PART 2: COASTAL AND SHORT-SEA SHIPPING

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2. Coastal and Short-Sea Shipping

2.1 Scope and aim of the paper

The purpose of this paper is to explain the current role of coastal shipping in the supply of transport between South African ports and between these ports and the ports of other countries in Southern Africa, as well as the prospects for the expansion of its share of the market for domestic and regional transport. Substantial changes in the demand and supply of shipping along the South African coast have occurred during its two hundred years of history and tend to influence perceptions about its potential development. In this paper, the aim is to avoid the nostalgia that often accompanies these perceptions and furnish a realistic assessment of the prospective function of coastal shipping on the Southern African coast taking account of the logistics and economics of the demand and supply of regional transport.

2.2 Introduction

The contention is often expressed in statements concerning national transport policy in South Africa that coastal shipping should supply a substantial proportion of the domestic freight transport between the coastal cities\(^1\).\(^2\). Underlying that contention is the belief that coastal shipping has substantial economic cost advantages over rival road and rail transport (Jones, TB 1988; 222., Wicks, RL 1989). Nevertheless, coastal shipping has not attained its expected market share of domestic transport during the long history of enterprise in the South African coastal trade (Rennie, D 2004). Various reasons have been advanced why the expectations have not been realised. Among these are:

- That the weather and sea conditions along sections of the South African coast preclude the maintenance of punctual services and supply chain reliability.
- That port charges are arbitrarily too high to enable coastal shipping to compete with road transport over short sea routes.
- That road transport is allowed to compete unfairly with coastal shipping through the tolerance by road authorities (in practice) of vehicle overloading.
- That, in any event, road hauliers benefit unfairly because the costs of the externalities of their road use are not included in their cost structures.
- That in the absence of cabotage legislation, foreign shipping can carry domestic cargo at marginal costs in competition with coastal shipping.
- That South African ports lack infrastructure designed to facilitate coastal shipping and so reduce the costs of coastal sea transport.

\(^1\) Opening address at the South African Transport Conference by Mr Jeff Radebe, Minister of Transport, CSIR, 9 July 2007. “As an unintended consequence, our transport system is bursting at the seams and is increasingly becoming inadequate in responding to the export led growth. Our road network is increasingly becoming congested while we have not made the correct policy response to the usage of one of our underutilised endowments – our ocean for coastal shipping.”

\(^2\) Statement by the Minister of Transport, Jeff Radebe, delivered at the International Maritime Organisation assembly held on 21 November 2005 to 2\(^{nd}\) December 2005. “There are seven major ports with another under construction providing tremendous potential for coastal shipping, an economical, and environmentally friendly and energy efficient mode of transportation.”
• That by nature and volume much of the cargo moving between coastal cities is more suited to direct road transport than by multi-modal services including shipping.

• That the location of industry at South African coastal cities and the infrastructure providing access to the ports are not conducive to the cost-efficient intermodal movement of cargo in supply chains that include coastal shipping links.

• That when all the requirements of efficient supply chains are taken into account coastal shipping succeeds only when the bulk of cargo consignments is beyond the capacity of the available overland transport.

These reasons, even when taken together, do not account for the lesser role of coastal shipping in the supply of domestic transport in South Africa at present. A more fundamental analysis is required in order to identify the share of the market that would be acquired by coastal shipping if modal shares were determined by comparative costs only and to establish that externalities in the market override those costs and result in its actual share.

When all competing modes of transport achieve market shares in accordance with their comparative cost advantages, the costs to the economy are at a minimum and the supply is considered to be coordinated in the most economic efficient manner. That was the inherent intention of the administrative regulation of the supply of road transport in South Africa for some sixty years – from 1930 until the deregulation of road freight transport in terms of the Transport Deregulation Act, 1988 (Act 80 of 1988), which was enacted in the belief that efficiency would be achieved through competition in the markets. However, no provision was then made to compensate for the market externalities that favoured road transport, with the outcome that road transport now carries far more freight in South Africa than is justified by the resource costs of the services it supplies. The abolition of regulation has thus not brought the economic efficiency that free enterprise is intended to achieve and consequently freight transport costs in South Africa are currently higher than would result from the optimal modal split and too high according to international benchmarks (National Freight Logistics Strategy, 2005).

The distortion in the comparative costs of the competing transport modes in South Africa is not the fault of the functioning of the markets or partial markets in which transport is supplied, but is attributable to the externalities that afford some modes of transport and carriers unfair advantages and result in competitive disadvantages for others. This problem that stems from both the technology of transport and the fragmentation of the markets in which transport is supplied and provides the grounds underlying the original motivation for the regulation of the supply. Deregulation and free enterprise consequently succeed in promoting economic efficiency in the supply of freight transport only when accompanied by measures to compensate the effect of the technological externalities that result in unfair advantages or disadvantages for competitors in the market.

In this study, the externalities that bear on the supply of coastal shipping are identified with the purpose of prescribing measures in the implementation of transport policy that are essential if the economy is to benefit from its inherent cost-efficiency in the supply of domestic transport. The analysis is preceded by the identification of the existing and potential functions of coastal shipping in that supply and an examination of the public benefits achievable through the inherent cost efficiency of the mode.
2.3 Sectors of South African coastal shipping and shares of market

Domestic transport by sea between South African ports is provided by the coastal shipping company Ocean Africa Container Lines (OACL), co-owned by A.P. Moller (Maersk Line) and Grindrod Ltd, offering regular services. OACL also provide feeder services for the transport of containers transhipped from deepsea liners for South African ports and regional services, including feeder services, between ports on the Southern African coast. Most of the feeder services by OACL are provided for Maersk Line/Safmarine, although some 22 shipping companies are served. Feeding is also undertaken by deepsea liner companies. Imported containers that have bypassed their destination ports are often ferried back on deepsea liners, sometimes interline. Most of the deepsea liners are also used to carry containers with domestic cargo between South African ports if capacity is available and cargo is offered. All these services presently comprise “coastal shipping”. Although most of the services by OACL can also be described as ‘short sea shipping’, the services by the deepsea liners over the same routes are better described as ‘way porting’, although even that description is not altogether correct as some of those services comprise multi-porting at the end of intercontinental voyages. The description ‘coastal shipping’, which is geographically correct is used throughout this report.

Apart from container shipping there is a tanker service for fuel products by Grindrod Shipping (Unicorn Lines) on the coast (see Part 1.2).

The routes of the services provided by OACL are shown in Figure 2.1–2.4 and the schedules of services in Table 2.1.

Figure 2.1: West Coast Service of OACL, 2011

Source: Ocean Africa Container Lines, 2011
Figure 2.2: Namibian Feeder Service by OACL, 2011

Source: Ocean Africa Container Lines, 2011

Figure 2.3: SAECS Feeder Service by OACL, 2011

Source: Ocean Africa Container Lines, 2011
Table 2.1: Schedules of services by OACL operated from South African ports

<table>
<thead>
<tr>
<th>Route</th>
<th>Schedule</th>
<th>No of ships on route</th>
<th>Type of cargo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durban - Mozambique</td>
<td>Weekly</td>
<td>2</td>
<td>General cargo</td>
</tr>
<tr>
<td>East London – Port Elizabeth</td>
<td>Weekly</td>
<td>1</td>
<td>CKD’s for Mercedes Benz</td>
</tr>
<tr>
<td>Port Elizabeth – Walvis Bay</td>
<td>10 days</td>
<td>1</td>
<td>Maersk Line transships from Far East/Middle East</td>
</tr>
<tr>
<td>Durban – CPT – WB – Angola ports</td>
<td>Fortnightly</td>
<td>2</td>
<td>General cargo, empty returns with subsidized salt from WB and malt and wheat from CPT</td>
</tr>
</tbody>
</table>

OACL operates 6 Standard CV 1100 ships (see Figure 2.5), owned through German KG schemes and Greeks out of Hong Kong. The capacity of each ship is 700 TEUs.
2.4 Coastal traffic

OACL has declined for marketing reasons to provide detailed statistics of the number of containers carried by its feeder, domestic and regional services on the coast. However, particulars of the number of containers carried on its domestic, feeder and regional services during the past five years have been derived and are shown in Table 2.2.

