Assessment of Tanzania's Ports in the Regional Economic Environment

Beneficiary Country:

The United Republic of Tanzania

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<td>CTMS</td>
<td>Container Terminal Management System</td>
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<td>DFID</td>
<td>UK Department for International Development</td>
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<td>Public Private Partnership</td>
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<td>Reli Assets Holdings Company</td>
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<td>Rail Mounted Gantry crane</td>
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<td>TSIP</td>
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1 Executive Summary

Introduction

A study on Tanzania’s ports, logistics and trade has been undertaken jointly by EU, AfDB and TMEA and financed from EU funds available under the Technical Cooperation Facility instrument. It is part of the African Development Bank’s non-lending portfolio in its Country Sector Programme.

The study is executed by experts from the Parsons Brinckerhoff consortium. This draft Final Report provides the study team’s findings which will be presented in a Workshop on 24 May in Dar es Salaam.

The objective of the Study is to formulate policies to Government on strategic planning of transport infrastructure, services and regulation in a regional environment.

After collecting and reviewing comments a final report is due at the end of June 2012.

Present state of affairs in the Tanzanian transport sector

Tanzania possesses a network of infrastructure components that is not matched to international standards.

Trunk roads are only 50% paved and have two lanes and cannot sustain heavy truck traffic. Road maintenance is insufficiently funded. Railway infrastructure is all single track, not electrified and ageing.

Port facilities are available but cannot accommodate vessels over 10 m draft and maximum 240 m length (DSM port). Other sea ports and the Lake ports are poorly equipped. Some intermodal freight stations exist but are not sufficiently equipped. Inland Container depots only exist in DSM and have Customs clearance licences.

Transport services are also costly due to non-tariff trade barriers that include a high number of road checks, port congestion, port and border document procedures.

Strategic planning

In a regional economic environment supply chains are needed to trade goods and commodities successfully. This calls for integrated Transport Corridor development.

Strategic planning needs to be undertaken regularly including the setting of priorities for transport infrastructure investment and service improvement.

The planning cycle is as follows: demand analysis + capacity analysis >> infrastructure and transport service gaps >> corridor priorities >> investment cost estimates >> funding options (PPP) >> implementation plan and monitoring >> adjust plan every 5 years with yearly rolling demand analysis.
**Corridor priorities**

Four corridors are identified for development. Most relevant for up-country and international supply chain is the Central Corridor. High priority should be given to all elements of this corridor (ports, railways, intermodal hubs, regulations.

**PPP**

Public Private Partnerships are essential in Tanzania, as investment demands are huge and cannot be covered from public funds alone.

Corridor Development plans require multi modal improvements:
1. Ports: optimize use of present port facilities, limited increase of capacity based on expected demand
2. Railways: rehabilitation of TRL and TAZARA network back to original design capacity, rehabilitation of existing rolling stock (locomotives and wagons), acquisition of new rolling stock for container transport
4. Port efficiency: speed up container handling
5. Trade facilitation: Customs Clearance in the ports, optimize interface ports and hinterland connections, and develop Intermodal Freight Villages on key locations
6. HR development: to educate and train the human resource force up to the demand of the sector

**Funding options**

PPP has been relatively unsuccessful in the transport sector but is still high on the government’s agenda.

Large investments in transport sectors can only be funded by PPP whereby public sector limits its role to custodian of infrastructure and / where financial feasibility fails / support private sector investment by guarantees of external credit from International Finance Institutions.

**Policy in place**

The National Transport Policy 2009 (NTP) recognises a number of freight transport trends towards the economic deregulation of transport operations. This trend reflects the view that the traditional economic regulation of competitive transport markets, (i.e. entry control, price regulation, and quantity regulation) is not necessarily compatible with the requirement of promoting effective competition and innovation, and economic efficiency.

The policies are however not complete in terms of targets, benchmarks, funding or timescales.

The railway institutions need to be adapted to allow private operators to run trains at a certain moment in future. RAHCO and TAZARA should adopt also – at an appropriate time – the infrastructure custodian role to achieve the improvement of services through private participation.

**Key Policy Recommendations**

Summarising the conclusions and recommendations of the above chapters the following key Policy recommendations are:

**Institutional**

- Gradual transition of TPA into a pure Port Landlord by transferring handling operations at all service and tool ports to the private sector.
- Reorganize the TPA organisation in view of stevedoring and warehousing functions and handling equipment maintenance gradually disappearing.
- A social plan needs to be made smoothly to transfer redundant staff to either the new operators or to other positions in governmental agencies or the introduction of compensation for voluntary redundancy.
- Introduce Activity Based Costing to TPA functions to assess cost efficiency and profitability.
- MoT to compose transport policies and strategies that are clear on-target and implementation time frames and funding schemes. In case of disapproval of plans and/or its public funding scheme by Parliament, recompose a Strategy that can be implemented.
• Strengthen the capacity at the Ministry of Transport in respect of PPP transactions and strategic planning.

• GoT to significantly increase port capacities based on a priority and planning scheme for corridors in the frame of a regional supply chain context.

• Where needed public service operators (TRL/TAZARA) to hire/employ external expertise to improve operations and rail transport services.

Infrastructure Investments

• Funding of transport infrastructure investments to be arranged as much as possible by PPP schemes.

• For all PPP investment projects, assess both economic and financial feasibility to formulate PPP risk sharing schemes.

• TRL and TAZARA lines to be upgraded by public funds and to allow wagons with heavy containers.

• Establish the Kisarawe Freight Station in line with DSM port expansion implementations.

PPP

• Upon the adopting of the PPP law, train MoT and transport authorities’ staff to be prepared to design PPP schemes for individual projects and to negotiate effectively with the private sector on terms and conditions of contracts.

• PPP options to be analysed and evaluated by experts to match private sector desires and at the same time protect public interests.

• Appoint for each PPP scheme a experienced Transaction advisor.

Transport means

• TRL and TAZARA rolling stock to be upgraded and renovated to allow efficient rail transport operation, through PPP funding

• GoT/MoT to stimulate ship building and ship investments through temporary subsidies or tax incentives.

Regulatory

• Prepare legislation and conditions for concession to allow private rail operators to run trains and wagons on the TRL and TAZARA networks.

• Regulations towards fixing or regulating handling charges should therefore be abolished. Private operators should be only controlled when sufficient competition cannot be attracted.

• IMO conventions and codes to be ratified and where ratified implemented by adopting legislation and provide financial and human capacity to enforcing regulation.
• Introduce system of user charges for those infrastructure investments that cannot be funded by public funds (toll roads, channel dues, BOT arrangements, etc).

• Reform SUMATRA to a regulator that refrains from transport tariff or benchmarking setting and monitoring to private sector, but safeguards transport users against abuse of monopoly positions in the transport market and safety and security of transport.
2 Introduction

The study on Tanzania’s ports, logistics and trade is undertaken jointly by EU, AfDB and TMEA and financed from EU funds available under the Technical Cooperation Facility instrument. It is part of the African Development Bank’s non-lending portfolio (i.e., economic and sector work (ESW)) programmed in its Country Sector Programme.

The study is also a continuation of the issues which were highlighted in the Bank’s African Development Report 2010, which features Ports and connectivity issues in Africa.

This Draft Final Report will hopefully serve as a reference document for any policy making and strategic planning in the area of ports and related transport logistics in Tanzania and the region, as well as to inform future operations of the Bank Group and other Development Partners.

The report is meant to provoke debate on findings, conclusions and recommendations to facilitate high-level policy dialogue and advisory services.

This report follows the chapter structure as indicated in the Terms of Reference to enable readers to clearly review findings on particular subjects at stake.

2.1 Objectives of the Study

The overall study objective is to critically examine the key challenges facing Tanzania’s ports and logistics infrastructure, and the collective implications of these for trade in the East African regions served by those ports. The specific objective is to propose recommendations to inform the policy debate on strategies to improve connectivity of African countries to regional and global markets with the aim to boost trade and, in turn, contribute to the economic development process.

The study assesses thereby the geographical situation of Tanzania’s ports in the wider economic environment and the role they can play in the economic development of an area or region.

2.2 Approach and Methodology

The methodology applied consisted of 3 activities:

a) Review of existing governmental plans and policy papers and consultancy reports by various donors.

b) Field survey to Dar es Salaam (DSM), Mtwara, Tanga, Mwanza, Musoma and Kigoma ports to assess physical conditions and operational methodology applied in these ports.

c) Interviews were held with various stakeholders: MoT, TPA, TICTS, TTFA, TASAA, TAFFA, CMA-CGM, RAHCO, TRL.

Based on the findings of the Study Team a Draft Final Report is produced for review.

The chapter composition as listed in the Terms of Reference has been applied but some chapter headings have been inserted to make report structure more readable.

On 24 May a Workshop has been planned with governmental agencies and relevant stakeholders (around 50 people) to discuss its findings, under the guidance of the cooperating institutions (the African Development Bank, the European Union and TradeMark EA) and their counterparts in government.

After collecting comments from the stakeholders, a Final Report will be submitted at the end of June 2012.
2.3 Limitations of the Study

The study focusses on freight transport only and does not take into consideration the infrastructural requirements to accommodate passenger transport.

The Study Team had no access to all relevant capital investment requirements for specific transport infrastructure projects and for some projects it was not clear what the physical infrastructure component was and what the equipment component.

As the Study copes with corridor development, only investments in the trunk road system are considered and not the regional and local roads (with the exception of roads that are the interface between main intermodal nodes).
3 Contextualizing Tanzania’s Ports and Logistics Challenges in a Changing World

3.1 Introduction

Ports are links in the supply chain of goods and commodities and as such part of Trade Facilitation. Supply chain management has gained importance in the past 25 years and is now a vital part of overall industry and trade development management in any country or global region. When assessing ports and planning port development, a holistic view needs to be applied that includes assessment of other parts of the supply chain, implying rail and road networks next to transport services and transport market regulation.

Rather than improving individual (sub-sector) transport infrastructure and services, entire supply chains need to be improved, meaning that all weak parts of the chain need to be addressed. Technology and market development is globally taking place in all transport subsectors (maritime, road, rail, air) and in its multimodal concepts. This development is driven by the everlasting demand for lower transport and logistics cost, more infrastructure and better quality of logistics services. Increasing East African regional trade volumes is unlikely without improving the port performance and transport infrastructure (road/rail network) in Tanzania.

3.2 Maritime transport

Globally, maritime transport is growing at a high pace since transport users understand the laws of the economy of scale that favours maritime transport above other transport modes.

Apart from ocean going cargo vessels becoming more fuel and capacity efficient, shipping is an industry in which supply and demand are more harmonised in sub-markets to reduce empty legs on maritime routes as much as possible. This is particularly the case in container shipping which has developed the structure of main ports and feeder ports based on respectively global and regional routes. To maintain access to the global market, many African ports receive their cargo partly via transhipment from larger regional hubs rather than directly from the country of origin. 50% of Africa’s container traffic is shipped through these hubs (UNESCO, 2009).

Tanzania is connected to the maritime shipping – due to its scope of demand and its port capacity limitations – through regional shipping services with direct shipping links to India, the Arab Gulf States and parts of Asia and indirectly with other parts of the world such as Europa and America.

The coastline of Tanzania is some 1000 km which does not seem to justify two high capacity sea ports in Tanzania. Main ports have by definition the tasks to cater for large vessels that cannot enter smaller (secondary) ports. The establishment of 2 main ports in close vicinity will create undesired competition when cargo flow volumes are too modest to justify the required large main port investments.

Secondary sea ports are ports that have more ship size and cargo handling limitations but can play an important role as hub for local demand and as feeder port to connect to the main port. The catchment area of these ports will determine the size of the port and its scope of services. Typical secondary ports are Mtwara and Tanga.
3.3 Lake shipping

Lake shipping is next to maritime transport the cheapest mode of transport and is developed in countries that have inland waters. Ferries are the most common type for short or long distances but more dedicated motor barges have emerged to cater for low cost and high volume transport capacity. With the present technology, Motor barges are shallow draft vessels and need little crew and are cost effective.

Container barges have been designed for all trades such as container transport (see figure 1). The Tanzanian lake have shipbuilding facilities which makes modern Lake shipping a feasible transport mode at all the lakes.

3.4 Intermodal transport

Transport service industry has developed into new business concepts in which multi-modal transport has grown to an independent service industry equally important individual transport modes. The operators (integrators) offer door-to-door services that enable suppliers and traders that aligns better with the principles of Just-in-time or other product delivery models.

Logistics services nowadays include all types of transport and handling and storage of goods and may include value added services such as stuffing and stripping, warehousing, packaging, labelling customs clearance and physical distribution.

3.5 Port competition

East Africa as defined as Tanzania and neighbouring countries consist of some 168 million people, a combined GDP of $83 billion and an annual volume of trade exceeding $27 billion. The main seaports in this region are Mombasa and Dar es Salaam. Both provide vital access to world markets for this region and thus their roles are not only important to the national interest but are also crucial for neighbouring states which depend on Tanzanian ports for their international trade.

Tanzania has the opportunity to become a vital International Hub for landlocked countries such as Uganda, Rwanda, Burundi and DRC. The general shift in trade to the East (China and India) is likely to be beneficial to Tanzanian sea ports in the form of increasing demand. DSM port will be well positioned to serve as an import/export hub for all types of cargo, so long as it can compete on capacity and port performance with other East African hubs.

Mombasa port has equal ambitions as DSM port to become the main hub for mid-East Africa and has some natural advantages over Dar es Salaam. Mombasa is the largest deep sea port in East Africa with a capacity of handling dwt 85,000 ts vessels with a length of over 300 m. The port is equipped with 16 dry cargo and 2 tanker jetties with a total length of 4 km. Port traffic reached on average to 17 mln tons (of which 85 % import cargo) and handles over 750,000 TEU per annum (forecast 2011). The share of transit cargo to Landlocked countries stands at 21 % of the total throughput volume or 3.5 mln tons per annum. Port Traffic is projected to grow to 32 mln tons by 2020 and to 56 mln tons by 2030 (ref KPA/ToR/PIP 2012). Clearly Mombasa port is the main competitor to DSM port and has a head start advantage in the shipping and trade markets.

Djibouti has developed a new deep sea port and has signed a concession with Dubai World Ports for the handling operations. The port is equipped with modern technology (ship shore cranes, yard handling equipment). The port is however far away from land locked countries while road and rail infrastructure is poorly developed. Tanzanian will not likely be affected by this development since major container hubs do exist in the Djibouti region (Aden, Yemen and Salalah, Oman).
Durban is a major container port and services as transhipment port for East African destined cargo. The distance to Tanzania is however big and it is unlikely that Asian-Tanzania trade will be routed through this port.

### 3.6 Transport Corridor development

Large nations tend to define various transport corridors for reasons of security of the supply chain and for reasons of regional economic development. The corridors are designed along major producers and consumer areas and fit into a regional framework of international (regional) corridors.

Corridor effectiveness is depending on effectiveness of each section of the corridor, so determining the quality by the weakest link.

While port capacity and port performance may be poorly developed, rail and road infrastructure and transport services need to be aligned with port development. Ports without a rail link and professional rail transport services are nowadays not feasible. At the same time port development is harmonised with urban or rural planning in which routing schemes are defined.

In Europe, long lasting programmes are in place (TEN-T programme commissioned by the EC) to improve major transport corridors to establish a demand covering network of transport infrastructure.

In Africa, transnational corridors have been identified and being upgraded. Other regional corridors need to be defined and developed to create a more dense road and rail network to optimize supply chain. Chapter 4 elaborates on the sub-regional corridor development.

### 3.7 Rail and Road networks

Road networks are essential for transport corridors as main mode of inland transport. Road capacity is required between and in industrial and residential areas. In essence the network should allow heavy traffic of trucks according to axle load limitations. Market forces however induce truck operators to overload vehicles that cause damage to the road network. This is particularly valid for parts of the main roads in Tanzania. Road maintenance is thus essential and should be properly budgeted while road inspections are required to reduce overloading.

Truck fleets are adapted to specific needs to trading partners and come in a variety of designs to optimise cargo loads and safety. Truck drivers are trained not only to drive their vehicle but also in safe loading and handling of dangerous goods. Truck operating regulation is nowadays introduced to reduce traffic accidents by maximizing driving time periods and set minimum resting time.

The road network in Tanzania is poorly developed as it is single carriageway on main corridors and not well maintained, contributing to high levels of traffic accidents.

Rail network development has led to a standardisation of the gauge in most continents (with some exceptions, cf. Russia/Finland). This standard is not available in East Africa. Economies of scale requires railway lines to be able to run trains at min 80 km per hour and have rakes of 50/60 wagons. These transport schemes are therefore not possible in East Africa. This implies that transport unit cost (ton/km price) is relatively high in Africa for rail transport.

To increase capacity nations have established double track rail networks and electrification to lower operating cost.
3.8 Financial and operational benefits of private participation in infrastructure development and service delivery

Financial benefits of port privatisation

Financial benefits of PPP schemes are logically the reduced claim on national budgets. This is particularly valid for less developed nations such as Tanzania where national budgets for transport infrastructure and superstructure investments are limited in view of other social obligations and industrial development plans.

Green field ports investments can be funded partly or even entirely by private sector provided sufficient guarantees can be secured by government. Guarantees are also needed to convince financial institutions to provide long term credit, essential for large infrastructure investments in transport.

The transfer of public transport services to the private sector has a short term downside which needs to be addressed. The transfer will on the one hand create new (specialised) jobs but on the other hand make groups of civil servants redundant. This consequence needs to be seen as a price for development that provides a larger overall benefit. Social guidance programs and compensation schemes for redundant staff needs to be formulated and agreed.

3.9 Port performance indicators and benchmarks

Operationally, port performance needs to be at an internationally accepted standard to attract shipping lines to have service calling a Tanzanian port. Port performance is depending on both available technology (matching the physical limitations of the port), port service standards and port management.

Basically three main performance indicators are reviewed in ports assessments:
1) Ship Turn around Time (TAT),
2) Cargo handling speed and
3) Cargo(container) dwell time

The TAT in major ports in the world is kept to a minimum whereby ship waiting time at anchorage is more or less restricted to 1 or 2 days and the balance is reserved for cargo handling at berth or jetty. This level is in strong contrast with DSM port where container vessels need to wait up to 10 days for a berth at the dedicated container terminal (TICTS) but may reduce idle time to berth their vessels to the non-dedicated container terminal of the Tanzanian Ports Authority (TPA). This however comes at a price of slower handling speed.

Port performance indicators for cargo handling operations are usually recorded in terms of cargo throughput (tons, TEU, etc) per annum. Logically handling technology plays an important role in this indicator but handling skills are just as relevant. International benchmarks are thus hard to compare as both aspects vary from port to port also due to the vessels size and type of cargo.

Dwell time of cargo in ports is primarily important for containerized (high value) cargo and benchmarks are hard to compare since cargo documentary and cargo/vessel inspection processes (Customs and other) in the port determine the height of this indicator. High dwell time increase handling costs and make ports uncompetitive. Container dwell times can be as low as 2 to 3 days (main global gateway ports) while DSM now stands at some 7-9 days (ref TAFFA).

Ports in the world have been able to improve port performance not only by apply new technology but also by supporting the coordination process with all port stakeholders.
In Africa the above benchmarks are applied by regulatory authorities to control port performance, in particular the handling of cargo (rather than of ships). This is not the case in fully developed ports where benchmarks are merely set as measurement of competitiveness and not used to control actions in port. In Tanzania detailed benchmarks are applied since a biopoly exists for container handling (2 operators) offering equal tariffs with different conditions but with little alternatives to customers. (see further Chapter 8. Regulatory framework).

To improve performance in ports, competition must be introduced to provide alternatives services to shippers and receivers of goods (traders/producers).

### 3.10 The diversification and globalization of investors and operators in the ports and logistics industry

Port development is today a fully grown-up industry where proper port infrastructure, cargo handling technology and port management are the key factors to success. The required investments in port infra and superstructure are however substantial and many Port authorities are not sufficient financially strong to fund all necessary investments. More and more Port authorities around the world invite private sector to (co-)invest in infra and/or superstructure in a public private partnership (PPP).

The international development of PPP schemes for transport infrastructure and cargo handling services has been mainly induced by the need for funding and the need for improved port performance.

The concessions that go along with those PPP schemes are taken mainly by a few global but highly experienced investors/operators that specialise in port and terminal handling activities. Known names are HPH, Dubai World Ports, Port of Singapore Investments and APM (a Maersk subsidiary).

Some of these global port operators however may have different strategies towards individual port development. Port operators as APM are basically interested in managing/upgrading terminals for their own Shipping Lines. This may work out fine from a funding and efficiency point of view but may lead to discrimination of other Shipping Lines that will not have the best handling facilities in the same port.

Other Operators may enter into concessions just for strategic reasons that include the exclusion of competition in a particular area. In those cases operator may not work on sufficiently on port efficiency which is normally a national requirement.

The global trend is however that, especially in large regional hubs, Shipping Lines prefer their own private terminal for reasons of secured berthing and maintaining tight sailing schedules in service loops. Such terminal exclusivity to one Shipping Line is not feasible in Tanzania as volumes are (for at least a number of years) too limited and port facilities too few to satisfy all Shipping Lines. Multi-operator terminals provide normally the best results in port efficiency as berth occupancy can be maximized and idle berth time can be avoided. This however comes at a cost as ships may face berthing delays which raises maritime transport cost.

Port management has developed into two main sub-categories: a) the port as facilitator to shipping and logistics through a package of infrastructure (access channel, port basin, quays/jetties, yards, storage areas, etc.) and b) the cargo (and passenger) handling from/to ship and in port. While the former has remained primarily in the hands of public bodies (either as authority or as state owned entities) the handling of cargo has shifted gradually from public to private hands.

Constructing new of rehabilitation of old ports can be a costly affair and also here private sector has stepped in with funding to relieve public budgets. The involvement of the private sector is globally acknowledged but not everywhere implemented due to the lack or poor quality of a
national PPP policy and regulation or due to poor concession contract conditions between public and private parties (see further Chapter. 6)

### 3.11 Port Models and implementation

The World Bank’s Port Reform Toolkit (2007) distinguishes 4 main port models:

- service port;
- tool port
- landlord port;
- whole port concession.

A service port is primarily defined as a port in which the port authority offers a complete or substantial range of services.

A tool port differs from a service port in the sense that the handling activities (not the equipment) is chartered to a private operator.

A landlord port is characterised by a mix of private and public sector functions, with the public sector acting as the regulatory body and as landlord, and the private sector acting as port service operations.

A whole port concession is where the public sector hands over the complete responsibility for port management and operations to the private sector for a fixed number of years.

Although the boundary line dividing public and private sectors varies from country to country and has been redrawn over the years, there is a general agreement that a shared model of public-private partnership with the government playing a landlord role is the most optimum model of port management and operation. This model is however in Africa not yet very common although policies and laws prescribe the application often. It is the implementation that is lagging behind policy making. Only Ghana and Nigeria have fully embraced the landlord port model to date. Generally, the port authorities in other African nations have been reluctant to divest itself completely of operating assets, remaining a partner in the port or terminal operating company.

Concentration in the hands of a few operators is another concern. Container-terminal concessions have generally gone to a small number of global operators.

Independent port regulators are rare in Sub-Saharan Africa, and the regulatory framework is generally underdeveloped. Presently, most regulation is done by a ministry of transport, and governmental agency or a port authority. The system creates conflicts of interest, since an agency such as the port authority cannot be objective about grievances because it is an interested parties. Indeed, South Africa is the only African country to have adopted an independent port regulator, through the National Ports Authority Act.

A more detailed overview of Port models is presented in Chapter 6.
4 Evolution of Tanzania’s Ports and Logistics in a Competitive World

4.1 Historical overview

Mainland Tanzania, formerly known as Tanganyika, had been colonised by Europeans in the 19th century, along with much of sub-Saharan Africa.

Tanzania has inherited a transport infrastructure from the colonial era, much of which was installed up to a century ago to address transport needs which have changed dramatically over the intervening years. The infrastructure has, of course, been adapted to changing needs and practices. This adaptation, although imperfect, has been more successful in the sea ports, and Dar es Salaam in particular; whereas much of the older inland infrastructure remains in need of substantial updating. This pattern is to be expected, given the exposure of the principal sea port to international trends, while the lake ports remain a largely closed and relatively isolated system.

Ports

Seaports

The eastern seaboard of Africa had long been subject to foreign trading activity, principally from Arabia. Dar es Salaam was an obvious choice for a port, a naturally sheltered “peaceful haven”, around which grew the city which is now home to an estimated ** million people. As with many traditional port sites worldwide, DSM gradually became a victim of its own success, as the city has grown to hem in the port. The problem is exacerbated by steady growth in cargo volumes, accelerated by the introduction of containerisation.

While other ports have been used along the mainland seaboard (Tanga, Pangani, Kilwa, Lindi and Mtwara). DSM port has maintained its pre-eminence because of several factors:

- Sizeable and sheltered deep basin, only recently (with increasing vessel sizes) being considered depth-limited
- Proximity to Zanzibar
- Growth of Dar es Salaam city – source or destination for a high proportion of the cargoes
- Its choice as the terminus for two long-distance railways – first the Central Line to Kigoma (completed in 1914), and then the Tazara Line into Zambia (completed 1974)

Of the other seaports, only Tanga and Mtwara remain commercially operational for freight, and then at far lower throughputs than Dar. At both of these smaller ports, however, there are proposals for substantial expansion and diversification.

Lake ports and fleets

The lake ports form an essential component in the transit network for neighbouring landlocked countries; and serve also numerous small lakeside communities. They are on a much smaller scale than the seaports, and have reached in many cases a run-down condition, with dwindling throughput. At Mwanza and Kigoma, the reduction in traffic is directly linked to the declining (TRL) railway service.

A summary of current port conditions, constraints and possibilities is presented at Annex B.

State ownership extends to much of the shipping fleet on the Lakes (Victoria, Tanganyika and Nyasa), having been taken over from the former combined East African Community ownership.
Much of the fleet is very old, dating from pre-independence times, vessels having been built in UK and European shipyards, then shipped out to East Africa in part-assembled form.

The fleet includes 4 surviving of an original 5 rail ferries, dating from the mid 1960s, which served the Lake Victoria ports Port Bell (near Kampala), Kisumu, Musoma, Mwanza and Bukoba, effectively linking the meter-gauge rail systems of Uganda, Kenya and Tanzania. In its day, this system was a well-used extension to the rail networks; although it is to be considered technically-inefficient by modern standards.

**Development of the railway network**

It is perhaps misleading to refer to one network, since Tanzania's railways have been developed in a piecemeal fashion, with the several main elements each constructed for a specific purpose, rather than to a coherent strategy:

- The closest approach to a network as such is the metre-gauge system formed by the linking of the Usambara Line (north-east Tanzania) with the Central Line and its several branches (most notably Tabora-Mwanza). The network concept of this system was also effectively extended by the rail-ferry system, linking Tanzania, Uganda and Kenya across Lake Victoria (see **

- The 610mm-gauge system from Mikindani (near Mtwara) inland, intended to serve the production areas for the ill-fated Tanganjika Groundnut Scheme, and running to some 250km. The Scheme failed and was abandoned in 1951, and the remaining narrow-gauge network finally closed in 1963.

- The 1067mm (Cape-gauge) TAZARA line, completed in 1974. This line, sponsored by the People's Republic of China, provided coastal access to landlocked Zambia independent of that country's southern neighbours – Rhodesia (now Zimbabwe) and South Africa. This is essentially a simple arterial line, rather than a sub-network.

There have also been numerous minor narrow gauge systems.

Operation of the extant metre-gauge network (TRL) is now under the control of the state-owned Tanzanian Railways Company, with a separate entity RAHCO being responsible for upkeep of the permanent way. The TAZARA line is under an entirely separate bilateral (Tanzania-Zambia) administration.

