African Ports Infrastructure Investment and Development: Key Challenges and a Look Ahead – Some impacts on Container Terminals in South Africa

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Intermodal Africa – Cape town, April 2017

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PRESENTATION

- → **Current Paradigms and Perspectives**
  - Leadership
  - Business
  - Technology
- → **Opportunity - Ships size revolution**
  - Background
  - Container fleet developments
  - Demand for Transshipments
  - Transshipment Hub requirements
  - Implications on Container Terminals
- → **Opportunties for a paradigm shift**

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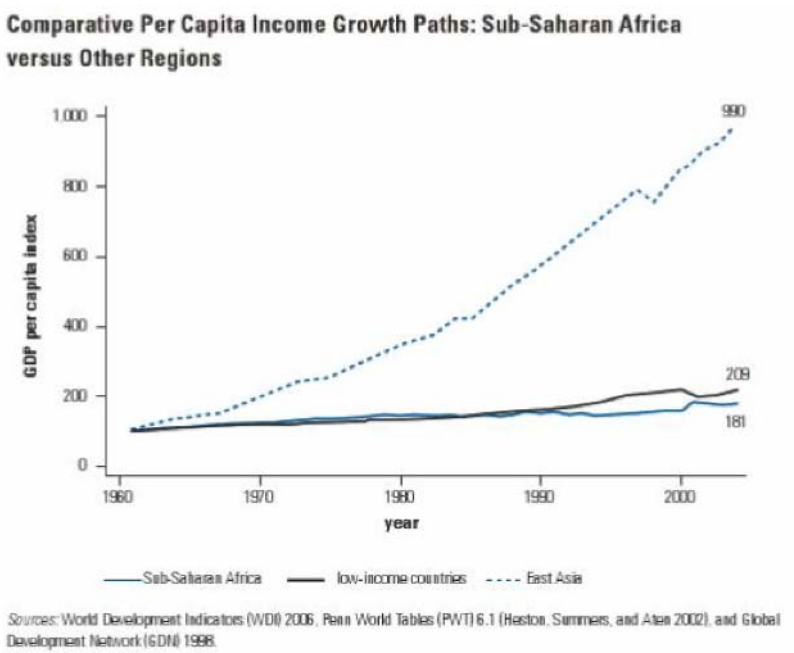
CURRENT PARADIGMS AND PERSPECTIVES - META-ANALYSIS



- **Main inhibitor is poverty – need to break out**
- **African urbanisation and infrastructure development**
- **Energy and Natural Resources – Potential and Curse**
- **Water and Food Security**
- **Increasing Economic Activity**
- **Supply Chain Development and Efficiencies**

Source: Ndulu, Benno, L. Chakraborti, and L. Lijane. Challenges of African Growth, edited by Benno Ndulu, et al., World Bank Publications, 2007. ProQuest Ebook Central .

CURRENT PARADIGMS AND PERSPECTIVES - META-ANALYSIS - EAC

- Leadership dealing with
  - Racial injustice
  - Religious intolerance
  - Hostility amongst people
  - Extreme poverty fueling socitel ills
- Growing trend for African leaders to have empathy which is a proven necessity for high performance teams
- Growing trend in authenticity of leadership
- Duality in African Leadership between Afrocentric and Eurocentric approaches influenced by cultural differences
- Success is achieved by integratgion of differences which takes time but yields improved solutions. African cultures have a high degree fo humanism which has inherent qualities of fairness, altruism, generousity and gentleness
- Shortcomings in assertiveness and uncertainty avoidance and future orientation.

