operate in many trades, including routes to Africa

Source: Drewry Research

Fleet Forecast

Fleet as at :	10000+ TEU vessels		2016		2017		2018		2019		Rise p.a. (3 years)
TEU nominal	No. of vessels		398		469		528		539		teu terms
18000-21000	Total TEUs		5.356M		6.434M		7.389M		7.571M		44,2%
13300-17999 *											14,2%
10000-13299	% of Total		26%		29%		32%		33%		10,6%
7500-9999	454	3 985 032	487	4 291 437	489	4 310 237	489	4 310 237	489	4 310 237	2,6%
5100-7499	510	3 148 660	511	3 155 542	517	3 190 752	523	3 222 522	525	3 233 112	0,8%
4000-5099	735	3 335 118	737	3 343 118	741	3 359 118	741	3 359 118	741	3 359 118	0,2%
3000-3999	262	908 010	269	933 188	280	973 588	286	995 988	286	995 988	3,1%
2000-2999	648	1 639 599	681	1 719 220	711	1 796 973	729	1 846 909	732	1 855 309	4,0%
1500-1999	581	992 755	614	1 050 804	634	1 086 852	651	1 117 080	651	1 117 080	4,0%
1000-1499	696	807 604	715	828 551	735	852 751	742	862 171	742	862 171	2,2%
500-999	748	556 171	750	557 314	750	557 314	750	557 314	750	557 314	0,1%
100-499	182	57 978	182	57 978	182	57 978	182	57 978	182	57 978	
TOTAL	5 153	19 938 065	5 344	21 293 106	5 508	22 619 485	5 621	23 718 297	5 637	23 919 187	6,0%
TOTAL after Exp. Scrap/Slip	5 153	19 938 065	5 192	20 843 106	5 268	22 019 485	5 281	22 868 297	5 197	22 819 187	4,7%
Rise 12 months	2015 >	8,5%	2016 >	4,5%	2014 >	5,6%	2017 >	3,9%	2018 >	-0,2%	

Source: Alphaliner Jan 2016

Acquisitions & Alliances

- Bigger container ships goes hand in hand with consolidation of the container shipping sector.
- Maritime sector - dominated by economies of scale
- Bigger firm size needed to afford bigger ships and fill them.
- Result: mergers and acquisitions and alliances.

Creation of Alliances

Creation of larger shipping line has:

- **Enabled the deployment of ever larger container ships**
- **Increased the challenges on global container terminal industry**
- **Placed significantly greater demands on ports and terminals**
- **Driven up operating costs and capital expenditure requirements**

Source: Drewry Research

Challenges for Owners/ Shippers

- **Owners - savings of bigger vessels dependent on extent ships are filled.**
- **Cost savings decreasing owing to low slow growth of world containerized seaborne trade, massive ordering & oversupply of new mega ships**
- **Shippers - prefer frequent/ reliable maritime transport links, but bigger ships reduce service frequency (service & cargo concentration)**
- **Mega ships reduced choice and limited supply chain resilience**
- **Hedge risks by parceling out goods in different ships not all in one ship.**

Source: The Impact of Mega Ships © OECD/ITF 2015

Impacts on Ports

- The emergence of such a hub-and-spoke network is connected to increasing vessel size
- Need expansion of infrastructure (bridge height, river width/depth, canals/locks) for higher peaks related to mega ships, more yard and berth capacity
- Depth depends on the tides and the load factor of the vessel
- Load factor depends on route configuration (port location in the vessel rotation)
- Dredging: costly/ sensitive issue with local opposition related to perceived damage to the environment and eco-systems.

Port Infrastructure

- Air-draft: stacking more containers on deck, which diminishes the possibility to access terminals located behind bridges
- Quay walls: heightened, strengthened and lengthened to accommodate the largest ships and their exercised forces when berthed and moored.
- More quay wall bearing capacity to support higher/ larger cranes, container handling equipment and Stacks
- Impact of tug assistance within navigation channels
- Resulting effect on the two way traffic

Bigger ships Bigger peaks

- This is the result of decline of call frequency (less weekly services) and higher call size: more cargo loaded and unloaded per ship in the same port.
- No. of container moves increases with larger ships.
- Peaks in (a) ship to shore handling, (b) yard operations and (c) for the interface between the yard and hinterland transport
- Larger ships pose challenges to cranes in terms of outreach and height