Table 2.2: Number of containers carried on South African coastal services by OACL

<table>
<thead>
<tr>
<th>Type of service</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeder</td>
<td>137 933</td>
<td>146 553</td>
<td>139 119</td>
<td>146 791</td>
<td>120 660</td>
<td>81 995</td>
</tr>
<tr>
<td>Regional</td>
<td>6 027</td>
<td>5 990</td>
<td>5 856</td>
<td>6 129</td>
<td>3 762</td>
<td>5 610</td>
</tr>
<tr>
<td>Domestic</td>
<td>26 724</td>
<td>22 940</td>
<td>23 095</td>
<td>20 037</td>
<td>21 276</td>
<td>17 299</td>
</tr>
<tr>
<td>Total</td>
<td>170 684</td>
<td>175 483</td>
<td>168 070</td>
<td>172 957</td>
<td>145 698</td>
<td>104 904</td>
</tr>
</tbody>
</table>

Figure 2.6 shows the share in container volumes of each service type as a percentage of the total market of OACL for 2010.

Figure 2.6: Percentage share per service type of OACL container volumes, 2010

The containers carried between South African ports for the purpose of feeding cargo to and from deepsea services comprise by far the largest portion of the traffic by coastal shipping, but it is questionable whether that portion properly comprises cabotage for which a local market could be developed. The need for feeding results from the logistical strategies of the liner companies which are constantly being changed and which can result in direct services replacing feeding and transhipment for feeding being switched to foreign ports, as explained in Part 3. Furthermore, MSC undertakes its own feeding as an internal logistical arrangement, while OACL is partly owned by Maersk Line in order to feed its traffic, including that of Safmarine. The issue of whether domestic feeder services comprise...
cabotage is clouded by the recent customs requirement that all cargo be cleared at the port of first entry instead of at the port of destination. The implications are dealt with in Part 4.

In this paper, the assumption is made that the feeder services on the South African coast, whether undertaken by the liner companies for their own traffic or by a third party, do not comprise a segment of the market for coastal shipping that can be developed through Government intervention for private investment and for job creation because of the dependence of the demand on the logistical strategies of a few liner companies.

Although the deepsea liner companies accept cabotage cargo on occasion, virtually all domestic interport cargo is presently carried by OACL and amounts to less than 10% of the tonnage of freight (including empty containers) carried by road hauliers between South African port cities. (See Table 2.3 for the estimated volumes of freight carried by road on coastal corridors). OACL currently carries domestic freight by sea only between Durban and Cape Town. (Road transport is used to carry its cargo between Durban and East London/Port Elizabeth). Most of that freight comprises containerised bulk products, namely sugar, malt, paper and liquids (chemicals and cosmetics) in tanks. Only the sugar is of a sufficient quantity to require the capacity of ships for transport, as between 9 000 and 11 000 trips, in both directions, by heavy vehicles would be needed annually to undertake the task. Without coastal shipping from Durban, sugar for the Western Cape would probably be imported from abroad as the cheapest alternative, resulting in a loss of foreign exchange for South Africa.

Table 2.3: Road haulage on coastal corridors, 2007 – 2010 (tonnes)

<table>
<thead>
<tr>
<th>Corridor</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durban - Cape Town</td>
<td>3 080 601</td>
<td>4 020 211</td>
<td>4 091 837</td>
<td>3 298 402</td>
<td>3 473 428</td>
</tr>
<tr>
<td>Cape Town - Durban</td>
<td>2 990 562</td>
<td>3 210 755</td>
<td>3 774 084</td>
<td>3 560 875</td>
<td>3 603 154</td>
</tr>
<tr>
<td>Cape Town - Port Elizabeth</td>
<td>3 993 335</td>
<td>3 220 347</td>
<td>4 949 670</td>
<td>4 117 282</td>
<td>4 345 822</td>
</tr>
<tr>
<td>Port Elizabeth - Cape Town</td>
<td>2 059 599</td>
<td>2 637 339</td>
<td>1 754 535</td>
<td>1 527 054</td>
<td>1 574 637</td>
</tr>
<tr>
<td>Durban - East London</td>
<td>6 507 320</td>
<td>5 689 224</td>
<td>7 141 244</td>
<td>4 887 926</td>
<td>5 035 109</td>
</tr>
<tr>
<td>East London - Durban</td>
<td>5 071 196</td>
<td>2 938 783</td>
<td>4 362 159</td>
<td>2 352 225</td>
<td>2 405 283</td>
</tr>
<tr>
<td>Durban – Richards Bay</td>
<td>4 410 775</td>
<td>5 154 082</td>
<td>2 900 540</td>
<td>1 940 098</td>
<td>2 004 488</td>
</tr>
<tr>
<td>Richards Bay - Durban</td>
<td>2 764 398</td>
<td>1 908 546</td>
<td>2 344 452</td>
<td>1 949 315</td>
<td>1 988 485</td>
</tr>
<tr>
<td>East London - Port Elizabeth</td>
<td>3 074 990</td>
<td>3 047 997</td>
<td>3 636 902</td>
<td>2 573 508</td>
<td>2 667 451</td>
</tr>
<tr>
<td>Port Elizabeth - East London</td>
<td>2 913 731</td>
<td>2 617 240</td>
<td>3 555 379</td>
<td>3 127 120</td>
<td>3 235 741</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36 866 507</strong></td>
<td><strong>34 444 524</strong></td>
<td><strong>38 510 802</strong></td>
<td><strong>29 333 805</strong></td>
<td><strong>30 333 598</strong></td>
</tr>
</tbody>
</table>

Source: Transnet Freight Demand Model

Note:
1) These tonnages include all traffic in the corridor over short and long distances – the volume of intercity traffic remains unknown, but might be 10% of the tonnages shown.

Although the coastal shipping of feeder and regional cargo is port-to-port, domestic cargo necessitates arrangements extending onshore. The details cannot all be disclosed, as delivery arrangements comparable to the quality of service of road transport are a competitive necessity as well as a marketing feature. In broad outline, competitive coastal shipping requires the collection and warehousing of cargo at the port of loading in order to
ensure the full utilisation of the capacity of ships as well as the warehousing of cargo at the port of discharge for distribution on demand, as the quantities usually exceed the storage capacity of individual consignees. Such arrangements, which add to the costs of the coastal shipping of domestic cargo, are essential to adapt the frequency of voyages carrying large quantities of cargo to the frequency with which customers require delivery of small quantities, and to buffer customers against the irregularity of services along the South African coast. Such irregularity is attributable to the severe weather conditions as well as the port congestion and berthing delays that have persisted for many years and are seemingly unavoidable at the Port of Durban. The arrangements with individual customers differ according to circumstances and some cargo might move as bulk while other cargo will be containerised. Furthermore, in some instances cargo accepted for coastal shipping might actually be carried by road transport when it is cheaper and more efficient to use that mode.
2.5 Feeder shipping

Approximately 80% of the cargo by volume carried by OACL comprises feeder traffic transhipped to or from liners on international services. The number of shipping firms using the service in 2010 was 22. Such feeder traffic is a recent addition to South African coastal shipping. In accordance with the economics and logistics of container shipping and the volumes of traffic, it is likely to increase although very recently feeder cargo that otherwise would be carried by coastal shipping has been carried by deepsea liners as a consequence of logistical changes in their networks. That might cease when volumes increase, but as described in Part 3, transhipment arrangements and the need for feedering can change overnight, especially as a consequence of the recent deployment of larger liners on trunk routes. The need is determined by the economics of the logistics of liner services. When capacity is in short supply and the economies of scale of large liners can be realised on intercontinental routes, transhipment of cargo to feeder services by smaller liners or coastal shipping at the main ports at either end – the so-called hub and spoke scheme – is generally considered to be the most efficient logistical arrangement in contrast to multi-porting. With oversupply of capacity in the market – as at present – direct services between more ports enable the optimal utilisation of smaller liners and might instead be the most efficient logistical tactic on some routes. In practice, liner companies continually adapt the utilisation of their capacity and deployment of ships as well as their services and transhipment arrangements to fluctuations in demand in order to achieve cost efficiency, which means that hard-and-fast rules do not apply to liner shipping in the current economic circumstances. Furthermore, it should be borne in mind that although large ships with capacities of 6 000 TEUs are being deployed on the intercontinental routes serving Africa and the East Coast of South America from the Far East, draught limitations restrict their admittance to many ports at present.