Source: Authentic African Leadership, Authentic African Leaders Defined

CURRENT PARADIGMS AND PERSPECTIVES - META-ANALYSIS –EAC

- Business / Economic
  - Droughts remains the leading cause of famine, over long term steady decline in the long duration rains, food security
  - Maturing of EAC P3 Policy Frameworks,
    - E.g Kenya (22 P3, 4 bn USD), Tanzania (21 P3, 3,4 bn USD), Uganda (22 P3, 3.5 bn UDS).
  - Anti-corruption measures appear unsuccessfull, SA, Kenya and TZ remain and Ghana declining
  - Banking, Telecoms and Power growing and attractive to investors
  - Increased integration allowing capital to flow freely
  - Financial inclusion becoming a reality
  - Dumping compromsies local development
  - Inceasing regional integration
  - Funds that bridge economic and financial viability
  - Impact of Brexit , US view on Africa incl aid support
  - Global terrorism and war on terror
  - Trading partners determine country success

Source: Finweek, King Report

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CURRENT PARADIGMS AND PERSPECTIVES - META-ANALYSIS -EAC

- Technology
  - Rural areas are being urbanised, base infrastructure proving to be poor
  - Traffic congestion in Dar es Salaam and Nairobi are good indicators that business wants to happen
  - Lack of alternative transportation such as rail
  - Power problems differ viz Kenya's focus on geothermal, Uganda needs power, and Tanzania needs both power and distribution, but generally insecurity in energy
  - Shortage of in country infrastructure development skills needed in engineering, financial, legal and regulatory / policy and ability to implement
  - Tested and firm strategic development plan
  - Inefficient use of Energy Power/ unit output

Source: Finweek, King Report, Dellotte Africa Report.

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So What ?

Let us consider a current phenomenon affecting the continent providing the opportunity to integrate leadership, business and technology

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I - SHIP SIZE REVOLUTION – BACKGROUND

PRIMARY TRADE	**Much larger vessels on 'Primary' trade and also larger vessels deployed on 'Secondary' deepsea trades – where port capacity permits.**
SECONDARY TRADE	**This is driven by an excess of vessels displaced from primary deepsea trades cascading to the secondary trades.**
DEMAND	**Actual demand at present seldom justifies these much larger vessels – but it's a 'fact of life.'**
ORDERS	**With ongoing orders of ever larger vessels the cascading effect will continue'**
FEEDERS	**'This will also push of larger vessels into the feeder sector'**

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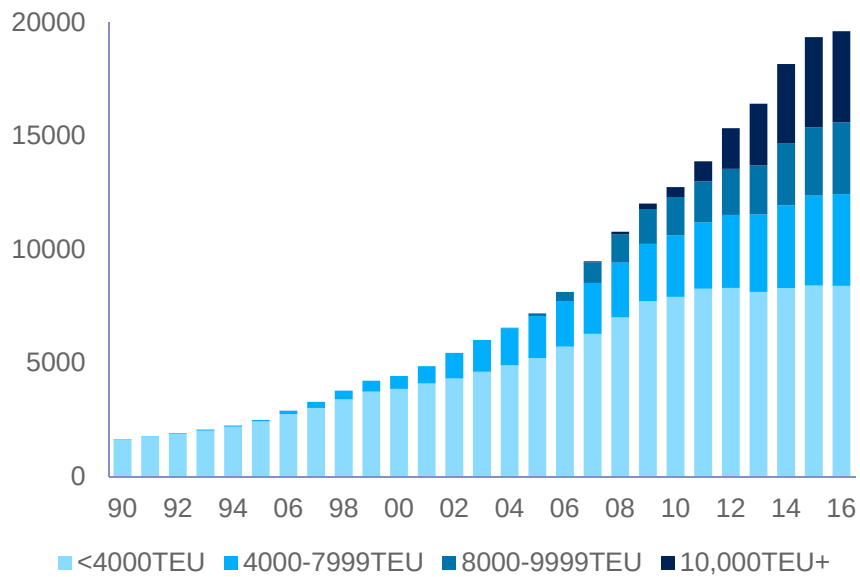
I - INDUSTRY TRENDS - SHIP SIZE REVOLUTION