Challenges for Terminal operators

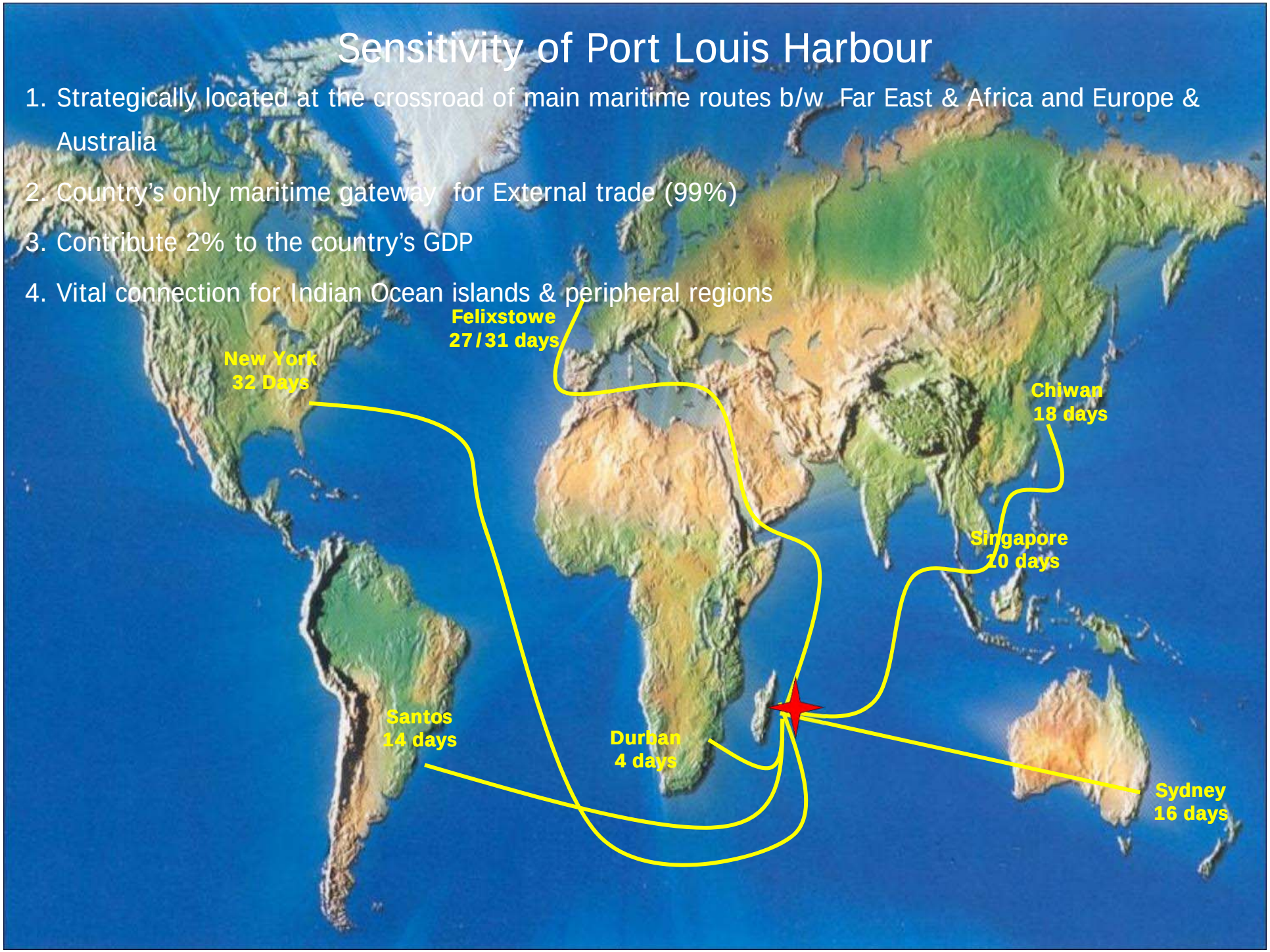
- Mega-ships require min crane width for handling 23 container rows
- Investing in super-post-Panamax cranes to expedite handling operations.
- Short port-stay requires higher berth productivity
- Assuming constant crane productivity in the short term, achieve higher berth productivity by deploying
  - more cranes,
  - more yard equipment,
  - to avoid terminal congestion.