The TRL and TAZARA lines both serve the Port of Dar es Salaam, and closely approach one another at Kisarawe (just outside DSM [insert cross-reference] and further south-west at the end of the TRL branch line at Kidatu. They are not interoperable, however, by reason of the gauge mismatch. Schemes have been proposed to link traffic between the two lines by means of a transfer facility. The TAZARA line has the better access to DSM Port; the TRL line having to pass through central Dar es Salaam via congested at-grade crossings.

**Historical evolution of the rail network**

**Metre-gauge (Central and North-East – TRL).**

Dar’s significance as an international gateway, serving neighbouring land-locked territories, was substantially reinforced by the construction of the Central Line railway (Tanganjika-Bahn) to Kigoma. This 1,252 km route was completed after a nine year period in early 1914. The original motivation for this venture was to access the interior of the larger colonial territory of German East Africa, which included modern-day Rwanda, Burundi, Uganda and Kenya, as well as mainland Tanzania. The corridor so created assumed international significance by reason of the subsequent partition of the formerly German-held territory, into the various European mandates and protectorates which eventually became the sovereign independent states of today.

The Central Line also facilitated development of the interior along its route, in the era before road trucks or 4wd vehicles. Passenger transport was an important element of the service. The Dar-Kigoma Central line was not, however, the first railway engineering venture on present-day Tanzanian territory. The Usambara Railway, commenced at the end of the 19th Century, was originally conceived to connect Tanga with Lake Victoria – a precursor of the current proposal to...
develop a Tanga-Musoma corridor. Various other narrow-gauge (600mm and the 750mm Sigi-Bahn) lines were installed to service the extensive sisal plantations in the Tanga region. Trading routes have existed for centuries; but these are typically just an attribute of the natural terrain – the least difficult route accessible by pedestrians and beasts of burden. The advent in East Africa of the railways, as the first investment of fixed and/or mobile infrastructure to support transport of people and/or goods, was arguably the effective introduction of the transport "corridor".

From the outset, the relatively ambitious plans were not always matched by successful implementation. The privately-sponsored Usambara Railway ran into financial difficulties at an early stage, and was eventually taken over by the Ostafrikanischer Eisenbahngesellschaft, the treasury-backed company responsible for construction of the Central Line. The Dar-Kigoma line was successfully completed. Work then began on a branch northward from Tabora, the so-called Ruandabahn, planned as a link into the territory, now state, of Rwanda, with a view to capturing the lucrative trade in cattle hides. The advent of war in 1914, however, thwarted further development by the German colonial power.

Railways continued to provide the basic network for long-distance mechanised transport up until and beyond the Second World War, when Tanzania was under British colonial administration. The metre-gauge network was extended, with the Usambara Line being extended to Arusha by 1930 (its westernmost extent, but still slightly less than half-way towards its originally-conceived destination of the Speke Gulf in Lake Victoria). A connection had also been made with the Kenyan system (also metre gauge), between Voi on the Mombasa-Nairobi line and Kahe on the Usambara Line.

Meanwhile, several branches were added to the Central Line. Using the pre-WW1 German works for the proposed Ruandabahn out of Tabora, the Mwanza line was completed in 1928. As late as 1920, the terrain over which this line was to pass was reported as largely unmapped. Other branches were Kaliua-Mpanda (opened 1950), Kilosa-Kidatu (opened 1965) and the short-lived Msagali-Hororo (opened 1948; closed 1951). The Central and Usambara Lines were connected by the western coastal line in 1963.

Administration of the system
Administration of the railways in the region, following post-WW1 colonial re-arrangements followed the then widespread practice of combining ports and railways, recognising the strong logistical and commercial interdependence between the two sectors. In 1948, the East African Railways and Harbours Administration brought these sectors across Tanzania, Kenya and Uganda under a single organisation. The formation of the East African Common Services Organisation (in due course superseded by the East African Community) enabled the survival of this trans-national administration beyond the independence era of the early 1960s. Ports and railways were separated in 1969 (not before the establishment of the Lake Victoria rail-ferry system).

The Tanzanian Railways Corporation was formed in 1977, to take over the Tanzanian metre-gauge system when the East African Community was dissolved. (The TAZARA system remained independent, and the southern Tanzania narrow-gauge system was by then already abandoned.) Commentators typically date the onset of decline in the Tanzanian railway system from this point. It is fruitless, however, to try at this stage to identify any causality. Other pressures, such as the increasing competitiveness of truck transport, will have played their part. Nonetheless, there was a progressive decline in services, with parts of the network being shut down and many passenger services discontinued.

In 2007, operation of the remaining metre-gauge system was let on a 25-year 51%-stake concession to an Indian-based operator, RITES. The decline in traffic levels and service reliability thereafter accelerated, with the result that the Tanzanian Government terminated the concession, and operation was brought back under 100% public ownership under the Tanzania Railways Company (TRC). The permanent way is managed by a separate organisation, also 100% publicly owned and funded, RAHCO.
TRC effectively assumed control of the system in July 2011, to effect what is intended to be a revival project for the metre-gauge railway system.

This present Study will not attempt an analysis of the particular causes of failure of the RITES concession, a question which remains politically controversial and probably not susceptible of wholly-objective analysis. Certain general observations can be made, however, about the constraints and requirements of the present system, regardless of how the system is to be managed and funded henceforth.

**Condition of the metre-gauge Tanzanian railway system in 2012**

- The construction of any kind of working railway across the centre of present-day mainland Tanzania, in the early years of the 20th century, was in itself a considerable feat of engineering. It may be assumed that the design margins of the track and associated civil engineering works were necessarily tight. In consequence, it is wholly reasonable, in the absence of a full-scale re-engineering of the line, that this century-old asset is working at many points on the limits of viability. If the system is to be kept operational, then a comprehensive programme of upgrading, progressing through the identified problem areas on a technical priority basis, must be put in hand.

- In the meantime, those sections of the line awaiting engineering improvements will remain susceptible to failures, and a relatively high average level of ad hoc repair expenditure will need to be provided for. Certainty of available funding/credit, in order to carry out the improvement works and to be able to respond to major repair incidents in the interim, is an essential pre-requisite to keeping the track in an operational state.

- Prolonged and/or frequent track outages, requiring substitute road transport for the affected sections, renders impossible a reliable service.

- Serious problems also exist in respect of the railway fleet – locomotives and rolling stock – with the greatest problems in respect of the former. The locomotive fleet is ageing, with no unit less than 30 years old. Apart from generally deteriorating performance (reduced power), this results in frequent – and often protracted – breakdowns.

- It has been reported to the Study team that the available fleet of locomotives in operational condition, as of May 2012, numbers approximately 15. Even this number might be halved at short notice, given the risk of frequent breakdowns. This is not a sufficient fleet to run the system even at minimal traffic levels.

- Under present conditions, reported freight transit times between DSM and Kigoma are typically ≈30 days, but 90 day transits are not unknown. Other problems, such as non-weatherproof boxcars, poor or nonexistent consignment tracking information, contribute to the general unattractiveness of the rail freight service currently on offer.

- Clearly there is a need for massive investment in improvements of both fixed and moving infrastructure, as well as assured working capital in the short- to medium-term to enable system failures to be promptly repaired. In the absence of funding to effect the necessary basic improvements, the severe unreliability of the service will outweigh the advantage of substantially lower tariffs, and shippers will increasingly choose the known, if costly, service offered by road transport, even over distances of 1000km+.

- As well as the risk entailed in such investment, returns will not accrue immediately, given the time required to acquire and deliver new rolling stock, and to effect the more urgent permanent way repair and reinforcement works. It is unrealistic, at least in the early stages of any rail recovery programme, to expect any real interest from private sector investors. Substantial governmental/IFI funding will therefore be required.

- Even in the long term, should recovery of the railway freight service be feasible, continuation of any passenger services must realistically be seen as requiring continuing subsidy, as a social provision.

- The present reality is that RAHCO is obliged to apply for funding on a project-by-project basis for track repairs or improvements. TRC, in the meantime, is receiving from government less than 20% of the funding allocated for the current financial year, in turn less than half of the Tsh63Bn proposed by TRC for a revival programme.
Meanwhile the TAZARA system, although remaining generally in regular operation, was also deteriorating, with much of its rolling stock unserviceable and staff salary payments months overdue, for want of working capital. The TAZARA operation is generally supposed to have been financially loss-making from its inception. In 2010, the People’s Republic of China, original sponsors of the TAZARA railway construction, agreed to provide a US$39 million interest-free rescue loan.

**A word about gauge**

The gauge of a railway is the transverse distance between its running rails.

Numerous railway gauges are in use throughout the world. Much of the modern system in the UK, Western Europe, and the United States is on a so-called “standard gauge” of 4’8½” (1.435m). Many of the systems installed in Africa in the colonial era were 1.000m “metre-gauge”. Metre-gauge systems are also in use elsewhere, however. Additionally, several southern African countries (as well as others worldwide) use the so-called “Cape gauge” of 1.067m. Tanzania thus finds itself between the zones of two widely-used African gauges, with substantial track length of both meter-gauge and Cape-gauge, mutually non-interoperable.

The metre-gauge systems in Africa have come to be widely regarded as inferior to standard gauge systems, but this view is at least partly influenced by association with its colonial origins. Thus, there is a widespread desire for the “upgrading” of metre-gauge systems to standard gauge.

Standard gauge is superior to metre gauge, insofar as it can handle faster train speeds. Thus, a modern, high-speed passenger rail system cannot realistically use metre-gauge. Typically, the differences between standard-gauge and narrow-gauge railways are not merely due to the gauge itself, but to other factors, including track alignment (curves, gradients) and loading gauge (wagon width and height limitations) whereby a narrow-gauge railway might be adapted to difficult terrain and/or achieve savings on the sub-structure civil engineering, at the expense of carrying capacity or performance. The carrying capacity of the track, for example, in terms of axle weight, is determined not by gauge but by rail weight, for which a range of values can be adopted, irrespective of gauge. Thus, for heavy freight services, where train speed is not of primary concern, it is difficult to justify an “upgrading” to standard gauge on the basis of simple engineering performance.

One very obvious consideration, when selecting gauge for construction or rehabilitation of a railway, is the interoperability with other networks. Thus, introduction of standard gauge to Tanzania would initially make matters even worse, by adding a third standard, incompatible with both of the existing (metre-gauge and Cape gauge) systems. It is possible also to lay dual-gauge (3- or 4-rail) tracks, which could accommodate both standard gauge and narrow gauge train rigs; but this solution cannot be used to combine metre-gauge and Cape gauge compatibility, because they differ by only 67mm, less than the width of the rail itself.

There may be instances where new or rehabilitated lines would still be more useful, for the time being, in metre-gauge. There is also a particular difficulty with the TAZARA line – if it were re-engineered to standard gauge (or metre-gauge), the incompatibility problem would simply be shifted southwards to Zambia.

The difficulties of so-called “break of gauge” are self-evident. Transfer of traffic between two lines of differing gauge involves physical unloading and loading of trains, costly for containers and more so for bulk product or boxcar/flatbed general cargo. Entirely separate fleets of locomotives and rolling stock must be maintained for each gauge in use.

Use of standard gauge does give an operator access to a wider choice of rolling stock, if seeking to buy second-hand or to lease.

**Steps towards the introduction of standard gauge**

There is a case to be made for constructing any new track as standard gauge, given the benefits of standardisation and of possible use of higher train speeds, even if only envisaged for the future.
However, the timing of the changeover to standard gauge is important. If the adoption of standard gauge is seen as an end in itself, that may result in poor spending decisions as the railway network is progressively upgraded. Rather, the conversion to standard gauge should be seen as the final step in a logical sequence of upgrades to the Tanzanian railway network.

- Investment is needed primarily to deal with weak spots in the infrastructure (including the provision of a working capital or credit line sufficient to the short- to medium-term emergency repair requirements) and replacing ageing locomotives and rolling stock, all to improve reliability.
- Next comes the need to upgrade axle capacity, requiring replacement of rail and sleepers, and possibly strengthening or replacement of some bridge structures.
- As a matter of general policy, all new or re-engineered civil works on the railway should be constructed with trackbed, sleepers, rail section (weight), loading gauge and – where possible – alignment geometry all to full-scale standard gauge heavy railway. Some of these improvements will also benefit metre-gauge operations in the meantime.
- As and when the conversion to standard gauge is begun, it remains only to move the rails or to add a third rail. Since complete re-gauging or replacement of the fleet will take some considerable time, it may well be found convenient to run certain lines as dual-gauge (3-rail) tracks, during the changeover period.
- The changeover period should be kept as short as investment rates will allow (track engineering, fleet replacement or modification), to minimise the diseconomies of simultaneously maintaining two fleets of dissimilar gauge.

Global technological influences

Containerisation

The single most important change within the second half of the 20th Century is, of course, the advent of containerisation. The economies deriving from the relative efficiency of containerisation as a freight format have the potential to stimulate economic growth. This benefit is realised only to the extent that containerisation is able to penetrate the transport system – it is not best suited to all forms of cargo, and requires adaptation of infrastructure.

A highly efficient means of transferring freight between ship and shore, the container system dictates wholly different port layout parameters from those required for general cargo operations, with extensive container stacking areas and an open quay layout, to permit equally rapid transfer of containers to/from the quayside. This requirement for greater hinterland area per linear metre of quay is in conflict with the general tendency of traditionally-located ports to become hemmed in by burgeoning development of the parent city.

Containerised traffic in Tanzania – whether local or serving neighbouring countries – is dominated by imports, with much of the outbound movements being empty boxes [figures]. The greater port cargo throughput volume made possible by containerisation in turn places pressure on surface transport serving the ports; again, even more of a problem in a city-enclosed port. Thus, the adaptation of ports to containerisation is relatively straightforward, if initially costly. But increased volumes passing efficiently across port quays then place burdens on the onward transit infrastructure. This is very much the stage which Tanzania has reached: there is pressure on traffic across the Dar es Salaam quays, which calls urgently for increased capacity; but the medium-term solutions (additional berths and deepening to accommodate larger vessels) are available. The infrastructure as one moves inland, however, becomes progressively less capable.

A large proportion of containerised imports is actually destined for consumption (or stripping) in the greater Dar es Salaam conurbation. Even this is handled with difficulty by the current system, with excessive dwell times (albeit improved over recent years) and congestion around the Port. Longer-distance shipments are heavily reliant on road transport, indeed almost entirely so for traffic moving west or north-west out of DSM. This traffic must all use the A7 east-west road out of Dar es Salaam towards Morogoro – a congested single-carriageway highway where progress is constrained by slow-moving heavy good vehicles (typically 20ft+40ft truck/trailer rigs). Many sections are seen to be deteriorating under high volume of heavy-axle traffic, and will require full-
depth reconstruction. Surface water drainage is also often poor, making for hazardous driving conditions during rainy seasons.

As for the lake ports, those with railway connections no longer benefit to any meaningful extent from a rail freight service, which has either been discontinued or – as in the case of the DSM-Kigoma Central Line – has degenerated in speed and reliability to a state of near-uselessness. Were traffic levels to increase, however, the lake ports would be hard pressed to cope. Quay structures at the lake ports are outdated, many of the installations dating from the pre-independence era. Only Kigoma has any real capability for container handling, and that in need of modernisation/refurbishment. What was once a working, if modest, network of lake transport under the East African community has become fragmented. Crucially, however, outdated infrastructure has remained virtually untouched for half a century, and is now largely unusable.

**Shipping – trend in vessel size**

There has also been a steady trend of increasing vessel sizes in world shipping. What might once have been ideal port sites, in terms of, e.g. natural protection from ocean weather, have subsequently to be abandoned in favour of new sites with deepwater accessibility. This is not a uniquely Tanzanian, or African, problem. In the particular case of Dar es Salaam, the depth available at the berths and for navigation in and out of the port basin is now a real constraint on ships which can be accommodated.
5 Strategic Planning Cycle for Corridor Development

5.1 Introduction

This chapter describes the sequence of steps in the planning and programming of transport development in Tanzania in view of supply chain needs and subsequent transport corridor development.

The Transport Sector Investment Program (TSIP) is a 10-year subsector program which is to be implemented in two phases of 5 years each. A major drawback of the TSIP is that it lists priority projects drawn up by each of the subsector agencies without examining the possible integration of the different modes or determining the economic and financial aspects relating to individual components of the program. The overall plan is also not related to the level of resources available and this has limited its usefulness in achieving the transport infrastructure agenda. MOT is currently preparing phase 2 of TSIP which covers the next 5 years (2012/13–2016/17). (ref Transport Sector Review, M18 May 2012).

5.2 Strategic Planning Cycle

While core investment is required in infrastructure, support to planning and management of the sector are essential components if the sector is to successfully underpin the economic and social development. At present, the majority of the planning is undertaken at the subsector level without significant interaction with other modes. This planning has produced adequate plans for individual sectors but does not necessarily produce the optimal transport plans for the whole country.

At the central level, MOT has to decide between various projects in preparing the national transport plan to reduce the risks in resource misallocation. It is recommended that prior to the next five-year plan, the MOT should prepare an integrated multimodal transport plan covering all modes to define the shape and form of the overall TSIP for the period beyond 2016. It is essential that the plan incorporates economic and financial analysis and demonstrates the viability of individual projects. It is recommended that an integrated transport plan is prepared in the 2014/15 period.

MOT requires capacity building programs in several areas to support policy assessment and implementation. A key area for support is to incorporate greater private sector investment in transport sector projects. Technical support for a PPP unit in MOT would help to establish the unit and build the capacity required to promote and investigate projects for private sector participation.

The following steps should be assumed in the planning cycle:

1. Identification of demand in domestic regions and international regions (neighbouring countries)
2. Identification of supply chain concepts that included entire transport corridors.
3. Assessment of existing corridor capacity and quality of services
5. Identification of required improvement (or establishment) needs for each identified corridor and make cost estimates.
6. Assess economic feasibility of upgrading of existing or upgrading of new corridors
7. Cost of implementation of improvement plans
8. Assess funding opportunities (public/private) and assess financial feasibility for private funding arrangements.
9. Assess institutional reforms requirements and identify regulatory amendments.
10. Repeat the steps every 5 years with a yearly rolling update.

This report will use this approach in determining priorities in corridor development.

### 5.3 Planning bottlenecks

For the initial 5 years in the TSIP phase 1, the estimated investment was $6.174 million although the plan indicated that only 40% of the funding had been committed or secured at the outset.

The actual expenditure levels in the first two years of the plan were only 64% of the budgeted amount. Furthermore, in the later stages, the road sector contracted a large volume of works which was well above the available budget. This resulted in numerous contracts that have limited implementation progress, while others have stretched the capacity of the budget to reimburse contractors for accomplished work.

One of the large unknowns in planning for TSIP phase 2 is the amount of investment that might result from PPP arrangements. Planning for participation by the private sector is significantly easier than realising actual investments.

There are many countries in a similar situation as Tanzania who are seeking to augment government budgets and local revenue streams with foreign direct investment. As a result, there is intense competition for each investment in an environment that is not always conducive to generating returns over the long term due to perceived high level of risks. Thus, planning for private sector investment is less certain than for government investment and can often be delayed as agreements often take lengthy periods to reach fruition.

### 5.4 Traffic through Tanzanian Ports

In 2010, Tanzania Ports Authority handled in excess of 10 million tons of cargo. Most of this was destined for domestic markets (imports for the retail and manufacturing industries in Dar es Salaam and to areas of industrial potential - especially the gold mining belt south of Lake Victoria – and exports from areas of greatest population density, especially the main cash-crop growing regions from the peripheries of the country). The transit trade to Tanzania’s neighbours accounted for approximately 35% of all port throughput volumes, most to the Zambia and the DRC (which combined currently account for 21.3% of imports and 33.1% of exports), Rwanda and Burundi (which account for 10% of imports and 1% of exports) and the remainder to Malawi and Uganda (1.9% of imports and 0.4% of exports).

Of all the ports, Dar es Salaam is the largest and currently handles over 9 million tons of cargo (90% of Tanzania’s import and export volumes). Tanga handled approximately 0.5 million tons and Mtwara approximately 0.25 million tons. Of the inland lake ports, Mwanza South port on Lake Victoria and Kigoma Port on Lake Tanganyika dominate, each handling approximately 0.2 million tons.

Most port trade is currently heavily secured toward imports. In the previous 10 year period, there has been no export of dry bulks or vehicles. At Dar es Salaam, the ratio of imports to exports in the liquid bulk trade is approximately 58:1, while for break bulks, the ratio is 11:1. Exports in these markets is orientated to the Island States (especially Zanzibar), mainly of petroleum products, manufactured and processed goods. Though the ratio between container imports/exports (or the ratio between boxes discharged/loaded) has been generally stable at 1:1, most of the export volumes are empty returns. In 2010, this trade accounted for 31% of all container throughput volumes. In the same period, imports accounted for 47%; exports 17% (equating to an import/export ratio of 2.7:1); transhipments and re-stows 5%.
Average year on year growth for the various trades in the last 10 year period though Dar es Salaam has been: 8% for liquid bulks (mainly petroleum cargo – especially white products); 17% for dry bulks (mainly grains); 5% for vehicles; and 13% for containers. Break-bulks volumes have declined year on year by about 4%, reflecting a shift towards bulk handling or containerisation (for low and high value commodities respectively).

### Dar es Salaam Port Throughput 2001- 2010 ('000 Harbour Tons/Vehicle Units/TEU)

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<td>Dry Bulk ('000 tons)</td>
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<td>Break Bulk ('000 tons)</td>
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<td>Containers ('000 TEU)</td>
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<td>Vehicles ('000 units)</td>
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<td>Containers ('000 TEU)</td>
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Source: TPA Briefing Paper September Conference, 2001

The main traffic trends for 2001 to 2007 can be summarised as follows (Source: Master Plan Tanzania Ports, 2009):

- Since 2001, the average cargo growth through coastal ports has been 9.2% per annum (8.5% per annum for imports and 9.1% per annum for exports).
- There has been a sharp increase in dry bulk cargoes through Dar es Salaam, from 385,000 in 2001 to 1.16 million tons in 2007. The increase has been mainly in wheat (+390,000 tons), fertilizers (+190,000 tons) and cement (+150,000 tons) and has been due to a mixture of strong underlying growth in these markets and conversion from bagged to bulk cargo. New bulk imports have occurred recently in sulphur at Dar es Salaam and coal at Tanga, whilst a coastal trade is gypsum is developing but has still to decide which ports to use.
- Liquid bulk traffic has been growing at around 5.4% per annum. It is mainly petroleum (92%), with the balance between crude oil and products affected by major rehabilitation works at the Ndola oil refinery in Zambia. Oil imports through Tanga have declined because of the substitution of local gas for oil in power generation.
- Container traffic has been growing at around 13.5%, mainly in Dar es Salaam. Since the start of the TICTS container terminal lease, transshipment traffic has grown to around 30,000 TEU in each direction.
- Break-bulk cargo has been fairly static. There has been a large decline in bagged imports, which have either transferred to bulk (wheat, maize, fertilizers and cement) or containers (rice, flour, sugar). Bagged exports these commodities – mainly to Indian Ocean islands – are small and variable. Imports of iron and steel and vehicles have grown strongly, but exports of other general cargo have fallen as copper exports from Zambia have been containerised.
- Transit traffic to the land-locked countries makes up a growing proportion of Dar es Salaam’s traffic. Since 2001 it has increased from 10% to 41% of liquid bulks, and from 25% to 39% of containers. Dry bulk and break bulk flows to/from the transit countries have remained fairly small, and fluctuate from year to year.
There is a growing amount of coastal traffic, in addition to container transhipment to Zanzibar, Tanga and Mtwara, although the volumes are still fairly small in total. This has occurred in spite of improvements to the coastal road network.

### 5.5 Traffic Forecast Tanzania Ports

Port traffic demand has been forecast to reach levels of between 29.1 million tons (low forecast) to 77.6 million tons (high forecast) per annum by year 2028.

**Tanzania Ports Master Plan - Cargo Demand Forecast at year 2028 (million tons per year)**

<table>
<thead>
<tr>
<th>Port</th>
<th>High Forecast</th>
<th>Low Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dar es Salaam</td>
<td>41.50</td>
<td>22.65</td>
</tr>
<tr>
<td>Tanga</td>
<td>4.60</td>
<td>1.45</td>
</tr>
<tr>
<td>Mtwara</td>
<td>24.80</td>
<td>2.40</td>
</tr>
<tr>
<td>Lake Victoria</td>
<td>2.05</td>
<td>0.60</td>
</tr>
<tr>
<td>Lake Tanganyika</td>
<td>3.25</td>
<td>1.70</td>
</tr>
<tr>
<td>Lake Nyasa</td>
<td>1.40</td>
<td>0.30</td>
</tr>
</tbody>
</table>

*Source: The Tanzania Ports Master Plan 2009*

In 2011, forecast volumes for Dar es Salaam were updated (Dar es Salaam Update Forecasts 2011) and the port is expected, by year 2028 to handle up-to 6.9m tons of liquid bulk cargo, 7m tons of dry bulks, 0.6m tons of break bulk, 3.3m TEU, 370 thousand vehicles and 1.9m ferry passengers per annum.

The Transport and Trade System Development Master Plan in Tanzania shows the following overall trade figures for 2010 and a forecast for 2030:

**2010**

- Import and export: 10.8 million tonnes
- Transit: 2.8 million tonnes
- Domestic: 34.2 million tonnes

Resulting in a total transport volume of 29,000 million ton-kilometres.

**2030**

- Import and export: 77.9 million tonnes
- Transit: 15.2 million tonnes
- Domestic: 269.3 million tonnes

Resulting in a total transport volume of 202,000 million ton-kilometres, almost seven-fold of the transport volume in 2010.

This means that the internal transport capacity (road and rail) in Tanzania also has to be upgraded over time in line with the expected increase in transport volumes.

The DSM Port is presently already experiencing severe problems with moving the cargo out of the port, due to inadequate hinterland connections (rail movement out of the port is not working optimal, the roads leading to the port are already heavily congested and lead through urban areas and no dedicated truck parking area near the port area).

The expected increase of cargo handling through the port of Dar es Salaam will only put more pressure on the connections from the port to its hinterland.
The Traffic forecasts presented should be treated cautiously as the future always remains uncertain. It is therefore very important to understand the underlying principles and assumptions of any traffic and trade forecast.

In general the demand for transport services in a country depends on the economic development of that country and those of the neighbouring countries (transport is a derived demand).

The transport infrastructure (ports and hinterland connections) should be developed in such a way that it is ready to absorb the demand for transport services in time. This means that the transportation infrastructure should already be in place at the moment the demand for transportation services is there. The capacity of the total transport infrastructure and organisation of transport services should not be the cause for a slowdown of the potential of economic development.

The basis for the assessment of the present and future development of the transport infrastructure in Tanzania is based on the economic policy of Tanzania as lined out in Integrated Industrial Development Strategy (IIDS) 2025, prepared by the Ministry of Industry of Trade of the United Republic of Tanzania in December 2011.

Therefore, the principle assumption is that Integrated Industrial Development Strategy will, eventually, be fully implemented and, consequently, the transport infrastructure has to adjusted accordingly in combination with the provision of transportation services. The timing of the full implementation of the IIDS by 2025 seems ambitious and difficult to achieve.

In addition it is to be noted that the demand for transit transportation services to the Tanzanian hinterland (Uganda, Rwanda, Burundi, Congo, Zambia and Malawi) will depend on the economic development in those countries.

Economic development can only be achieved when the supporting transport infrastructure is in place and when the total logistics sector provides efficient and cost-effective transport services.

5.6 Rationale for Corridor Development

Transport development plans therefore need to be developed in a holistic approach, in which demand is identified and met against existing supply chain capacity,

Regional industries and consumer areas requires access to markets and these demands are the basis of logistics and transport planning. This implies that integrated planning needs to be done by addressing the entire supply chain, consisting of transport infrastructure, connectivity between different transport modes, transport services, freight stations and regulatory framework.