	TEUs	Length overall (m)	Beam (m)	Maximum draught* (m)	Noted Required berth depth (m)*
First generation: 1968	1,100				
Second generation: 1970-80	2-3,000	213	27.4	10.8	12.0
Panamax: 1980-90	3-4,500	294	32.0	12.2	12.8-13.0
Post-panamax: 1988-95	4-5,000	280-305	41.1	12.7	13.5-14.0
Fifth generation: 1996-2005	6,400-8,000	300-347	42.9	14.0-14.5	14.8-15.3
Super post-panamax: 1997->	8,000-11,400	320-380	43-47	14.5-15.0	15.3-15.8
Ultra large container ships: 2006->	14,500	380-400	56.4	15.5	16.4
New-panamax: 2010	12,500	366	49.0	15.2	16.1
Triple E-Class	18,270	400	59.0	15.5	16.4
CSCL 18,400 Class	18,400	400	58.6	15.5	16.4
MOL Triumph	20,170	400	58.8	16.0	17.0

*Table 1: Design Development of Large Containerships**



Graph 1: World Container Fleet Development 1990-2016 ('000TEUs)

- China Shipping and MSC confirmed current orders to be extended to 19,000TEU.
- MOL Triumph of 20,170TEU is the largest vessel ever built and will be deployed in May, 2017.
- Expect other lines to follow – Maersk Line, CMA CGM, UASC all committed to larger tonnage.
- Ship cascading will continue to secondary trade lanes in Africa.

- Fully cellular containership fleet expanded to >16m TEU.
- Focus remains on larger vessels – 8,000TEU+ sector up by 10.8%.
- Trend for bigger ships well established since 2004 – 18,000TEU+ ships in service. Almost all major lines committed to ULCS.

** Maximum draught is rarely realised, even when vessels are fully laden, so required berth depth is less in practice.*

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I - INDUSTRY TRENDS - SHIP SIZE REVOLUTION

8,000 TEU to 14,000 TEU

E Class Maersk: 397m, 22 rows, 16m

- Port around the world were sized to accommodate the E class Maersk by providing 16m of draft.
- Cranes were upgraded to 22 rows

14,000 TEU to 18,000 TEU

Triple E Maersk: 400m, 23 rows, 16m

- Cranes were extended to 23 rows
- No change required for berth or channel drafts

18,000 TEU to 22,000 TEU

22,500 TEU: 400m, 24 rows, 420m, 23 rows? 16m?

- Could it be a step too far?
- Berth length should be able to accommodate but cranes would need 24 rows and deeper draft

Ports have accommodated as the increases were incremental. The next size of container vessels could result in significant capacity redundancies.

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I - INDUSTRY TRENDS - SHIP SIZE REVOLUTION

- Development of 22,000TEU vessels will be by means of increasing length, with 430-433m being the likely dimension.
- There are two options for 24,000TEU vessels – either further lengthening, with a slightly deeper draught or a shift to broader vessels on a length of up to 430m. This would entail an additional row of containers.
- WSP|PB team / Lloyds Register analysis confirmed there are no technical limits to building and operating even larger vessels up to 24,000TEU.

Current and Potential Container Vessel Sizes

	TEU's	LOA (m)	Beam (m)	Max Draught (m)
Maersk "EEE"	18,270	400	59.0	15.5
CSCL/UASC vessels	18,400	400	58.6	15.5
MOL TRIUMPH	21,700	400	58.8	16.0
New Generation I	22,000	430	59.0	15.5
New Generation IIA	24,000	450	59.0	15.8
New Generation IIB	24,000	450	61.5	15.5

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II - CONTAINER FLEET DEVELOPMENTS

The increase in liner capacity links in the region as a whole – capacity +142% between 1995 and 2010.

Focus of expansion in Asian Trades – especially feedering, but also some direct services to regional hubs appearing

Switch to cellular vessels – less use of ship's own gear – result of larger tonnage. 10,000TEU already on SAF trades.

Average vessel sizes of up to 3,000TEU on Asian Trade and 3,500TEU on Europe Trade in 2011 have now increased to 8,500TEU and 6,100TEU respectively. Further increases are also anticipated.