Port Louis Harbour

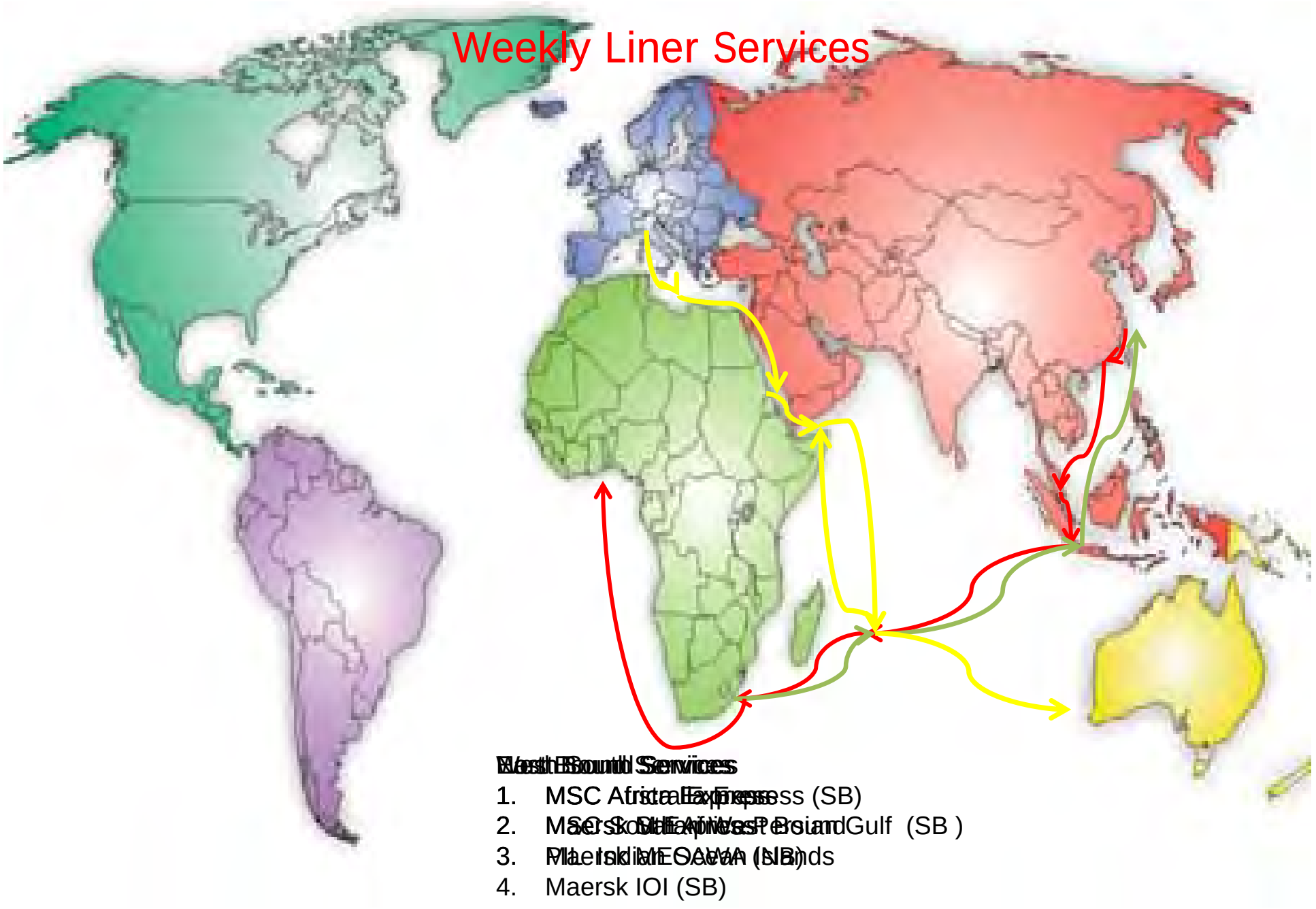
- Scarcity of land in the Port Area and the Proximity of Residential Areas.
- Total area within Port Limits – 330 ha
- Water Front and proposed waterfront project: 47 ha
- Area for port operation and port based industries:233 Ha
- Area of port Terminals I, II & III : 50 ha

Sensitivity of Port Louis Harbour

1. Strategically located at the crossroad of main maritime routes b/w Far East & Africa and Europe & Australia
2. Country's only maritime gateway for External trade (99%)
3. Contribute 2% to the country's GDP
4. Vital connection for Indian Ocean islands & peripheral regions