Cargo volumes to and from the lesser Southern African ports at present are insufficient to require the use of ships for feeder services of a size that economically would justify their use for direct international services instead, although for example, Dar-es-Salaam, Maputo and Walvis Bay are served directly. Nevertheless, feeding is likely to grow, especially as increasingly larger container ships are being taken into service in order to achieve scale economies on the major intercontinental routes. However, there is some contention in shipping circles on whether the trend will be towards more direct services with ships of different sizes as container volumes increase, or the employment of increasingly larger ships on major routes with transhipment to services feeding smaller ports. The advantages of the latter arrangement depend largely on the economics of transhipment as explained in Part 3.

Feeder shipping is thus likely to continue as an indispensable link in Southern Africa’s international supply chains in the future and be of increasing importance in the region’s physical trade. There should be no doubt about the need to integrate feeder shipping services into South Africa’s maritime supply chains in the most efficient manner if the economy is to realise the cost benefits of the larger and faster ships on the global routes. Those benefits can readily be dissipated if the interfaces between ocean shipping and coastal feeder services do not constitute efficient links in the supply chains. The need for port facilities to ensure such seamless interfaces is thus essential to the efficient supply chains that South Africa must develop if it is to benefit from the globalisation of the world economy.
While the supply of coastal shipping for domestic and regional transport depends upon the viability of the feeder services, the efficiency of the latter as an integrated link in South Africa’s maritime supply chains is the determinant of whether the South African coastal shipping industry survives. In section 2.8, the public policy that needs to be implemented to ensure such survival is discussed.
2.6 Regional services

The regional coastal shipping services in Sub-Sahara, including southern and West Africa and the Indian Ocean Islands, comprise a much smaller market than is widely believed to exist. The market is neither huge nor developing, contrary to opinions expressed in many official pronouncements, and has remained of little significance to shipping business for many years. Most of the region’s consumption goods are obtained from the Far East and there is no foreseeable prospect of cheaper sources emerging. The sea trade that does occur within the region is largely one-way from South Africa northwards with empty containers returning as cargo.

Participants in the region’s container shipping include OACL as a regional trader and many liner companies such as Maersk Line, including Safmarine, PIL, K-Line, Zim-Line, MSC, MOL and Hapag Lloyd.

The existing market comprising the annual trade in containerised cargo is estimated as follows:

Table 2.4: Estimated annual market for regional shipping in Sub-Sahara, 2011

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Countries include</th>
<th>TEUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>Angola</td>
<td>Angola</td>
<td>25 000</td>
</tr>
<tr>
<td>South Africa</td>
<td>West Africa</td>
<td>Nigeria, Ghana, Ivory Coast, Congo (Matadi)</td>
<td>43 000</td>
</tr>
<tr>
<td>South Africa</td>
<td>East Africa</td>
<td>Mozambique (very limited), Kenya, Tanzania</td>
<td>31 000</td>
</tr>
<tr>
<td>West Africa</td>
<td>West Africa</td>
<td>Nigeria, Ghana, Ivory Coast</td>
<td>35 000</td>
</tr>
<tr>
<td>Indian Ocean Islands</td>
<td>Indian Ocean Islands</td>
<td>Comores, Madagascar, Mauritius, Seychelles</td>
<td>20 000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>154 000</td>
</tr>
</tbody>
</table>

Source: AP Moller, 2011 as adapted

Not much growth in the market is expected. The traffic estimated in Table 2.4 includes feeder cargo from intercontinental liner services and regional trades. It should be borne in mind that there is a substantial volume of feeder traffic to and from African ports transhipped at hubs in the Mediterranean and Middle East, as well as at Walvis Bay. While freight rates in the world market are low, direct shipments between the Far East and countries in the region might incur less cost than shipments requiring transhipment in South Africa and feedering northwards. However, highly efficient transhipment at Mediterranean hubs of containers from the major East – West route is likely to prevail. The chronic congestion at South Africa’s main transhipment port (Port of Durban) which often necessitates the port being bypassed in order to maintain shipping schedules (as at present – June 2011) also deters reliance on feedering.
2.7 Competition with road transport

Road hauliers have succeeded during the past twenty years in acquiring much of the traffic that should have moved by coastal shipping if the costs structures and unit costs of those modes (when operated according to the law) are compared. While the reasons given in the introduction to explain why South African coastal shipping has not realised its potential share of the domestic transport market no doubt account for much of the loss of traffic to road transport, it should be borne in mind that the consequences implied in most of those reasons are in any event reflected in the costs of coastal shipping i.e. they are inherent in those costs. The public consequences of using road transport instead of sea transport for equivalent quantities of cargo implies a greater utilisation of resources, not only because ships are on average cheaper to operate per tonne of cargo than road vehicles, but because the costs of the public infrastructure (namely the road network) used by road hauliers is far in excess of the costs of the infrastructure needed for coastal shipping services.

Although the infrastructure costs of each mode of transport are to a greater or lesser extent borne by those modes (through internal costing, as in railways, license fees and fuel taxes in respect of road transport and port dues by coastal shipping), the allocation of infrastructure costs to services and modes is largely arbitrary. The public costs of road transport in South Africa have been quantified in several documents and in particular the excessive costs caused by overloaded road vehicles have often been emphasized. The obvious anomaly of official tolerance of a percentage of overloading (5% at present) in order to avoid too many prosecutions, and the over-design of roads to lessen the routine costs of repairing the damage caused, has often been pointed out\(^3\). That tolerance, which allows an overload of 2.8 tonnes, has been incorporated into their cost structures by many road hauliers, although more severe overloading, up to 100%, occurs. It is estimated that up to 25% of all loaded vehicles travelling on South African roads are overloaded\(^4\). Although it is contended that trucks pay approximately the same amounts (in user taxes) as their road costs\(^5\), that does not apply to overloaded vehicles for which the road costs are far higher.

The prospect in the future of adequate enforcement to eliminate the overloading of road vehicles on intercity routes is probably remote, as the beneficiaries of the practice are numerous and include the road haulers, their clients, road engineers and construction and maintenance contractors employed on road design and repair, vehicle manufacturers, and corrupt enforcement officers. Other measures are thus required to compensate for the externality of vehicle overloading, measures that in effect reduce the demand for road freight transport.

In summary, the overloading of road vehicles is a serious externality of the transport market that can apparently not be eliminated through the application of the law and countervailing economic means are needed to correct its distortion effects in the market.

\(^3\) Macozoma S, Improving efficiency in the movement of cargo on roads through overload control, *Civil Engineering*, September 2005.
The consequences of the withdrawal of the existing coastal shipping services will not necessarily be their substitution by road (or rail) services between the same origins and destinations, as the users can resort to a variety of alternatives including the import of goods from abroad, altering the logistics of their production processes, relocating their premises, substituting goods from other origins and even ceasing operations. On the assumption that shippers are rational in their choice of carriers in the sense that they minimize their generalised costs\(^6\), withdrawal of the coastal shipping services will obviously reduce the productivity of the current users and raise their costs. Some of those users may forego their enterprise with a consequent loss of employment. Furthermore, withdrawal of domestic shipping services will reduce the modal transport opportunities available to shippers and enhance the market power of road transport, which is economically undesirable.

Although all the cargo currently carried by sea on domestic routes will not be diverted to road transport should the shipping services cease, it is of interest to calculate the equivalent road traffic, (excluding the collection and delivery of cargo in the urban areas, which is assumed to require similar road traffic for each mode and route i.e. only the rural road traffic equivalent to the movement of cargo by sea is estimated). Furthermore, the assumptions are made that only superlinks, each fully loaded with 34 tonnes, would be employed, although that is unlikely in practice, and that the vehicles will all return in the opposite directions. Domestic shipping for the purpose of the calculations includes services between South African ports as well as Walvis Bay, in accordance with the definition of coastal shipping contained in the Port Tariff Book, but excludes feeder and regional services.

Approximately 41 trucks continuously employed could carry the cargo. Allowing for servicing and repairs, including breakdowns, the fleet needed to fulfil the task would compose some 55 superlinks. The route carrying the highest number of these combinations would be that between Durban and Cape Town via Harrismith and Beaufort West on which the additional traffic, allowing for public holidays, travel only during daylight and some bunching at dispatch, would be not more than seven vehicles per hour in each direction.

The consequences of withdrawing the existing feeder services provided by OACL depend upon whether the only alternative is road transport. At present, that would require a fleet of 992 flatrack vehicles operating continuously to undertake the task or 1110 such vehicles allowing for servicing, repairs and delays. However, it is most unlikely that feeder shipping would cease, as the international liner companies can arrange such services in various ways including using offshore hubs as long as feederings remains cost efficient, but the costs to users would rise.