Indian Sub-Continent Links still expanding.

Integration with major East-West services via Salalah, Djibouti, Aden , Colombo etc. and increasing number involve direct calls at transshipment hubs in Indian Ocean, South Africa and West Africa.

Port capacity lags behind demand – a transformation is required to increase capacity and productivity levels

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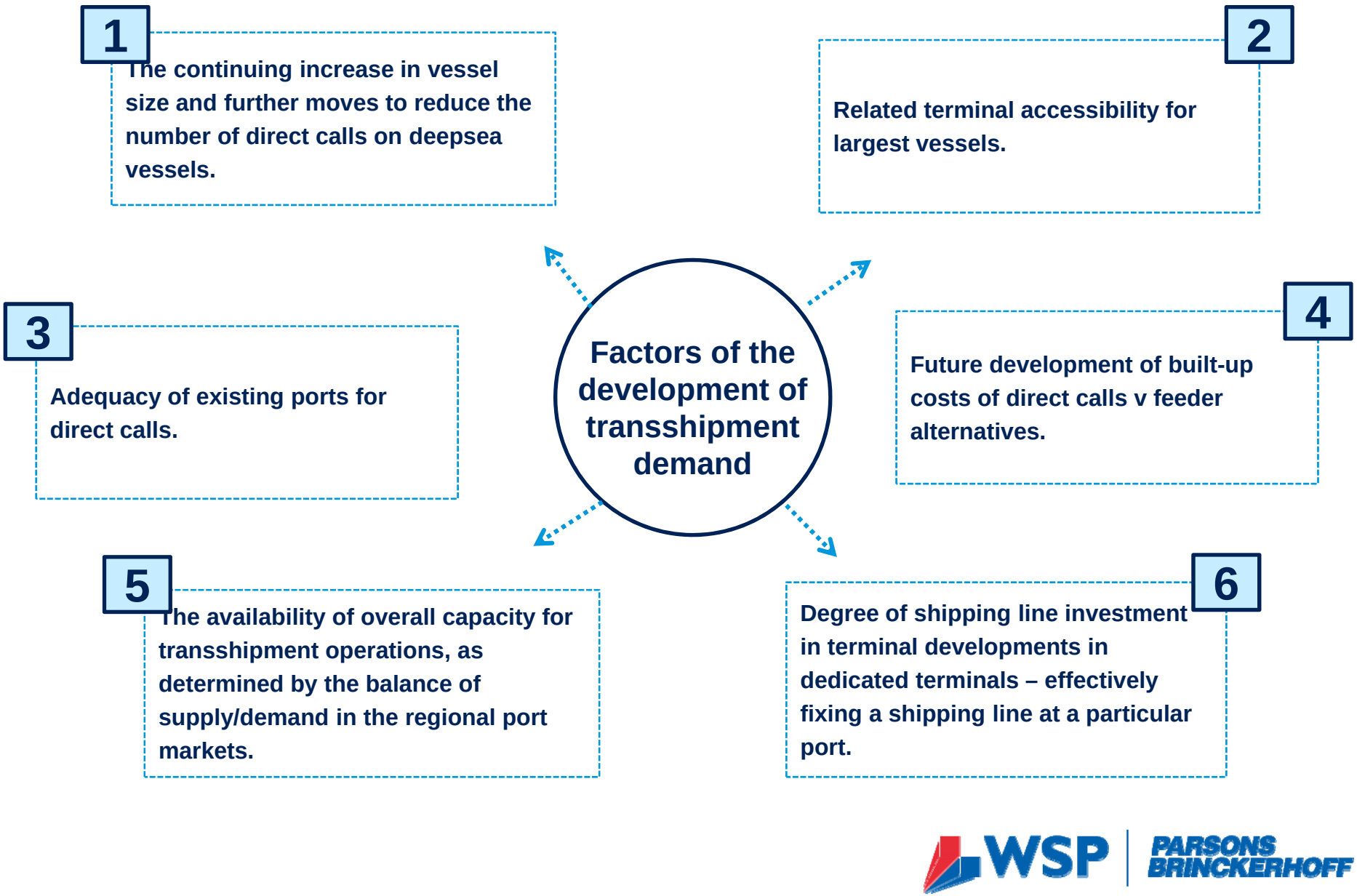
III - TRANSSHIPMENT DEMAND