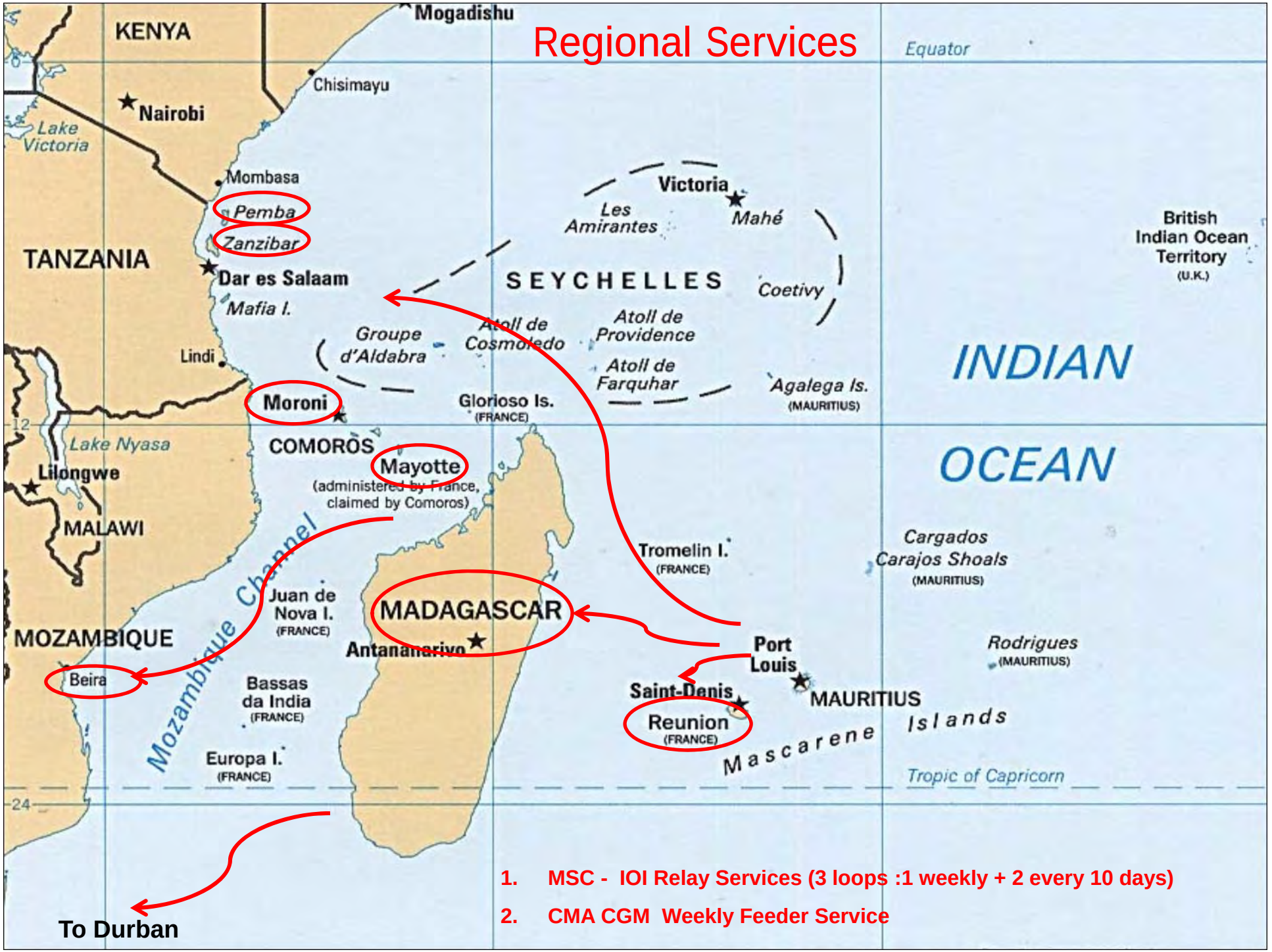


Weekly Liner Services

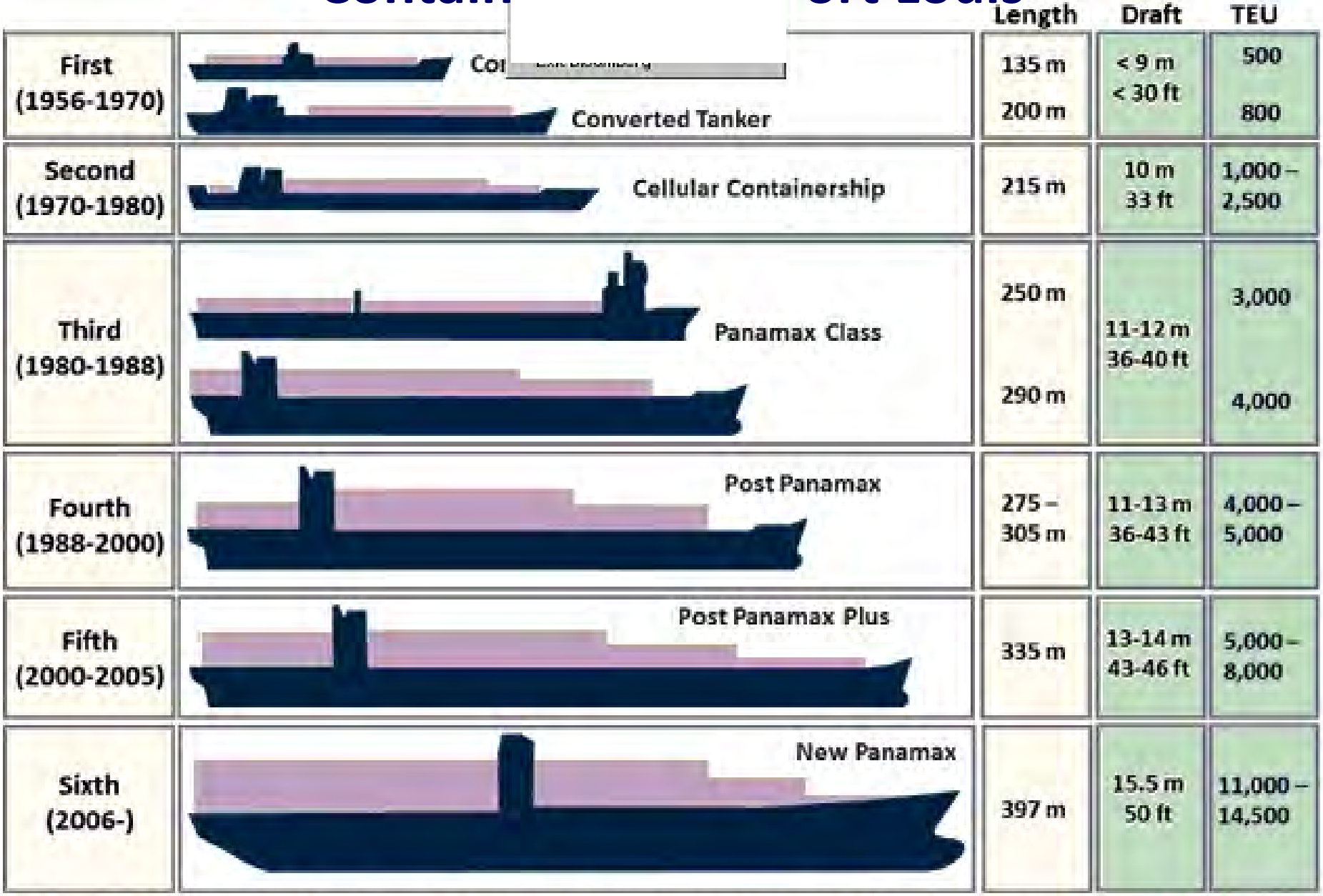


Westbound Services

1. MSC Africa Express (SB)
2. Maersk Sealand Persian Gulf (SB)
3. Maersk MEGAWA (SB)
4. Maersk IOI (SB)


Regional Services
KENYA
Mogadishu
Chisimayu
Nairobi
Lake Victoria
Mombasa
Pemba
Zanzibar
TANZANIA
Dar es Salaam
Mafia I.
Lindi
Moroni
Lake Nyasa
Lilongwe
MALAWI
COMOROS
Mayotte
(administered by France, claimed by Comoros)
Mozambique Channel
Juan de Nova I.
(FRANCE)
MADAGASCAR
Antananarivo
MOZAMBIQUE
Beira
Bassas da India
(FRANCE)
Europa I.
(FRANCE)
Equator
Victoria
Les Amirantes
Mahé
SEYCHELLES
Coetivy
Groupe d'Aldabra
Atoll de Cosmoledo
Atoll de Providence
Atoll de Farquhar
Glorioso Is.
(FRANCE)
Agalega Is.
(MAURITIUS)
British Indian Ocean Territory
(U.K.)
INDIAN
OCEAN
Tromelin I.
(FRANCE)
Cargados Carajos Shoals
(MAURITIUS)
Rodrigues
(MAURITIUS)
Port Louis
Saint-Denis
Reunion
(FRANCE)