5.7 Prioritizing Corridor Development

Transport corridors should firstly be part of a larger Continental network of corridors. The African Union has identified several transcontinental corridors in Africa. Tanzania is part of the Transcontinental corridor nr 4, running from Cairo to Cape Town and runs in Tanzania from Arusha south to Mbeya. This road corridor has is being upgraded at present and no further analysis has been made (see figure 5.1).
Corridor development plans should be based on global trends in the transport and logistics business sectors and take advantage of lessons learned in other countries.

Global trends
- Maximal containerisation of general cargoes, gradual phasing out of multi-purpose cargo handling (in unbalanced container trades, as much general cargo is put in empty return containers)
- Increase of container ship sizes (total capacity and draft)
- Use of specialised dry/liquid vessels for dedicated trades
- Introduction of Block Train principle for inland container transport
- Further use of Information and Communication Technology in the logistics sector
- Introduction of E-commerce
- Development of Intermodal Freight Villages with value added logistics services
The overall objective of the Corridor development plans is to fully utilize the existing transport infrastructure network to optimize transport network capacity and operate the network efficiently and arrange efficient transportation services. More specifically for individual transport modes:

1. **Ports**: optimize use of present port facilities, limited increase of capacity based on expected demand.
2. **Railways**: rehabilitation of TRL and TAZARA network back to original design capacity, rehabilitation of existing rolling stock (locomotives and wagons), acquisition of new rolling stock for container transport.
3. **Roads**: rehabilitation of existing road network up to normal standards.
4. **Logistics**: speed up container handling and Customs Clearance in the ports, optimize interface ports and hinterland connections, and develop Intermodal Freight Villages on key locations.
5. **HR Development**: education and skills training to plan and manage the transport system.

*Figure 5.2 Tanzanian Corridors*
Nomenclature of corridors

Depending upon the source consulted, differing names may be applied to some corridors, or a name may refer to differing corridor definitions.

This Report adopts the following nomenclature and definitions, as reflected in Figure 5.2, and consistent with that used in the EAC Transport Strategy & Regional Road Sector Development Program, September 2011.

Northern Corridor: an existing corridor from Mombasa, north-westward across Kenya (via Nairobi), and around the North of Lake Victoria to Kampala (Uganda), thence southwards along the Lake’s western shore to Masaka, and then south-westerly to Kigali (Rwanda) and Bujumbura (Burundi). This established corridor thus lies entirely outside Tanzania, and affords ocean access at Mombasa to the landlocked countries of Uganda, Rwanda and Burundi with no passage across Lake Victoria.

Between Mombasa and Kampala, the Northern Corridor is served by both road and rail. South-west of Kampala, the rail service is in need of improvement; whereas the south-westernmost section, between Kigali and Bujumbura, is road only.

Central Corridor: an existing link west-nor’-westerly from Dar es Salaam via Dodoma and Singida to Lusahunga (near to south-western corner of Lake Victoria); thence three alternative spurs respectively to Gisenyi (Rwanda/DRC border), Bujumbura (Burundi/Lake Tanganyika) and Maska (Uganda). The greater part of this corridor thus lies within Tanzania.

The Central Corridor is essentially a road-only corridor. However, part of its route is paralleled by the Central Railway: originally Zentralbahn, the east-west rail link between Dar es Salaam and Kigoma, on Lake Tanganyika. The western section of the line, beyond Manyoni (on the Central Corridor), traverses terrain largely inaccessible by road.

Both the Central Corridor and Central Railway have branches northwards to Mwanza, on Lake Victoria.

In addition to the so-called “major trade corridors”, Northern and Central abovementioned, are also:

Uhuru Corridor: linking Dar es Salaam and Mbeya (on the TAZARA line) and beyond, either to northern Lake Nyasa (at Itungi) serving Malawi, or via Tunduma (Zambian border) to southern Lake Tanganyika (at Mbulungu, Zambia). This corridor is also sometimes referred to as the “Dar es Salaam (TAZARA) Corridor” or simply TAZARA Corridor.

Road and rail lines follow substantially different routes over the greater part of this Corridor, i.e. between Dar es Salaam and Makambako (172km east of Mbeya).

Tanga Corridor: existing at present only as a road corridor Tanga-Moshi-Arusha-Musoma, this is of greater interest as the subject of high-level political initiatives between Tanzania and Uganda, to create a through rail service, providing the latter with an alternative to the Northern Corridor through Kenya as access to the Indian Ocean.

Mtwara Corridor: from Mtwara towards Songea, and thence to Lake Nyasa at Mbamba Bay. This corridor is also sometimes referred to as the “Southern Corridor”.

This corridor currently exists only as road, but future rail development may be envisaged.
5.7.1 Central Corridor

The Central Corridor is the foremost important corridor of Tanzania as it connects the principal sea port of Tanzania, Dar es Salaam, with the country and the (landlocked) hinterland countries.

For the purposes of the present study, the Central Corridor has been considered as 3 sub-corridors:

- Sub-corridor 3 (road): Dar es Salaam – Singida – Uganda/Rwanda/Burundi/Congo DR

The infrastructure backbone is provided by the Dar es Salaam to Kigoma railway (sub-corridor 1), with a mainline branch between Tabora northward to Mwanza (sub-corridor 2). In addition the country’s main trunk road runs from Dar es Salaam through Morogoro, and then on to Dodoma. The trunk road system then runs northwest to Singida (sub-corridor 3).

From Kigoma there are inland waterway connections north to Burundi (Bujumbura), west to the DRC (Kalemie and Uvira) and south to Zambia (Mapulungu). Within Tanzania the Central Corridor includes the regions of Dar es Salaam, Pwani, Morogoro, Singida, Dodoma, Tabora, Shinyanga, Mwanza, Mara and Kagera.

The Central corridor also has many other important links north to the Tanga Corridor and southwards to the Uhuru Corridor.

Economic importance of the corridor
The Central corridor is the backbone of the economy of Tanzania, as it connects the main industrial, agricultural and consumer regions with each other and, through the Port of Dar es Salaam, is the connection with the rest of the world.

The corridor is a mix of several transport modes that need to be tuned on each other in order to operate efficiently and cost-effectively.
It is to be noted that all costs incurred in the logistic chain from production to final consumer, including the costs of malfunctioning of the chain (e.g. waiting time vessels, dwell time containers, service unreliability, etc.) are transferred on to the final consumer.

**Port of Dar es Salaam**

The Port is the link with the world and therefore needs to cope with international shipping developments (bigger vessels with more draft, increasing containerisation, dedicated terminals for liquid and dry bulk). Plans already exist to deepen the entrance channel to the port and the port basin itself.

The cargo handling operations in the port are executed by both a public entity (TPA) and private entity (TICTS).

In the port of Dar es Salaam, several projects exist to increase overall port handling capacity: rehabilitation of berths 1-7, construction of 2 new berths (13-14) under a PPP arrangement with a Chinese company.

**Interface Port of Dar es Salaam - hinterland**

Both the rail and road interface between the port and its hinterland do not function optimally, causing unnecessary delays of delivering cargo from the terminals to the final destinations. The DSM port is connected to both TRL and TAZARA railway networks but little use is made by shippers as container services are unpredictable (especially the TRL services in view of locomotive breakdowns and subsequent service reliability.

The road leading to and from the port has reached its capacity limits and there is no dedicated parking space for trucks in the neighbourhood of the ports. Trucks have to cross the city centre and are a cause of severe traffic jams.

In Dar es Salaam many (mostly small) ICDs have been established to relieve the storage capacity in the Port itself. The use of ICDs does relieve the DSM port of its limited storage capacity for containers but adds cost to the logistics bill for freight forwarders. As a sustainable alternative the Kiserawa Freight Station plan has been proposed in 2010, whereby all up country and transit containers are shuttled by rail to a large multi user/purpose freight station some 35 km from DSM port (see figure 5.2).

*Figure 5.4 Kisarawe Freight Station plan*
Trade facilitation

In order to speed up the Customs Clearance process and the container delivery process from the port to the hinterland, a dedicated and advanced IT system is being developed. (a port Community System).

Such a system is however complex to define (different ports and countries have different needs) and to develop. The total process may be a matter of years as all relevant stakeholders have to be consulted and have to agree on its design and operating system. Such a system may also become very costly due to the design and maintenance. Figure 5.5 shows a typical structure of a full fledged port community system.

**Figure 55 Scheme of a possible Port Community system**

The logical developer, owner and manager of the Port of Dar es Salaam Community Service system would be the Port Landlord (TPA, after concluding its transportation process to the port landlord of all Tanzanian ports). However, all the involved stakeholders would need to have trust in the organisation.

TRL rail corridor

The theoretical capacity of the 1m. gauge Central rail line from DSM to Kigoma and Mwanza, if operating at design speeds and loading, is estimated at about 5 million tonnes per year (source: RAHCO). In the past the line carried at its peak about 1.5 million tonnes per year. In 2011/12 the rail links handled about 0.3 million tonnes per year. This means the utilization rate dropped from the maximum achieved of 30% to under 10% currently.

The reasons for this underutilization are the bad track condition – the line was built 100 years ago under the former German colonial administration – and the unavailability of sufficient and proper functioning of rolling stock (locomotives and rail wagons). Flooding of rivers in central Tanzania, particularly on the Kilosa – Msagali tranche, destroys regularly rail infrastructure and makes operating train services temporary impossible (in 2009 even for 6 months).

By law RAHCO is the TRL rail track owner and custodian and should ensure rail track availability. RAHCO cannot however implement its repair and upgrading programme, for want of financial resources. TRL, being the rail service operator, has similar funding problems and cannot offer reliable freight services due to the bad conditions of locomotives and the lack of a suitable wagon fleet in serviceable condition.
The central rail line is an essential component of the Central corridor and its under-performance has a substantial negative effect on performance of both DSM and the connected Lake ports of Kigoma and Mwanzana. Those ports underperform when the central rail corridor is not operating efficiently and reliably.

Plans have been brought forward to rehabilitate the TRL rail network. Next to that a US$ 4.5 billion plan exists to replace the present network with a standard gauge rail network, including an extension to Burundi and Rwanda.

Possible strategies for maintenance and improvement of the Central Line

Given the cumulative deficiency in past investment in the Central Line, the sums involved in its physical rehabilitation are very large. In the short- to medium-term at least, potential financial returns are unlikely to interest private-sector investors. Some means will have to be found of spreading this investment over time, and avoiding excessive “front-end” costs.

The investment strategy can be considered under two headings, *viz.*:
- Mobile assets – the fleet of locomotives and rolling stock,
- Static infrastructure – the track and its associated civil engineering support (bridges, embankments, etc.) – the “permanent way”.

As regards the mobile fleet, the number of locomotives and wagons for a given annual capacity and configuration of cargoes can be determined by operational analysis techniques. Thus, the optimum fleet make-up can be planned as the system’s traffic capacity is progressively increased.

Expanding the fleet will require substantial acquisitions in the early stages, given the small number of operational locomotives presently available. As for the older, unreliable locomotives (*i.e.* most of the present fleet), the choice may be between repeated repair or replacement; although the repair option becomes progressively less effective, and eventually impossible. Replacement is likely to be inevitable in many cases.

TRC report that options for second-hand acquisition or leasing are limited for metre-gauge equipment. If so, then new equipment will be required; and must be of a chassis design susceptible of re-gauging, bearing in mind the longer-term possibility of conversion of the network to standard gauge.

As regards the permanent way, several options exist:
- Upgrade the civil engineering design to a best-available, low-maintenance standard, sufficient for twin-track standard-gauge conversion in due course; or
- As above but for existing single-track metre-gauge configuration; or
- A low-cost upgrade, addressing only the most serious weaknesses; or
- No re-engineering at this stage – intervention limited to *ad hoc* remedial work to actual failures as they occur.

Of these, the minimum-intervention, low-cost solution automatically implies a higher on-going maintenance cost, for which sufficient funding must be available on-demand to ensure that track outages for repair work are kept to a workable minimum. This approach is not ideal, and may not be the most cost-effective on a whole-life evaluation basis; but does at least allow some of the heavy capital expenditure to be deferred. This may prove essential, given that available funds are finite, and the “make-do-and-mend” approach is less likely to work for the superannuated locomotive fleet. The Central Line permanent way has shown itself capable of being kept operational for many years on this low-cost basis – a default policy which financial exigency might require to be continued for the time being. The key requirement is that funds should be made available when required, to deal rapidly with actual track outages as they arise.
The best-available upgrade represents a long-term goal, conditional upon the continued viability and traffic growth of the railway; but the returns on the more-generous investment – whether by purely financial or broader economic parameters – would only be realised in the long term.

Road corridor
As far as the Study Team could assess the trunk road corridor from Dar es Salaam to the north-west of Tanzania is in an operational condition. However, it is a two-lane road of a very bad quality and is in need for serious rehabilitation. The part between Dar es Salaam and Charinze is heavily congested.

For freight transport a dual carriageway toll road from Dar es Salaam to, first, Dodama and later expanded to Isaka and Nyakanzi (and further-on to the borders of Uganda, Rwanda and Burundi) might be an option for development.

45 road checkpoints (mostly by Police) were recorded in 2011 on the route from Dar es Salaam to Kigoma. The Government involvement has reduced this level to some 20 (ref. TAFFA) but still puts pressure on transit time and additional cost of – allegedly – illegal fines.

Lake port development
Rail-borne cargo to and from Tanzanian lake ports was previously linked to Ugandan (Port Bell and Jinja) or Kenyan (Kisumu) ports by a system of rail ferries. That system proved very useful over many years but essentially was more appropriate to a pre-containerisation era, and is inefficient in terms of the large non-payload weights of the rail wagons. The rail link-span at Mwanza (South Port) remains in working order, while TPA advises that the link-span at Musoma is not working.

It is considered that more efficient onward shipment of containers from the lake ports would involve transfer from rail to semi-trailer and then onto ro-ro ferry, or rail to ship lift on-lift off. Both of these options would require new infrastructure work at Mwanza or Musoma. However, the ro-ro option is versatile in being able to cater also for other types of truck traffic without further adaptation; and required port works are little more than simple ramp slipways. Lift-on lift-off (LoLo) operations currently pose greater difficulties at Mwanza, by reason of the unsuitability of the old stepped-apron quay design, which effectively prevents access by mobile crane to the quayside. Musoma’s simpler (unequipped) quay configuration would allow access by a mobile crane; but the quay is only small (55m long). Musoma’s rail infrastructure is limited to the 0.5km spur connecting the old link-span to a disused warehouse structure; whereas Mwanza South has more extensive rail sidings (and an existing rail network connection). Ro-ro ramp slipways could be constructed with little difficulty in either Musoma or Mwanza (South).

The deciding factor will almost certainly be that Mwanza also forms part of the Central Corridor, and any development would therefore potentially yield a return from both Central and Tanga Corridor traffic. The slightly longer sailing time from Mwanza to Jinja or Port Bell at the northern end of the lake will not be significant in the context of the overall Uganda-Indian Ocean journey time.

Lake Victoria ports
Port of Mwanza (North and South): the North Port of Mwanza is at present basically used for ferry operations (freight and passengers) and has a non-working link span, the South Port for other cargo operations, predominantly done with manual labour.

The North Port has little development possibilities as it is situated next to the city centre, with unfavourable road connections to the main exit roads of the city.

The South Port has a reasonably good rail connection to the TRL rail network though hardly used, and also the road connection to the terminal is adequate. The port has a link span for rail ferries,
which is hardly used. Opportunities exist to install a ro-ro ramp to stimulate ro-ro ferry operations with Musoma, Bukoba and Ugandan ports.

The Port of Musoma is used for ferry services, both passengers and freight.

The port of Bukoba is also used for ferry services, connecting with Mwanza.

The port of Bukoba has not been visited by the Study Team, so the condition of the port, available handling equipment and the rail & road interfaces have not been evaluated.

**Lake Tanganyika ports**

Kigoma port is connected to the TRL central line terminus. The port has ample space and a private operator is contracted to handle cargo using TPA equipment.

The container terminal is used only for storage of containers as the container crane is out of order and needs comprehensive refurbishment.

**Lake shipping**

There are relatively few modern vessels in the Tanzanian publicly-owned (MSC) fleet on Lake Victoria, although the average age is not as great as on Lake Tanganyika. Four of the original five rail ferries (built mid-1960s) remain – so the Study Team understands – serviceable; and these could be used for road vehicles where the link spans remain operable. These vessels were allocated between Tanzania, Uganda and Kenya, having originally been owned and run by the former East African Railways and Harbours Administration. However, the concept of rail ferry shipping is outdated as it is not flexible and costly (the vessels are expensive and have a limited freight carrying capacity).

A number of privately-owned and operated ro-ro vessels ply Lake Victoria, and this type of vessel is seen as the most useful, given its versatility in handling trailer-mounted containers as well as other types of road vehicle. Only relatively modest cranes are required to transfer rail-borne containers to road trailers, instead of the much larger units required for quay Lo-Lo operation, in view of the greater working radii.

Inevitably, some investment in new vessels will be required, and both Mwanza and Kigoma Port can play a rôle, being equipped with two sizeable floating drydocks.

On Lake Tanganyika there is at present one container vessel operating, with a capacity of 14 TEU.

In order to develop the corridor concept, it will be necessary to have a fleet of lake container vessels.

**HR development**

The transport and logistics sector is a very specialized field and therefore it is essential for the entire transportation sector to have well-educated and properly trained staff. It appears that in Tanzania the education system specialized for the training of the transport and logistics sectors is on vocational level only.

At present, Tanzania has no dedicated educational institutes and training facilities for the training of the middle and high level management positions in the transportation industry.
5.7.2 **Uhuru Corridor**

The Uhuru Corridor is formed along the backbone infrastructure linking to Dar es Salaam port (a shared gateway with the Central Corridor) to the regions of Morogoro, Iringa, Rukwa and Ruvuma and to the Northern and Central Provinces in Zambia.

It extends to the Copper-belt, the Katanga Province in the Democratic Republic of Congo and to Malawi. The backbone infrastructure was built after Tanzanian independence as an alternative to the South African and Mozambique routes to Zambia and includes: The Tanzania-Zambia Mafuta Pipeline (TAZAMA) of 1,710 km in length; the Tanzania-Zambia Railway Authority (TAZARA) network of 1,870km in length (commissioned in 1976 to link Dar es Salaam Port to Kapiri Mposhi and thence to the Zambian Railways) and the Tanzania-Zambia (TANZAM) Highway, a paved trunk road system of 1,762 km linking Dar es Salaam port to Kapiri Mposhi.

*Figure 5.6 The Uhuru Corridor*

Source: Trademark EA
5.7.3 Mtwara Corridor

The Mtwara corridor runs from Mtwara port westward to Lake Nyasa.

**Figure 5.7 The Mtwara Corridor**

Source: Trademark EA

**Industrial Development**

Industrial developments are in process due to the acknowledged reserve for mineral oil, gas, iron ore and coal in the Mtwara-Ruvuma region. Chinese developers have shown interest in the exploration and it is this party that should analyse the overall production and logistics cost from mine to consumer to assess its viability. A feasibility study is in process by NDC.

TPA has already anticipated on this development by acquiring all the shores and back area of almost the entire bay of Mtwara. In total 2650 hectare (ref TPA MP 2009) is available for industrial and port development.

These developments require all a maritime in or outlet through dedicated port facilities in the bay. Due to the specific nature of the comities special berths, jetties and handling equipment if required. The first step to consider is the development of dedicated terminals under PPP (preferably a BOO or BoT scheme) supported by a concession to an experienced operator.

In order to make the industrial be successful, the port facilities need to be internationally competitive, in other words, proving capacity to enter port and berth for Panamax vessel. This size of vessels (Dwt 70-80,000) require a basin and berth depth of 15/16 m implying substantial capital dredging is required and navigation restrictions to enter the bay need to be addressed next to terminal infrastructure construction and superstructure installation.

Investment cost will be substantial and maintenance cost not small due to the siltation.

Apart from that the industrial development requires the construction of a new railway line between mines in Ruvuma and the bay of Mtwara. This railway should be standard gauge. Given that a heavy rail, line geometry and loading gauge must be sufficient to accommodate large gondolas, there would be little or no cost saved by adopting one of the Country's two narrow gauge standards. In the longer term, the line may be extended, and standard gauge will offer a better prospect for interoperability with other networks, in view of the broad political support for conversion to standard gauge nationwide in due course.
Expected volumes for all commodities and type of goods are ranging between 2.4 mln tons (low scenario / MP, 2009) and 24.8 mln tons(high scenario) in 2028. The feasibility study by NDC assumes a base scenario of 6 mln tons of coal and iron ore.

Coal and iron ore are low value commodities and cannot sustain high transport cost as international supply to consumer markets is abundant and competition fierce. This implies inland transport cost and port handling cost should be kept as low as possible to make the supply chain successful. The industry and corridor development is very much depending on the maximisation of production (and export) volumes.

**Extending the corridor to Lake Nyasa**

Plans exist to connect the rail link to Mbamba Bay at Lake Nyasa. The idea is to catch cargo from other Lake Nyasa ports in Malawi. This may be the case in future but cargo volume should be substantial to justify the high investment (and perhaps operating) cost of the link Ruvuma to Mbamba Bay. This extension of the line will be even more costly per km as the terrain from the mines to Mbamba Bay is even more accented.

Alternatively Malawi traders could use trucks transport to handle cargo at Mbamba Bay and bring it to the nearest rail station of the new (iron ore / coal line). This option may work in future after the railway line has been constructed and would require another rail transport operator to use the (not any longer) dedicated rail link to Mtwara. Provisions need to be made in any construction agreement with the private rail link constructing company to allow such other traffic to use the line in future. Ideally RAHCO would be the rail asset custodian but that option requires a financial compensation to the railway line owner.

A smaller but positive development if the establishment of a cement factory some 20 km out of Mtwara. Rail track design should take this development into account to optimize rail line utilization.

Oil and gas exploration requires completely different infrastructure in Mtwara bay and also here dedication is best in hands of private sector with TPA acting as pure land use custodian against a royalty fee.

Finally the existing facilities for general cargo and container handling in Mtwara port should be expanded with some 300 m length of berth. Due to the limited cargo volume, the Study Team sees no need in deepening the waterfront at berths in the short and medium term.(Note: this does not apply to oil, gas coal and iron ore facilities that are planned outside the berths areas!).

Finally, as applies to all Tanzanian ports, TPA should refrain from cargo handling (including stuffing/stripping activities) in Mtwara port and hand these over by lease contract to the private sector.

**PPP**

A PPP policy should be formulated to analyse the effects on various risk sharing packages between public and private sector for both railway and port development in the Mtwara-Ruvuma region.

The role of the public sector should be kept to the bare minimum in view of the risks of underproduction and/or deteriorating market prices for minerals.

A PPP scheme would thus contain the GoT policy that as much as possible investment cost (and transport/handling operating cost) are born by the Private party where as TPA does play the role of land custodian for which is receives a certain fee (royalty).

**Recommendations for corridor development**

1. Assess the feasibility of the rail link and dedicated handling terminal in the Mtwara bay to cater for coal and iron ore and set a PPP policy for various schemes of risk sharing.
2. Assess a similar approach for oil and gas port facilities
3. If assessment and risk sharing options are viable, deepen the port entrance to 15/16 m and estimate and introduce channel dues to cover the capital and maintenance dredging cost.
4. Extend the present dry cargo facilities with 300 m at 10 m depth.
5. Include in any PPP agreement that RAHCO and TPA act as Landlord of respectively the railway line and the port facilities (against a compensation when constructed by private parties.
6. Analyse the navigational restriction at the entrance of the bay in view of larger tonnage entering.

5.7.4 Tanga Corridor

The Tanga Corridor may usefully be considered as three interconnected elements:
- Tanga-Arushi (eastern part of Tanga Corridor)
- Arushi-Lake Victoria (western part of Tanga Corridor to Musoma)
- The Tanga Central Line link (not strictly part of the Tanga Corridor itself)

Figure 5.8 The Tanga Corridor (including western link to Mara Region/Lake Victoria)

The Tanga Corridor currently exists as a road corridor only, normally conceived as linking Lake Victoria (at Musoma) with the port of Tanga. Approximately the easternmost half of this corridor’s length exists—both as a (now-disused) metre-gauge railway and as a metalled road—each connecting Tanga with Arusha. Note that the railway line is a development of the Usambara line, commenced in the 1890s with the aim of connecting Tanga with the Speke Gulf of Lake Victoria—an early (unsuccessful) attempt at engineering a Tanga Corridor. The western half of the corridor

Source: Trademark EA
runs on more tortuous roads traversing first the Ngorongoro Conservation Area and then the Serengeti National Park – the latter a world-famous wildlife habitat, in particular for larger fauna.

The Tanga Corridor is currently perceived as a potential alternative to the Northern Corridor (across Kenya) to serve freight originating in or destined for Uganda and beyond, and indeed is already the subject of a Ugandan/Tanzanian Memorandum of Understanding to that effect. While the detailed feasibility of that proposal has yet to be investigated, there are ambitious expectations at the international political level.

In this improved configuration, the Tanga Corridor is provisionally seen as through-rail from Tanga to Musoma, carrying substantial volumes of containerised freight, with a rail-ferry connection onward across Lake Victoria.

Setting aside any political considerations (beyond the scope of the present study), there would clearly be – in the event of this scheme proceeding – a direct competition between Mombasa and Tanga for the Uganda traffic. The financial and economic viability of an upgraded Tanga Corridor in northern Tanzania thus relies upon its offering a competitively-priced and reliable alternative to the existing Kenyan land route.

It is indeed arguable that a variant of the corridor would use existing Kenyan road connections to the West, with a link from Nairobi to Arusha, and thence to Tanga. Thus, substantial improvements at Tanga Port could theoretically attract long-distance road-borne traffic which would otherwise pass to Mombasa, and with no need for the environmentally-problematic new trans-Serengeti link. For present purposes, however, this discussion is confined to a wholly-Tanzanian corridor between Tanga and lake Victoria.

Current plans for an upgraded Tanga Corridor identify the port of Musoma as the Lake Victoria terminus. It is arguable, however, that Mwanza would be equally suitable, given the relatively small additional distances involved for both the land and lake transport elements. Indeed, Mwanza already has a rail marshalling yard; whereas Musoma’s rail infrastructure consists of a single 0.5km line linking a disused loading bay to the (currently inoperative) rail-ferry link span. Moreover, investment in infrastructure improvement at two ports so closely located would clearly entail some wasteful duplication. Corridor evaluation thus requires this variant to be considered.

Whichever of these two possible Lake Victoria termini be adopted, the western section of the proposed corridor involves constructing a new land route – road and/or rail – across the Serengeti National Park. This will inevitably mobilise considerable worldwide opposition on environmental and conservation criteria. On a more prosaic level, such a project must have some adverse effect on tourism, a current and potentially burgeoning export earning trade for Tanzania. Should such a crossing of the National Park be undertaken, engineering costs would undoubtedly be increased by the environmental protection and mitigation features which would have to be designed in.

It is suggested that an all-rail route (as currently proposed), possibly using electric traction, would be much less environmentally disruptive than a road corridor.

The putative upgraded Tanga Corridor therefore contains the following 5 main elements:

- Tanga Port
- Surface transport (road or rail) Tanga-Arusha
- Surface transport (road or rail – trans-Serengeti) Arusha-Mwanza
- Transfer to lake shipping at Mwanza
- Lake shipping Mwanza-Uganda: Port Bell (for Kampala) or Port Jinja

Within this elemental definition, however, several variants must be considered:

- The differential in costs and efficiencies between the options of Mwanza and Musoma as the Lake Victoria terminus; and
- Whether to invest in streamlining the two surface transport elements to avoid the need for a (possibly inter-modal) transfer facility at Arusha.

As regards the latter variable, the following options present themselves:
• New highway Arusha-Lake Victoria (presumably linking to the existing highway at some point between Mwanza and Musoma). This is the least environmentally attractive option for crossing Serengeti, but offers the possibility of through vehicle journeys (no transfers), even as far as Uganda if ro-ro lake vessels are used. However, this is a straight line distance Tanga-Lake Victoria in excess of 700km, normally regarded as being more economically covered by rail.