The regional services of OACL do not carry much container traffic in comparison with the other services and their withdrawal by the company would probably result in reliance by the shippers on other sea carriers as well as road transport. At most, between 100 superlinks and flatrack vehicles would be needed, and add 7 to 10 additional vehicles per day at the main border posts between South Africa and the countries to the north and north-east.

\(^6\)Costs that take into account speed, safety, security, packaging, reliability and other qualities of service, as well as the logistics of their demand.
Although the road traffic that would replace coastal shipping services, (excluding feeder services) is not significant in comparison with existing traffic volumes on the routes served, it should be borne in mind that the effects of additional traffic escalate rapidly as volumes rise to near the capacities of roads and that the actual consequences as measured by delays (or congestion costs) can be determined only by examining the capacity-utilisation of the roads actually to be travelled\textsuperscript{7}. However, some roads in the vicinity of ports might carry less traffic, if alternative road transport services avoid the central business districts at the ports.

The substitution of road transport services for coastal shipping services would require a significant increase in employment for the purpose of driving and maintaining the vehicles. As many of those drivers would otherwise be unemployed, and on the assumption that they could be trained specifically for the purpose, the cost to the economy would be minimal i.e. the opportunity cost of their labour would be nothing. Approximately 100 new jobs would be created for the road haulage substituting domestic coastal services and 220 for the road services replacing regional coastal services. In contrast, it is unlikely that the withdrawal of the shipping services would result in job losses (in the national economy) as foreign crew are employed and the shore-based personnel would be needed to undertake the management and marketing tasks required for the road transport services. These conclusions are, of course, speculative and should be regarded as such.

The additional heavy vehicles on the roads would contribute to road costs in South Africa and, to the extent that license fees and the element of fuel tax dedicated to road funding \textit{are} insufficient to cover those costs, the difference would be borne by the public.

\textsuperscript{7}As the volume to capacity ratio on a road exceeds about 0.8 (i.e. 80\% utilisation) delay costs rise exponentially.
2.8 Public policy

The national transport policy of South Africa, makes no formal provision for measures to promote coastal shipping, although shifting road freight to domestic sea transport in order to use economic resources more productively has frequently been advocated in statements by public officials and in official documents.

Legislation that restricts cabotage to South African registered ships has been considered as a measure for implementation if competition by foreign shipping threatens the viability of the existing domestic coastal shipping to the extent that the supply becomes unreliable, although the existing coastal liner company is partly foreign-owned and operates under a foreign flag while its viability depends upon the feeder traffic of foreign liners. The adoption of such legislation is currently not urged by the owners of the liner company operating the coastal services, mainly because of the foreign flagging of its ships, but that problem can be overcome by requiring merely a genuine link with South Africa.

If domestic coastal shipping is to be developed in accordance with national maritime policy, the unfairness in the market resulting from the externalities benefiting road transport, needs to be rectified. Apart from more rigorous policing to prevent the overloading of road vehicles (see section 2.7), coastal ship operators should be afforded more control over their expenses in the ports, which constitute a substantial component in the cost basis for determining shipping rates. That could be achieved by allowing the coastal ship operators to negotiate terminal charges and arrange their own cargo handling in ports, and to eliminate the charges and the elements in the charges unrelated to actual port usage. The intention of the latter measure is to enable port charges for coastal shipping to be based on the actual costs incurred and not the revenue required by Transnet i.e. a competitive rather than a monopolistic charge. Coastal shipping presently benefits from an informal coastal tariff which allows reduced cargo handling charges and port and light dues, but the concession is at the discretion of Transnet and is not cost-based.

An investigation into the requirements for a national maritime policy was undertaken in 1996, and the outcome was included in the White Paper on National Transport Policy issued in August 1996, which contained no recommendations on a special dispensation for coastal shipping. Coastal shipping was not investigated specifically for the purpose of the subsequent draft White Paper on National Maritime Policy dated September 2006, but the need for regional coastal shipping is emphasized and the undertaking of Government declared to:

- Initiate an in-depth investigation into the potential for regional coastal shipping.
- Concede the role coastal shipping could play in the development of coastal industry in the region.
- Engage the regional structures with the view to establishing coastal development corridors based on the benefits of shipping as a primary mode of transportation.

As far as can be established, no investigation was undertaken. The emphasis in the investigation was evidently intended to concern the greater use of ships for domestic transport (and not specifically the coastal shipping industry and feeder services) and to explore the prospect of affording opportunities for Black Economic Empowerment and local
employment on a substantial scale if subvention for such transport were to be forthcoming from the Government. However, the prospects for attracting new investment to develop the industry are probably not as straightforward as might be envisaged in view of the dependence of the viability of coastal shipping on the feeder services for international cargo, as explained in section 2.5. Nevertheless, policy to ensure that the investment in the industry is retained in the public interest is essential if the existing and potential benefits ascribed to its use are not to be foregone and the growth of the industry is to be promoted. Such policy should obviously be aimed at ensuring that coastal shipping can compete on an equitable basis as a domestic carrier in the national transport market, which requires a financial dispensation for coastal shipping that ensures the competitiveness of the mode on an equal basis with other modes.
2.9 Support for coastal shipping in other countries

Public measures to support coastal shipping in other countries cannot readily be taken as examples of measures that should apply in South Africa, because of fundamental differences in the nature of the shipping services and the circumstance in which they are supplied. Furthermore, the ownership and operation of all the commercial ports of South Africa by Transnet, Ltd (a profit-seeking-company wholly-owned by the State) is unique among the ports of the world and virtually eliminates the scope for the owners of coastal ships to negotiate the services they require in ports or their port costs, as would be possible if port competition existed.

In Europe and countries incorporating island archipelagos, coastal shipping is generally referred to as short sea shipping and often functions as ferries conveying vehicles and passengers as well as freight, including mail, in the public interest. Virtually all the countries in which shipping constitutes an alternative to overland transport between domestic ports apply legislation to restrict cabotage to national shipping in order to protect local investment and employment of local seafarers, as well as to reduce road traffic. These reasons apply only to a very limited extent to the existing coastal shipping serving South Africa.

Nevertheless, it is worthwhile examining briefly the measures applied to promote coastal shipping in several of those countries or regions, especially where the coastal services are geographically in the nature of the services along South Africa's coast.

**EUROPE**

Short sea shipping in the Europe Union functioned under cabotage restrictions until 2002, when the services were "liberalised". However, subsidy programmes exist with the objective of reducing pollution caused by road transport.

The reason given by the CEC (Commission of the European Communities) for the public support of short sea shipping is that it is a transport mode capable of providing sustainable mobility and that it is environmentally friendly and safe and provides a viable alternative to road usage. Furthermore, because of its unused capacity, short sea shipping is the mode best capable of absorbing the present and future demand for economic growth. During the past ten years, the European Commission has applied this policy in order to:

- Support new services that would shift cargo from road to sea transport - aid was provided in the start-up phase;
- Improve the operation of entire intermodal chains;
- Disseminate information regarding best practices in the sector.

Short sea shipping succeeds as a viable transport mode in Europe because between sixty and seventy per cent of industrial production capacity lies near the coast or inland waterway network. Furthermore, the mode of transport is not hampered by the same hours of service restrictions imposed on other modes (and so there is better utilization of the assets available), while severe road and rail congestion in Europe before the recent economic recession required road pricing schemes to be imposed or limits to be placed on access to the network in order to spread the peaks in demand. Short sea shipping has the added
advantages of being highly energy efficient, while causing lower levels of air pollution and fewer fatalities than road transport.

Against short sea shipping in Europe is the contention that it is disadvantageous from the shippers’ point of view. It is slow and complex and the supply chains in which it participates are not properly integrated at the interfaces with overland transport at either end of the short sea service. That problem with supply chain linkages of short sea shipping in Europe extends to information technology systems and documentary requirements. Port charges also have a significant influence on the competitiveness of short sea shipping. The transit time is so much longer that European shippers expect rates to be at least 35 per cent lower than road freight charges to offset increased inventory costs. As an outcome, the shorter the distance, the less likely short sea shipping can compete with road freight on price. The longer the distance, the less likely short sea shipping will be competitive in transit time. As a consequence, short sea shipping has difficulty in meeting the service and price requirements of shippers. The opportunities for developing short sea shipping are thus limited, and the attributes of the mode need to be well-understood if they are to be properly exploited.

