

Focus on CSIR Built Environment Key Projects

March 2007

Future Ports: Enhancing competitiveness of SA's ports

Ports play a vital role in global trade facilitation, while also supporting the competitiveness of national and regional economies. The CSIR, in consultation with the National Ports Authority (NPA), has embarked on a three-year research programme called Future Ports, aimed at developing technologies to enhance the sustainable planning and development of South Africa's ports and their efficient, safe and environmentally sound operation.

The CSIR is investing a total of R6.7 million in the Future Ports programme, over the next three years. The project will be co-funded by the NPA.

The competitiveness of South Africa's economy relies on the quick, easy, economical and safe movement of people and goods through its ports. Ports must be able to not only meet the immediate demands of their customers in maintaining efficient operations, but also to invest in new facilities and continue to improve safety while safeguarding the environment.

Eight of the 13 southern African commercial ports are located in South Africa. They handle over 90 per cent of South African trade, including over 170 million tonnes of freight and 3 million containers annually. In 2005, some 14 000 vessels

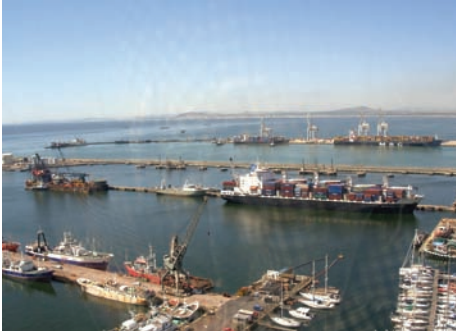


arrived with an overall gross tonnage of 257 million cubic metres.

South African ports face a number of significant challenges, including:

- improving the ability of the country's ports to handle new-generation vessels. Some ports have lost trade because bigger ships cannot use them; competitive ports are able to handle carriers in excess of 300,000 gross registered tonnes. Giant container vessels with more than 8,000 containers in 22 rows have become operational, and deep approaches, widest possible tidal windows, wider entrance channels and larger berths are required to accommodate these vessels;





- increasing the capacity (throughput) and/or efficiency of South Africa's ports. While the Durban Container Terminal has improved its average ship rate of 20 container movements per hour in 2002/3 to 35 container movements per hour, it still lags, for example, Australia's ports by almost 30 per cent;
- improving the integration of port facilities. Ports are the transfer points between different modes of transport and therefore an important means of integrating inland and marine transport networks. Apart from improve-

ments in port handling efficiency and storage facilities, good road and rail access also needs to be provided to maximise efficiency in the transshipment of goods from sea to road and rail, and vice versa;

- improving the safety of South Africa's ports, including improvements in port marine safety, the training of port marine professionals, oil pollution response and port security;
- improving the sustainability of South Africa's ports. Since shipping is one of the most environmentally sustainable means of transport, the potential of shipping on coastal and short sea routes should be further explored, as this will help to relieve pollution and congestion on the roads. Best use should be made of existing infrastructure in preference to expansion, wherever practicable. Where expansion is inevitable, sustainable, cost-effective and durable engineering solutions that uphold the best environmental standards in port design and operation should be sought;
- studies should be undertaken to assess the potential consequences of global warming, including the likely impact of climatic changes and rising sea levels, on the sustainability of South Africa's ports.

Government has acknowledged the importance of the contribution of ports to the national economy. The NPA, which owns and manages the infrastructure of all eight commercial ports in South Africa, is planning to invest more than R25 billion over a period of five years

on port infrastructure development. This includes operational infrastructure for the new Port of Ngqura, the widening of the entrance channel to the Port of Durban, the deepening of the container terminal at the Port of Cape Town, increasing the iron ore export from the Port of Saldanha and increasing the coal export through the Port of Richards Bay.

Future Ports will support the competitiveness of South Africa's ports by experimental research and by developing capacity to improve aspects that might be below present world-class standards, as well as ensuring that ports in South Africa and Africa fulfill their appropriate future role of providing goods and services within a coastal ecosystem.

Envisaged project outcomes include:

- technology-based service systems to support port planning, design and operations;
- integrative systems to support critical port operations linked to risk and vulnerability and regional prediction systems;
- a framework with a systemic view of port management requirements, critical decision and operational processes; operational risk management solutions and systems to improve safety;
- decision-support systems for port and logistics planning; and
- ensuring the sustainability of ports by making maintenance planning and operations more efficient, thereby reducing risks.

Contact details: CSIR Built Environment

Dave Phelps

Tel: +27 21 888 2539

Email: dphelp@csir.co.za

www.csir.co.za