Overview of the Proposed Durban Dig-Out Port Project (DDOP)

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Outline of presentation

• High-level scope & location
• The BIG picture
• Key drivers for development
• Timelines for port capacity developments in Durban
• The port development process & critical milestones
• High level layout options
• Critical success factors
Scope of project … from this ...

Port of Durban

Old Durban International Airport site
... to this ...!

Port of Durban

Artist’s impression of Durban Dig-out Port
Location of the proposed new port

We are here

Port of Durban

View from here

Approximately 11km

Proposed Durban Dig-out Port site
View of current Port of Durban (from West)
What’s the big picture? Strategic integrated Project 2 (SIP-2)

SIP-2 spans the Durban-Free State- Gauteng Corridor

Gauteng

Free State

Durban

SIP2 Portfolio

Northern Region

- Rural Development (SIP 11)
- Harrismith Logistics Hub

Central Region

- Pyramide South
- Sentra-Rand
- West Rand Hub

Southern Region

- City Deep
- Tambo Springs
- Electricity Transmission
- NMPP
- Dube Trade Port
- Port of Durban Port and Rail Expansions
- Cornubia Integrated Settlement
- Durban Dig-Out Port
- NMPP
- N3 Highway
- DFSG Rail Corridor

NSC (SIP 17)
Demand is a key driver for additional port capacity

(Source – Transnet Freight Demand Model 2013)
Container vessel sizes have more than doubled in the last decade ...

(Source: The geography of transport systems)
A new port is required to handle the latest generation vessels...

Port of Durban
- Routinely handles these vessels
- Special handling conditions:
  - At high tide
  - Partially laden
  - New deep-water berths will enable routine handling

Port of Durban
- Handle under special conditions

Durban Dig-Out Port
- Designed to routinely handle these vessels

Comparative size of the Titanic!

(Source: The geography of transport systems)
Maersk Line has ordered 10 x 18,000 TEU ships to be delivered between 2013 & 2015 …

Triple-E's - energy efficiency, economy of scale, environment
Less than 60 days to delivery!

Length = 400m
Beam = 59m
Draft = 15.5m

Will reduce CO₂ emissions by about 50 percent per container moved
Commissioning of the first tranche of Durban Dig-Out Port (DDOP) capacity is targeted for 2020…
Port of Durban - current
Existing Pier 1 and Pier 2 container terminals

PIER 1: 0.7m TEU : 2 berths : 680m
PIER 2: 2.1m TEU : 6 berths : 2110m
TOTAL: 2.8m TEU : 8 berths : 2790m
Port of Durban – 2017/18
Pier 1 with Salisbury Island infill, Pier 2 with new cranes and north quay deepened

PIER 1: 2.0m TEU : 5 berths : 1890m
PIER 2: 3.0m TEU : 6 berths : 2110m
TOTAL: 5.0m TEU : 11 berths : 4000m
Durban Dig-Out Port (DDOP) – 2020
Phase 1: 4 berth container terminal
Port of Durban - 2024
Infill between Pier 1 and Pier 2

Infill between Pier 1 + Pier 2

PIER 1 + PIER 2: 4.8m TEU : 8 BERTHS : 2760m
Durban Dig-Out Port – 2026
Phase 2: 8 berth container terminal

PHASE 2: 4.8m TEU: 8 BERTHS: 2800m
Port of Durban - 2027
Reconfiguration of Pier 2 stacks & back-of-quay

PIER 2 RECONFIGURED

PIER 1 + PIER 2: 4.8m TEU: 8 BERTHS: 2760m
DDOP - possible phases of development

Phase 5
- Automotive
  2040+
- Liquid bulk
  2040+

Containers
- 2020
- 2026
- 2031
- 2036

Other data not directly transcribed from the image.
DDOP – Project Lifecycle Process

Stakeholder engagement & communications


- Benchmarking
- Commodity investigations
- Vessel Size Analysis
- Capacity and Simulation Analysis
- Hydrodynamic Modelling
- Portside Layout and Infrastructure
- Landside Layout and Infrastructure
- Excavation and Dredging
- Intermodal Connections

SPDF & EIA
- Pre-Feasibility
- Feasibility

Construction – Phase 1
- DDOP Conceptual Design
- Critical Stakeholder Reviews and Investigations
- Spatial Assessment
- Hazard and Risk
- Procurement Strategy
- Construction Methodology
- Estimate & Construction Schedule
DDOP – Project Lifecycle Process

Stakeholder engagement & communications

- Concept design
- Pre-Feasibility
- Feasibility
- Construction – Phase 1

- Pre-feasibility – selection of preferred design option
- Feasibility – detailed engineering
- Construction – mobilisation & execution
DDOP – Project Lifecycle Process

- Development of the remaining phases will span ± 20 years after the completion of phase 1
- Phases will be developed to provide capacity ahead of demand
DDOP – Critical Milestones

- **2012**: Concept design
- **2013**: Pre-Feasibility
- **2014**: Feasibility
- **2015**: Detailed design completed
- **2016**: Environmental Authorisation obtained
- **2017**: Sustainable Port Development Framework completed
- **2018**: Construction Phase
- **2019**: Phase 1 container terminal commissioning commences
- **2020**: PPP Model implemented and funding secured
Single Buoy Mooring (SBM)
Approx 75% of RSA’s crude oil is pumped via SBM

Picture by Chris Hoare, courtesy SAPREF
Irrespective of the final port entrance geometry, the SBM will have to be relocated.