A choice would also have to be made between a closed expressway, or a road affording new entry points to the National Park. The latter option may be seen as likely to encourage harmfully excessive numbers of casual visitors.

A highway would also require at least some intermediate facilities (filling stations, restrooms, breakdown recovery stations, traffic police posts, etc.)

• New railway line Arusha-Mwanza. Standard gauge. Route landscaped and screened for minimum visual and audible impact. Far preferable to a highway, especially if electrified. Connected to existing road and/or rehabilitated Usambara Line railway via transfer station at or near Arusha.
• As above, but with Tanga-Arusha (Usambara) line rehabilitated and re-laid to standard gauge, to allow through trains Tanga-Lake Victoria.
• New trans-Serengeti railway line Arusha-Mwanza. Metre gauge, but built to full-scale loading gauge, heavy rail and “full-scale” trackbed, sleepers and alignment geometry. Through trains possible, using rehabilitated Tanga-Arusha line.

In the two preceding options, if only the trans-Serengeti section of the line is electrified, through trains would be possible by locomotive change at Arusha, or use of electro-diesel locomotives.

The railway would be single track with passing loops as necessary (minimised by the use of moderately high speeds possible on the new line). The required wayleave would be of a far more compact cross-section than that required for a highway, thereby reducing the costs of engineering/landscaping for environmental unobtrusiveness.

The rationale of proposing a metre-gauge trans-Serengeti railway, while contradicting the received wisdom that all new lines should automatically be built to standard gauge, is to allow through trains to operate over the whole Tanga-Lake Victoria line, without having first to re-engineer the Tanga-Arusha section to standard gauge. The Serengeti section would otherwise be constructed as a heavy-freight line, convertible to high-speed standard-gauge in due course by rail reconfiguration alone.

The alternative of a break of gauge at Arusha would require a transfer facility, thereby increasing cost, but with little or no benefit accruing – in terms of freight transit time or user cost – from the use of standard gauge over the Serengeti section.

In considering the relative merits of road vs. rail, the rail connection would conventionally be regarded as the lower-cost option (in terms of user charges) over the long distance involved.

However, the higher-than-usual capital cost of the wholly new rail section – by reason of special environment-related aspects of the design – would imply higher-than-usual freight tariffs to service the financing, unless especially generous terms could be obtained from internationally-based funders.

Tanga Port

The existing port at Tanga benefits from a naturally-sheltered harbour, affording anchorage to vessels in excess of 15m draft. However, the active local sedimentation régime limits the depth that can be maintained at the quay to 3.0m at low water. This is sufficient to deal with local coastal vessels, including traditional dhows, dealing largely with agricultural produce. There are also pedestrian ferries operating to Pemba Island from a dedicated jetty adjacent to the cargo wharf. Larger sea-going vessels are handled entirely by lighterage.
The Port, operated by TPA, deals with both containerised and non-containerised dry cargo, with clinker and cement traffic accounting for a large proportion of the latter. Cargo dwell time is claimed to be within 48 hours maximum, but the levels of traffic are such that even this modest port facility is working at well under capacity. With a reported container throughput (import + export) of 12,125 TEU in 2010, and conventional dry cargo throughput peaking at 392,000 t in 2008, this is clearly not a port operation on a scale commensurate with the ocean terminus of a principal international freight corridor.

Petroleum products imports are handled at a separate location, using a moored buoy connection (SPM) linked to a tank farm onshore, adjacent to a now-derelict fertiliser export jetty. The present Port is effectively hemmed in by the town, lying to its South, albeit that good efforts have been made to maximise efficient working space within the modest site. There is a railway connection into the Port, but the service is discontinued. In the meantime, newer and larger lighterage barges are on order. Plans for growth entail developing what is effectively a new greenfield site to the east of the Town, where the shoreline enjoys the protection of nearby Yambe Island. The TPA has made certain acquisitions (=200ha) of land in this area, in anticipation of development. A feasibility study has been carried out by consultants Scott Wilson.

In its present location, and restricted to lighterage operation for all but then smallest of coastal vessels, Tanga would be a bottleneck if the Tanga Corridor were to be seriously developed. On the other hand, it is difficult to see any justification for expanding, or indeed retaining, much of the capacity of the Port’s present location.

In any event, the current Tanga Port site cannot realistically be continued for container or industrial (e.g. cement) traffic, as some form of new port facility will have to be developed somewhere along the Tanzanian coast north of Dar. Existing ferry and dhow traffic could be retained without difficulty (served by trucks). The existing port sits on a largely unspoilt coastal bay immediately next to the town, and presents possibilities for future use for residential or tourist development. As a port, however, the present site at Tanga offers no serious scope for external investment.

Several justifications are offered for a development of a Tanga New Port, which would entail substantial construction and dredging costs:

- Opening up of the upgraded Tanga Corridor to Lake Victoria
- Traffic growth generated from a truncated Tanga Corridor, i.e. as far as Arusha only.
- Local industrial development – a second cement works is already under construction in Tanga; There is said to be scope for producing soda ash in the area north of Tanga, and numerous other, as yet unspecified, local industrial developments are envisaged
- Overflow traffic from Port of Dar es Salaam. Even with deepening of channel and existing berths, and construction of the new container berths 13&14, DSM Port is expected to reach saturation at some time between 10 and 20 years hence (according to the projections adopted). There are proposals to develop a new industrial port and city at Bagamoyo, some 70km north of Dar es Salaam. In terms of railway distance, Tanga is some 170km more distant from the Central Line and DSM than Bagamoyo (assuming a new 20km link from Bagamoyo to the existing Tanga-Central coastal line), but this need not be a decisive distance. Tanga would be 170km closer to destinations in an upgraded Tanga Corridor, which includes substantial population centres even if it were never developed beyond Arusha.

In considering the foregoing justifications:

- The Lake Victoria link, given the cost and environmental obstacles to be addressed, and its questionable competitiveness with existing transit routes through Kenya to Mombasa, is probably unlikely to be implemented in the short- to medium-term, if ever. To undertake a costly new deepwater port development at Tanga in anticipation of traffic from Uganda/Lake Victoria would be highly speculative at this time.
- Additional traffic from Tanga-Arusha has shown no sign of putting pressure on existing container traffic through Tanga, growth in which has been remarkably static. Better facilities and lower tariffs might attract some new business, but this is again speculative.
Local industrial development and Dar es Salaam overflow might sensibly be considered together. The Bagamoyo project, as conceived, will include onshore industrial development as well as extensive deepwater port facilities. There would appear to be little sense in planning for two industrial complexes, each with new deepwater port facilities, within 140km of one another. The need for additional port capacity as Dar es Salaam becomes saturated is generally taken as a certainty, but a choice of site has to be made – Tanga, Bagamoyo, or another location in between. To attempt to develop two such sites would be to over-stretch potential investment capital and create counter-productive competition for the traffic. If chosen as the preferred location for Dar es Salaam overflow, Bagamoyo could also become a substitute for Tanga as the terminus of the upgraded Tanga Corridor, if and when the latter is developed.

**Tanga to Central Line Link**

While it cannot be considered a corridor in its own right, the Tanga to Central Line link will be a vital component as a collector for:

- Tanga Corridor traffic (whether from Arusha or Lake Victoria)
- Tanga region industrial development traffic
- Dar es Salaam Port overflow traffic

And feeding this traffic to whichever new port location is chosen – Bagamoyo, Tanga or “Port other”.

Any evaluation of a Tanga Corridor link across the Serengeti should be considered against the possibility of concentrating investment on upgrading the Central Corridor, which could serve equally well to link Tanga/Bagamoyo with Mwanza/Lake Victoria.

At present, this link must rely on the railway line. The highway alternative uses the already overburdened A7 DSM-Chalinze, with lower-grade roads beyond, quite unsuited to heavy commercial traffic. The rail line also has potential operational use for moving locomotives and rolling stock between the Central Line and a revitalised Tanga Corridor (former Usambara Line) network.

**Policy Recommendations – Tanga Corridor and Tanga**

1. Explore current Understanding between Tanzania and Uganda to establish possible extent of any investment contribution by Uganda towards opening up a new Lake Victoria-Arusha link. This development has political and environmental dimensions which must be addressed at the highest level. Until such principles are worked out and enshrined in treaty, any further technical studies of a Tanga Corridor to Lake Victoria are purely speculative.
2. Carry out a comparative evaluation of the Tanga and Bagamoyo sites to take Dar es Salaam overflow, in order to choose only one site at which to proceed.
3. Plan for minimal port investment at present Tanga site, with a view to possible more appropriate long-term development.
4. Ensure that the Tanga-Central Line rail link is retained for eventual upgrading and re-commencement of services.

**5.8 Priorities for Corridor Development**

In the previous paragraphs the trade and traffic forecasts and the corridor development concept have been worked out and based on that and the corridor development rationale, the Study Team has prepared an overview of the potential corridor development projects and prioritized them.

**5.8.1 High priority**

**Central Corridor**

- TRL rail network rehabilitation and rehabilitation of rolling stock (locomotives and waggons)
- Kisarawe Freight Station (intermodal rail centre connected to the port of Dar es Salaam)
- Port of Dar es Salaam expansion with berth 13-14
- Improve road access to the Port of Dar es Salaam and arrange parking area trucks
- Expanding capacity of the TRL rail network and acquisition of new rolling stock
- TAZARA rail network
- Upgrading Port of Kigoma: refurbish container gantry
- Upgrading Port of Mwanza: refurbishing quay apron, instalment of ro-ro ramp
- Establishment of a Port, Transport and Logistics Academy in Dar es Salaam (B.Sc. / M.Sc. level)
- Transfer TPA terminals to private operators (TPA Landlord model) in DSM, Mwanza and Kigoma

**Uhuru corridor**
- DSM port development (as above)
- Acquisition/rehabilitation rolling stock (TAZARA)
- Develop Rail shuttle service to KFS (see above)

**Mtwara corridor**
- Transfer handling activities to private sector (TPA Landlord model) in Mtwara
- Extend quay with 300 m for general cargo, container handling

**Tanga Corridor**
- None – pending clarification of funding liabilities at international level

### 5.8.2 Medium priority: implementation of projects between 3 and 10 years

**Central corridor**
- Deepening of entrance channel and basin of the port of Dar es Salaam.
- Expanding capacity of the TRL rail network to the maximum and acquisition of new rolling stock.
- Dual carriageway road from Dar es Salaam to Dodoma.
- Upgrading Port of Kigoma: refurbishing quay apron, instalment of ro-ro ramp.
- Upgrading Port of Mwanza: development of container terminal (lo-lo).
- Introduction of container shipping on Lake Victoria.
- Isaka Freight Station (intermodal centre on the crossing of the central rail and road corridor).
- Introduction of container shipping on Lake Tanganyika.
- Establish branches of the Port, Transport and Logistics Academy on key locations (e.g. Mtwara, Kigoma and Mwanza).

**Uhuru corridor**
- Create a multi-modal hub at Mbeya for rail (TAZARA) and road traffic.
- Develop the Lake port of Kyete through concession.
- Develop Lake shipping (RoRo/LoLo) on Lake Nyasa.
- Allow other operators on the TAZARA line.

**Mtwara corridor**
- Develop dedicated terminals for dry bulk, cement and oil/gas in PPP.
- Develop a BOT for the rail link Mtwara-Ruvuma.

**Tanga Corridor**
- Relocation of heavy commercial activity (basic facilities) from old Port site, e.g. to new site east of Tanga.

### 5.8.3 Low priority: implementation of project after 10 years

**Central corridor**
- Dual carriageway road Dodoma to Nyakanzi (and further on to the borders of Uganda, Rwanda and Burundi).
• Construction of a new standard gauge rail network from Dar es Salaam to Isaka-Keza/Kigali – Musongati.
• Construction of a new greenfield port (Bagamoyo / Kigamboni).
• Establish branches of the Port, Transport and Logistics Academy throughout the country.

**Uhuru Corridor**
• Transform TAZARA into a Rail Network Authority with only private rail services operators (concessions).

**Mtwara Corridor**
• Extend rail link to Mbamba Bay.

**Tanga Corridor**
• Develop port facilities at Mwambani in line with capacity assessment at DSM port.
6 Considerations for Alternative Ports and Logistics Management Structures and Models

6.1 Introduction

This chapter outlines the present management structures in the Tanzania port sector, the involvement of the private sector, considerations for the future and the view of the Study Team on the consequences for TPA.

As it is essential to understand the motivation of the Study Team for its recommendations on the required Port Management Models for the port sector in Tanzania, the chapter gives a concise introduction on PPP in connection with Port Management Models for the development and delivery of the port infrastructure and port services and the consequences for the range of activities for TPA in the future.

6.2 PPP, Port Management Models and Port Infrastructure

PPP in general refers to forms of cooperation between public authorities and the world of business which aim to ensure the funding, construction, renovation, management or maintenance of an infrastructure or the provision of a service.

PPP is not a new, separate legal instrument. It is a mechanism for the procurement and delivery of public infrastructure and services. PPP is implemented using various existing legal instruments as needed, for instance standard public works contracts, concession agreements, the establishment of a corporation with mixed public and private shareholders and contracts governed by civil and commercial law.

In the annex a detailed explanation of PPP and Port Management Models in combination of the delivery of public infrastructure is given for reference purposes.

Figure 5.1 Range of delivery models for public infrastructure

Source: Rebel Group Belgium

The following table gives the principal characteristics of delivery models for port infrastructure, which are also applicable for other public infrastructure like railways, roads and intermodal freight villages/dry ports.
Table 5.1 Key characteristics delivery/procurement models for port infrastructure

<table>
<thead>
<tr>
<th>Contract types</th>
<th>Public delivery</th>
<th>Operating concession</th>
<th>Integrated contracting without finance</th>
<th>Integrated contracting with finance</th>
<th>Joint Company</th>
<th>Build, Operate, Transfer concession</th>
<th>Transfer of management rights</th>
<th>Private delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Works and services contracts</td>
<td>Lease, concession</td>
<td>DBM, DBMO</td>
<td>DBFM, DBFMO</td>
<td>Corporation, joint venture agreement</td>
<td>BOT, BOOT, BTO, BLT, ROT…</td>
<td>Concession</td>
<td>Sale, BOO</td>
<td></td>
</tr>
<tr>
<td>Time horizon</td>
<td>Short</td>
<td>10-15 yrs, up to 40</td>
<td>10-15 yrs</td>
<td>10-30 yrs</td>
<td>In perpetuity or fixed duration</td>
<td>20-30 yrs</td>
<td>30-50 yrs</td>
<td>In perpetuity</td>
</tr>
<tr>
<td>Own</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public/private</td>
<td>Private → Public</td>
<td>Public</td>
<td>Private</td>
</tr>
<tr>
<td>Delivery phase*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public/private</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
</tr>
<tr>
<td>Design</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private/private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Build</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Private/private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Maintain/Operate</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Private/private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Finance</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private/private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
<tr>
<td>Client</td>
<td>Public or private</td>
<td>Private</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
</tr>
</tbody>
</table>

* The table entries show the responsible party for each delivery phase: public authority or private contractor. The responsible party may outsource the actual activities to specialised subcontractors. For instance, designing and building are always outsourced to engineering firms and building contractors. Also maintenance and operating sources may be partly or wholly outsourced.

Source: Rebel Group Belgium

The delivery of port infrastructure and the management of ports are closely related. The involvement of private parties in the provision of port infrastructure through PPPs is one of the ways to reform port management. In addition some delivery and management models are not compatible.

Table 5.2 Types of port management models

<table>
<thead>
<tr>
<th>Management model</th>
<th>Infrastructure</th>
<th>Superstructure</th>
<th>Port labour</th>
<th>Other functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service port</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Majority public</td>
</tr>
<tr>
<td>Tool port</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
<td>Public/private</td>
</tr>
<tr>
<td>Landlord port</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Public/private</td>
</tr>
<tr>
<td>Private service port</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Majority private</td>
</tr>
</tbody>
</table>


Table 5.3 Available PPP options in function of port management model

<table>
<thead>
<tr>
<th>Port management model</th>
<th>Operating concession</th>
<th>Integrated contracting without finance</th>
<th>Integrated contracting with finance</th>
<th>Joint Company</th>
<th>Build, Operate, Transfer concession</th>
<th>Transfer of management rights</th>
<th>Full privatisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service port</td>
<td>Yes with change management model</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
</tr>
<tr>
<td>Public tool port</td>
<td>Yes with change management model</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
</tr>
<tr>
<td>Public landlord port</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
</tr>
<tr>
<td>Private port (or privatised with concession of management rights)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Rebel Group Belgium

In the preceding paragraphs it is demonstrated that a wide variety of delivery models is available for the provision of port infrastructure, involving different degrees of private involvement.
Consequently, port policy makers can choose from different options in function of policy objectives and public interest considerations.

Introduction of PPP has both advantages and disadvantages.

The advantages of PPP fall into two categories.

- The first category is grouped under the term “Value for Money”. Experience across the world has shown that PPP can supply public services with a better price to quality ratio than the traditional public delivery model.

- The second category of benefits of PPP derives from the use of private finance. Governments often lack the funds to make the investments that are required to provide public infrastructure and services, especially in areas with fast-growing needs. Using PPP gives access to private capital and allows accelerating the required investments so that needs are met in a more timely fashion.

The advantages of PPP must be weighed against the disadvantages. Three groups of disadvantages can be distinguished.

- First, PPP contracts entail higher transaction costs than traditional procurement. Due to the transfer of risks to the private sector and the long-term nature of PPP arrangements the contracts are much more complex. The preparation and negotiation of these contracts is very time-consuming and labour intensive.

- Secondly, the private sector generally faces higher borrowing costs than the government, so that PPP increases the cost of financing the infrastructure.

- The third disadvantage of PPP is inflexibility. All service requirements that the private partner must satisfy are specified in the contract. Once the contract has been signed the possibilities for altering these requirements are limited.

Essential for introduction of all forms of PPP in port infrastructure is a competitive tender procedure and concluding a well-specified PPP contract.

Figure 5.2 Three-stage tender procedure

A PPP contract serves a dual purpose.
1. It must give reassurance to the private contractor that it can earn the expected return on investment.

2. It must ensure that the public sector (or in fact the national economy) effectively obtains the best “value for money” on the basis of which the contractor has been selected.

The PPP contract achieves its objective mainly by clearly stating the rights and obligations of the public and private partners of the project. The contract covers at least the following points:
6.3 Present Port Management Models in Tanzania

At present TPA ports function as a mix between a public service port and landlord port. Most terminals are operated by TPA (service port) and some terminals are operated by private parties (e.g. TICTS). In Lake Victoria there are several wholly private owned terminal facilities.

The following table shows the present Port Management Models applicable in the Tanzanian ports.

<table>
<thead>
<tr>
<th>Basin</th>
<th>Port</th>
<th>Port model</th>
<th>Port manager</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea</td>
<td>Dar es Salaam</td>
<td>Public service</td>
<td>TPA</td>
<td>TPA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Landlord</td>
<td>TPA</td>
<td>TICTS</td>
</tr>
<tr>
<td></td>
<td>Mtwara</td>
<td>Public service</td>
<td>TPA</td>
<td>TPA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Landlord</td>
<td>TPA</td>
<td>Off-shore exploration co.</td>
</tr>
<tr>
<td>Tanga</td>
<td>Public service</td>
<td>TPA</td>
<td>TPA</td>
<td></td>
</tr>
<tr>
<td>Victoria</td>
<td>Mwanza</td>
<td>Public service</td>
<td>TPA</td>
<td>TPA</td>
</tr>
<tr>
<td></td>
<td>Musoma</td>
<td>Public service</td>
<td>TPA</td>
<td>TPA</td>
</tr>
<tr>
<td></td>
<td>Bukoba</td>
<td>Public service</td>
<td>TPA</td>
<td>TPA</td>
</tr>
<tr>
<td></td>
<td>Several landings</td>
<td>Private</td>
<td>-</td>
<td>Private</td>
</tr>
<tr>
<td>Tanganyika</td>
<td>Kigoma</td>
<td>Tool</td>
<td>TPA</td>
<td>MUAPI</td>
</tr>
<tr>
<td></td>
<td>Kasanganga</td>
<td>Tool</td>
<td>TPA</td>
<td>??</td>
</tr>
</tbody>
</table>
Investments in port infrastructure by private parties were very low. Under the Port Act of 2004, Tanzania Ports Authority was formed as a landlord port authority, implying that port operations are handed over to private terminal operators.

In order to further establish this shift, TPA should speedily step back in its role of supervising authority and encourage private participation in port development and terminal operations through Public-Private Partnerships (PPP) and concessioning existing port terminals.

Physically, terminals should have dedicated facilities and each be fenced and have its own access gates. All security is to be in place under ISPS regulations, under the responsibility of the private operator. Ownership of equipment and facilities and employment of operational staff for terminals are to be transferred from TPA to private terminal operators under the concession agreement. Such a shift may be undertaken in the confidence that market forces of free competition and – last but not least – return on investments will drive efficiency improvements and cargo growth in the port.

TPA is therefore strongly encouraged to further focus on this shift to increase efficiency, attract private capital and gain market share. The first step would be to give all newly developed terminals (such as berth 13/14 in Dar es Salaam) in concession to private operators. The next step could be to segregate operations in the existing port areas and give terminal operation concessions to one or more private entities.

### 6.4 Conditions to attract global container operators

Global container port operators (DP World, ICTSI, APM, Hutchinson Whampoa, etc.) are dominating the container handling operations worldwide by investing in new container handling capacity and thus creating a global network of main—and hub container terminals.

The global port operators can be the future investors in the Tanzania container handling sector, though they will only be interested under certain conditions.

As huge investments are involved in the development of container handling capacity, the global operators use following port selection criteria:

- **Country**
  - Political stable
  - Open economy
  - Labour costs
  - Tax regime
  - Cargo availability
  - Total port costs
  - Nautical aspects
  - Hinterland connections
  - Feeder connections
  - Operational fit
  - Commercial fit

- **Port**
  - Customs regime
  - Safety & security
  - Facilities
  - Environmental regime
  - Availability of services
  - Capacity
  - Customer preferences
  - Port community system

Global Container Operators will base their willingness to invest in Tanzania’s port infrastructure based on an assessment of above mentioned criteria.
6.5 **Assessment of Financial Consequences**

Under a Port Landlord Model the following division of responsibilities is foreseen:

**Landlord:** delivers the basic infrastructure and the maintenance of it of a port and its terminals.

The basic infrastructure of a port consists of:
- Breakwaters
- Entrance channel
- Port basin
- Quay walls and fendering
- Pavement of the terminals
- Road and rail infrastructure on the terminal
- Energy supply

**Private operator:** delivers the superstructures and ship-shore and terminal equipment. The private operator delivers the ship-shore and terminal handling services. It is the responsibility of the private operator to provide those services on a professional and cost-competitive manner.

As TPA has to be transformed into a Landlord organisation, some revenues will disappear (no revenues from cargo and freight handling activities), while other sources of revenues will come into force (lease revenues, royalties). As a consequence TPA should review parts of its port tariffs in the future.

The basic principle to be applied for the new TPA port tariffs is that all TPA capital investments for new basic infrastructure and depreciation costs for existing basic infrastructure and costs (operating, maintenance and overhead) are to be recuperated through income generated by its concessions or lease activities and a sufficient Return on Investment should be made over time.

The capital investments, operating, maintenance and overhead costs are to be based on the activity based costing principle and yearly adjustments are to be made with respect to inflation/cost increases.

The principle behind activity based costing is that all costs (direct and overhead) made by an organisation are allocated to the different services of TPA. For overhead costs a mode of allocation has to be identified to distribute those (financial turnover) to the different revenue generating activities.

Following gives an overview of the range of rates and fees TPA can apply under the Port Landlord model.

**Types of rates applicable for the Port Landlord:**

**Berth:**
- Quay dues (ship related: length or GT)

**Terminal:**
- Land lease (area related: m2)
- License fee (one-time payment to obtain license to operate/can be in several yearly installments)
- Royalties (cargo or financial turnover related)

Various formats of the basic rental charge to be paid by the lessee to the lessor (landlord) can be distinguished:
- a fixed annual amount;
Framework Contractor: Parsons Brinckerhoff Consortium

Assessment of Tanzania Ports in the Regional Economic Environment

- a schedule of escalating annual rental payments, but not linked to activity;
- a percentage of the lessee’s gross earnings/cargo throughput;

Additionally, a royalty schedule can be agreed on the basis of an increment for additional throughput, either with or without maximum throughput compensation (resulting in minimax leaseholds or revenue-sharing leaseholds).

As Landlord TPA will continue to charge the following dues:

Port dues:
The port dues is a charge to recover the cost incurred in providing the facilities and services which are necessary to ensure the safe navigation of vessels within the area under the port’s jurisdiction. It should include the provision of breakwaters, training walls, and port surveillance facilities.

Navigation dues:
Navigational dues is a charge to recover the cost incurred in providing and maintaining the entrance channel (dredging) and the navigational aids to the port area.

Berth dues:
This is a charge related to the ship, to recover the costs associated with the berthing of the vessel and for the use of the berth for a stated period of time. It includes expenditure on the provision, maintenance and operation of docks, maintenance of dredged depths alongside and in the dock basin, fendering, provision of quays and facilities provided on the quay apron.

Four strategic issues come into play.

First and foremost, there is the **sharing of business risk** incorporated in the rental and royalty structure. A fixed rental places all of the business risk squarely on the shoulders of the lessee, at least if the stated amount fully covers the total fixed and variable costs associated with making the facility available. A combined rental and royalty charge based on activity will allow for the sharing of the business risk between the licensee and licensor.

A second strategic issue is whether the **activity charge** will be levied through a charge specified in the agreement or as a percentage of the revenues collected under the agreed tariff. The former may present the opportunity for the lessor to receive an equal amount per extra ton or container handled or for the lessee to incorporate a declining handling rate, while the latter will automatically provide for any volume discounts that the lessee may offer his leading customers. In any event, the arrangement incorporated in the leasehold license agreement should fully reflect the conditions of the lessee’s winning bid.

The third strategic issue concerns the allotment of the **financial obligations** relating to the facilities (e.g. business taxes, property taxes and in some cases utility charges). Some of these should be borne by the lessor (TPA) and others by the lessee (private operator). In order to avoid unnecessary wrangling during the lease period, it is important to specify in the agreement what distribution key will apply for allotting these charges.

The fourth and final strategic issue relates to the **procedure for adjusting the rental charge** and/or the royalties. For short-term agreements (up to five years) this may not be relevant, but leasehold licences are mostly long-term. Thus a procedure for escalation is required. The escalation is not only to counteract inflation but also to account for any changes, over time, in the value of the assets being licensed to the lessee and the changing value of the business which is transferred under the licence to the private sector.

In the Tanzania port sector where there are no many competitors and where the possible entry of new players is limited, TPA may wish to have a certain control over the handling rates applicable in the Tanzanian ports.

The basic options are:

- The licensee is required to charge according to the published port tariff, a copy of which is then attached to the lease/concession agreement; this is an option that should be ruled out because it inevitably leads to rate protection and rent taking;
• The licensee will charge the user a maximum as specified in the rates set out in the published port tariff but will be allowed to offer rebates and discounts; the rationality of this option depends on the reasons for and the basis upon which the rebates and discounts are calculated;

• The licensee is permitted (if he accepts certain rules to avoid monopoly pricing) to negotiate directly with individual port users (mainly the shipping lines) for setting specific charges.

It should be noted that all costs the private sector is to make (i.e. all the tariffs and rates TPA is to impose), will be passed on to the users of the TPA ports and therefore to the Tanzanian consumers (for imports) and producers (for exports).

It is therefore essential for the development of the Tanzanian economy that TPA takes a balanced decision on the future tariffs and dues applied to the users of the TPA ports (cost recovery versus profit maximisation).

6.6 Recommendations

At present all the Port Management Models are applicable to the ports in Tanzania: public service ports, landlord ports, tool ports and private ports.