Although ports in Europe have established short sea shipping terminals, short sea shipping firms have particular problems with customs inspection procedures despite the common market, and with cargo handling and port charges, as well as with severe imbalances in the traffic flows on many voyages. Although short sea shipping is considered to yield savings of 10-20% against road haulage, it is not evident to whom those savings accrue – the consumer (as a net economic benefit), the carrier or the cargo owner through lower transport prices.

**United States**

The universal objective of government interest in short sea shipping seems to be to seek solutions to traffic congestion and reduce green-house gasses. In the United States, short sea shipping takes place under the Merchant Marine Act of 1920 (otherwise known as the Jones Act), which prescribes strict cabotage control and no liberalisation of services, so limiting the scope for investment in short sea shipping. Under that Act, MARAD (Maritime Administration) supports the development of short sea shipping with the stated objective of easing traffic congestion and alleviating air pollution. However, the economics of short sea shipping are not straightforward. The cargo carrying capacity of the vessels is considerably greater than that of road vehicles and the capital cost of the transport conveyance, including amortization, and (under existing tax policy), capital cost allowances, incurs greater risk for the ship operator than the risk borne by road hauliers. The investment by the ship operator is thus much greater and it is difficult to ensure the viability of the mode as an alternative to road transport in the market. The experience with short sea shipping in the USA is thus very similar to that in the European Union (and South Africa) and similar official objectives exist, while the operators encounter similar limitations.
**CANADA**

In accordance with the belief in the EU and USA, Canadian Authorities consider that short sea shipping should be used to seek solutions to traffic congestion and reduce green-house gases and have taken account of policy implementation in the EU and US (by MARAD) to support the development of short sea shipping. Canada’s specific policy towards the promotion of short sea shipping is to alleviate highway congestion as well as facilitate trade, improve utilization of waterway capacity and reduce green-house gas emissions.

Canadian Authorities have evidently come to the conclusion that the social costs imposed by road congestion, including the cost of air pollution, are not borne to a sufficient extent by the suppliers of road transport and that the difference is an external cost imposed on taxpayers, and consumers. Road congestion and pollution are not at the same levels as in Europe and so the pressure on the government to mitigate those social costs by moving freight off the road onto more fuel-efficient modes, such as coastal shipping, has not been accredited with the same urgency as in Europe.

**AUSTRALIA**

As in many other countries including South Africa, most of the cargo transported by coastal shipping in Australia consists of bulk cargo. Some of the difficulties confronting the industry are considered to be:

- a decline in number of registered vessels,
- an ageing fleet,
- cabotage restrictions,
- skills shortage,
- labour action
- foreign competition.

According to the Maritime Union of Australia, cabotage restrictions curtail competition in the market and increase the prices of the services, so it has introduced the single voyage permit (SVP) and the continuous voyage permit (CVP), whereby a foreign ship can obtain a permit to undertake only one coastal voyage or a permit to conduct continuous voyages for six months on the coastline of Australia.

Experience in Australia is believed to have proved that coastal shipping has the potential to ease the anticipated increase in heavy vehicle road traffic, rebalance modal shares, bypass land bottlenecks and provide a sustainable transport option. Even though coastal shipping moves substantial volumes of freight between cities in Australia, the general trend towards the use of road transport remains, because of its punctuality and reliability. Sea transport’s share of domestic freight has consequently dropped substantially during the past 30 years from about 50 to 25%.

Legislation applicable to coastal shipping regulates the transportation of freight by ships between ports in the states of the Australian Federation, and includes provision for the licensing of ships engaged in the coastal trade. Cabotage restrictions do not entirely reserve the industry for Australian-registered ships, while the costs associated with meeting the
various legislative requirements intended to ensure the national benefits, actually reduce the attractiveness of the competitive shelter so provided. Foreign-registered vessels operating under the SVP & CVP are not similarly constrained. The federal government issues such permits where no nationally-registered ship is available, or the existing services are regarded unable to meet the freight needs on certain coastal routes.

The Tasmanian region in Australia depends largely on coastal shipping for the transport of non-bulk cargo. However, shipping non-bulk items such as fruit, vegetables and wheat require more attention and careful handling than bulk cargo. To alleviate such cost disadvantage, the Australian Government provides subsidies to operators shipping selected non-bulk goods between Tasmania and mainland Australia.

An environmental consideration regarding coastal shipping is that the land transport is estimated to generate fourteen per cent of national carbon dioxide emissions, while shipping is estimated to generate only two per cent. It is consequently believed that even a small modal shift in favour of domestic shipping would reduce such emissions attributable to transport and be environmentally worthwhile.

The Maritime Union of Australia also believes that government policy needs to support investment initiatives in coastal shipping as well as a new taxation policy including a tonnage tax regime.

**NIGERIA**

Nigeria introduced cabotage restrictions on their coastal shipping trade in 2003 with the aim of improving the local content of the maritime industry by ensuring that ships operating within Nigerian waters were owned by Nigerian citizens and crewed by Nigerian seafarers. In addition, the measures were adopted to stimulate the local shipbuilding industry by requiring all coastal ships to be built in Nigeria. In reality, the aims were unrealizable.

Despite the cabotage laws and the intended reform of the maritime industry, most of the maritime business is still in the hands of foreigners.
2.10 Resource costs

In virtually all the literature on the topic of the economic costs of national transport, it is contended that the costs of coastal shipping are less than the resource costs of the alternative modes of transport. Rigorous proof of that contention requires specific services by coastal shipping and the alternative modes to be compared by means of cost-benefit analysis, in which all the opportunity costs and the socio-economic benefits of each service are identified, quantified and evaluated, using shadow prices where necessary. Although the analysis could be undertaken for a representative route to avoid the formidable task of analysing all routes, the difficulty exists that the shipping serving South African coastal routes does not provide an alternative mode of transport for the demand for all coastal traffic, nor could the other modes realistically accommodate all the traffic moved by coastal shipping.

Each mode has features that in practice capture traffic for that mode alone, or which meet the demand in a manner that results in benefits for users unattainable through the use of other modes. Bearing that difficulty in mind, it is nevertheless feasible to describe the costs and benefits of each mode in a general manner and to reach conclusions about the resource utilisation without undertaking a representative cost-benefit study.

**ROAD TRANSPORT**

The resource costs of the supply of road freight transport comprise mainly the following:

i. The costs of operating the vehicles at market prices, less taxes and duties, which include the costs of maintenance attributable to the use of the vehicles, fuel, wear on tyres and labour at market wage rates, except in respect of labour which otherwise would be unemployed, for which the opportunity cost is nil or minimal,

ii. The costs at market prices, less taxes and duties, of the damage to the roads traversed (or the costs of repairing the damage), attributable to the particular road vehicles used to carry the traffic and return to the origin of the trips,

iii. The costs of the delays (time and operating costs attributable to congestion) caused to other traffic by the vehicles used for the services,

iv. The costs (or costs of mitigation) of the air and noise pollution caused by the vehicles used for the services,

v. The costs of the road accidents (loss of life, injury of persons and damage to property) attributable to the vehicles used for the services.

Items (ii) to (v) are externalities that are partially internalised in respect of road damage through license fees and an element of fuel tax, and through insurance in respect of road accidents, but the costs of road traffic congestion and noise and air pollution, including so called green-house effects, are borne by the public and not the road hauliers as such. It is these latter costs that largely motivate the efforts in Europe and in some countries elsewhere to promote coastal or short sea shipping as an alternative to road transport.

There can be no doubt that traffic congestion and noise and air pollution are costly externalities of heavy road haulage in South Africa, although perhaps not to the same extent as in Europe at present. However, the costs are likely to escalate substantially if the use of road haulage continues to increase at the current rate.
The benefits of road freight transport are reflected in the service to customers and are thus privately received. Those benefits often include externalities, i.e. benefits for customers not included in the market price of the services, but which impose public costs.

**COASTAL SHIPPING**

The resource costs of coastal shipping comprise mainly:

i. The costs of operating the ships excluding taxes, which include ship maintenance, fuel and manning (manning costs need to be valued at the cost of the foreign exchange required for imported labour in respect of seafarers recruited overseas), or the costs to the economy of the foreign exchange if the ships used on the coastal services are charted in.

ii. The costs of cargo and marine services (depending upon chartering arrangements) in ports, which need to be shadow priced as the charges for those services do not reflect market prices or opportunity costs.

iii. The costs of warehousing domestic cargo at origin ports in order to make up loads and at destination ports where that is necessary to ensure the reliability of supply chains in the event of the disruption of shipping schedules as a result of delays at ports.

iv. The costs of the collection and delivery of cargo to and from the ports by other modes of transport.