SBM must be relocated before construction of the breakwater can commence.
Some port layout options
Possible breakwater orientations
Relative investment - Phase 1

Circa ZAR 37 billion (unescalated)

Marine Infrastructure 65%

Landside Infrastructure 19%

Terminal Equipment 16%

(Source: Transnet – Durban Airport Site Expansion, Port Panning Study, March 2011)
Circa ZAR 30 billion (unescalated)

(Source: Transnet – Durban Airport Site Expansion, Port Panning Study, March 2011)
Relative investment - Phase 1

Circa ZAR 7 billion (unescalated)

(Source: Transnet – Durban Airport Site Expansion, Port Panning Study, March 2011)
Critical success factors to be addressed

Development and implementation of an integrated Sustainable Port Development Framework, e.g.

- Cost mitigation/offsets for eco-system services impacts
- Design imperatives

- Social impact
- Corporate Social responsibility & Investments

- Contribution to GDP & growth
- Skills development & job creation

- Compliance – Constitution, authorisations
Critical success factors to be addressed

Supply chain thinking – the port is one component of an integrated logistics corridor

- Upgrading of intermodal terminals & construction of new super terminals within the Gauteng area

- Rail corridor upgrades to match port expansion plans & significant migration of road to rail freight on corridor

- Back-of port logistics facilities and supporting road infrastructure to be developed
Proposed super-terminals & freight ring
Proposed Natcor upgrades

Development Strategy: 
Short term: 2013 – 2020: 18 to 42Mtpa
• Additional block signals to allow for more trains
• Electrical supply (3 kV DC) and transformer upgrades

Medium Term: 2020 - 2025: 42Mtpa to 51Mtpa
• Relieving of gradients and curves
• Upgrade of Johannesburg to Newcastle section to heavy haul
• Upgrade of Kroonstad to Ladysmith section

Long term: 2025 – 2041: 51 to 84Mtpa
• Converting Johannesburg - Newcastle section to 25kVAC
• Migration to CBA (in cab) train control
• Cato Ridge to Durban new bypass line and modifications to segregate PRASA from TFR services
Durban Rail-in-Port Plans

Durban Back of Port Container Rail Demand vs Capacity

- DIA Dig out port Terminal 3
- DCT Phase II (50w)
- DCT Phase 1 (50w)
- DIA Dig out port Terminal 2
- Kings Rest Terminal 1 (50w)
- Kings Rest Yard/DCT Buffer Stack
- Pier 1
- Pier 2

Gauteng - Durban Port Rail Demand (FDM)
Interesting statistics (approximate) …..

- 800 hectares of land to be acquired
- 70 million m$^3$ of material to be dredged
- 3,5 million tonnes of rock
- 2,5 million m$^3$ of cement
- 52 000 tonnes of reinforcing steel
- 14,5 million m$^3$ earthworks

(Source: Transnet – Durban Airport Site Expansion, Port Panning Study, March 2011)
Our Vision

Vision

• Largest container port in Africa
• World-class port in terms of efficiency
• World-class supply chain
• Leading-edge “green” port
• “Community” port
• State-of-the-art security

Expected Benefits

• Expected Capex Impact on GDP of R 48 billion
• Expected Operational Impact on GDP of R 56 billion (per annum at full operation).
• Income/wages generation during construction – KZN impact – estimated at R 24 billion
• Expected to create approximately 64 000 construction jobs
• Expected to create approximately 28 000 operational jobs
• Reduced total logistics cost

(Source: Transnet – Durban Airport Site Expansion, Port Panning Study, March 2011)
City inputs

- Port Evolution
- Roads
- Intermodal hub and spokes
- Back of Port Land use
- Traffic management planning
Evolution of a Port:

The Beginning:

Now: ???

The Future: Super Port!

Source: Adapted from “Port Regionalization: Towards A New Phase In Port Development”; Notteboom, T.; Rodrigue, J.-P, University of Antwerp, 2005
Super Port!