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IV - REQUIREMENTS FOR TRANSSHIPMENT HUBS

LOCATION	**Geographic location - minimal deviation from main East-West route.**
TARIFF	**Tariff levels and operating costs.**
LEVELS	**Performance and service levels.**
LABOUR	**Labour/workforce arrangements .**
FACILITIES	**Facilities (e.g. physical accessibility, water depth, size/number of cranes).**
CAPACITY	**Availability of capacity.**
CONGESTION	**Avoidance of congestion.**
POTENTIAL	**Potential for dedicated facilities/terminal areas.**
BUREAUCRACY	**Low degree of bureaucracy at port, especially customs authorities.**
VESSEL SUPPORT	**Efficient vessel support systems in place – i.e. pilots, tugboats etc.**
BERTHING	**Priority berthing.**
VALUE-ADDED	**Value-added services.**
OTHER SUPPORT	**Other support services and functions.**
SECURITY	**Good security and protection coverage at all times.**

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V - "CASCADE" EFFECT

1

The increase in the size of vessels deployed on the main arterial lanes has resulted in a displacement of the vessels that were historically dominant on the Asia-Europe routes, i.e. 6,000-8,500TEU capacity vessels to secondary routes.

2

These service effectively replacing services that transship in Algeciras by services that offer transshipment opportunities at hubs in the Indian Ocean, South and West Africa.