Although coastal vessels also contribute to so-called green-house effects and sea pollution, and accidents involving crew do occur, there are few externalities attributable to coastal ships that result in costs borne by the public. However, it should be borne in mind when considering the resource costs of coastal shipping that it cannot provide a service comparable to door-to-door road transport and the collection and delivery of cargo still requires the use of road transport that adds to road traffic congestion and air pollution. As most of South Africa’s commercial ports are located adjacent to the central business districts of coastal cities, traffic congestion might in fact be aggravated by the use of road transport to serve coastal shipping if direct road transport would otherwise have avoided central city areas.

The private benefits of using coastal shipping are similar to the benefits of using direct road transport if the users receive a similar quality of service according to their requirements. Public benefits are reflected mainly in the savings in the costs of the externalities that would result from the use of alternative modes of transport.

**RAIL TRANSPORT**

Although the intention of Transnet is to regain much of the rail traffic lost to road transport during the past twenty years, railways are unlikely to compete to any significant extent on coastal routes in the foreseeable future, largely because of the geography of the rail network. It is consequently unnecessary to deal with resource utilisation by railways for the purpose of this report, except to remark that the mode consumes less resources than road transport per tonne kilometre, although there are particular externalities such as the consequence of severance by the rail infrastructure, excessive noise and vibration cause by trains, uncompensated costs of level crossing accidents and air pollution from diesel fumes and the...
emissions from thermal power stations in the generation of the electricity required to operate electric locomotives.

**LENGTHS OF HAUL**

When comparing the resource costs of the different modes of domestic transport, the comparative advantages of the lengths of haul need to be taken into account. It is obvious that the mode enabling cargo to be moved over a shorter distance than other modes to meet a demand for transport will have an advantage in comparative resource utilisation. The distances between the ports on the routes traversed by sea, road and rail transport are shown in Table 2.5.

*Table 2.5: Comparative distances by mode between South Africa’s ports*

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Sea (km)</th>
<th>Road (km)</th>
<th>Rail (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Town – Durban</td>
<td>1,474</td>
<td>1,660</td>
<td>2,106</td>
</tr>
<tr>
<td>Cape Town - Port Elizabeth</td>
<td>787</td>
<td>756</td>
<td>1,068</td>
</tr>
<tr>
<td>Cape Town - East London</td>
<td>1,006</td>
<td>1,042</td>
<td>1,412</td>
</tr>
<tr>
<td>Port Elizabeth - East London</td>
<td>250</td>
<td>300</td>
<td>740</td>
</tr>
<tr>
<td>Port Elizabeth – Durban</td>
<td>719</td>
<td>927</td>
<td>1,606</td>
</tr>
<tr>
<td>Durban - East London</td>
<td>469</td>
<td>667</td>
<td>1,519</td>
</tr>
</tbody>
</table>


As Table 2.5 shows, the distances by road are substantially less than the distances by rail, which in principle counts heavily against rail transport as a rival for road transport in the utilisation of resources for haulage between the ports. Sea transport requires the shipping of cargo over shorter distances than road transport, although it needs to be borne in mind that the cargo still has to be collected and distributed by road to and from the ports for carriage by sea. Some distance should also be taken into account for the collection and distribution of the freight hauled by road to and from rail terminals.

**RESOURCE COSTS PER TONNE KILOMETRE**

Without undertaking a full cost-benefit analysis in order to illustrate the economic benefits of coastal shipping services instead of road transport services, some conclusions about the comparative resource utilisation can be derived from the calculation of the economic costs of a tonne kilometre by road transport in South Africa (using a heavy vehicle) and by coastal shipping. While the resource costs of the actual operations can be calculated with acceptable accuracy, the costs of the externalities included in the overall costs must necessarily be derived from general estimates, e.g. the cost generally of the health consequence of the air pollution attributable to the emissions of road vehicles in South Africa and the average cost of road accidents according to the incidence of their severity.
The externalities of road transport usually taken into account are those caused by traffic congestion (i.e. the value of time lost by vehicle occupants, transit time and the effects of the increased transit time on goods inventories, plus the cost of wear on vehicles as a result of the additional vehicles on the road), road accidents, air pollution and the gas emissions contributing to climate change. Although the costs of the externalities in specific circumstances have been estimated in the course of several economic evaluations of road and rail projects in South Africa, no local studies on the topic for reference purposes exist. Much scientific literature on the issues involved with quantification of the costs is available overseas. For example, estimates of the external costs of road transport attributable to accidents, noise and air pollution to buildings have been made for all countries in Europe as well as the United Kingdom and the USA. No estimates of the costs of externalities for short sea shipping seem to have been made, although only the effect of emissions on climate change is probably of significance.

The methods of estimating the costs of externalities cannot be dealt with in this report because an explanation of their complexities would require too much space and detract from the focus of the report. It is sufficient to explain that the costs of road accidents are often calculated by the CSIR and published with explanations of their methodology. The value of the personal costs of traffic congestion are usually determined by the increase in travelling time as average traffic speeds decrease, with time being valued according to the income of the vehicle occupants. Many estimates of traffic congestion costs have been made for the purpose of economic appraisals of road projects in South Africa. In order to assess the costs of the other externalities, it is necessary to rely on studies undertaken overseas and to adapt the results to local circumstances. Although various methods exist for the evaluation of those externalities, the most acceptable results have been obtained through surveys of the willingness of those affected to pay for the avoidance or amelioration of the consequences. Such surveys often rely on the sophistication of the respondents to perceive those consequences, which might not be present when the communities concerned are struggling to subsist.

With the use of the available information and a great deal of calculation to derive averages for individual vehicles, the economic cost of the externalities caused by a single flatrack vehicle carrying one TEU over a distance of one kilometre has been estimated. To this has been added the resource cost of operating the vehicle. An obvious problem when calculating the traffic cost is the fluctuation in the fuel price, which is a substantial element in that cost. However, when comparing the resource cost of road transport to that of coastal shipping, it is assumed that they fluctuate in unison, although the effect is less on the costs of coastal shipping. While fuel costs are less than 25% of the total costs of supplying coastal shipping, the costs for road transport are 45% or more.

When estimating the total resource cost caused by coastal shipping, it is necessary to allow for the collection and delivery of cargo by road over an average distance estimated at 22 kilometres at each end of voyages. Apart from the externalities caused by the road transport, no other allowances for externalities have been made, although the emissions attributable to the thermal generation of electricity for cargo handling and the emissions from a ship’s engines contribute to the so-called green-house effects.
The results of the calculations indicate that the ratio of the resource cost of carrying a TEU by road transport over one kilometre compared to coastal shipping, with allowance for the road transport involved, is 7.82:1. While this ratio is accurate only to the extent of the assumptions made, different assumptions would not alter the ratio sufficiently to require amendment of the conclusion that can be derived, namely that a sound public argument exists for the promotion of coastal shipping as an alternative to road transport where both modes can meet the demand. Although the operating cost of a road freight vehicle per tonne kilometre can be reduced through overloading in order to gain an advantage over shipping, the cost of road damage, which is an externality, escalates exponentially with the increase in the overloading, thus raising the resource cost of road transport. Coastal ships cannot be overloaded as adherence to load lines is strictly enforced through Port State Control and ship insurance.
2.11 Effect of cost structures

Differences in the cost structures of the competing modes of domestic transport are an impediment to their economic co-ordination through the unregulated market. Road hauling costs become increasingly variable as the quantity of freight to be moved exceeds the capacity of a single truck, especially as the flexibility of operation inherent in the technology of the mode allows services to be adapted readily to the demand. In contrast, most of the costs of coastal shipping are fixed because of the comparatively large capacity of individual ships and the need for services to be scheduled in order to ensure access to port facilities and provide customers with acceptable delivery frequencies. Some flexibility can also be achieved in shipping arrangements through the use of buffer warehouses at destination ports, but hardly to the extent that the costs of the services can be matched to their demand.