MAURITIUS
Islands
Mascarene
Tropic of Capricorn
12
24
To Durban
1. MSC - IOI Relay Services (3 loops :1 weekly + 2 every 10 days)
2. CMA CGM Weekly Feeder Service

Containerships at Port Louis



Six Generations of Containerships Since the beginning of containerization in the mid 1950s, containerships undertook six general waves of changes, each representing a generation of containership:

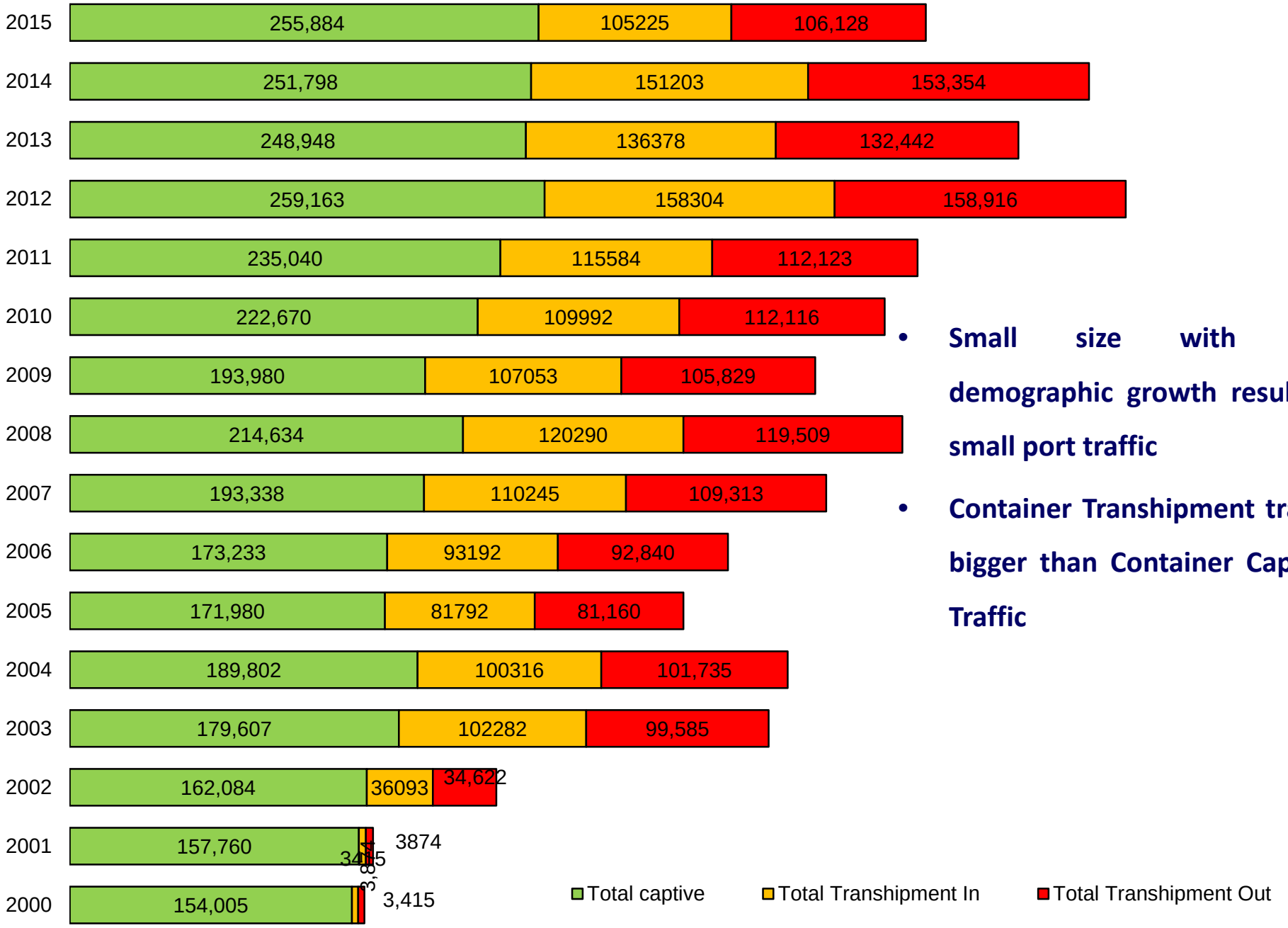
Situation in South West Indian Ocean

- Introduction of one megaship requires additional investment because of cascading effects in our region
- 11,000+ TEUs vessels already mobilised in South West Indian Ocean ahead of development in the region.
- But calling with a reduced draft as most ports do not have dredged depth of more than -14.0 m
- Capacity of these large vessels not optimised and no benefits from economies of scale
- Coega: only port capable to accommodate the 11,000+ TEUs vessels