In order to comply with the Port Act of 2004, TPA is strongly encouraged to further focus on the shift to become a Port Landlord organisation in order to increase efficiency, attract private capital and gain market share. The first step would be to give all newly developed terminals (such as berth 13/14 in Dar es Salaam) in concession to private operators. The next step could be to segregate operations in the existing port areas and give terminal operation concessions to one or more private entities.

The revenues for TPA will, as a result, become different compared with the present situation. No more revenues from cargo handling and storage operations, but only the Landlord revenues (lease/concession fees, license fees, royalties).

The defining of lease/concession related fees need to be assessed very carefully. At one side the public interest should not be sold to cheap, while at the other side, the private sector should not be scared away by implying too high fees. A mix of a base fees and royalties should be considered.

Tender procedures for lease/concession agreements need to be carefully prepared and managed.
7 Financial Implications of Ports and Logistics Reforms

7.1 Introduction

This chapter addresses the financial implications of introducing PPP in the delivery of port infrastructure and assess the key risks associated with it. The detailed theoretical background of the financial implications of introducing PPP is included in the Annex.

7.2 Financing and paying for infrastructure

An important distinction needs to be made between financing infrastructure on the one hand and paying for infrastructure services on the other hand. Both are separate issues that are often confused when discussing PPP.

The term “financing” refers to the furnishing of funds to cover the initial investment expenses. The term “paying” refers to the payment of a price for using the infrastructure. The revenues from the payments by users are employed to cover operating and maintenance costs, as well as to remunerate the providers of the investment funds (redemption of debt, payment of interest charges and dividends).

Both the financing of and the paying for infrastructure can be either public or private, resulting in the four combinations shown in the table below.

Table 7.1 Options for financing of and paying for infrastructure

<table>
<thead>
<tr>
<th>Financing of infrastructure</th>
<th>Paying for infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>The state finances and operates the infrastructure and makes it available to users free of charge.</td>
</tr>
<tr>
<td>Private</td>
<td>A private company or consortium (banks, equity investors) finances the infrastructure and may also operate it. The state pays user fees to the private investor, allowing it to recover its costs and earn a return. The infrastructure is made available to users free of charge.</td>
</tr>
</tbody>
</table>

Source: Rebel Group Belgium

7.3 Relation between PPP models and the strategies for financing & pricing port infrastructure

Depending on the quadrant in the table of the previous paragraph that is chosen, other models for the delivery/procurement of port infrastructure are eligible, as shown in the following table.
Table 7.2 Financing of and paying for infrastructure under alternative delivery models

<table>
<thead>
<tr>
<th>Financing of infrastructure</th>
<th>Public</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>Public delivery without user charging</td>
<td>Public delivery with user charging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating concession</td>
</tr>
<tr>
<td>Public/private</td>
<td></td>
<td>Joint Company</td>
</tr>
<tr>
<td>Private</td>
<td>Integrated contracting with finance</td>
<td>BOT concession</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer of management rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full privatisation</td>
</tr>
</tbody>
</table>

Source: Rebel Group Belgium

Depending on the budget constraints and the pricing objectives of the government, the relevant quadrant of above table shows the available delivery models.

- If the government has no budget available for the financing of port infrastructure, not in the short run nor in the long run, then the options are BOT concession, a concession of management rights or full privatisation. In the case of a concession there are two alternative criteria for awarding the concession: the highest concession fee (or more exactly the present value of the expected fees) or the lowest price for the end-user. Usually the first option is chosen, which maximises financial benefits for the government but is not necessarily the best option from the perspective of national economic development.

- If the government wishes to provide the infrastructure free of charge (or at a price below cost), but has no funds to finance the infrastructure then integrated contracting with private finance (DBFMO contract) offers a solution. This allows spreading the budgetary cost over a long period. Moreover, although the port infrastructure is privately financed, the public sector retains full control over its development. There are several reasons why a price below cost (and even close to zero) may be economically efficient from the point of view of society. In many cases the provision of port infrastructure is not commercially viable, either because the traffic is too low and the risks too high (due to indivisibilities and sunk costs), or because it is socially optimal to make the infrastructure available to users at a low price below the full cost level (marginal cost pricing, promotion of growth pole effects). In those instances the public sector has to step in by financing and/or paying for the infrastructure. This is especially the case for basic port infrastructure (maritime access channel, breakwaters,…).

- If the government has the required funds to finance port infrastructure, wants to some retain control over its development and operation, but also wants to recover the infrastructure costs from users, then the options in the top right quadrant are available. This quadrant applies is particular to cargo handling infrastructure (basins, jetties, quay walls). The arguments to provide this infrastructure free of charge are weaker than for basic port infrastructure. However, there are still reasons to preserve some degree of public control, such as the management of externalities and the prevention of the abuse of market power.
7.4 Achievability of PPP

The fact that a particular PPP model offers the best overall “value for money” does not imply it is achievable. The efficiency gains of the most desirable PPP model can only materialize if the model is well implemented. The following conditions need to be satisfied for a successful PPP.

They relate to the skills and commitment of the public sector to PPP and the project, the market appetite of the private sector and, last but not least, the level of trust between public and private parties.

**Public sector requirements**

- **Political and social commitment:** is there strong political commitment to the PPP approach, will a PPP solution be socially and politically acceptable
- **Local and National government policy:** does the policy environment favour PPPs and does it cater for the different components required for a PPP, is PPP consistent with other government policies i.e. land use, social policies, etc.
- **Legal Framework:** is there a sufficiently stable and comprehensive legal framework for enabling the use of PPPs, is there sufficient legislation and transparency to support the management and supervisory role of the public sector in a PPP
- **Taxation/accounting framework:** tax status of a PPP, how are PPPs treated in corporate accounting, any particular advantages (tax breaks, depreciation mechanisms, subsidies, etc.) to stimulate the development of PPPs
- **Technical and organizational issues:** sufficient data available about existing service provision, can competitive tendering be assured, government capable of monitoring and assuring quality control

**Private sector requirements**

- **Market structure:** are private service providers sufficiently autonomous, are efficient private sector operators available and are they competent, sufficiently capitalized and interested in PPP
- **Financing issues:** access to capital markets easy for the private sector, national capital market exist or international funding needed, can private sector financing compete with public financing, are financial support mechanisms by government available

**Trust**

- does the private sector operators trust the partnering government and vice-versa, does the general public trust private sector providers or is there a strong “anti-privatization” sentiment

7.4.1 Conditions for successful PPP in ports

The conditions for a successful PPP in ports (and also in other sectors) can be summarized in a succinct statement consisting of five parts:

1. a well-defined and profitable project...
2. awarded in a competitive tender procedure...
3. implemented in a well-specified PPP contract...
4. supported by an adequate legal framework.
A private investor will only invest in a port infrastructure project if he expects that he will be able to recover his investment outlays and earn an adequate return. Profitability of the underlying project is therefore an obvious condition for a successful PPP. In order to forecast the profitability of the project with reasonable confidence and preciseness the project needs to be well defined. This means among other that the scope of the project, the investment costs, the timing of the works, the target markets, the pricing policy, etc., are known.

The value of a project not only depends on the investment costs and the market outlook, but also on the way the project is financed and managed. PPP, through its impact on the financial and management structure of the project, increases the value of the project, but only on condition that the right PPP model is chosen. The potential added value of PPP depends on a number of project characteristics. A right choice means therefore that the PPP model is selected in function of these characteristics.

The value of a PPP for the public sponsor of the project depends on how good a deal it gets from the private partner. The private investor will offer a better deal if it has to compete against other bidders in order to win the contract. If there is no competition, PPP will generally also create additional value. However, in that case the private investor will capture most of the additional value itself in the form of higher profits, leaving little or no benefits for the public interest.

The fact that a PPP model allows to increase the value of the project, does not imply that the additional value is effectively created. The advantages of a PPP model are only potential. They do not emerge automatically. The effective realisation of the potential added value of a PPP model depends on the existence of a well-specified contract that induces all signatories to take the appropriate actions to effectively achieve the advantages of the PPP model.

Finally, the fulfilment of the above conditions is facilitated by the presence of a legal and regulatory framework. This framework consists among other of decision-making procedures regarding PPP, tender procedures, model PPP contracts, etc.

**Other conditions to an effective PPP**

It is essential that a transport development master plan is to be prepared and regularly updated, taking into account all relevant economic developments and translating them to transport infrastructure needs. Capacity building at government level includes:

a. Strengthen the capacity at the Ministry of Transport for a professional implementation of the Transport Development Plan and Strategy for Tanzania, which includes knowledge and skills of securing of finance, engaging in PPP and negotiating skills.

b. Reform SUMATRA to a regulator (no tariff nor benchmarking setting for the private sector, safeguard abuse of monopoly positions in the transport market, introduce enforcement tools). *(see chapter 8)*

### 7.4.2 Finance Options for the Development of Transportation Infrastructure and Services in Tanzania

A serious amount of projects have been initialized in Tanzania to upgrade the transport infrastructure with related financial requirements. It is clear that not all those project are, at present time, economic and financial viable and choices will have to be made.

Transport infrastructure projects can be financed by several means:

- Governmental budget or budget from governmental agencies (e.g.TPA, TRL, RAHCO)
- Commercial loans to the Government;
- Soft loans from IFIs to the Government;
- Grants from IFIs to the Government
- By the private sector
- By a mix of public and private capital (PPP)
- And it is possible to have a combination of the above (e.g. part IFI grant and part PPP).

In general, the delivery of transport infrastructure falls under the responsibility of the public sector and therefore the Government should secure finance.

However, in certain case it is very well possible for the public sector to team up with the private sector to realize transport infrastructure projects.

Finance under PPP constructions for the development of transport infrastructure is to be considered, in general, under the following criteria:

- Capital investment between 10 and 250 million USD.
- The project involves the delivery of a public service or a mix of public and commercial service.
- The project should be well-defined and (politically) uncontroversial.
- The project should be economic viable.

7.5 Potential PPP projects in Tanzania Transport Sector

The following tables give an overview of all known corridor development project, the estimated capital investment (as far as could be assessed, the potential for possible PPP (at this moment) and other finance options.

In the numbering a distinction is made for the type of projects:
P= Sea port projects
M= Intermodal / interconnectivity projects
Ra= Rail projects
Ro= Road projects
LP= Lake ports projects
LS= Lake shipping projects
HR= Human resource development

Table 7. Central Corridor

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Name Project</th>
<th>Estimate Capital Investment</th>
<th>PPP potential</th>
<th>Other Finance Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>DSM berth 1-7 (upgrading)</td>
<td>USD 251.5 million</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>P2</td>
<td>DSM berth 13-14 (new)</td>
<td>USD 525 m.</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>P3</td>
<td>DSM dredging channel/basin</td>
<td>Unknown</td>
<td>No</td>
<td>TPA, FI</td>
</tr>
<tr>
<td>P4</td>
<td>Bagamoyo port</td>
<td>USD 1,000 m.</td>
<td>No</td>
<td>TPA</td>
</tr>
<tr>
<td>P5</td>
<td>Kigamboni port</td>
<td>Unknown</td>
<td>No</td>
<td>TPA</td>
</tr>
<tr>
<td>P6</td>
<td>Port Community System DSM</td>
<td>Unknown</td>
<td>Yes</td>
<td>IFI</td>
</tr>
<tr>
<td>M1</td>
<td>DSM port - road access</td>
<td>USD 60 -80 million</td>
<td>No</td>
<td>City DAR budget</td>
</tr>
<tr>
<td>M2</td>
<td>DSM port - rail access</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>M3</td>
<td>Kisarawe Freight Station</td>
<td>USD 280 million</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>M4</td>
<td>Isaka Freight Station</td>
<td>Unknown</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>Ra1a</td>
<td>Rehabilitation TRL network</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>Ra2b</td>
<td>Rolling stock TRL service</td>
<td>Unknown</td>
<td>Concession</td>
<td>TRL, IFI</td>
</tr>
<tr>
<td>Ra2a</td>
<td>Upgrading TRL network</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>Ra3a</td>
<td>Standard gauge TRL network</td>
<td>USD 5,580 million</td>
<td>No</td>
<td>State budget</td>
</tr>
<tr>
<td>Ra3b</td>
<td>Rolling stock standard gauge</td>
<td>Unknown</td>
<td>Concession</td>
<td>TRL, IFI</td>
</tr>
</tbody>
</table>
### Assessment of Tanzania Ports in the Regional Economic Environment

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Name Project</th>
<th>Estimate Capital Investment</th>
<th>PPP potential</th>
<th>Other Finance Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ra4</td>
<td>Railway Link to Bagamoyo</td>
<td>US$ 64 million</td>
<td>No</td>
<td>State budget</td>
</tr>
<tr>
<td>Ro1</td>
<td>Dual carriageway road DAR-Dodoma</td>
<td>Unknown</td>
<td>BOT or concession (toll road)</td>
<td>State budget, IFI</td>
</tr>
<tr>
<td>Ro2</td>
<td>Dual carriageway road Dodoma-Nyakanzi</td>
<td>Unknown</td>
<td>BOT or concession (toll road)</td>
<td>State budget, IFI</td>
</tr>
<tr>
<td>LP1</td>
<td>Kigoma refurbishing container gantry</td>
<td>Unknown</td>
<td>Under concession</td>
<td>IFI</td>
</tr>
<tr>
<td>LP2</td>
<td>Kigoma upgrading quay</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>LP3</td>
<td>Kigoma ro-ro ramp</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>LP4</td>
<td>Mwanza upgrading quay</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>LP5</td>
<td>Mwanza ro-ro ramp</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>LP6</td>
<td>Mwanza container terminal</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>LS1</td>
<td>Container ships Lake Tanganyika</td>
<td>Unknown</td>
<td>Private</td>
<td>-</td>
</tr>
<tr>
<td>LS2</td>
<td>Container ships Lake Victoria</td>
<td>Unknown</td>
<td>Private</td>
<td>-</td>
</tr>
<tr>
<td>HR1</td>
<td>DAR Transport &amp; Logistics Academy (B.Sc. and M.Sc.)</td>
<td>Unknown</td>
<td>No</td>
<td>IFI, State budget</td>
</tr>
<tr>
<td>HR2</td>
<td>Transport &amp; Logistics Academy branches (Mtwara, Kigoma, Mwanza)</td>
<td>Unknown</td>
<td>No</td>
<td>IFI, State budget</td>
</tr>
</tbody>
</table>

Source: Study Team

**Uhuru Corridor**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Name Project</th>
<th>Estimate Capital Investment</th>
<th>PPP potential</th>
<th>Other Finance Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ra1</td>
<td>Upgrade Rolling stock</td>
<td>Unknown</td>
<td>Concession</td>
<td>Chinese government</td>
</tr>
<tr>
<td>M1</td>
<td>Development Yamboo ICD</td>
<td>Unknown</td>
<td>Concession</td>
<td>TAZARA</td>
</tr>
<tr>
<td>M2</td>
<td>Kisarawe Freight Station</td>
<td>USD 280 million</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>M3</td>
<td>Freight station at Mbeya</td>
<td>Unknown</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>LP1</td>
<td>Port development Kyete (Lake Nyasa)</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>LS1</td>
<td>Shipbuilding</td>
<td>Unknown</td>
<td>Private</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Study Team

**Mtwara Corridor**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Name Project</th>
<th>Estimate Capital Investment</th>
<th>PPP potential</th>
<th>Other Finance Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ra1a</td>
<td>Construction of the Mtwara – Mchuchuma/Liganga Railway Line</td>
<td>USD 1,386 million</td>
<td>BOT</td>
<td>RAHCO</td>
</tr>
<tr>
<td>Ra1b</td>
<td>Rolling stock</td>
<td>Unknown</td>
<td>Concession</td>
<td>TRL</td>
</tr>
<tr>
<td>Ra2</td>
<td>Extension rail link and port development Mbamba Bay</td>
<td>Unknown</td>
<td>BOT operator</td>
<td>ADB, WB</td>
</tr>
<tr>
<td>Nr.</td>
<td>Name Project</td>
<td>Estimate Capital Investment</td>
<td>PPP potential</td>
<td>Other Finance Options</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------</td>
<td>-----------------------------</td>
<td>---------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>P1</td>
<td>Tanga New Port quays and dredging</td>
<td>USD 700 million</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>P2</td>
<td>OR Bagamoyo</td>
<td>USD 1,000</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>M1</td>
<td>port road connection</td>
<td>Unknown</td>
<td>No</td>
<td>TANROADS, IFI</td>
</tr>
<tr>
<td>M2</td>
<td>port rail connection</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>P3</td>
<td>Relocation of heavy operations out of old Port site</td>
<td>Unknown</td>
<td></td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>P4</td>
<td>Re-develop old Tanga Port site for non-port use</td>
<td>Unknown</td>
<td>Yes</td>
<td>TPA</td>
</tr>
<tr>
<td>Ra1</td>
<td>Rehabilitate Tanga-Arusha rly</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>Ra2</td>
<td>Trans-Serengeti rail link 1m</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>Ra3</td>
<td>Electrification rail</td>
<td>Unknown</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>Ra4</td>
<td>Rolling stock and traction</td>
<td>Unknown</td>
<td>Concession</td>
<td>Uganda</td>
</tr>
<tr>
<td>LP1</td>
<td>Port of Musoma development</td>
<td>Unknown</td>
<td>BOT or concession</td>
<td>TPA</td>
</tr>
<tr>
<td>Ra5</td>
<td>Construction of the Arusha – Musoma Railway Line</td>
<td>USD 1,419 million</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
<tr>
<td>Ra6</td>
<td>Upgrading of the Tanga – Arusha Rail to Standard Gauge &amp; port connection</td>
<td>USD 400 million</td>
<td>No</td>
<td>RAHCO, IFI</td>
</tr>
</tbody>
</table>

Source: Study Team
8 Regulatory and Institutional Development

8.1 Introduction

This chapter examines some of critical regulatory and institutional factors in the transport sector in Tanzania in relation to:
(i) Transport options: competitiveness of the country’s port and inland transport system in terms of total system costs and available options;
(ii) Operational performance: competitiveness of each of the country's port in terms of capacity and level of cargo handling services;
(iii) Tariff comparisons: competitiveness of each port in terms of level of port charges; and
(iv) Financial performance: competitiveness of each port in terms of its overall profitability.

Main aim is to harmonise the regulatory and institutional framework to the two main strategies: a) to increase competition and the number of competitors in all logistics activities (transport ports, supporting services and b) the upgrade of transport capacity (the introduction of new berths or terminals; the division of the existing port into terminals; entering into short-term operating agreement, lease, or management contract, etc.).

Based on the existing institutional and regulatory framework and on the National Transport Policy, bottlenecks were identified and conclusions drawn to improve the framework.

8.2 Institutional Framework in the Transport sector

Public Sector
The Ministry of Transport is responsible for oversight and formulation Transport Policy, setting strategic goals as well as monitoring and evaluation of the performance of the sector. Under the Ministry of Transport, departments, agencies and authorities exist.

Authorities are SUMATRA, TCAA, TPA, RAHCO, and TAZARA.

Unlike the executive agencies which have been established by the generic Executive Agencies Act of 1997 with amendments of 2009, different Authorities and Boards have been established by an Act which is specific to each of them.

The Ministry of Works is responsible for management and oversight of the execution of national road works while the PMO-RALG is responsible for local roads.

A range of other Ministries are responsible for other transport related activities. Home Affairs is responsible for traffic enforcement, while the Ministry of Lands, Housing, Human Settlements and Development is responsible for physical planning.

Public Training institutions are National Institute of Transport (NIT), Morogoro Works Training Institute (MWTI), Dar es Salaam Maritime Institute (DMI), Civil Aviation Training College (CATC) Bandari College, Tabora Railway Training College, Kigoma Meteorological and Mbeya Appropriate Technology Training Institute (ATTI).

Private Sector
The private transport sector is represented by various associations such Tanzanian Shipping Agents Association (TASA), Tanzanian Freight Forwarders Association TAFFA), the Tank
Operators Association (TATOA), Tanzania Truck Operators Association (TAROTA), Tanzania Roads Users Association (TARA).

8.3 Regulation in the Transport Industry

The main relevant laws in the Tanzanian Transport sector are:

- The Surface and Marine Transport Authority Act, 2001
- The Merchant Shipping Act, 2003
- Fair Competition Act, 2001

Furthermore a large number of underlying regulations are in place for all transport modes.

The regulation of the transport industry is the responsibility of the Surface and Marine Transport Regulatory Authority (SUMATRA) which was enacted by SUMATRA Act No 9 of 2001. It was created as an outcome of the restructuring and reform process in the utilities and transport sectors. The reforms significantly changed the structure of the transport sector by placing emphasis on greater private sector participation, replacing government’s role as owner, operator and regulator.

Within the sector, the functions of SUMATRA are transport and economic regulation. The main role of SUMATRA in the economic regulation of the sector is primarily to promote competition and ensure fair trade practices among service providers. Economic regulation is conducted by ensuring that rates charged for freight and passenger services are in line with costs of operations and taking into account reasonable financial returns.

With respect to regulation of transport, it performs several functions including:
(i) licensing of commercial vehicles and ships
(ii) licensing of shipping agents, freight forwarders and trucking companies
(iii) determining and/or monitoring national and international benchmarks which can be used to determine the reasonableness of rates and tariffs charged by providers of transport services.
(iv) formulating and reviewing codes of conduct for providers and users of transport services, (v) overseeing investigations in transport accidents in conjunction with other stakeholders,
(vi) developing rules and regulations in transport sectors
(vii) regulating tariffs and charges.

Freight forwarders and ICDs are furthermore licensed by TRA (Customs Authority) if they undertake customs clearance activities.

Based on the existing institutional and regulatory framework and on the National Transport Policy, bottlenecks were identified and conclusions drawn to improve the framework.

The National Transport Policy 2009 (NTP) recognises a number of freight transport trends towards the economic deregulation of transport operations. This trend reflects the view that the traditional economic regulation of competitive transport markets, (i.e. entry control, price regulation, and quantity regulation) are not necessarily compatible with the requirement of promoting effective competition and innovation, and economic efficiency. The trends now are:
- To reduce economic controls but at the same time foster greater competition in the provision of transport services
- Monitor market performance carefully and where appropriate combat restrictive practices and the exploitation of dominant market positions; and
• To ensure that the businesses engaging in the transport apply, and adhere to established safety and security practices and also follow the basic rules applying to business concerns.

8.4 Transport Policy review

The NPT states a number of Policy Statements and Directions (in Italic) for all transport subsectors.

Road Freight Transport

Policy:

i. The Government will promote an effective operator licensing system to ensure that systems and procedures are in place to ensure a service of adequate quality;

ii. Freight operators will be able to set their own tariffs and but be subject to regulations governing competition ;and

iii. The government will closely monitor the performance of operators to ensure that quality services are provided and that competition is sustained.

Effective licensing can make a difference when the skills of operators can be improved. A license system as such is not a guarantee that services are rendered at good quality or can be improved.

Apart from driving licenses to truck drivers and truck registration, no other requirements exist for transport companies. Especially safety standards are inadequate and transport company management should be obliged to have trucks and driver tested periodically. The Truck Operating Association (TATOA) can play an important role is setting standards to their members in order to comply with safety standards (loading techniques and load restrictions,, handling dangerous goods, resting time arrangements, etc.)

Vehicle inspection is part of the scheme to improve road safety and trucking companies should be obliged to have their vehicles inspected at certain intervals.

To maintain transparency in its operations, a dialogue is regularly held with bus industry operators. A common topic of these meetings is consumer complaints regarding unofficial fare hikes and transport charges.

Although SUMATRA monitors freight rates it does not regulate freight charges for road transport but it does regulate port services charges and port handling charges.

Rail Transport

Policy:

i. Empowering rail transport companies to set their own transport charges but subject to the requirements of competition legislation; and

ii. Promoting PPPs, and making deliberate effort to increase public sector investment in rail transport.

Institutional structure

In Tanzania a unique rail transport system exists with two different (and not interconnected) railway systems with different operating structures.

While infrastructure and transport service on the TRL network is clearly divided, the TAZARA infrastructure and transport services (pax and cargo) are not separated in regulation.

This does not create an opportunity for the GoT to increase competition on the TAZARA line. To allow in future more operators on the TAZARA network the TAZARA organisation must be divided in to two legally independent units for respectively rail infrastructure and rail transport services.
The latter could furthermore be divided into two business units, one for freight and one for passenger transport.

An additional obstacle may be the fact that for any decision in this direction, bilateral agreements are needed between Zambia and Tanzania.

**Rail network management**

For both available networks, sustainability of the track and related infrastructure (bridges, tunnels, signalling, crossings, etc.) is vital for reliable (and economic) rail transport services. Both RAHCO and TAZARA must guarantee that rail tracks are in good condition and that regular maintenance is executed. This requires a sound Operating plan with adequate funding.

The funding in Tanzania is however subject to MoF approval and lack of funds may hamper required upgrade and maintenance work to the network.

This can only be avoided by guaranteeing sufficient funds from MoT budget without interference from other GoT Ministries.

Providing guarantees does not imply that RAHCO and TAZARA management cannot be held responsible for overspending or underperforming of its tasks.

Management performance must be monitored and controlled and needs to be secured by a Performance Contract with MoT. Such a contract will make management accountable with present sanctions for under-performance. Only then can rail transport operators effectively offer reliable and economically acceptable rail transport.

**New railway lines**

New railway lines are desired to serve certain industries. New railway lines may be financed partly by private sector (such as under a BOT) and regulation is required to assign the track maintenance responsibility to a national body. The logical choice is RAHCO as custodian for all new railway networks. For dedicated rail tracks serving a particular purpose (such as to serve coal and iron ore mines in Ruvumu region) a private line operator may be allowed. Such a scheme needs to be arranged by special regulation under MoT control.

**Privatisation of rail transport services**

Until 2010 the TRL based transport services were concessioned to Rites of India. At present the TRC is the single operator. The legislation allows a new concession of the services but taking the single line and limited capacity into account, competition of the line would not likely create better services nor lower transport cost.

A more realistic approach to upgrade the services is to TRC services may not be required in the short and medium term when sufficient funds can be procured to upgrade the services (and the rail infrastructure).

The upgrade process and the related upgrade of the service package and service performance by TRC needs however to be sharply monitored by MoT according to a detailed Business and Operational Plan that includes targets, time frames and service conditions for all types of freight and passenger transport.

**Shipping and freight forwarding Services**

**Policy:**

Government will reform shipping services to make them competitive. Towards this end, the government will gradually remove current restrictions on entering into the markets for services by shipping agencies and freight forwarders and will also empower these companies to set their own charges, but subject to competition legislation. The performance of operators will be closely monitored to ensure that quality services are provided and that competition is sustained. The government will also initiate a dialogue with transport operators through their trade associations.

Shipping services need to be developed, primarily for Lake transport. This requires efforts by MOT to stimulate ship building and ship investments such as through subsidies and tax incentives.
Tanzania is in possession of various shipyards at Lake ports (Mwanza South, Kigoma) that will support the fleet expansion. Both ship building operations and shipping services need to be privatised under the TPA Landlord model implementation through multi-annual lease contracts as well as the commercial fleet of the Marine Transport Holding Company.

**Maritime Port Services**

*Policy:*

*The Government will significantly increase port capacities, develop state-of-the-art port terminals, promote safe and sustainable green ports offering excellent accountability and customer satisfaction.*

Port capacity can be increased by deepening the channel and basins or by applying advanced handling technology for handling cargo.

The latter requires TPA to fully implement their role as Landlord (both by Law and by GoT Strategy) and prepare the remaining TPA terminals for lease to private operators. The Ports Act 2004 allow such actions though TPA holds certain powers to monitor terminal operations.

The main objective to privatise terminal operations is to increase competition and increase efficiency by demanding new technology to be installed. Competition can only thrive when port handling charges are not controlled by MoT (e.g. SUMATRA). The regulations towards fixing or regulating handling charges should therefore be abolished.