Although coastal ship owners can capture traffic from other modes through low prices based on marginal costs when capacity is available, such pricing tactics are not sustainable and are really justified only for single consignments that otherwise would be carried by alternative modes of transport. While the capacity of road freight vehicles allows less scope for pricing at marginal cost in order to win coastal traffic, especially when the regular demand in opposite directions is balanced, unused capacity is often available on backhauls enabling highly competitive or even predatory pricing. Furthermore, entry into the road hauling industry does not necessarily require much investment, because most of the costs of owning and operating the vehicles can be rendered variable with the consequence that competition in the industry is rife, forcing unsustainable cost-cutting and a high turnover of operators. As an outcome, coastal shipping is subject to continuous competition at freight rates that are often too low to ensure the viability of individual road hauliers, but prevail in the market through the competition forthcoming from new entrants. Such circumstances have obliged coastal ship owners on domestic routes to resort to niche markets, carrying traffic for which it has comparative cost advantages attributable to the nature, packaging and volume of the cargo.

Coastal shipping is also at a disadvantage vis a vis road freight transport to the extent that its costs necessarily include higher external charges, over which it has little or no control and which are not cost-based. While road hauliers are required to bear fixed annual license fees for each vehicle irrespective of the freight carried and road tolls on some routes, coastal ship owners pay port dues and are charged for marine services whenever a ship enters a port irrespective of the quantity of cargo on board. Those charges in South African ports tend to distort the market by imposing costs on coastal shipping that do not reflect resource utilisation. Although there is some contention about whether the annual license fees for heavy road vehicles and the tax for road funding included in the pump prices of fuel compensate, in effect, for the damage to untolled roads caused by the heaviness of the vehicles, the official intention has been to achieve some correspondence, notwithstanding that license fees are not earmarked for road spending. The achievement of correspondence between the charges borne by coastal shipping and the public costs of the resources used by that mode has never been intended or attempted by Transnet, which requires a substantial surplus from its ports division to maintain the financial viability of the company. The fees for pilotage and tug assistance, although to some extent cost-related, are mandatory, while port dues are not based upon costs. Furthermore, cargo dues, while dependant on the volume of cargo landed or shipped and intended to cover infrastructure
costs, are far in excess of the opportunity or resource costs attributable to the actual landing or shipping of the cargo. That is borne out by the substantial surplus, largely attributable to port dues, that accrues to Transnet from its exploitation of South Africa’s ports.

These considerations indicate that the private costs of road hauliers more nearly approach the costs of the resources used by that mode of transport than the private costs of coastal shipping which are burdened with charges in excess of the costs of the resources employed. The effect is obviously to reduce the competitiveness of coastal shipping and to distort market shares on coastal routes to the detriment of the economic co-ordination of domestic transport.
2.12 Logistics of coastal shipping

Coastal shipping constitutes a link in a variety of intermodal supply chains serving South African industries. These include supply chains with domestic and regional origins and destinations as well as supply chains for imports and exports transhipped to or from liners operated on international services. The links provided by coastal shipping are logistically indispensable to many of these chains because of the capacity needed and facilities such as buffer warehousing, included in the services. Several users of the existing domestic coastal services contend that they cannot envisage how their needs could be met without coastal shipping.

It should be borne in mind that intermodal supply chains are usually developed through co-operation between cargo owners and transport operators and tend to evolve according to the exigencies of the production and distribution processes of their users. Once established, they tend to become entrenched, and complex relationships evolve between the service providers and their customers. The consequences need not be considered in this study, but the favourable outcome of those relationships is a co-operative strategy for the development of the supply chain. As competition in the markets for goods is increasingly becoming dependent upon supply chain efficiency, it is in the national interest for their development to be promoted and especially for co-operative strategies to be pursued. The Government as the provider of public infrastructure through its departments, agencies and enterprises is necessarily (albeit by default) a participant in those strategies. Its main task should be to ensure that the recovery of the costs of the public infrastructure used by the supply chain (in whatever form) reflect the opportunity costs of that use. That also applies to the charges by Transnet for port services. Obviously co-operative strategies to raise the efficiency and competitiveness of supply chains, including coastal shipping links, can be frustrated through port charges borne by the supply chain in excess of the actual costs incurred, including the costs of the infrastructure used. That this is so at present is borne out by the fact that it is largely the group’s maritime interests that enable Transnet to maintain its financial viability. As the port operations of Transnet constitute a monopoly, the large surplus from its maritime interests implies an excessive external cost for South Africa’s maritime supply chains, which cannot but undermine their logistical efficiency and reduce their competitiveness.

This does not apply only to domestic and regional supply chains, but also to South Africa’s maritime supply chains that compete globally. Coastal shipping provides a link in those chains through its feeder services. South Africa’s ports also constitute links in the chains, with Transnet as the service provider, but unfortunately not as a participant in a co-operative strategy aimed at ensuring the cost-efficiency of the chains as its common purpose. The difficulty in achieving that purpose through supply chain integration attributable to Transnet’s ownership and operation of the railways and ports in South Africa has been dealt with elsewhere\(^8\). It is sufficient in this context to point out the logistical consequence is to preclude South Africa’s maritime supply chains from being developed to achieve their potential optimal efficiency\(^9\).

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\(^8\)Fourie, Y 2006. Structuring South African maritime supply chains for higher efficiency.

\(^9\) Obviously supply chains in which link providers exploit their own aims and seek their own profits are less efficient than supply chains in which all link providers co-operate to achieve a common aim.
Coastal feeder services are likely to become an increasingly important link in the international supply chains of the container trade as long as the unit costs of shipping containers can be lowered through the employment of larger ships on trunk routes. The limitations of port infrastructure and the size of cargoes required to justify the costs of port calls confine the large containerships to hub ports at the ends of the routes plied and necessitate the use of smaller ships to feed the traffic to and from lesser ports. That practice tends to increase until cargo volumes render direct services to and from lesser ports economically viable and the ports are upgraded to receive ships of sizes that can be operated economically.

**CONFERENCE AND FEEDER SHIPPING**

South Africa is currently served by several conferences of liner companies, the foremost of which are SAECS (South African-Europe Container Service) and Safari I which serves the route between South Africa and the Far East. Not all the liner companies trading to South Africa are members of these conferences, notably MSC which has a 20% share of the trade between Europe and South Africa, but is not a member of SAECS. The SAECS string comprises ships of Safmarine, MOL, DAL and Maersk Line and serves the ports of Port Elizabeth – Durban – Cape Town – Las Palmas – Rotterdam – Tilbury – Bremerhaven – Port Elizabeth in the loop. Safari I is the main conference serving the Far East in the loop Hong Kong – Shanghai – Ningbo – Yantian – Tanjung Pelepas – Port Louis – Durban – Port Elizabeth – Cape Town. MSC, which has an 18% share in the South Africa-Asia trade, is not a member of that conference.

The coastal feeder services are linked mainly to the ocean liner services of the participants in the conferences, but also carry containers transhipped to and from the liners of other companies, slot operators and freight forwarders (so-called third parties), when required. MSC undertakes its own feedering with deepsea liners.

Feeder shipping, when developed into a hub and spoke system enables the use of ships with capacities that match the demand and allows more frequent calls at ports with low volumes of throughput than otherwise would be cost-justified. The result is beneficial for the hinterlands of those lesser ports as well as the liner companies which achieve higher capacity utilisation of their ships and lower costs per unit of cargo on intercontinental routes, and which will be reflected in lower shipping rates in the competitive market. The success of the pattern of regular feeder services, which are essential to the development of efficient supply chains, depends on the ability of ports to ensure rapid ship turnaround, as delays will wreck shipping schedules and raise costs, as well as disrupt production dependent on “just-in-time” deliveries and raise inventory costs.

Coastal feeder services operate between all the ports in the range Durban, Port Elizabeth, East London, Cape Town, Lüderitz and Walvis Bay. An analysis indicates that much of the feeder traffic moving between the container ports depends upon the exigencies of the international shipping services, but obviously the feeder services to and from the other ports provide links in maritime supply chains.

Among the exigencies that contribute to the generation of coastal feeder traffic between the container ports are delays through congestion at Durban and gale force winds at Cape Town.
that prevent loading and offloading. Although large sums are being spent on raising the capacities of the container terminals in the ports at Durban and Cape Town and to accommodate larger ships, those ports are located adjacent to the central business districts of cities and it is inevitable that the rising opportunity costs of both the land occupied and congestion caused by the road traffic generated by the ports on the access roads, will eventually render the relocation of the ports, or at least the container terminals, economically justified. When that should happen, if it is not already justified, can be shown through an economic evaluation (cost-benefit analysis) of the relocation of the ports or terminals.