Limitations at Port Louis

- Dredged depth in the navigational channel: -14.5 m
- Dredged depth at the Mauritius Container Terminal quays: -14.0 m
- 5 Post Panamax Ship-to Shore Cranes having an outreach of 16 containers across only but 8000+ TEUs vessels have 17 containers across.
- Restricted stowage of containers to avoid turning of vessels
- With the ongoing berth extension project, limitations in accommodating big ships of LOA 300+ m

Container Throughput at Port Louis



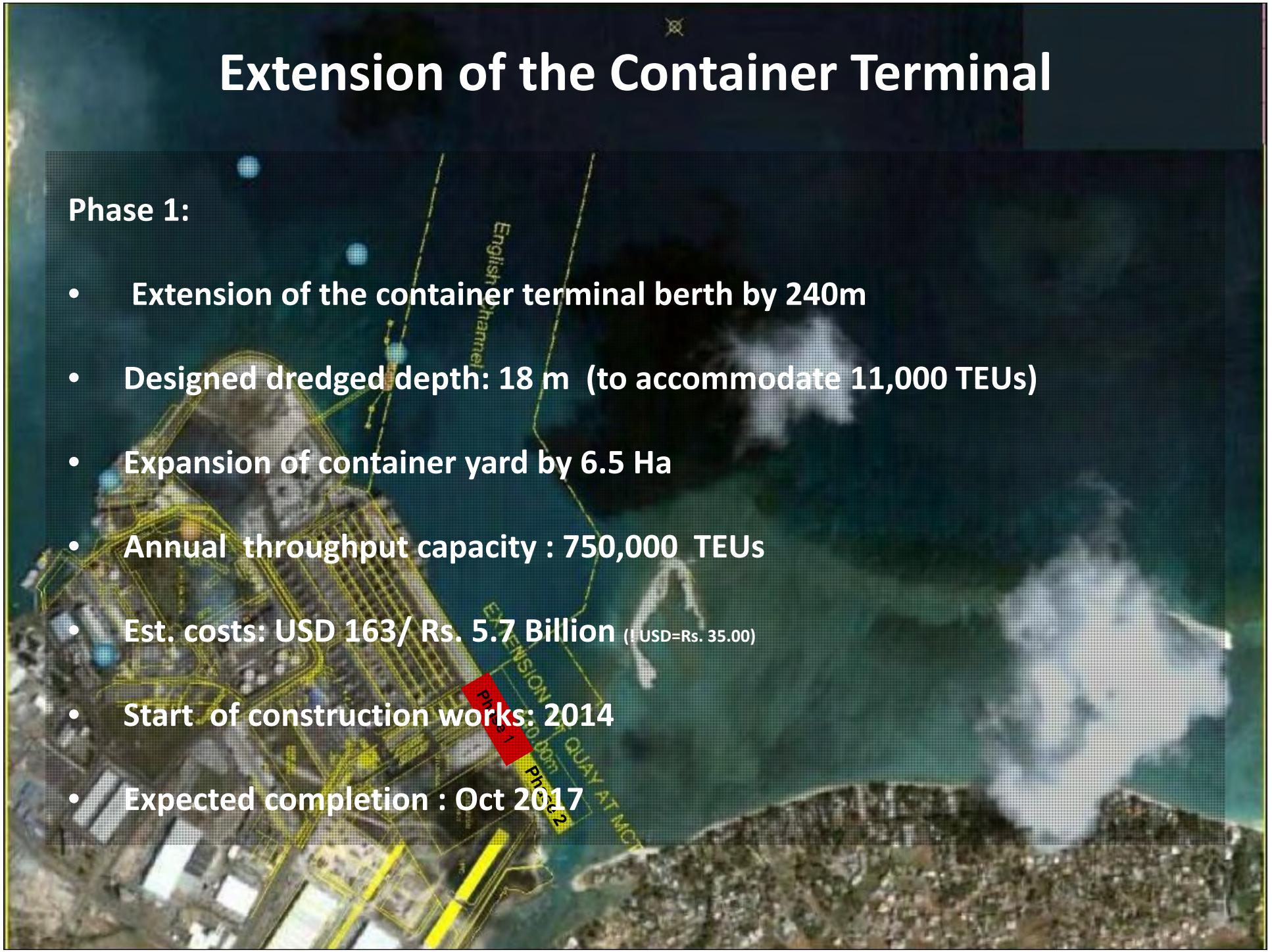
- **Small size with low demographic growth result in small port traffic**
- **Container Transhipment traffic bigger than Container Captive Traffic**