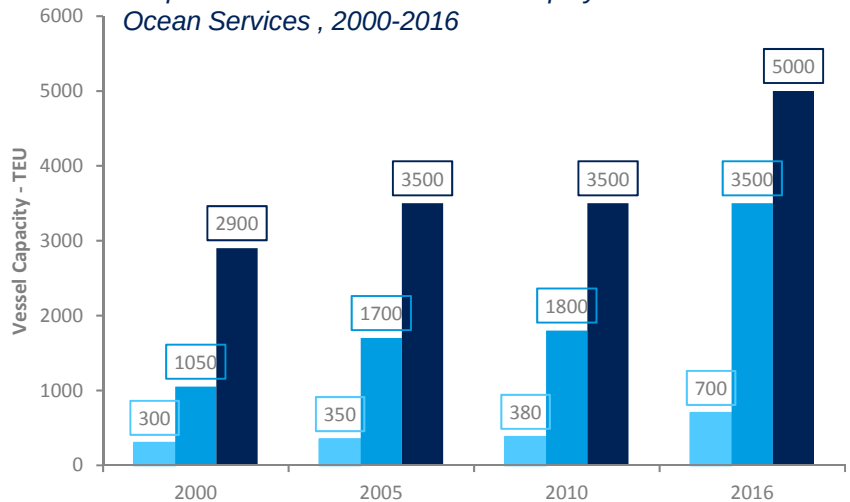
3

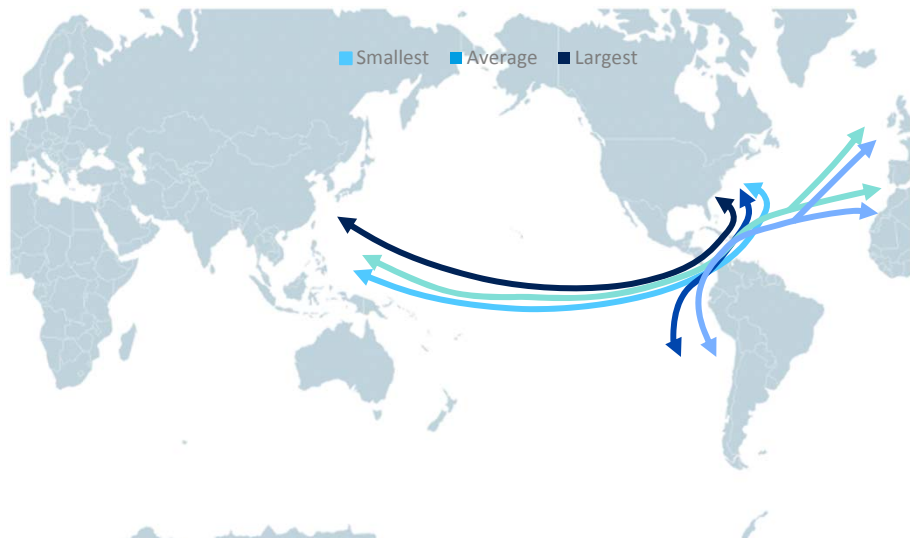
Displacement of 2,500TEU vessels by 3,500-4,300TEU vessels on FE-SAF-WAF services as a result of new cooperation.

4

When more services of this type are introduced, there will be a likely increase in the average size of vessels handled particularly in the ports in Sub-Saharan Africa and the Indian Ocean region.

Graph 2: Container Vessel Sizes Deployed in East Africa and Indian Ocean Services , 2000-2016





5

New services such as the "Africa Express" Service operated by MSC, are now operated by vessels of up to 8,500TEU capacity and which serves Indian Ocean and both South and West Africa from Asia via the Cape of Good Hope instead of the Suez Canal.

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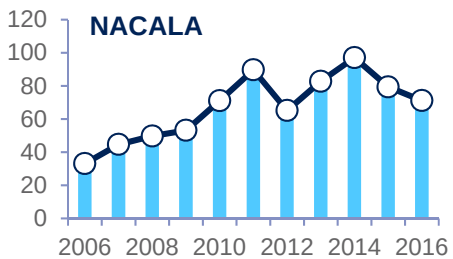
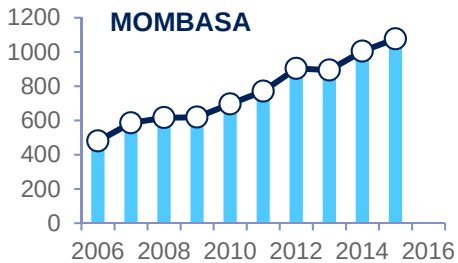
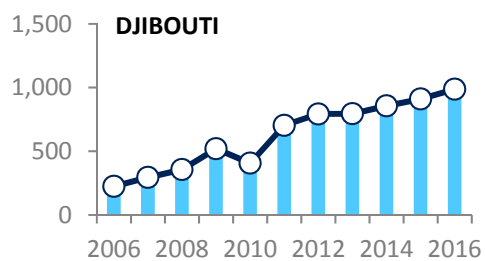
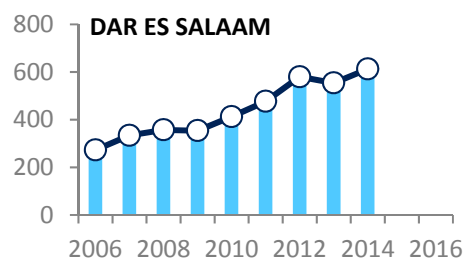
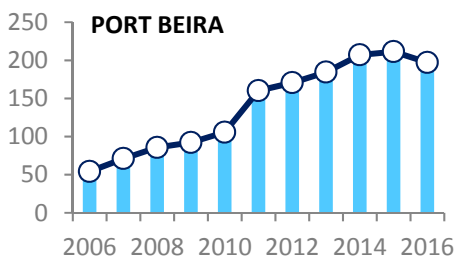
VII - HISTORICAL REGIONAL PORT VOLUMES IN (000')TEU'S