In the study ‘Moving South Africa’, it was recommended, somewhat simplistically, that South Africa should be served by two containers ports only – Cape Town for traffic to and from the west and Durban for traffic to and from the east. It is not difficult to show that the use of the Ports of Saldanha and Richards Bay instead for that purpose would have locational cost advantages over the long term, but that would ignore the function of the Port of Ngqura at Coega, which was not taken into account in the ‘Moving South Africa’ study and which has been equipped by Transnet with a modern container terminal capable of being expanded to accommodate more traffic than any of the other port terminals. Although the eventual function of the terminal at Ngqura in the logistics of South Africa’s container traffic is still somewhat obscure, the declared intention is that it will be used for transshipments, presumably as a hub for large ships plying on a main east-west route in the Southern Hemisphere. Whatever success is achieved in promoting that notion (see Part 3), there can be no doubt that the container terminal at Ngqura has the potential to rival Durban as a port serving Gauteng if the existing rail infrastructure and rail service between Port Elizabeth and the City Deep terminal (or a new inland terminal) are upgraded. The economics of turning around ships from Europe at the Port of Ngqura instead of Durban might then prevail, while Ngqura could well serve container shipping from the Far East as the first port of call in South Africa (which it now does to a small extent). The container terminal at Ngqura would then need to be linked to efficient feeder services to the other ports in the Durban – Walvis Bay range if the full benefits of the deepwater port, with a modern container terminal served by large capacity container ships, are to be realised. This scheme was researched in 2003 in a study for a private client and further elucidation is unnecessary, except to remark that its prospects for success would be enhanced through private participation in both the operation of the terminal and the rail service to Gauteng.

The purpose in this part of the study for drawing attention to the development of the container terminal at Ngqura and the prospects for its use is that the coastal shipping of feeder traffic has potentially a strategic function to fulfil in the logistics of the container trade with South Africa in the future. It is consequently necessary to ensure that the coastal shipping industry remains viable and efficient and is developed in accordance with the particular needs of the operation of South Africa’s complementary system of ports and railways. It would be short-sighted if the development of the industry at this stage in the evolution of the container logistics that determine the cost-efficiency of the liner shipping on which South Africa’s international supply chains depend were to be neglected.

Some of the logistical consequences of integrating supply chains through the Ports of Cape Town, Ngqura and Durban could be as follows:

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10Coega Project (Port of Ngqura, South Africa) independent traffic analysis, MERIT, 14 May 2003.
SERVICES FROM THE WEST (EUROPE, UK AND NORTH AMERICA)

a. If ships turn around at Cape Town, the freight cost of containers destined for the hinterlands of Port Elizabeth and Durban will rise because of the costs of transhipment and time, as well as the higher costs of the coastal shipping to those ports in comparison with the marginal costs of extending the voyages to Durban. Containers destined for Gauteng will arrive two days earlier as determined by the saving in voyage time less the additional time for the overland transport. Ship utilisation would be improved.
b. If ships turn around at the Port of Ngqura, the cost of containers destined for the hinterland of Durban excluding Gauteng and beyond will rise because of the costs of transhipment and time as well as the higher costs of coastal shipping for the reasons given in (a). The ships will still call at Cape Town, as the cost and time of transhipment and backhauling will exceed the cost of the call. Containers destined for Gauteng will arrive one and a half days earlier (assuming a speedy train service is provided). Ship utilisation would be improved.

SERVICES FROM THE EAST (JAPAN, FAR EAST AND SINGAPORE)

a. Ships turning around at Durban will enable cargo destined for Gauteng to move over the shortest overland route available at the lowest generalised transport cost of any route from the coast to Gauteng. If the ships turn around at Cape Town, calls will be made at Port Elizabeth, as the marginal cost of doing so will be less than the costs of transhipment and transport by coasters to that port from Cape Town or Durban.

If ships turn around at the Port of Ngqura, time savings will be achieved equivalent to the savings in dwell time of cargo in other ports, because the new terminal will support rapid and efficient ship-rail transhipments, although the rail service to Gauteng will have a disadvantage of several hours as against the service from Durban. It is believed that overall time savings could be achieved with the use of the container terminal in the port as a hub on an East – West route, as a fortnightly service on the route Far East – South Africa – South America has now been introduced. Ship utilisation would be improved. Coastal feeder services would have a greater function in the movement of cargo to and from South Africa than at present.
2.13 Conclusions

- That the market for coastal shipping from South African ports is segmented into feeder services for the deepsea liner companies, domestic transport and regional services in Southern Africa and that the financial viability of the only coastal liner company providing these services depends upon the business generated by the feeder services.

- That some of the feederling of containers between South African ports is undertaken by the deepsea liner companies and that the feeder services provided by the existing coastal liner company are derived mainly from its part ownership by Maersk Line/Safmarine. (As shown by the analysis in Part 3, the volume of feederling by deepsea liners is small, while the way porting of domestic cargo is insignificant.)

- The domestic coastal cargo comprises mainly containerized bulk shipped between Durban and Cape Town and that the service is not financially viable without the income from the feeder services.

- That intra-regional traffic comprises a small percentage of the existing coastal trade and has not developed over the past 90 years and is unlikely to develop in the foreseeable future in view of the dependence of most countries in Southern Africa on intercontinental imports and exports and the use of direct shipping services.

- That the use of national resources by coastal shipping is less intensive than that of road freight transport (its main rival), but the benefits for the economy are not being realized through the market because of the externalities that benefit road transport and the inability of sea transport to compete with the quality of road transport.

- That in order to improve the economic co-ordination of the supply of domestic sea and road freight transport and so use resources more effectively, in the absence of government regulation of the market, remedial measures to rectify the effect of the externalities are necessary.

- That those measures should ensure that the costs of the supply of coastal shipping are aligned to the value of the resources utilised, which in practice requires inter alia that the port charges borne by the mode reflect the resource costs (i.e. the opportunity costs of the infrastructure use and services supplied), rather than the revenue required by Transnet or value of the services.

- That coastal shipping cannot bear port charges equivalent to the charges for ocean-going cargo ships and international cargo, without risking a contraction or even the demise of the industry and that the current viability of the industry requires that at least the existing concessionary port charges for coastwise cargo be retained.

- That coastal shipping has a strategic function to fulfill in the logistics of South Africa’s container trade in the future and its development in order to ensure the competitiveness of the country’s international supply chains should be ensured.

- That further concessions to remedy distortions in the transport market currently attributable to externalities that hamper coastal shipping should be considered and implemented, if it can be shown that the existing concessions are inadequate for that purpose.

- That coastal shipping is sponsored through concessions in Europe, North America, India, Australia and elsewhere, but that the circumstances differ from those in Southern Africa and do not provide motivation for special dispensation locally.
• That restrictions to confine cabotage on the South African coast to nationally-registered ships or even ships in which a beneficial financial interest is genuinely linked to South Africa might result in the demise of the existing coastal shipping service, with the consequence that both the existing domestic sea cargo and the feeder cargo would need to be carried by deepsea liners, although it is likely that the sugar required in the Western Province would be imported from abroad rather than transported from Durban.

2.14 Recommendations

The recommendations stemming from this part of the study are:

a. That the dispensation for South African coastal shipping should be formalised in maritime policy and that the dispensation should include provision for the existing port tariffs applicable to the mode, as well as for special port facilities that will enable the reliability and punctuality of the services to be improved. It is also recommended that the policy be designed to enable coastal shipping to be assured of tariffs and port facilities that will support the industry to develop as an alternative mode of transport in meeting the demand for freight transport in South Africa to a greater extent than in the past. In particular, coastal shipping needs to rely on port facilities that allow berthing without delays and cargo handling and procedures that enable the services to match the punctuality and reliability of road transport.

b. That the dispensation proposal in (a) should apply only to ships operating on the South African coast in which South Africans have a genuine beneficial financial interest irrespective of ship registration.

c. That the criterion for the extent of the dispensation recommended in (a) should be the equalisation of the total comparative costs to users of the provision of road haulage and coastal sea transport.

d. That cabotage should not be restricted.

These conclusions and recommendations apply to coastal shipping as presently provided by the existing operator and international liner companies. In section 4.3, the likely consequences of the withdrawal of the existing supply are discussed and public policy towards the supply of coastal shipping irrespective of the existing services is proposed.