Perspectives of the Economy

- Small economy with no hinterland or direct connection to other markets
- Resulting in limited port facilities, equipment and infrastructure.
- Port Development Projects not always economically / financially viable.
- Funding of projects not easy to be secured in that case
- Transhipment activity highly volatile, investing for Transhipment is risky
- Growth in Captive Container Traffic follow trend of GDP growth.
- To survive we need Modern Infrastructure, Efficient service, Security of cargo and Competitive port charges

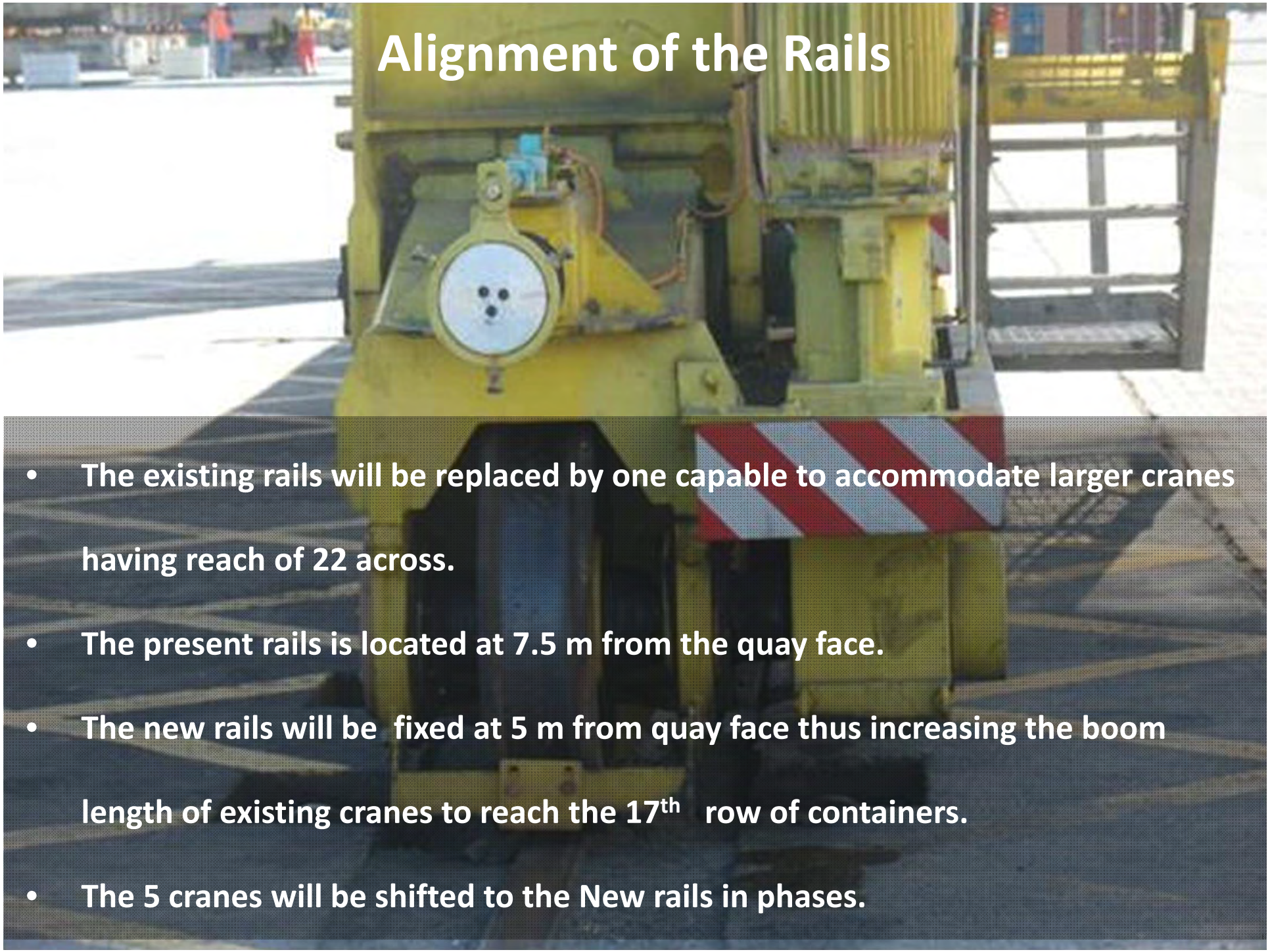

Port Development
Projects

Extension of the Container Terminal



Phase 1:

- Extension of the container terminal berth by 240m
- Designed dredged depth: 18 m (to accommodate 11,000 TEUs)
- Expansion of container yard by 6.5 Ha
- Annual throughput capacity : 750,000 TEUs
- Est. costs: USD 163/ Rs. 5.7 Billion (1 USD=Rs. 35.00)
- Start of construction works: 2014
- Expected completion : Oct 2017