This does not imply that MoT should not monitor the economic performance of handling terminals as a whole, in other words, stimulate operators to invest in modern technology and business systems. In case of existing terminals, assigned to be let to private parties, certain performance indicators can be set to stimulate operators to reach a certain volume of cargo per annum. These benchmarks should have a generic nature and not deal with specific parts of the terminal handling operations. SUMATRA is no monitoring ship-shore handling performance based on equipment applied which sets unfair competition and does not create a better overall port performance. SUMTRA regulation should therefore be amended in this direction.

The privatisation of operations is partly in place in the port of Kigoma. The terminal operator is however still forced to use TPA technology. (NB the new mobile cranes was not his choice...) The present contract is due to expire in September 2012, an excellent chance to redesign the public tender for full operational lease.

**Maritime and Inland Water Transport**

*Policy:*

*Government will ratify all necessary maritime and inland waterway transport conventions regarding safety, security and environment. Towards this end, Government will initiate a review whereby additional conventions and international agreements of relevance to maritime and inland affairs will be ratified and incorporated into Tanzania Laws.*

There where Tanzania has not ratified IMO (SOLAS, ISPS, MARPOL, STCW, ISM, PSC, etc), inland water transport conventions and UN conventions (IMDG) and the Maritime Labour Code (ILO), the MoT should do so and prepare action plans and budget for implementation including targets and time frames. (see also Shipping services above).

**Intermodal Transport**

*Policies:*

*Government will encourage transport operators to establish complementary services in different transport modes provided that this does not compromise safety and security, and will promote the
establishment of well-run terminal facilities that are critical for operations of good multimodal transport.

To improve the ‘ease of doing business’ the government will encourage the removal of ‘red tape’, provided that this does not compromise safety and security, preventing transport operators from establishing complementary services in different modes transport. For freight transport the use of ‘through bills-of-lading' will be encouraged.

Intermodal transport requires adaptation of the regulations towards the use of so-called “Combined (or Through) Bills of Lading” which needs to be embedded in transport laws in view of different (modal) liability conditions.

While many Shipping Lines already acts as Intermodal operator (as part of their Point-Bills of Lading regime) new operators may emerge. As counts for Freight forwarders, Intermodal transport operators should be licensed under a scheme of competence requirements that can include testing and examination of staff on knowledge of operations and safety. TAFFA may again play an important role in setting the criteria and organise training and examination.

Policy:
Where possible the government will support the establishment of well run terminal facilities. As far as possible these facilities should be paid for out of transport revenues, however, where this is not possible, and there is a social or regional development case then the government will support alternative funding via cross-subsidisation or via direct subsidies.

TPA and other land-owning authorities should solely play the role of Landlord and allocate areas for development (in line with economic activity development plans). Intermodal freight stations in hands of public authorities should be privatised (Isaka).

General NPT observations

The above transport sector policies statements show a positive attitude by GoT towards increased participation by the private sector and more ease of regulation while not compromising on standards of safety and security and economic market regulation.

The NPT however does not state how, when and with which means and tools the statements can be effectuated. The statements need to be elaborated into clear policies and strategies that include clear targets, allocation of responsible authorities, time frame and funding schemes.

8.5 Public Private Partnerships (PPP) regulation

In relation to infrastructure, GoT accepts foreign investment in Build, Operate and Transfer (BOT) projects and has launched a concession system aimed at attracting foreign investors to build infrastructure. A respective law was passed in 2010, which also allows for the establishment of a PPP Coordination unit within the TIC for assessing and supporting the establishment of PPPs.

In relation to the port sector it is the responsibility of TPA to clearly define policies regarding concessioning and private sector participation in the provision of services, including inland container depot and freight station services.

In Tanzania, there is particular interest from the East and particularly China, with EXIM Bank currently negotiating to fund the development of Berths 13 and 14.
9 Policy Recommendations

Although the study did not include the assessment of future transport infrastructure requirements for passenger transport, it should be noted that in growing economies like Tanzania, people tend to become more mobile and therefore will increasingly use the available transport infrastructure. Especially road transport in and around main cities will exponentially increase and there will be an increase of passenger rail transport services between the main cities, especially over longer distances.

Summarising the conclusions and recommendations of the above chapters the following key Policy recommendations are:

Institutional

- Gradual transition of TPA into a pure Port Landlord by transferring handling operations at all service and tool ports to the private sector.
- Reorganize the TPA organisation in view of stevedoring and warehousing functions and handling equipment maintenance gradually disappearing.
- A social plan needs to be made smoothly to transfer redundant staff to either the new operators or to other positions in governmental agencies or the introduction of compensation for voluntary leave.
- Introduce Activity Based Costing at TPA functions to assess cost efficiency and profitability.
- MoT to compose transport policies and strategies that are clear on target and implementation time frames and funding schemes. In case of disapproval of plans and/or its public funding scheme by Parliament, recompose a Strategy that can be implemented.
- Strengthen the capacity at the Ministry of Transport in view of PPP transactions and strategic planning.
- GoT to significantly increase port capacities based on a priority and planning scheme for corridors in the frame of a regional supply chain context.
- Where needed public service operators (TRL/TAZARA) to hire/employ external expertise to improve operations and rail transport services.

Infrastructure Investments

- Funding of transport infrastructure investments to be arranged as much as possible by PPP schemes.
- For all PPP investment projects, assess both economic and financial feasibility to formulate PPP risk sharing schemes.
- TRL and TAZARA lines to be upgraded by public funds and to allow wagons with heavy containers.
- Establish the Kisarawe Freight Station in line with DSM port expansion implementations.
PPP

- Upon the adopting of the PPP law, train MoT and transport authorities’ staff to be prepared to design PPP schemes for individual projects and to negotiate with the private sector on terms and conditions of contracts.

- PPP options to be analysed and evaluated by experts to match private sector desires and at the same time protect public interests.

- Appoint for each PPP scheme a experienced Transaction advisor.

Transport means

- TRL and TAZARA rolling stock to be upgraded and renovated to allow efficient rail transport operation, through PPP funding

- GoT/MoT to stimulate ship building and ship investments through temporary subsidies or tax incentives.

Regulatory

- Prepare legislation and conditions for concession to allow private rail operators to run trains and wagons on the TRL and TAZARA networks.

- Regulations towards fixing or regulating handling charges should therefore be abolished. Private operators should be only controlled when sufficient competition cannot be attracted.

- IMO conventions and codes to be ratified and where ratified implemented by adopting legislation and provide financial and human capacity to enforcing regulation.

- Introduce system of user charges for those infrastructure investments that cannot be funded by public funds (toll roads, channel dues, BOT arrangements, etc).

- Reform SUMATRA to a regulator that refrains from transport tariff or benchmarking setting and monitoring to private sector, but safeguards transport users against abuse of monopoly positions in the transport market and safety and security of transport.
ANNEX A – List of Consulted Reports and Documents

The following reports and documents have been consulted:

- Tanzania Ports Master Plan Final Report, February 2009, Royal Haskoning
- Feasibility Study Upgrade of the Dar es Salaam To Isaka Railway, March 2009, BNSF Railway
- Feasibility Study for the Proposed Port at Mbegani-Bagamoyo Draft Final Report, April 2010, HPC
- Aide Memoire of the 4th Joint Infrastructure Sector Review (JISR) In Transport, 15-16 September 2010
- Pre-feasibility study, review of PPP options and optimum option for establishment of the Kisarawe Freight Station Draft FINAL Report, December 2010, Ecorys Nederland BV
- Central Development Corridor (CDC) Regional Spatial Development Initiative Program (RSDIP) Integrated Transport Strategy – Lakes Tanganyika and Victoria Volume I Recommended Transport Strategy & Volume II Situation Analysis and Background Information, February 2009, Marine Logistics Limited
- Transport, Construction and Meteorology Sector Statistics and Information, June 2010, Ministry of Infrastructure Development
- Feasibility Study, Preliminary Design and Preparation of Tender Document for Development of Port and Economic Zone at Mtwara Port Interim Report, February 2012, URS
- Tanzania Port Authority Development Program Project Brief, September 2011, TPA
- Dar es Salaam Port Top 5 Issues Requiring Address to Improve Performance and Accountability, Parastatals Accountability Conference, 23-24 January 2009
- Annual Report and Accounts Tanzania Port Authorities 2009 – 2010
- Tariff Book of Port Dues and Charges
- Tanzania Port Act, 2004
- Feasibility Study for the Proposed Port at Mbegani-Bagamoyo Final Report, HPC
- Tanzania National Transport Policy Final
- SUMATRA regulations on ports, tariffs and fair competition

Annex – Reference documents 1
Annex B

Tanzanian Ports

Summary Descriptions and Comments on sea ports and lake ports visited by the Study Team in April-May 2012
The sea ports

**Dar es Salaam**

<table>
<thead>
<tr>
<th>Location:</th>
<th>on the Tanzanian coast (Indian Ocean), roughly opposite the southern tip of Zanzibar Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing hinterland connections:</td>
<td>roads through congested conurbation of Dar es Salaam city.</td>
</tr>
<tr>
<td></td>
<td>rail sidings in port for two entirely separate railway lines, of differing gauge:</td>
</tr>
<tr>
<td></td>
<td>TAZARA – an artery serving Zambia, co-sponsor of the line</td>
</tr>
<tr>
<td></td>
<td>TRL – a network consisting of lines to Kigoma, with branches including one to Mwanza, and a link northwards to Tanga, connecting with the line to Arusha. As of May 2012 only the Kigoma and Mwanza lines remain operational, and even those with severely-degraded service levels. The TRL line also has to pass through at-grade crossings of major roads in the city.</td>
</tr>
<tr>
<td>Proposed/possible hinterland connections:</td>
<td>possible construction of an inter-modal transfer station at Kisarawe, allowing containers to be removed from the Port via the more convenient TAZARA railway, and then switched onto the TRL line.</td>
</tr>
</tbody>
</table>
The Lake Ports

<table>
<thead>
<tr>
<th>Location:</th>
<th>on the eastern shore of Lake Tanganyika, approx. 50km south of the Tanzania/Burundi border</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing hinterland connections:</td>
<td>generally poor and indirect roads north-eastward, with substantial stretches unmetalled. Single-track metre-gauge railway east to Dodoma and Dar es Salaam: Kigoma is the western terminus of the Zentralbahn, first opened in 1914. Service still functioning but unreliable as of May 2012.</td>
</tr>
<tr>
<td>Proposed/possible hinterland connections:</td>
<td>possible rehabilitation of Central Corridor railway, including replacement traction and rolling stock.</td>
</tr>
</tbody>
</table>
### Kigoma

| General configuration/description: | Main general cargo quay facing N approx. 300m long has stepped apron, with evidence of voids under pavement. Existing very old rail-mounted dock cranes and poor access for mobile crane due to quay apron configuration. Berths recently re-dredged with TPA, demountable cutter-suction dredge. Passenger ferry terminal at western end of quay. Separately-operated TPA-owned petroleum products jetty and tank farm to NE across bay. Area of rail sidings to rear (South) of quayside warehouses, extending to western end of storage yard where is found a container storage area. Restored 80m slipway with synchronised winch gear beyond passenger ferry terminal, opposite Navy berths. Various workshops equipped with lathes, mills, etc. |
| Current traffic: | Regular calls from small cargo vessels. Geo-exploration vessel also using quay when visited by Study Team |
| Cargo handling equipment: | very elderly Belgian-built rail-mounted dock cranes functional but load-derated due to age and condition, and therefore of little use. Rail-mounted gantry crane serving container park, and with cantilever reach over berth. Age, capacity and other details not available; but reported May 2012 that concession operator Muapi had just agreed to take hoist motors for rewinding. Newly-acquired 30t Grove mobile crane, of doubtful usefulness, given configuration and condition of general cargo quay apron. |
| Condition/comments: | This port is operated by a concessionaire, and it shows. Main quay and equipment is very old, and some remedial work is required around quay, if wholesale reconstruction is not carried out. Most promising is the existence of the container gantry crane. This should be comprehensively surveyed by crane specialists, with a view to its comprehensive refurbishment and upgrading (motors, control systems, cabling etc.). This is a valuable asset, and indeed the only item of powered handling equipment capable of lifting commercial loads across the quay. |
| Possibilities/plans: | Port depends crucially on reinvigoration of railway operations. Survey of quay apron is recommended, to determine extent and seriousness of suspected cavitation beneath apron – reconstruction will anyway be required before the quay can be of further use. Container gantry currently offers only serious cargo-handling capability across quay, and should be refurbished and reinstated as a priority. |
| Commentary/recommendations: | Kigoma is the only Lake Tanganyika terminus for the Tanzanian railway network, and thus has an essential rôle in any reinvigoration of the Central Corridor. Railway traffic will be very important, in view of the relatively poor road network eastwards towards Dodoma and Dar. Kigoma’s recently-refurbished could be a valuable asset in enlarging and maintaining Lake Tanganyika’s ageing vessel fleet. |
Mwanza (South)

<table>
<thead>
<tr>
<th>Location:</th>
<th>just inside Mwanza Gulf, on the southern shore of Lake Victoria, approximately 65km SW of Kenyan border, and 55km S from limit of Ugandan waters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing hinterland connections:</td>
<td>good metalled road north-eastward toward Musoma, Kenyan border and Nairobi; poorer part-metalled road connections to South and West. Single-track metre-gauge railway to South, via Isaka, connecting with (TRL) Dar-Kigoma Central Line at Tabora.</td>
</tr>
<tr>
<td>Proposed/possible hinterland connections:</td>
<td>possible rehabilitation of Central Corridor railway, including Mwanza Branch. Possible new line from Isaka to Rwanda (speculative). Possible preferred alternative to Musoma for lake terminus of new corridor from Tanga (highly speculative).</td>
</tr>
<tr>
<td>General configuration/description:</td>
<td>Main general cargo quay approx. 180m long has stepped apron. Existing very old rail-mounted dock crane and poor access for mobile crane due to quay apron configuration. Substantial area of rail sidings to rear (East) of quayside warehouses, with land available for further expansion. Rail ferry link-span and berthing dolphins at southern end of quay, reportedly in working order. Two large floating drydocks currently moored at N end of quay.</td>
</tr>
<tr>
<td>Current traffic:</td>
<td>Regular calls from small cargo vessels. 2 such vessels alongside when visited by Study Team</td>
</tr>
<tr>
<td>Mwanza (South)</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td><strong>Cargo handling equipment:</strong> none operational or with access to quayside; cargo handling reliant on manual labour (&quot;hand-balling&quot;)</td>
<td></td>
</tr>
</tbody>
</table>
| **Condition/comments:** Structure of link span appears sound, and TPA Engineering HQ in DSM confirm that this one remains in working order, and no works planned to restore it.
Quay structure apparently sound, but of limited utility, since stepped configuration restricts access for vehicles or mechanical handling plant. |
| **Possibilities/plans:** Space for possible ro-ro ramp slipway adjacent to rail ferry link-span, and accessible from sidings area. Any lo-lo operations must rely on manual handling until quay is substantially reconstructed to allow access to cranes and other mechanical handling equipment. Further space adjacent to site is available for goods/container storage. |
| **Commentary/recommendations:** Mwanza is the only Lake Victoria terminus for the Tanzanian railway network, and thus has an essential rôle in any reinvigoration of the Central Corridor. Railway traffic will be very important, in view of the relatively poor road network to the South of Mwanza.
Mwanza’s two dry-docks could be a valuable asset in enlarging and maintaining Lake Victoria’s vessel fleet. Here is also a small slipway (no equipment) and adjoining yard area, on which the construction and launching of a small ro-ro ferry had just been completed in May 2012.
Mwanza North Port is relatively unequipped, and with poorer (wholly dilapidated) rail access. It has traditionally been used for passenger traffic, for which it is better adapted. |
### Musoma

<table>
<thead>
<tr>
<th><strong>Location:</strong></th>
<th>eastern shore of Lake Victoria, approximately 65km SW of Kenyan border, and 55km S from limit of Ugandan waters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing hinterland connections:</strong></td>
<td>road only – 17km from main highway between Mwanza and Nairobi. Metalled surface single carriageway. Full reconstruction of road on approach to Musoma close to completion as of May 2012.</td>
</tr>
<tr>
<td><strong>Proposed/possible hinterland connections:</strong></td>
<td>proposed as possible lake terminus for new corridor from Tanga, via Arusha. This proposal entails corridor crossing Serengeti National Park and therefore likely to give rise to much environmental controversy at international level. Project favoured by Uganda as alternative to dependence on Kenya/Mombasa for Indian Ocean access.</td>
</tr>
<tr>
<td><strong>General configuration/description:</strong></td>
<td>Minimal infrastructure. Sheet-piled concrete-capped low wharf approx 55m long, facing NE, backed by open yard (unpaved) approx. 1900m², with substantial further parking/storage area available to landward. From NW end of wharf, a substantial finger pier approx. 100m long projects at right angles. While this theoretically affords a second wharf (facing SE), the height and available width (≈3m) of quay platform renders it of no use for freight transfer. Main function of finger pier is to serve as a berthing structure for adjacent rail-ferry link span. Design suggests that berthing may be difficult due to local river currents. Condition of link pier structure appears OK but elaborate fendering system is totally degraded (rotten timbers, corroded steel fittings), and some of the rubber cone units have been removed in anticipation of supporting/fixing hardware failure.</td>
</tr>
<tr>
<td><strong>Current traffic:</strong></td>
<td>≈nil. Last reported ship call, as of May 2012, was September 2011</td>
</tr>
<tr>
<td><strong>Cargo handling equipment:</strong></td>
<td>none</td>
</tr>
</tbody>
</table>
### Musoma

| Condition/comments: | Structure of link span seems sound, but TPA Engineering HQ in DSM state that this one is not in working order, and no works planned to restore it.  
Note that this link span does not connect to hinterland rail network, but only short spur line (~450m) to derelict godown with platform, formerly used for stuffing rail wagons. |
| Possibilities/plans: | TPA has acquired land along the shoreline extending for approximately 1km around the bay to the West of the Port, as far as the newly-constructed ferry jetty. There is room for the construction of a basic ro-ro slipway at the north-eastern (Port) end of this shore; and indeed a temporary slipway had previously been formed here. |

**Commentary/recommendations:**

Musoma now enjoys a good road connection with Mwanza, and it is difficult to justify maintenance and development of both ports. Musoma is essentially unused, and its future appears to be linked to the proposed Northern Corridor, linking Lake Victoria with the coast at Tanga, and involving a highly-controversial new road or rail link across the Serengeti. Notwithstanding that the Northern Corridor remains a distant, if not unrealistic, prospect, Musoma is not necessarily a better choice than Mwanza for the Lake Victoria terminus. Since Mwanza also has a rôle in a possible reinvigoration of the Central Corridor, Musoma Port has little to offer.

In the short- to medium-term, there is little maintenance required, and the Port might do occasional service as a station for e.g. customs or police patrol boats, small ferries, even occasional pleasure craft. Remaining fendering should be stripped off the finger pier, so that the rubber cone units might be salvaged. The rail ferry link-span is currently sound, but will deteriorate with age; and dismantling should be carried out before the structure becomes unsafe. This is not an urgent requirement.
ANNEX C – Introduction to PPP and Port Management Models

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1.1 **Definition of PPP**

At the risk of stating the obvious we will nevertheless give a definition of PPP.

We have taken our general definition of PPP from the Green Paper on PPP published by the European Commission in 2005. The Green Paper has no ambition to establish an official definition of PPP, but observes that the term "in general ... refers to forms of cooperation between public authorities and the world of business which aim to ensure the funding, construction, renovation, management or maintenance of an infrastructure or the provision of a service."

The Green Paper goes on to identify a number of distinctive characteristics of PPPs.

- joint development whereby the role of the public partner mainly consists of defining the objectives of the project (in terms of price and quality of services to be delivered and conditions to be met), while the private partner focuses on achieving these objectives in the most efficient way;
- sharing of project risks between the public and private partners in accordance with their respective abilities to control these risks;
- relatively long duration of the relationship, which encompasses different project stages (design, construction, operation);
- participation of private partner in the funding of the project.

Almost every action of public authorities involves some interaction with private companies. However, the mere existence of interaction does not imply that there is a public-private partnership. The following frequently occurring relationships between public and private entities each lack several characteristics listed in the above definition and can therefore not be regarded as PPP:

- purchase of goods and services from private suppliers on spot markets (no risk-sharing, no duration, no private finance, no joint development);
- arm’s length contracts with private suppliers, such as outsourcing contracts (very limited risk sharing and joint development, no private finance);
- regulation of private companies (no risk-sharing, no joint development, no private finance).

PPP is not a new, separate legal instrument. It is a mechanism for the procurement and delivery of public infrastructure and services. PPP is implemented using various existing legal instruments as needed, for instance standard public works contracts, concession agreements, the establishment of a corporation with mixed public and private shareholders and contracts governed by civil and commercial law.

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1.2 Types of PPP in Port Infrastructure

There is a wide spectrum of procurement and delivery models, ranging from the public model to full privatisation. Between these two extreme options there is a variety of delivery models, each characterised by a different mix of public and private responsibilities.

At a conceptual level (i.e. abstracting from specific contractual forms) the delivery models can be characterised along three dimensions:

- the extent of private sector involvement in the different delivery stages (financing, concept, engineering, construction, operation, …);
- the degree of integration of different delivery phases;
- the identity of the payer for the infrastructure services: a public sector agency or the (private) end-users of the infrastructure.

On the basis of these dimensions we distinguish eight delivery models. In the figure below they are ranked according to the extent of private involvement, starting with the public option on the left to the full private option on the right. All intermediate models can be considered as different forms of PPP. However the name “PPP” is often reserved for a smaller subset of options involving private finance and operations in joint companies or concession formulas.

1.3 Range of delivery models for public infrastructure

This paragraph gives an overview of the range of delivery models for the public infrastructure. As the project focuses on the port sector, the delivery models are explained for this sector though they might, to some extent, also be applicable to other public infrastructure (rail, road and lake shipping).

The delivery models in the above figure apply to all types of public infrastructure, including port infrastructure. In the following paragraphs the models are described in more detail from the perspective of investments in port infrastructure.

1.3.1 Public delivery

The key characteristic of this model is that the public sector assumes responsibility for all stages of the delivery of the port infrastructure: concept (i.e. determining the port infrastructure requirements and defining a port infrastructure programme), design, construction, maintenance and operation. The fact that the public sector is responsible does not imply however that it performs all the activities in the delivery process. The design and construction of the infrastructure are always outsourced to specialised private firms
(engineering firms, dredging firms and building contractors). Maintenance and operations are usually carried out by the public sector but may also be partially or wholly outsourced. However, even when operating activities are outsourced, the public port authority retains the responsibility for transacting with the end-users of the port facility. The private operator does not offer its services to the end-user but to the public port authority.

There are two options with respect to pricing of the port infrastructure. In the first option the public port authority makes the port facility available to users free of charge. The costs of the port authority are covered by grants and subsidies from national or local governments. In the second option the public port authority charges port dues to the users of the port infrastructure. If a full cost-recovery pricing policy is pursued, then the level of port dues is set to cover recurring costs (maintenance and operation) and capital costs (depreciation and interest costs). Combinations of partial cost-recovery and public subsidies are also observed.

The contract forms used in the public delivery model are public works and services contracts. With traditional procurement the design and construction of the facility is divided among several public procurement contracts. In the concept phase several consulting firms are hired to perform technical, environmental and economic feasibility studies. Next an engineering firm is contracted to design the facility and draw up detailed terms of reference for the construction (bill of quantities). The works are parcelled into distinct parts (dredging, construction of quay walls, building of access roads,...) and put up for separate tenders.

A more innovative procurement approach involves the integration of design and construction in a single Design and Build (DB) contract. DB contracts share a few of the features of PPP arrangements: output-based contracting and transfer of construction risk from public to private sector optimization. However, the public sector remains ultimately responsible for delivering the infrastructure to the end-user. Therefore DB contracts are generally considered as a variant of traditional procurement rather than as a type of PPP. But some of the advantages and disadvantages of PPP that will be described below also apply to DB.

For the same reason Design, Build, Finance, Transfer (DBFT) contracts and financial leases are not included among the PPP options. Although the infrastructure is privately financed in these schemes, the private sector is not involved in the service delivery.

The public delivery model is commonly used by public port authorities all over the world for the construction of the infrastructure under their management.

1.3.2 Operating concession

The public sector finances and constructs the port infrastructure through traditional procurement (outsourcing the actual design and construction activities as described in the preceding paragraph). The infrastructure is then leased or given in concession to a private operator for a specified period. The operator invests in superstructure and equipment and operates the facility on a commercial basis, selling the infrastructure services directly to the end-user. In return for the concession rights the operator pays a concession fee to the public sector, which remains owner of the facility. Depending on the contractual agreements the concession payment takes the form of a one-time sum, periodic fixed payments or a variable payment in function of the level of use. The public sector may also impose operational requirements on the concessionaire in the concession agreement. In this way the public sector can ensure that public interests are safeguarded. At the end of the concession period the assets are returned to the public owner, which will usually launch a tendering procedure to select a concessionaire for the next concession period. The length of the concession period depends among other on the size of the investment in superstructure and equipment and the bargaining power of the contract parties. It varies from 10 years for a small general cargo terminal to 40 years for large container terminals.
The key feature of this delivery model is that the public sector finances and builds the infrastructure in a traditional way, while the private sector operates it on a commercial basis. In contrast to the public delivery model the private operator sells its services directly to the end-users. Consequently, this model excludes that infrastructure is made available free of charge. It is possible that the infrastructure is provided at a price below full cost. This will be the case if the concession fee paid to the public port authority is insufficient to cover the capital costs (depreciation and interest). If the public sector is in addition prepared and permitted to subsidize the operator (i.e. the concession fee is negative) it is even possible to provide the infrastructure at a price below operational costs.

We consider this delivery model as a type of PPP because the private sector finances the investment in superstructure and equipment, and is responsible for the delivery of the infrastructure services to the end-user. Some authors reserve the name PPP for arrangements involving private financing of the infrastructure. The operating concession falls outside this more restricted definition of PPP.

This delivery model is widely used in the port sector for the provision of cargo-handling infrastructure (berths, jetties, docks).

1.3.3 Integrated contracting without finance

As in the public delivery model the public sector finances and owns the port infrastructure. However, instead of outsourcing engineering, construction and maintenance/operations with separate contracts, these services are procured with a single integrated contract: a Design, Build, Maintenance (DBM) or a Design, Build, Operate (DBO) contract. The contractor (usually a consortium of specialised firms covering the required expertise) is required to design and build an infrastructure meeting the functional specifications of the responsible public sector agency, and to maintain/operate it afterwards for a specified period. The integration of construction and maintenance/operation makes one contractor responsible for the whole life-cycle of the project.

The contractor does not sell its services directly to the end-user of the port infrastructure, but to the public port authority (or another competent public agency). At the acceptance of the infrastructure, the contractor is paid in full for the construction costs (so it does not finance the infrastructure). During the maintenance/operation period it receives a price for the performance of agreed maintenance and operating activities.

The public port authority transacts with the end-users of the facility. As in the public delivery model the port authority can choose to provide the infrastructure free of charge, at a price equal to full cost or at a price between zero and full cost.

Since the private contractor does not contribute to the financing of the infrastructure, integrated contracting without finance does not fall within a strict definition of PPP. We employ a broader definition and include this model in the range of PPP arrangements because the private sector plays an important role in the delivery of the service to the end-user.

A recent example of this model is the construction of Maasvlakte 2 in Rotterdam (extension of port area on land reclaimed from the North Sea). The construction has been procured through a design and build contract, but also includes maintenance and repair elements. The contractor is responsible for maintenance of the seawalls for the first five years after delivery. In addition, the contractor must repair the damages of smaller storms (frequency less than once every 50 years). The damage risk of larger storms is borne by the port authority.
1.3.4 Integrated contracting with finance

As above, but the integrated contract now also includes partial or full private financing of the port infrastructure. Hence, the private contractor finances, designs, constructs, maintains and often also operates the infrastructure (DBFM or DBFMO), all according to the specifications of the public port authority (or other competent agency). The private contractor does not directly sell its services to the end user of the infrastructure. Its client is the public port authority. It is paid by the public sector in the form of availability fees (payment in function of the availability of the infrastructure) or shadow tolls (fee per user, but paid by the public sector instead of the user) for the duration of the contract only starting after the acceptance of the infrastructure. The revenues from these fees are used to cover costs and earn a return on investment.