Source: Adapted from “Port Regionalization: Towards A New Phase In Port Development”; Notteboom, T.; Rodrigue, J.-P, University of Antwerp, 2005
## Major Road Needs

<table>
<thead>
<tr>
<th>PRIORITY</th>
<th>DUE BY</th>
<th>DESCRIPTION</th>
<th>LENGTH (km)</th>
<th>COST (2010 Rands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2020</td>
<td>Cato Ridge to PMB to 6 lanes &amp; PMB I/C’s upgrade</td>
<td>21,5</td>
<td>R2,05bn</td>
</tr>
<tr>
<td>2</td>
<td>2020</td>
<td>De Beers Pass</td>
<td>98</td>
<td>R3,44bn</td>
</tr>
<tr>
<td>3</td>
<td>2020*</td>
<td>Freight Route Phases 1&amp; 2</td>
<td>44</td>
<td>R2,76bn</td>
</tr>
<tr>
<td>4</td>
<td>2030*</td>
<td>Freight Route Phase 3</td>
<td>23</td>
<td>R1,92bn</td>
</tr>
<tr>
<td>5</td>
<td>2030*</td>
<td>PMB Bypass</td>
<td>60</td>
<td>R3,65bn</td>
</tr>
<tr>
<td>6</td>
<td>2025</td>
<td>Heidelberg - Germiston</td>
<td>40</td>
<td>R1,0bn</td>
</tr>
<tr>
<td>7</td>
<td>2035</td>
<td>Germiston - End</td>
<td>5</td>
<td>R0,5bn</td>
</tr>
</tbody>
</table>

**TOTAL** | **R15,32bn**

* Current investigation underway on an N3 8-lane option and how this could extend the start date of these projects
Existing Situation - Roads
Phase 1a of Road Upgrade
Phase 1b of Road Upgrade
Phase 2 of Road Upgrade
Phases 1-2 of Roads
(with all residential lower priority routes also shown)
Phase 1c: Mariannhill to Cato Ridge

Phase 1a: Port to Mariannhill

Phase 1b: North – South Freight Route

Major Road Infrastructure Proposals from Port of Durban to Cato Ridge
URBAN PLANNING AND ECONOMIC POTENTIAL ASSESSMENT

Typical Route Impact Analyses

Broad Land Cover

Key Industrial Clusters

Industrial Accessibility
## HIGH LEVEL COST ESTIMATE

<table>
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<tr>
<th>Description</th>
<th>Estimated Cost (R million)</th>
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<tbody>
<tr>
<td>Road works (excluding viaducts and structures)</td>
<td>3 390</td>
</tr>
<tr>
<td>Viaducts</td>
<td>1 160</td>
</tr>
<tr>
<td>Retaining walls</td>
<td>30</td>
</tr>
<tr>
<td>Interchanges</td>
<td>1 050</td>
</tr>
<tr>
<td>Overpasses, underpasses, river bridges</td>
<td>780</td>
</tr>
<tr>
<td>Total construction costs</td>
<td>6 410</td>
</tr>
</tbody>
</table>
Broad Spatial Location of Logistics Companies and proposed Intermodal hubs

- Hillcrest: 8.7%
- Westville: 3.9%
- Durban: 50.6%
- Phoenix: 5.9%
Back of Port land use changes
Requirements for Back Of Port Facilities:

ZONE 1
- Container terminals
- Break bulk terminals
- Liquid bulk terminals

ZONE 2
- Maintenance area
- Workshops
- Staff facilities
- Export buffers* for:
  - Break bulk
  - Motor vehicles
  - Containers:
    - Full
    - Empties

ZONE 2 (Rail export buffer stacks for:
- Containers
- Motor vehicles

* Can be located in zone 3 if space is limited

ZONE 3
- 3rd party parking/unpacking
- Empty container depots
- Intermodal logistics area for import / export buffers for pipelines
- Export buffers for break bulk cargo
- Export buffers for motor vehicles
- Shipment buffers for coastwise petroleum

N.B. This sketch does not indicate land ownership - the location of BoP activities is independent of whomsoever owns the land
## Current Back of Port Land Uses

<table>
<thead>
<tr>
<th>Year</th>
<th>Back of ports (ha required)</th>
</tr>
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<tbody>
<tr>
<td>2011</td>
<td>150</td>
</tr>
<tr>
<td>2014</td>
<td>179</td>
</tr>
<tr>
<td>2017</td>
<td>204</td>
</tr>
<tr>
<td>2019-2037</td>
<td>628</td>
</tr>
<tr>
<td>2037-2050</td>
<td>878</td>
</tr>
</tbody>
</table>
INTEGRATED LONG-TERM PORT, RAIL, ROAD AND LAND-USE PLAN
Integrated Freight & Logistics Framework & Action Plan
Aim of the project

• Build on freight plans already developed by eThekwini Municipality, Transnet & Dube Tradeport;
• Develop a set of interventions that will essentially address freight & logistics infrastructure & operations within the municipal area;
• Minimize logistics costs; &
• Enhance the cities industrial competitiveness by taking advantage of freight & logistics infrastructure & operators located in the municipal area.
Thank you!

Do you have any questions!