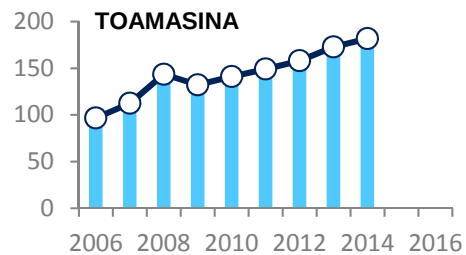


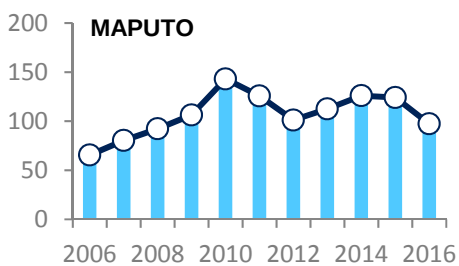


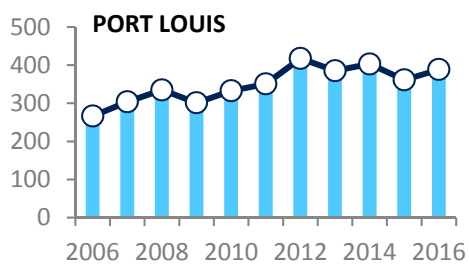


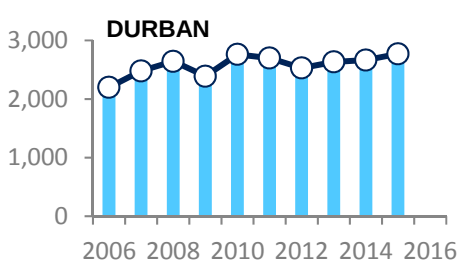


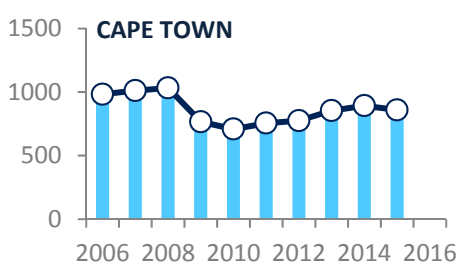


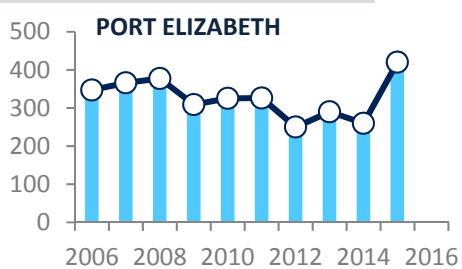


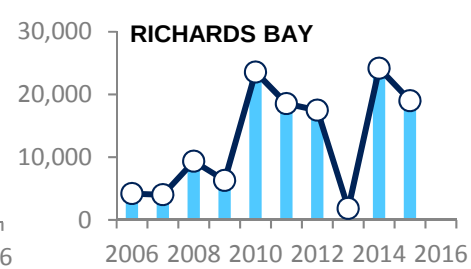








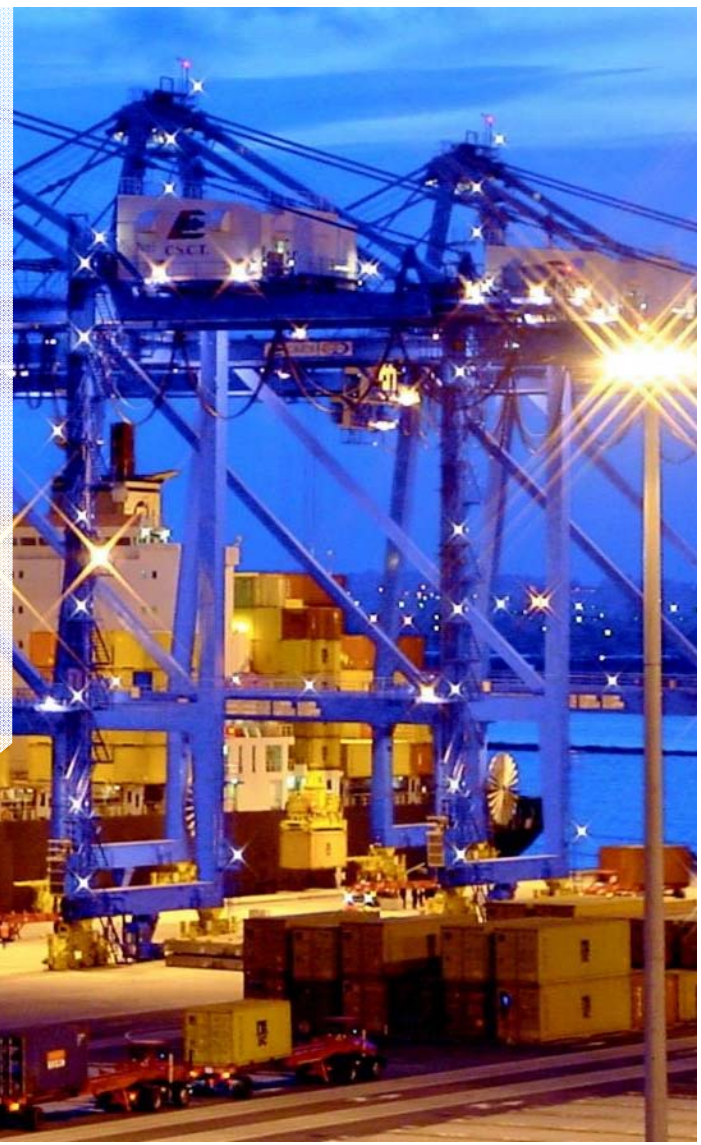




NOTE: non-verified data

X IMPLICATIONS FOR CONTAINER TERMINALS

- Terminals must expand and make better use of existing facilities to handle larger vessels and consignment sizes
- Terminal productivity has improved, but there remains a need for further improvements
- Terminals which do not lift productivity will see market share decline
- Need for dredging – approach channels and berths. Clear planning needed for all terminal developments. Depth alongside is critical to 'future-proof' terminals. Channel and approach dredging can follow later.
- Longer berths ; larger terminal area; increased gate pressure
- Larger/Heavier Quay Cranes - Longer reach; Taller clearance; Twin/Tandem Lifts
- Increase in load on quay structures and increase in electrical loads and electrical infrastructure



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OPPORTUNITIES FOR A PARADIGM SHIFT

- **Increased number of t/s hub options in East Africa, Indian Ocean, Indian Sub-Continent and South Africa. Is our planning in SA inherently assuming that we will compete with EAC. SA has planned and implemented a complementary port system for many years with success. Can this thinking be expanded to the EAC's as well ?**

- **What can be done to improve local efficiencies and can we do or offer 'something different' to be able to attract business ?**

- **How can a regional approach assist in managing competition whilst making better use of infrastructure in Coega for example. Currently planned capacity increases in Kenya, Tanzania and Indian Ocean Islands (Port Louis, Reunion and potential in Madagascar) will put pressure on traditional t/s hubs in South Africa. Does this have to be the case ? We know that transhipments is price sensitive, but we control the pricing.**

- **New service structures will see introduction of larger tonnage and consolidation of volumes at major t/s hubs across the region. We are able to decide on where these hubs will be ? Can we plan as such and integrate with EAC's?**

- **Trade share likely to remain fairly constant for SAF ports. I am sure that the status quo is longer acceptable as we need to grow to meet the demands of urbanisation, industrialisation as as result of increasing economic activity and ports and have a direct impact on facilitating such development**

- **Without deepwater some ports may have to settle for feeder port status, or look to serve other shipping sectors. Some ports may not need developments.**

→ **Ultimatley the influence and effects of competing with our neigbours may not serve all as there will always be winners and losers**

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THANK YOU

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