The port authority retains the commercial contacts with the port users. It can choose to provide the infrastructure free of charge, at a price equal to full cost or at a price between zero and full cost.

DBFM(O) is a type of PPP even according to the most narrow definition. The public sector concentrates on specifying the infrastructure services that are needed, and the private sector carries out all stages of the delivery process. DBFM(O) contracts are widely used for the delivery of public buildings (hospitals, schools, prisons) and land infrastructure (roads, railroads). In principle they are also suitable for port infrastructure. However, we have not been able to find examples. Private finance of port infrastructure is usually arranged through a BOT concession (discussed below).

1.3.5 Joint company

Port facilities are managed by a mixed public/private joint enterprise. This joint enterprise is responsible for all stages of the delivery process: finance, design, construction, maintenance and operation. Part of the actual activities (notably design and construction) may be outsourced. The joint enterprise sells the infrastructure services directly to the end-users on a commercial basis.

Usually the joint venture is an incorporated company with public and private shareholders, but depending on the legal framework of the country involved other legal forms may be possible.

This model is not commonly used in the port sector.

1.3.6 Build, Operate, Transfer (BOT) concession

A private contractor finances and builds port infrastructure on publicly-owned land and maintains and operates it for a specified period (20-30 years and more) on a commercial basis. In return for the concession the private contractor pays a concession fee (one-time lump sum, periodic fixed payments or use-dependent payments). In addition the public sector may impose operational requirements on the concessionaire in the concession agreement in order to safeguard public interests. At the expiry of the concession the assets are transferred to the public sector.

This delivery model resembles integrated contracting with finance, but differs from the latter in one essential respect: the private concession holder sells its services directly to the end-

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2 In this report we have defined the terms DBFMO, BOT and concession in a consistent way on the basis of a few essential contract features, in particular the identity of client of the private contractor (public sector agency or private end-users). Notice that in the literature other and sometimes mutually contradictory definitions of these contract types can be found.
user of the port infrastructure and assumes the commercial risk. It is not paid by the public port authority. In contrast, it pays a concession fee to the public port authority.

BOT concessions also differ from operating concessions in the fact that the latter do not involve private finance and construction of port infrastructure, but only operations (including investments in superstructure and equipment).

There are a number of variants of the BOT concession:

- **BOOT (Build, Own, Operate and Transfer)**. The concessionaire obtains ownership of the land as well as the infrastructure during the concession period. At the end of the concession period the ownership rights are returned to the public sector at an agreed price. A BOOT arrangement offers more collateral to the concessionaire.

- **BTO (Build, Transfer, Operate)**. The ownership of infrastructure is transferred immediately after the construction to the public sector. In contrast with a BOOT contract a BTO arrangement reduces the asset basis of the concessionaire that can be used for collateral. In a BTO scheme the only collateral is the concession contract itself.

- **BLT (Build, Lease, Transfer)**. A private sponsor builds a new infrastructural facility at its own risk, transfers ownership to the public sector, leases the facility from the public sector and operates it on a for-profit basis up to the expiry of the lease.

- **ROT (Rehabilitate, Operate, Transfer)**. A private sponsor rehabilitates and expands an existing facility, then operates and maintains the facility at its own risk for the contract period.

BOT concessions (and variants) are widely used for the construction or rehabilitation of infrastructure, including port infrastructure. The model requires that the underlying assets directly generate user revenues. It is therefore more suitable for cargo handling infrastructure than for individual items of basic infrastructure (such as a breakwater). For instance several large container terminals in India (Vallarpadam, Tuticorin) have been developed with BOT contracts.

### 1.3.7 Transfer of management rights

A BOT concession as described above relates to a single construction project and a single infrastructure item. A concession of management rights covers the entire port and multiple construction moments. The concessionaire acquires the right to manage and operate an existing port during a certain period (30-50 years) on a for-profit basis. In return it pays a concession fee (one-time lump sum, periodic fixed payments, payments per cargo unit or revenue sharing). During the concession period the concessionaire is responsible for financing the expansion and renovation of the port infrastructure. At the end of the concession period all assets are returned to the public sector (which may conclude a new concession agreement with the same or another operator).

A transfer of management rights amounts to a quasi-privatisation of the port during the concession period. The concession agreement usually specifies infrastructure investments that need to be undertaken by the concession holder within a certain time frame. Beyond these commitments the private concession holder is free to develop the port in function of the market opportunities it perceives. It therefore takes over a large part of the concept stage of the delivery process (i.e. determining the port infrastructure requirements and defining a port infrastructure programme), which in a BOT concession model remains largely public.
1.3.8 Privatisation

Port infrastructure is sold to a private company, which subsequently develops and operates it on a commercial basis. The sale can be made subject to commitments by the buyer to undertake specific investments in the renovation, upgrade or expansion of the basic port infrastructure. The public sector loses, however, its influence on the further development of the port beyond the investments specified in the sales agreement.

In the case of an investment in new infrastructure a Build, Own, Operate contract is used. A private contractor builds a new facility at its own risk, then owns and operates the facility at its own risk.

Notice that the public sector can capture most of the effects from port privatisation through a concession of management rights, without the need to abandon ownership of the port land and as a result any future ability to pursue a port development policy. Therefore full privatisation is only rarely observed in multi-purpose ports (with the main exception of the United Kingdom and New Zealand). Most fully private ports belong to oil, mining or industrial companies and serve only internal requirements.

1.4 Summary PPP models for Port Infrastructure

The key characteristics of the delivery models are summarised in the following table.

| Characteristics of delivery/procurement models for port infrastructure (and other public infrastructure) |
|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| Public delivery | Operating concession | Integrated contracting without finance | Integrated contracting with finance | Joint Company | Build, Operate, Transfer concession | Transfer of management rights | Private delivery |
| Contract types | Works and services contracts | Lease, concession | DBM, DBMO | DBFM, DBFMCO | Corporation, joint venture agreement | BOT, BOOT, BTO, BOT, ROT,... | Concession | Sale, BOO |
| Time horizon | Short | 10-15 yrs, up to 40 | 10-30 yrs | 20-30 yrs | 30-50 yrs | In perpetuity | In perpetuity |
| Own | Public | Public | Public | Public | Private | Private | Private |
| Delivery phase* | Public | Public | Public | Public | Public/private | Private | Private |
| Concept | Public | Public | Public | Public | Public/private | Public | Private |
| Design | Public | Public | Private | Private | Private | Private | Private |
| Build | Public | Public | Private | Private | Private | Private | Private |
| Maintain/Operate | Public | Private | Private | Private | Private | Private | Private |
| Finance | Public | Public | Public | Public | Private | Private | Private |
| Client | Public or private | Private | Public | Public | Private | Private | Private |

* The table entries show the responsible party for each delivery phase: public authority or private contractor. The responsible party may outsource the actual activities to specialised subcontractors. For instance, designing and building are always outsourced to engineering firms and building contractors. Also maintenance and operating sources may be partly or wholly outsourced.

1.5 PPP and Port Management Models

The delivery of port infrastructure and the management of ports are closely related. The involvement of private parties in the provision of port infrastructure through PPPs is one of the ways to reform port management. In addition some delivery and management models are not compatible.
1.5.1 Management models of World Bank Port Reform Tool Kit

The best known typology of port management models has been published in the World Bank Port Reform Tool Kit and is reproduced in the table below. The management models of the Port Reform Toolkit are mainly characterised by the public-private mix of the ownership of infrastructure and superstructure/equipment. In principle many combinations are possible but in practice four main models can be distinguished. Ranked from high to low public involvement, they are:

- public service port;
- tool port;
- landlord port;
- private service port.

### Types of port management models in World Bank Port Reform Tool Kit

<table>
<thead>
<tr>
<th>Management model</th>
<th>Infrastructure</th>
<th>Superstructure</th>
<th>Port labour</th>
<th>Other functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service port</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Majority public</td>
</tr>
<tr>
<td>Tool port</td>
<td>Public</td>
<td>Public</td>
<td>Private</td>
<td>Public/private</td>
</tr>
<tr>
<td>Landlord port</td>
<td>Public</td>
<td>Private</td>
<td>Private</td>
<td>Public/private</td>
</tr>
<tr>
<td>Private service port</td>
<td>Private</td>
<td>Private</td>
<td>Private</td>
<td>Majority private</td>
</tr>
</tbody>
</table>


In the **public service port** model a public port authority owns and operates all port assets (land, infrastructure, superstructure, handling equipment) and performs all port functions (pilotage and towage, cargo handling, regulatory functions,…). All port activities are carried out by labour employed by the port authority.

In the **tool port** model the public port authority also owns and operates all port assets (land, infrastructure, superstructure, handling equipment) and performs all port functions (pilotage and towage, cargo handling, regulatory functions,…). However, the cargo-handling activities are divided between the port authority and private cargo-handling firms. The port authority operates the handling equipment (cranes, forklifts) and rents equipment services to private cargo-handling companies. The latter are contracted by shipping agents and perform the other handling activities (i.e. except operating equipment) on-board the vessels, on the apron and on the quay.

In the **landlord port** model a public port authority owns the land and infrastructure. The infrastructure is leased to private cargo-handling companies. The latter own and operate the superstructure and equipment and carry out all handling activities. The landlord port authority performs the regulatory functions.

In the **private service port** model all port assets (land, infrastructure, superstructure, handling equipment) are owned and operated by a private port authority. The latter also performs most of the regulatory functions.

Each model has specific strengths and weaknesses.

The integration of functions under a unified command in the **public service port** model could in theory achieve high efficiency. In practice most public service ports show low levels of inefficiency due to various reasons. Public entities lack the drive to be user-oriented and cost-efficient. Political interference may further impede efficient operations. The timing and size of investments is more determined by the state of the budget than by market demand, generally resulting in under-investment.
The **tool port** model emerged in response to the inability of small cargo-handling companies to invest in superstructure and handling equipment. The public port authority undertook the required investments, so that the port could modernize and expand unimpeded by the small investment capacity of the private sector. However, the split operation of cargo-handling is a source of conflicts of interest and inefficiencies. The model worked satisfactorily as long as handling equipment was relatively simple and generic. Today well-designed and efficiently operated superstructure and equipment are an important source of competitive advantage for cargo-handling companies. To exploit these competitive advantages they must own and operate the equipment. While the tool port provided a solution to small cargo-handling companies, it prevented these companies from expanding into strong, international port terminal operators.

The **landlord port** model strikes according to many authors the right balance between public and private responsibilities. Most port operations are performed by private companies, ensuring a high level of efficiency and user-orientation. However the public sector keeps its regulatory and infrastructure development role, allowing the safeguarding of public interests. A weakness of landlord ports is a tendency to over-invest leading to excess capacity. The demands of private terminal operators for additional capacity often show overlap because several companies chase the same demand. The landlord port model is the dominant governance structure observed in large ports worldwide.

The **private service port** model enables maximal operational efficiency and market-orientatedness. However, there are also some important weaknesses. They are all related to the fact that the public sector has little or no stake in the ports. The government loses the ability to pursue its own port development policy. The private port operator may even decide to convert or sell the port area for the development of non-port functions. The relinquishing of regulatory functions to the private port operator creates significant risks of abuse of market power and of regulatory slackness with regard to safety and environment. Since the private operator does not take into account wider economic benefits of port development, but only shareholder value, there is also a risk of under-investment from a societal point of view.

The strengths and weaknesses of the four port governance models are summarised in the table below.

**Strengths and weaknesses of World Bank port management models**

<table>
<thead>
<tr>
<th>Management model</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service port</td>
<td>Unity of command</td>
<td>Not user/market-oriented[1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of internal competition, resulting in inefficiency[2]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Risk of under-investment as a result of dependence on government budget[3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Risk of waste and inefficiency as a result of government interference[4]</td>
</tr>
<tr>
<td>Tool port</td>
<td>Lower entry barriers for cargo-handling companies (since they do not have to invest in superstructure and equipment)</td>
<td>Split cargo-handling operations, resulting in conflicts of interest[5]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Risk of under-investment as a result of dependence on government budget[3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private operators stay small and do not develop into strong firms[6]</td>
</tr>
<tr>
<td>Landlord port</td>
<td>User/market oriented, while maintaining public role in regulation and port development</td>
<td>Risk of excess investments[7]</td>
</tr>
<tr>
<td>Private service port</td>
<td>Maximal user/market-orientatedness</td>
<td>Government loses ability to implement port development policy[8]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Privatization of regulatory powers may lead to regulatory slackness and cause harm to public interests (competition, safety, environment)[9]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Risk for under-investment[10]</td>
</tr>
</tbody>
</table>

Source: Adapted from World Bank Port Reform Tool Kit (summarised and slightly altered)
1.5.2 Relations between PPP and port management models

PPP is an alternative mechanism for the delivery of public infrastructure. Consequently it is not an available option for private ports or for ports that have been privatised through a transfer of management rights. A concession of management rights is itself a type of PPP, but once the transaction has taken place the delivery of port infrastructure becomes a purely private responsibility for the duration of the concession.

Public ports can regardless of their management model employ all types of PPP. However, some types of PPP will result in a change of their management structure. In this respect PPP can be used as an instrument to achieve port reform.

Consider first the perspective of public service ports. Integrated contracting without or with finance increases the role of the private sector in the provision of the port infrastructure, but does not fundamentally alter the management structure. The public sector remains responsible for defining the services that need to be delivered and for transacting with the end-users. The outsourcing of activities to a private contractor allows making use of the greater efficiency and management skills of specialised private firms, while keeping ultimate control of the delivery process in the hands of the public port authority. The private contractor offers its services to the public port authority and is paid by the latter.

Concession formulas (operating concession or BOT concession), on the other hand, not only increase the role of private sector in the provision of port infrastructure, but also give the private contractor the right to sell services directly to the end-user. This fact represents a fundamental change of the management model. The port can no longer be considered a public service port. Operating and BOT concessions are usually conferred for cargo-handling infrastructure (terminals). The port becomes then a public landlord port (at least with respect to the terminals that are given in concession).

The conversion of the port authority to a mixed public/private company does not change the scope of its activities: it remains a service port. However it is no longer a public service port, but a public/private one. A transfer of management rights or privatisation has a similar impact: they convert the public service port into a private one, respectively for the duration of the concession or permanently.

Consider next public tool ports. As in public service ports integrated contracting increases the role of the private sector in the provision of the port infrastructure without fundamentally altering the management structure. The potential scope of the integrated contracts is smaller than in the case of service ports. Some cargo-handling activities are excluded because they are already performed by private operators.

Concession formulas (operating concession or BOT concession) change the management structure of public tool ports. Private contractors take on responsibility for the management (and in BOT schemes also the financing) of terminals, as well as for investing in superstructure and equipment. Hence the port becomes a public landlord port.

A conversion of the port authority to a mixed public/private company, a transfer of management rights or a privatisation preserves in first instance the organisation model of the tool port, but reduces or eliminates its public character.

Finally we look at the impact of PPP on public landlord ports. As in public service and tool ports integrated contracting increases the role of the private sector in the provision of the port infrastructure without fundamentally altering the management structure. The potential scope of the integrated contracts is further reduced compared to tool ports. The operation of terminals (including investments in superstructure and equipment) is already performed by private companies.

The use of operating concessions corresponds to the normal practice of public landlord ports. In case of a BOT concession the private terminal operator also finances, builds and
maintains the terminal infrastructure, which in landlord ports is done by the port authority. However, this does not significantly change the management structure. The port authority remains responsible for the management and the development of the port land.

A conversion of the port authority to a mixed public/private company, a transfer of management rights or a privatisation changes the ownership structure of the port. It remains a landlord port, but a public/private or private one instead of a public one.

The possible PPP options depending on the port management model are summarized in the following table.

**Available PPP options in function of port management model**

<table>
<thead>
<tr>
<th>Port management model</th>
<th>Operating concession</th>
<th>Integrated contracting without finance</th>
<th>Integrated contracting with finance</th>
<th>Joint Company</th>
<th>Build, Operate, Transfer concession</th>
<th>Transfer of management rights</th>
<th>Full privatisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service port</td>
<td>Yes with change management model</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
</tr>
<tr>
<td>Public tool port</td>
<td>Yes with change management model</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
</tr>
<tr>
<td>Public landlord port</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes</td>
<td>Yes with change management model</td>
<td>Yes with change management model</td>
</tr>
<tr>
<td>Private port (or privatised with concession of management rights)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

1.6 **Choice of the best delivery model for port infrastructure**

In the preceding paragraphs it is demonstrated that a wide variety of delivery models is available for the provision of port infrastructure, involving different degrees of private involvement. Consequently, the port policy maker can choose from different options in function of policy objectives and public interest considerations.

The selection of the optimal delivery and procurement model depends on two sets of factors: desirability and achievability.

The desirability of the model relates to the costs and benefits of the model from the point of view of society. The question is which delivery model yields the best cost-quality combination.

The achievability of the model relates to its practical implementation. The benefits of the theoretically most desirable model will only materialize if the model is well implemented. This depends among other on the presence of the required skills in the public procurement agency and with the potential private partners, the legal and institutional framework, the availability of sufficiently developed capital markets, etc.

**Why is government intervention in ports needed?**

Before examining the determinants of the desirability of PPP we must first recall the public interest of ports. PPP involves the cooperation of the public and private sector in the provision of infrastructure or a public service. Consequently PPP appears only as an option if the public sector is involved in port operations. In fully private ports PPP is not relevant.

The classical economic analysis of government intervention is based on the concept of market failure. In principle goods and services are most efficiently produced by private
enterprises operating in free markets. Private enterprises have the strongest drive to be cost-efficient and market-oriented. However in some cases markets do not function properly. If such market failures occur then government intervention is economically desirable.

In standard economic textbooks a number of frequently occurring market failures are described. Most of these also apply to some degree to seaports, especially to basic seaport infrastructure (maritime access channels, breakwaters, vessel traffic management system).

**Public good**

“Public goods” is the technical term reserved for goods that satisfy at least one of two characteristics:

- non-rivalry of consumption: consumption (or use) of the good by one consumer (user) does not diminish the availability of the good to other consumers (or users).
- non-excludability of consumption: once the good is supplied, it is impossible or very difficult to prevent non-paying consumers (or users) from consuming (using) it.

A textbook example of a public good is a lighthouse marking the position of dangerous rocks on a shipping lane. The observation of the lighthouse signal by one ship does not make it less visible to other ships. It is not impossible but nevertheless rather difficult to prevent ships from using the lighthouse signal when they do not pay the light dues.

In the economically most efficient equilibrium, the price of a good must be equal to its marginal cost (i.e. the cost of producing one additional item). Non-rivalry in consumption implies that the optimal price of the good is equal to zero, as the marginal cost of serving one more customer also equals zero. Non-excludability of consumption makes it impossible to charge a price higher than zero, as non-paying consumers (users) can not be prevented from consuming (using) the good.

A price of zero obviously does not allow a private producer to cover its costs, so that the public good will be underprovided or not provided at all. The public sector must intervene as provider or buyer of the good in order to elicit its supply.

Basic port infrastructure possesses public good characteristics. As long as the port is not congested, there is non-rivalry in its use. One extra vessel calling the port does not increase the costs of the general port infrastructure. The optimal price charged to the users should then be zero, preventing the seaport infrastructure provider from recovering its costs. Non-excludability of use is generally not a problem in the case of seaports. The port users can be easily identified and made to pay port dues.

The non-rivalry in use of basic port infrastructure points to the conclusion that the public sector should step in. It can either supply the general infrastructure services itself, or it can purchase them from a private supplier and make them available to users free of charge. However, the issue is more complex. The provision or purchase of the good by the public sector requires tax funds (even if initial investments are financed by a loan, this loan must eventually be paid back). Taxes also create inefficiencies in the economy, for instance by reducing labour supply or by discouraging entrepreneurship. The inefficiency of an increase in taxes to cover the costs of basic port infrastructure must be compared to the inefficiency of charging the costs to users (which is possible in this case because non-excludability does not pose a problem).

**High fixed costs and indivisibilities**

---

3 The optimal price maximizes welfare for all members of society. The optimal price is not equal to the profit-maximizing price, which is not optimal from the point of view of society but only from the point of view of the producers. Generally, the optimal price will be lower than the profit-maximizing price.
Most of the costs of basic port infrastructure are fixed, i.e. they do not vary in function of the traffic volume. For instance, depreciation, interest charges and maintenance costs are all fixed once the infrastructure has been built. Moreover, the provision of port infrastructure is characterised by indivisibilities. A port can not be constructed below a certain minimum size. Afterwards, capacity is added not continuously in function of rising demand but in large lumps.

The combined presence of high fixed costs and indivisibilities creates several difficulties for the provision of basic port infrastructure by private companies.

As long as the port is not congested, the marginal cost (and hence optimal price) of serving one additional ship is almost zero. This has already been pointed out above in the paragraph on public goods. High fixed costs are in this case the cause of non-rivalry of use. Only when the port is congested the optimal price rises above zero (because it includes congestion charges), allowing a private port infrastructure provider to earn revenues and recover its costs. However, due to the presence of indivisibilities there are long periods in which capacity by far exceeds demand and no congestion occurs.

Indivisibilities also increase the risk for an infrastructure provider. The minimally required investment is large and sunk (i.e. if demand turns out smaller than expected, the investment can not be undone and the funds invested elsewhere).

As a result of high fixed costs and indivisibilities the provision of basic port infrastructure is a local natural monopoly. This means that the demand for port infrastructure services in a given region only leaves room for one or a few ports. However, the establishment of a monopoly or oligopoly opens the door for the abuse of market power in the form of charging prices above costs. This problem is mainly present in regions with only a few ports so that there is little or no inter-port competition. It is then important to have sufficient intra-port competition between several terminal operators. However, this poses the problem of who provides the shared basic port infrastructure.

The problems of high fixed costs and indivisibilities also arise in the case of investments in operational port infrastructure (e.g. terminals), but to a much smaller extent. Hence in many (but not all) ports there is room for several operators competing with each other.

Externalities

Externalities are effects on third parties outside the scope of the market. Since the costs or benefits of these effects are borne by third parties and carry no price, the enterprises causing these external effects do not take them into account when making investment decisions. This leads to outcomes that are economically inefficient from the point of view of society: investments of the wrong size (too large or too small) and/or of the wrong kind.

The construction and exploitation of port infrastructure generates several types of externalities, both negative and positive:

- disturbance or even destruction of wetlands and coastal habitats;
- pollution emitted by ships and hinterland transport;
- consequences of ship accidents;
- congestion on hinterland roads and railroads (or extra costs to expand the capacity of hinterland infrastructure to cope with increased port-related traffic without congestion);
- strengthening of the competitiveness of national industries depending on overseas imports or exports;

---

4. Before the construction of the infrastructure, its size and therefore cost can be chosen in function of the expected traffic volume. However, once the infrastructure has been built the costs are fixed regardless the number of ships calling the port.
• attraction of investments in logistics and industry (growth pole effect).

Private port infrastructure providers, when guided solely by their own interests, take these externalities insufficiently into account. This results in port infrastructure that has a suboptimal capacity (i.e. too large or too small to obtain the best balance of costs and benefits to society), that is insufficiently coordinated with land use and transport infrastructure in the vicinity of the port, or that includes too few measures to prevent or mitigate the environmental and safety impacts. Some form of public sector intervention is needed to remedy these market failures.

State ownership of water areas

Ports extend both over land and water areas. In most countries private individuals or enterprises can not obtain full property rights to water areas. The state is the owner of the water areas in navigable rivers and in front of the coast. This means that the construction and operation of a port requires the cooperation and involvement of the public sector.

Forms of government intervention in ports

The previous paragraphs demonstrate that there are several reasons for the public sector to intervene in the provision of port infrastructure, especially basic port infrastructure (i.e. shared facilities such as maritime access, breakwaters,…). However, this does not imply that ports should be built, owned and operated by state or local authorities. There are less intrusive ways for ensuring the public interests in port development and operation, which leave a role for the private sector alongside the public sector.

For instance many of the market failures described above can be remedied through appropriate regulation. Regulation can ensure that private companies do no engage in anti-competitive practices and pay attention to safety and the environment, or at least that socially harmful actions are substantially reduced. The public sector must then focus on the implementation of an efficient regulatory and enforcement framework, while leaving most of the management and operation of the port to the private sector.

Nevertheless the analysis presented suggests that there is one important area where direct public intervention is often necessary: the provision of port infrastructure and especially basic port infrastructure. In many cases the provision of port infrastructure is not commercially viable, either because the traffic is too low and the risks too high (due to indivisibilities and sunk costs), or because it is socially optimal to make the infrastructure available to users at a low price below the full cost level (non-rivalry in use, promotion of growth pole effects). In those instances the public sector has to step in by financing and/or paying for the infrastructure.

Advantages and disadvantages of PPP

The advantages of PPP fall into two categories.

• The first category is grouped under the term “Value for Money”. Experience across the world has shown that PPP can supply public services with a better price to quality ratio than the traditional public delivery model.

• The second category of benefits of PPP derives from the use of private finance. Governments often lack the funds to make the investments that are required to provide public infrastructure and services, especially in areas with fast-growing needs. Using PPP gives access to private capital and allows accelerating the required investments so that needs are met in a more timely fashion.

The advantages of PPP must be weighed against the disadvantages. Three groups of disadvantages can be distinguished.

• First, PPP contracts entail higher transaction costs than traditional procurement. Due to the transfer of risks to the private sector and the long-term nature of PPP
arrangements the contracts are much more complex. The preparation and negotiation
of these contracts is very time-consuming and labour intensive.

• Secondly, the private sector generally faces higher borrowing costs than the
government, so that PPP increases the cost of financing the infrastructure.

• The third disadvantage of PPP is inflexibility. All service requirements that the private
partner must satisfy are specified in the contract. Once the contract has been signed
the possibilities for altering these requirements are limited.

### Risks and their preferred allocation in port infrastructure projects

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Preferred allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning approval</td>
<td>Risk that necessary approvals may not be obtained or may be obtained only subject to unanticipated conditions which have adverse cost consequences or cause prolonged delay.</td>
<td>Preferably planning approval is obtained before beginning the tender process. If that is not feasible, then the public sector should assume the risk in complex or sensitive projects. If the risk is small, it can be well managed by the private contractor.</td>
</tr>
<tr>
<td>Construction risk</td>
<td>Risk that events occur during construction which prevent the facility being delivered on time and on cost</td>
<td>Private contractor, unless the adverse event is caused by public intervention (public responsibility preferred) or force majeure (risk sharing if the risk is too large to be borne by the private party alone)</td>
</tr>
<tr>
<td>Maintenance and operating risk</td>
<td>Risk that maintenance and operating costs are higher than anticipated (for instance because design and/or construction quality is inadequate, the costs of inputs are higher than expected,…)</td>
<td>Private contractor</td>
</tr>
<tr>
<td>Demand/revenue risk</td>
<td>Risk that the demand for the project services is lower than expected, resulting in a shortfall of revenues. Demand risk has both external causes (general economic downturn, uncertainty about traffic volume) and causes that are partially under the control of the private contractor (competitiveness of facility in comparison with facilities in rival ports).</td>
<td>The preferred allocation depends on the predominant cause of the demand risk (external or within private control). In case of the concession of an existing facility with a track record the external demand risk is relatively small and can be borne by the private concession holder. In case of new port facilities without traffic history the external demand risk may be very substantial and unacceptable for the private contractor (unless with a very high risk premium on the rate of return). The risk should be assumed by the public sector, or at least shared.</td>
</tr>
<tr>
<td>Financial risk</td>
<td>Risk that financing costs are higher than expected due to unanticipated changes of interest rates, exchange rates,… Risk that that when debt and/or equity is required by the private party for the project it is not available then and in the amounts and on the conditions anticipated.</td>
<td>Private contractor, which can insure or hedge these risks to an important degree</td>
</tr>
<tr>
<td>Regulatory risk</td>
<td>Risk of a change in legislation/policy that could not be anticipated at contract and that has adverse cost consequences for the private party</td>
<td>Public sector, but only for changes that are not anticipated. The risk of general changes in tax law or decisions made by regulators under existing legislation should be borne by the private party. Extreme political risks (breach of contract, expropriation, civil war,…), are necessarily borne by the private party, although it can not control these risks. But they can be partially insured (MIGA)</td>
</tr>
</tbody>
</table>

### Indicative risk allocation under alternative delivery/procurement models
It is not possible to rank the delivery models according to the optimality of the risk allocation. Which model features the most efficient risk allocation depends on the preferred risk allocation, and this depends in turn on the characteristics of the project.