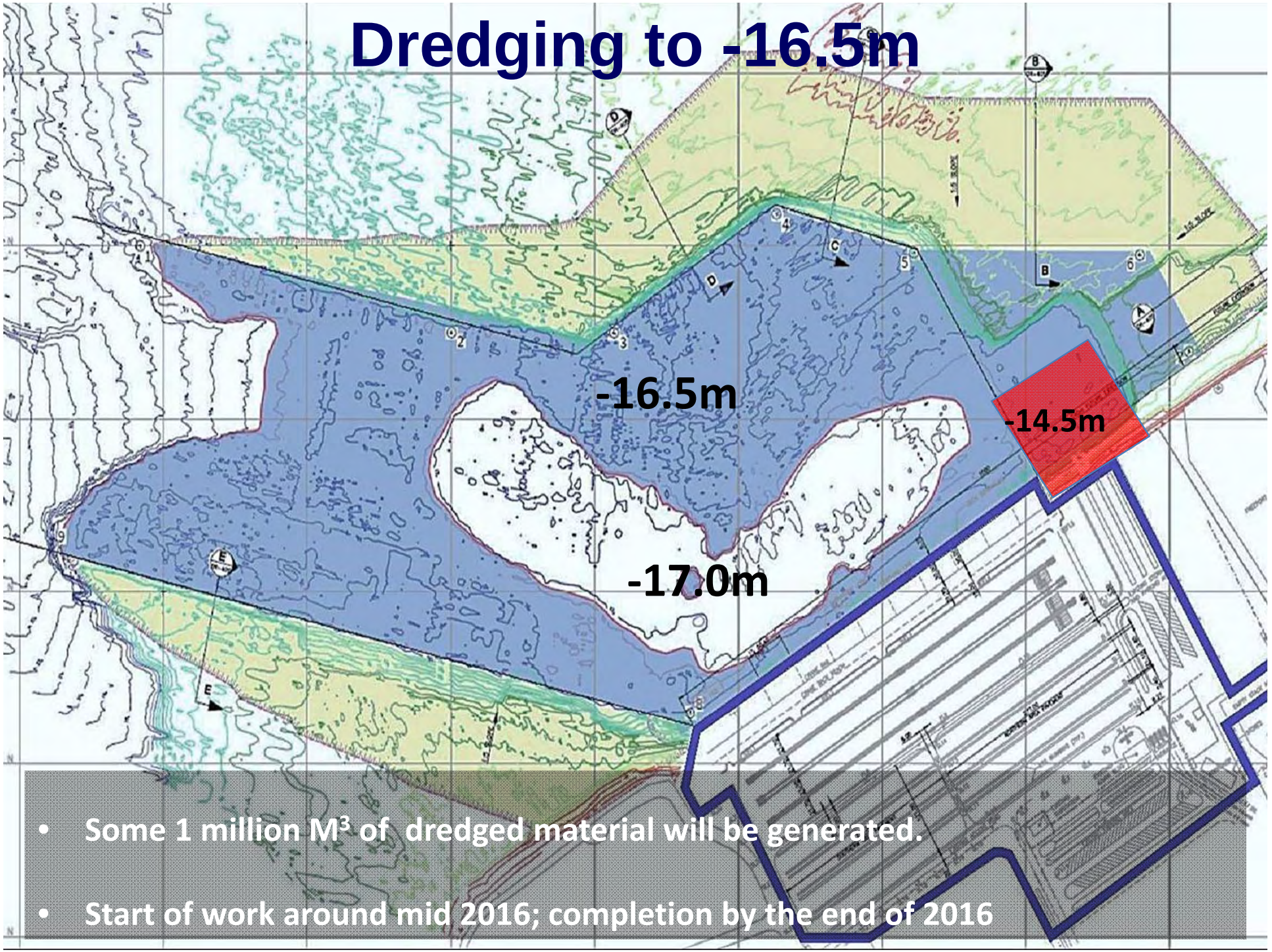
Alignment of the Rails

- The existing rails will be replaced by one capable to accommodate larger cranes having reach of 22 across.
- The present rails is located at 7.5 m from the quay face.
- The new rails will be fixed at 5 m from quay face thus increasing the boom length of existing cranes to reach the 17th row of containers.
- The 5 cranes will be shifted to the New rails in phases.

Marine and Civil works

- Expansion of the container stacking area completed by Feb 2016.
- Completion of the 240m length berth extension Apr 2016
- The Existing Quay will be strengthened to enable deepening of the seabed alongside the berth to -18 m.
- The strengthening of the existing quay expected to be completed in Oct 2017.

Dredging to -16.5m



- Some 1 million M^3 of dredged material will be generated.
- Start of work around mid 2016; completion by the end of 2016


PROPOSED BUND WALL
AT FORT WILLIAM &
FORT GEORGE
Dredged material s used for land reclamation at Fort George and Fort William
FORT GEORGE SITE
MOORING BUOYS
FORT WILLIAM SITE

Breakwater and Island Terminal – Long Term

- Construction of 2 km breakwater + Reclaimed land: 60 Ha
- Re-alignment and Dredging of the navigation Channel to -18 m
- Container Terminal : Quay length: 1 km, Container yard: 40 Ha
- Throughput capacity: >1 M TEUs
- Pre-Qualifications exercise for techno-economic feasibility study launched in July 2015
- RFP will be sent to shortlisted consultancy firms in 2016
- Completion of the study expected by mid 2017

Port Louis Harbour – Long Term

Conclusions

- Ports investment costs of accommodating megaships v/s economic benefits (port income, savings to local shippers/importers/exporters)
- Align port tarrifs to recoup major costs of megaship like dredging costs
- Improve port productivity by Innovation, technical development, workforce training , labour reform practices
- Optimise usage of infrastructure, e.g. by truck appointment systems and incentives for port truck moves during night / weekends.
- Release peaks at port terminals via dry ports where space is constrained.

Thanks for Your Attention

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