Nevertheless we can conclude that the integrated contract models permit the most refined risk allocation. They can be tailor-made to achieve a very detailed and almost optimal risk allocation in function of the project. The drawback is greater complexity and transaction costs.

An essential characteristic of concession agreements is that they transfer the demand risk to the private operator or investor. Whether this is efficient depends on the project characteristics, as was pointed out in Error! Reference source not found.. The concession framework does not permit as much flexibility with regard to risk allocation as the integrated contract models. More complex risk sharing mechanisms could be built in (for instance to share the demand risk), but in practice concession agreements are relatively standardised.

In a joint company all risks are by definition shared among the public and private shareholders. Sharing risks does not imply, however, that they are efficiently allocated. In fact, it is difficult to fine-tune the risk allocation in a joint company.

Notice that the risk allocation scheme is not only determined by the mix of public/private roles in the provision of infrastructure (finance, design, construction, operations) but also by the payment mechanism. Through the rewards and penalties in the payment mechanism risks are transferred to the private contractor (for instance penalty for late delivery). Again the integrated contract models allow the greatest flexibility in this respect.

1.7 Choice between PPP models

The four PPP models described above are potentially optimal. Which model of the four is optimal in a particular project can not be said in general, but depends on the specific characteristics of that project. Below we examine the factors determining the choice of the best PPP model. Each phase in the provision of the port infrastructure is treated in turn.

Operation

General port infrastructure has been defined as port infrastructure that has no direct commercial function (unlike terminals). Consequently, the superior commercial skills of the private sector provide no reason in this case to allocate the operation of general port infrastructure to the private sector. But there are other reasons why the private sector may be more efficient than the public sector in purely operational tasks. On one hand the efficiency of the public sector may be hindered by factors such as restrictive labour practices, lack of management skills, complex chains of command, political interference in the management,... On the other hand the profit motive of private firms provides a continuous incentive to increase efficiency. If these factors are present, a delivery model must be chosen in which the operation of the infrastructure is transferred to the private sector.
Financing (including management of design and construction)

The reasons to transfer financing and the management of the construction process to the private sector are the same as in the case of commercial infrastructure:

− lack of public funds, so that private financing is the only remaining option to realise the project;
− better skills and stronger incentives to manage the construction process (higher probability of completion on time and within budget);
− synergies between design, construction and operation.

Planning

As explained in section Error! Reference source not found., general port infrastructure has much stronger and wider public interest aspects than commercial port infrastructure. This pleads for maintaining direct public control over planning and policy with respect to the overall port and general port infrastructure. This does not exclude a role for the private sector. Using service/management and DFBMO contracts, public control is compatible with allowing the private sector to participate in the operation and the financing of general port infrastructure.

A long-term concession of management rights transfers the control over port planning to a large extent to the private sector. The concession agreement usually specifies infrastructure investments that need to be undertaken by the concession holder within a certain time frame. In this manner, the public sector retains influence on port development. Beyond these commitments the private concession holder is free to develop the port in function of the market opportunities it perceives. Naturally, its development strategy will be guided by maximization of profits and shareholder value rather than wider economic development. This will result in socially too low investments in port infrastructure.

Under particular circumstances a concession of management rights may nevertheless be the best option for the financing and operation of general port infrastructure.

- There are enough competing ports in the region to avoid monopolisation.
- Public interests can be safeguarded by effective regulation and by clauses in the concession agreement.
- The public sector lacks the managerial capacity and commercial skills required for an efficient overall port management.\(^5\)

A concession of management rights with the primary goal of raising revenues for national or local governments must be avoided. The risk of a conflict between financial objectives (maximal revenues, necessitating high port tariffs to pay the concession fee) and socio-economic objectives (efficient low-price ports supporting economic development) is then very great.

1.8 A competitive tender procedure

Suppose that the public sponsor of a port infrastructure project has chosen the most advantageous PPP model to realise the project, taking into account the factors described in the preceding section. The mere selection of the best PPP model does not by itself guarantee that the efficiency gains of this model will be effectively delivered. In order to effectively obtain the benefits of PPP two conditions must be fulfilled:

- the selected private contractor has offered to supply these benefits in his proposal to carry out the project;
- the selected private contractor honours the promises in his proposal.

\(^5\) We have argued earlier that the operation of general port infrastructure has no direct commercial functions. That is indeed true for individual items of general port infrastructure (for instance the maintenance of the navigation channel). However the overall management of the port has important commercial aspects, notably the terminal concession policy and the marketing of the port as a whole.
The second condition must be enforced through the PPP contract. This issue will be addressed in the next section.

The key factor to satisfy the first condition is a competitive tender procedure. Only if a sufficiently large number of bidders compete against each other, they will be induced to offer the deal with the best possible cost-quality combination (best “value for money”). If only one or a few bidders are in the race, they do not have an incentive to offer the best deal possible in order to get the contract. In that case they will not be induced to share the efficiency gains of PPP with the public sector or with the community at large. For instance, efficiency gains will be converted into higher profits for the private contractor rather than lower prices for users or a higher concession payment to the public sponsor.

In essence there are two requirements for a competitive tender procedure:

- transparency;
- equal treatment of all bidders.

In order to attract bidders, they must be informed about the project and reassured that they have a fair chance of winning the contract. This implies:

- international publication of requests for proposals;
- selection of the contractor on the basis of previously announced procedures and criteria;
- notification of the award of the contract;
- registration of the decisions during the selection procedure (so that they can be referred to in disputes);
- review procedures (enabling wrongfully treated bidders to file a complaint).

Some of these measures might be objected to because they can lengthen procurement procedures. While this may be true, it is the price to be paid for getting the “best value for money” in the context of public procurement. Moreover, if implemented well, transparency can also help to reduce the length of procedures. If it is transparent to all bidders that the contract has been awarded fairly, the incentive to challenge the award in court will be lower.

Equal treatment of all bidders implies that:

- all bidders receive the same information on the project (for instance by means of a data room);
- all bids are evaluated according to the same criteria;
- the selection criteria do no discriminate against certain types of bidders, unless these restrictions are necessary to get better “value for money”.

An example of the latter is the exclusion of bidders that that already have a strong presence in the port, in order to avoid the risk of the emergence of monopolies.

An efficient tender procedure strikes a balance between allowing competition (many bidders is better) and controlling the costs of running the procedure (few bidders is better). This balance is obtained by a multi-stage tender procedure. The most complete procedure has three stages (see Figure 1).

1. All bidders are invited to submit a candidacy to participate in the tender procedure. Out of the candidates a smaller number of participants is selected on the basis of qualitative criteria with respect to technical expertise and financial strength.
2. Only the pre-selected bidders are allowed to submit a proposal. The best few proposals (generally not more than two or three) are selected for further consideration. These proposals are fine-tuned in negotiation with the bidders who have submitted them.
3. Finally the remaining bidders are invited to submit a Best and Final Offer (BAFO). The contract is awarded to the candidate with the most advantageous BAFO.

A three-stage procedure is only required for complex projects involving finance, construction and operation. For the awarding of an operating concession of existing infrastructure a two-stage procedure (pre-qualification and a single bid phase) is generally sufficient.\(^6\)

\(^6\) The three-stage tender procedure sketched in Figure 1 resembles most closely the negotiated procedure as defined by the classic public procurement directive of the European Union (2004/18/EC). According to this Directive the negotiated procedure can only be used for exceptionally complex projects. Most PPP projects would fall under a new procurement procedure labelled the “competitive dialogue”. In case EU procurement directives apply the three-stage tender procedure described above.
1.9 A well-specified PPP contract

The PPP contract serves a dual purpose.

1. It must give reassurance to the private contractor that it can earn the expected return on investment.
2. It must ensure that the public sector (or in fact the national economy) effectively obtains the best “value for money” on the basis of which the contractor has been selected.

The PPP contract achieves this mainly by clearly stating the rights and obligations of the public and private partners of the project. The contract covers at least the following points:

- definitions of terms used in the contract;
- specification of investment commitments by the private contractor;
- operational and maintenance obligations;
- performance standards, and penalties in case these standards are not attained;
- payment schedules (by/to contractor depending on the project);
- reporting obligations, so that the obligations and performance standards can be verified;
- obligations of contracting authority (for instance complementary investments, commitment to change or not to change particular regulatory rules,…);
- duration of the contract;
- early termination of the contract: reasons and compensation;
- enforcement of contract and arbitration.

Below some important points are treated in more detail.

Optimal risk allocation

The risk allocation between public and private parties is mainly determined by the distribution of responsibilities (who does what in the provision of infrastructure) and the payment mechanism (which factors determine the payments between private contractor and public contracting authority).

must be somewhat modified. The second phase consists then of the dialogue phase. The pre-selected bidders admitted to the dialogue do not submit offers, but propose solutions in consecutive dialogue stages. At some point the remaining bidders are asked to submit a final offer. The third stage consists of post-tender discussions in which the bids are clarified and fine-tuned, but may not be materially altered. Finally a single preferred bidder is selected, with whom a contract is signed after final clarification and confirmation of commitments.

Notice that only projects involving works fall under the public procurement directive. Operating concessions for existing infrastructure are outside the scope of the public procurement directive. However, the general rules of transparency and non-discrimination still apply because they follow from the Treaty of the European Union.
The guiding principle of optimal risk allocation is that risks should be allocated to the party best able to manage them. Only then overall project risks (and the risk premium in the financing costs) are minimized. If a party is obliged to take on risks that it can not control, the only results is more expensive financing without any risk reduction.

Application of this principle in general calls for the following allocation of risks:

private contractor:
- construction risks (risk that construction is completed too late and over budget);
- operational risks (risk that operational costs are higher than expected);
- financial risk (risk that interest rates are higher than expected);

contracting authority:
- force majeure (natural disaster, war);
- changes in laws and regulations that have specific impact on project.

The optimal allocation of revenue/traffic risks depends on the project. In the case of commercial port infrastructure the private partner is best able to manage the revenue risk. The revenue risks should therefore be allocated to the private partner, as is the case with both optimal PPP options that we have retained for investments in commercial port infrastructure (see section). Under an operating concession and a BOT-contract the private partner derives its revenues from the end-users of the port, so that the traffic risk is ultimately borne by the private partner.

If the revenue/traffic risk is too high, so that allocating the risk to the private contractor renders the project unbankable, there are a few options to share the risk with the public sector. As explained in previous section for an operating concession instead of a BOT is a way of transferring part of the costs, and therefore the risk, to the public sector. Also the concession payment mechanism can be used to share the revenue risk (see below).

In the case of general port infrastructure, on the other hand, the private contractor has little or no control over the level of traffic. Most of the revenue risk is caused by external factors determining port traffic volume, such as macro-economic growth and the commercial success of the terminal operators in the port. In these circumstances imposing traffic risk on the private contractor increases the costs of financing, while they are little or no efficiency gains from a better risk management. It is then optimal to choose a PPP model in which the private contractor is protected from traffic risk. This is the reason why we prefer a DBFMO contract based on availability payments to a BOT contract for the private financing of general port infrastructure. In a DBFMO contract based on availability payments the private contractor does not derive its revenues from the market, but receives an availability fee from the public contracting authority. The availability fee is paid if the infrastructure is available and in good working order. The construction-related and operational risks are therefore borne by the private contractor, but that is as it should be.

An alternative to availability payments are shadow tolls or shadow fees. A shadow toll is a payment made by the contracting authority, not in function of availability but in function of the use of the infrastructure (for instance the number of vessels calling at the port). A shadow toll is similar to a toll, but paid by the contracting authority instead of by the actual user of the infrastructure. A shadow tolling scheme allocates the traffic risk to the private contractor. In general we would recommend against such a payment mechanism in the case of general port infrastructure, for the same reasons as why we oppose BOT arrangements. At most one might consider applying a partial shadow toll (i.e. covering a part of the costs, the remainder being covered by availability payments) if the operational costs are related to the traffic volume, or if the operational efficiency of the private contractor has an impact on the traffic volume that can be accommodated.

Duration of the contract

The duration of the contract should be sufficiently long for the private contractor to recover the investment costs and earn a normal rate of return on invested capital. The higher the capital intensity of the project, the longer the required duration of the contract. For an operating concession of a general cargo terminal (where the operator only needs to invest in handling equipment) 10-15 years is
generally sufficient. For container terminals a longer duration is required, because the handling equipment is much more expensive. In the case of BOT and DBFMO contracts, where the contractor also invests in immobile infrastructure, contracts with a length of 25-50 years (and occasionally even longer) are required.

**Payment mechanism**

A distinction must be made between concession-type contracts (operating concession, BOT, concession of management rights) and DBFMO-type contracts. In the former the private contractor receives market revenues and pays a concession fee to the public contracting authority. In the latter the private contractor receives a payment from the public contracting authority against the supply of a service.

The most common types of concession fees are:
- flat annual fee (for instance a land lease per m²);
- fee per tonne or TEU handled;
- percentage of the gross revenues of the terminal.

These three options are characterised by a different degree of revenue risk sharing. In the case of a flat fee the revenue risks end up completely with the private contractor. The revenues of the public contracting authority are fixed. The other two options result in a sharing of the revenue and traffic risks between the private contractor and the public contracting authority. The choice depends on views of contracting parties with respect to sharing the revenue risk. Sharing the risk may be preferred in case the traffic risk is very high (too high to be borne by the private contractor alone), or as a way to give the public partner a continuing stake in the commercial results of the project (which offers more reassurance to the private partner that its public counterpart will not take actions that harm the project).

Payments in the context of DBFMO contract come in two main forms: availability fees and shadow tolls. We have already explained above that from the perspective of optimal risk allocation an availability fee is generally preferred. To extract an optimal service level from the private contractor the availability fee must be made dependent on performance. If performance falls below the requirements set out in the contract the fee is reduced by a penalty. Establishing the level of the penalty is a balancing act. The penalty should be more than a “tickle”. It should really “hurt” the contractor, without however being so strong as to “kill” him.

Availability fees and shadow tolls are usually only partially adjusted for inflation (for instance 80%). The assumption is that over time the productivity of the contractor will increase.

**Early termination of contract**

The specification of what will happen if the project runs into problems is especially important to safeguard the interests of the signatories of the contract and for the bankability of the PPP. The early termination clauses of the contract are therefore crucial.

There are several reasons why the contract may be terminated before the expiry of its normal term:
- major breach of contract by the private contractor (for instance the private contractor persistently fails to offer the service level specified in the contract or to pay the agreed concession fee);
- insolvency of the private contractor;
- major breach of contract by the contracting authority (for instance failure to undertake complementary investments);
- mutual consent of both parties;
- unilateral termination by the contracting authority for reasons of general interest.

An important condition for the bankability of the project is that the private contractor must always be compensated in case of early termination of the contract, regardless the reason of the early termination. Otherwise the private contractor will be unable to attract external financing. The reason of termination has nevertheless an impact on the amount of compensation. If the reason is not due to a
fault by the private contractor, then the compensation is equal to the “Fair Value”. This is the market value of the project, including a compensation for the loss of future profits. The compensation at “Fair Value” applies in case of a major breach or a unilateral termination of the contract by the contracting authority. If the termination is due to a fault of the private contractor, the compensation is equal to the net book value of the investments and the outstanding debt. This allows the private contractor to redeem the external providers of funds, but does not include a compensation of foregone profits.

Even if enough compensation is provided to pay off the external creditors an early termination of the contract causes delays and costs. It is therefore preferable if an early termination can be avoided. That is the purpose of step-in-rights. They allow the lender to appoint, with the consent of the contracting authority, a new contractor if the existing contractor fails to fulfil its obligations. The step-in-rights are arranged by a direct agreement between the contracting authority and the lenders of the private contractor. The presence of step-in-rights is often an essential condition for lenders to be willing to fund the project.

1.10 An adequate legal framework

The purpose of the legal and regulatory framework is to establish a firm foundation for the conditions we have described in the previous sections. The framework can comprise decision-making procedures regarding the choice of the most optimal PPP model for a particular project, tender procedures and model PPP contracts.

An adequate legal framework does not imply the existence of a special PPP law. PPP is essentially a particular way of public procurement. Hence in many countries legal provisions regarding PPP are included in overall public procurement law (as is the case in EU law). Also civil law, port law, administrative law and foreign investment law may contain provisions that are relevant for PPP. The more complete the general legal framework, the less need for a special PPP or concession law. If a special PPP law is enacted care should be taken that there no contradictions between the PPP law and the general legal framework.

Trade-off between general legal framework and special PPP law

In fact, even a legal framework is not absolutely necessary. The aspects that are not regulated in the legal framework can be settled in the PPP contract.

Trade-off between legal framework and contract

Having said that a legal framework has some important advantages.

- A legal framework offers investors more certainty than only a contract.
- An adequate legal framework is an instrument of efficiency. If more aspects are settled by the legal framework, then contracts can be shorter resulting in a saving of transaction cost.
- The enforceability of the contract is a key issue. The possibility to appeal to international arbitration may be necessary for the bankability of PPP projects.
Ultimately, the trust in competence and reliability of the public contracting authority is the most important enabling condition for a PPP. An excellent legal framework and a solid contract are no substitute for trust.

### 1.11 Financing and paying for infrastructure

An important distinction needs to be made between financing infrastructure on the one hand and paying for infrastructure services on the other hand. Both are separate issues that are often confused when discussing PPP.

The term “financing” refers to the furnishing of funds to cover the initial investment expenses. The term “paying” refers to the payment of a price for using the infrastructure. The revenues from the payments by users are employed to cover operating and maintenance costs, as well as to remunerate the providers of the investment funds (redemption of debt, payment of interest charges and dividends).

Both the financing of and the paying for infrastructure can be either public or private, resulting in the four combinations shown in the table below.

**Options for financing of and paying for infrastructure**

<table>
<thead>
<tr>
<th>Financing of infrastructure</th>
<th>Paying for infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>The state finances and operates the infrastructure and makes it available to users free of charge.</td>
</tr>
<tr>
<td>Private</td>
<td>A private company or consortium (banks, equity investors) finances the infrastructure and may also operate it. The state pays user fees to the private investor, allowing it to recover its costs and earn a return. The infrastructure is made available to users free of charge.</td>
</tr>
</tbody>
</table>

Starting from the fully public top left quadrant there are three options to increase the financial contribution of the private sector to the provision of infrastructure.

1. The first option is to ask payments from private users (top right quadrant). This allows the state to recover financing costs (i.e. interest charges and repayment of the debt incurred to finance the infrastructure) as well as maintenance and operational expenditures, thereby easing the burden on the public budget. However, the state still has to finance the infrastructure. Hence this option provides no solution for short term budget and borrowing constraints.

2. The second option is to call on the private sector for the financing, and possibly also the maintaining and operating of the infrastructure (bottom left quadrant). The state remains however responsible for paying for the infrastructure. The state pays user fees to the private investor in place of the actual users. The latter can use the infrastructure free of charge. Examples of such payment mechanisms are the shadow toll (the state pays a price for every individual user like in a toll system), the availability fee (the state pays a price for every time unit – hour, day, month,... – that the infrastructure is available in good condition) or lease payments. The impact on the budget of this option is opposite to that of the first option. In the short term the budgetary burden is taken away. However, the state assumes a long-term engagement of typically 30-50 years to pay fees to the investor in the form of shadow tolls, availability fees or lease payments.
3. In the third option the private sector is asked to finance as well as pay for the infrastructure (bottom right quadrant). A private company finances the construction of the infrastructure and operates it afterwards. It collects fees from the users of the infrastructure. The revenues from the user fees are used to recover costs and earn a return on investment. In this option the infrastructure is provided at no cost to the budget neither in the short run nor in the long run. The role of the state is limited to the issuing construction and operating permits and regulatory functions.

It is obvious that only the options involving private payment for the infrastructure achieve a real reduction of the budgetary burden of the infrastructure. Private financing without private payment merely shifts the budget impact from the present to the future. This does not imply, however, that the combination of private financing and public payment (bottom left quadrant) must be ruled out as an invalid option. It provides a real solution if the government mainly faces short term budget constraints. In that case private financing allows accelerating the supply of new, urgently needed infrastructure. In addition private financing may bring about efficiency gains and cost savings as described before, thereby also reducing demands on the budget.

1.12 Relation between PPP models and the strategies for financing & pricing port infrastructure

Depending on the quadrant in the table of the previous paragraph that is chosen, other models for the delivery/procurement of port infrastructure are eligible, as shown in the following table.

<table>
<thead>
<tr>
<th>Financing of infrastructure</th>
<th>Public</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>Public delivery without user charging</td>
<td>Public delivery with user charging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating concession</td>
</tr>
<tr>
<td>Public/private</td>
<td>Joint Company</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>Integrated contracting with finance</td>
<td>BOT concession</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer of management rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Full privatisation</td>
</tr>
</tbody>
</table>

Depending on the budget constraints and the pricing objectives of the government, the relevant quadrant of above table shows the available delivery models.

- If the government has no budget available for the financing of port infrastructure, not in the short run nor in the long run, then the options are BOT concession, a concession of management rights or full privatisation. In the case of a concession there are two alternative criteria for awarding the concession: the highest concession fee (or more exactly the present value of the expected fees) or the lowest price for the end-user. Usually the first option is chosen, which maximises financial benefits for the government but is not necessarily the best option from the perspective of national economic development.
• If the government wishes to provide the infrastructure free of charge (or at a price below cost), but has no funds to finance the infrastructure then integrated contracting with private finance (DBFMO contract) offers a solution. This allows spreading the budgetary cost over a long period. Moreover, although the port infrastructure is privately financed, the public sector retains full control over its development.

There are several reasons why a price below cost (and even close to zero) may be economically efficient from the point of view of society. In many cases the provision of port infrastructure is not commercially viable, either because the traffic is too low and the risks too high (due to indivisibilities and sunk costs), or because it is socially optimal to make the infrastructure available to users at a low price below the full cost level (marginal cost pricing, promotion of growth pole effects). In those instances the public sector has to step in by financing and/or paying for the infrastructure. This is especially the case for basic port infrastructure (maritime access channel, breakwaters,…).

• If the government has the required funds to finance port infrastructure, wants to some retain control over its development and operation, but also wants to recover the infrastructure costs from users, then the options in the top right quadrant are available. This quadrant applies is particular to cargo handling infrastructure (basins, jetties, quay walls). The arguments to provide this infrastructure free of charge are weaker than for basic port infrastructure. However, there are still reasons to preserve some degree of public control, such as the management of externalities and the prevention of the abuse of market power.

1.13 Achievability of PPP

The fact that a particular PPP model offers the best overall “value for money” does not imply it is achievable. The efficiency gains of the most desirable PPP model can only materialize if the model is well implemented. The following table shows some conditions that need to be satisfied for a successful PPP. They relate to the skills and commitment of the public sector to PPP and the project, the market appetite of the private sector and, last but not least, the level of trust between public and private parties.

1.13.1 Conditions of achievability

<table>
<thead>
<tr>
<th>Condition</th>
<th>Assurances needed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public sector requirements</strong></td>
<td></td>
</tr>
<tr>
<td>Political and social commitment</td>
<td>• Is the government regarded as a credible partner in PPPs?</td>
</tr>
<tr>
<td></td>
<td>• Is there strong political commitment to the PPP approach?</td>
</tr>
<tr>
<td></td>
<td>• Will a PPP solution be socially and politically acceptable?</td>
</tr>
<tr>
<td>Local and National government policy</td>
<td>• Does the policy environment favour PPPs and does it cater for the different components required for a PPP?</td>
</tr>
<tr>
<td></td>
<td>• Is PPP consistent with other government policies i.e. land use, social policies etc.?</td>
</tr>
<tr>
<td>Legal Framework</td>
<td>• Is there a sufficiently stable and comprehensive legal framework for enabling the use of PPPs?</td>
</tr>
<tr>
<td></td>
<td>• Is there sufficient legislation and transparency to support the management and supervisory role of the public sector in a PPP?</td>
</tr>
<tr>
<td>Taxation, reporting and accounting framework</td>
<td>• How are PPPs treated in corporate accounting?</td>
</tr>
<tr>
<td></td>
<td>• How are PPPs treated in national authority accounts?</td>
</tr>
<tr>
<td></td>
<td>• How are public disclosure requirements defined?</td>
</tr>
<tr>
<td></td>
<td>• What is the tax status of a PPP?</td>
</tr>
<tr>
<td></td>
<td>• Are there any particular advantages (tax breaks, depreciation mechanisms, subsidies, etc.) to</td>
</tr>
</tbody>
</table>
### 1.13.2 Conditions for successful PPP in ports

The conditions for a successful PPP in ports (and also in other sectors) can be summarized in a succinct statement consisting of five parts:

1. a well-defined and profitable project…
2. and a well-founded choice of the PPP model…
3. awarded in a competitive tender procedure…
4. implemented in a well-specified PPP contract…
5. supported by an adequate legal framework.

A private investor will only invest in a port infrastructure project if he expects that he will be able to recover his investment outlays and earn an adequate return. Profitability of the underlying project is therefore an obvious condition for a successful PPP. In order to forecast the profitability of the project with reasonable confidence and preciseness the project needs to be well defined. This means among other that the scope of the project, the investment costs, the timing of the works, the target markets, the pricing policy,… are known.

The value of a project not only depends on the investment costs and the market outlook, but also on the way the project is financed and managed. PPP, through its impact on the financial and management structure of the project, increases the value of the project, but only on condition that the right PPP model is chosen. The potential added value of PPP depends on a number of project characteristics. A right choice means therefore that the PPP model is selected in function of these characteristics.

The value of a PPP for the public sponsor of the project depends on how good a deal it gets from the private partner. The private investor will offer a better deal if it has to compete against other bidders in order to win the contract. If there is no competition, PPP will generally also create additional value. However, in that case the private investor will capture most of the additional value itself in the form of higher profits, leaving little or no benefits for the public interest.

The fact that a PPP model allows to increase the value of the project, does not imply that the additional value is effectively created. The advantages of a PPP model are only potential.

### Technical and organizational issues

- Is there sufficient data available about existing service provision (quality, quantity, users, etc)?
- Is there sufficient data available about assets currently in use?
- Can competitive tendering be assured?
- What quality control mechanisms exist?
- Is the government capable of monitoring and assuring quality control?

### Private sector requirements

#### Market structure

- Are private service providers sufficiently autonomous?
- Are efficient private sector operators available and are they competent, sufficiently capitalized and interested in PPP?
- Are private sector operators willing and able to scale up the service provision?

#### Financing issues

- Is access to capital markets easy for the private sector?
- Does a national capital market exist, or is international funding needed?
- Can private sector financing compete with public financing?
- What financial support mechanisms by government are available?

#### Trust

- Do private sector operators trust the partnering government?
- Does the government trust the partnering private sector operator?
- Does the general public trust private sector providers, or is there a strong “anti-privatization” sentiment?
They do not emerge automatically. The effective realisation of the potential added value of a PPP model depends on the existence of a well-specified contract that induces all signatories to take the appropriate actions to effectively achieve the advantages of the PPP model.

Finally, the fulfilment of the above conditions is facilitated by the presence of a legal and regulatory framework. This framework consists among other of decision-making procedures regarding PPP, tender procedures, model PPP contracts, etc.