Development Policy Research Unit
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How will the Maputo Development Corridor impact freight flows?

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REGIONAL INTEGRATION, ECONOMIC COOPERATION IN SOUTHERN AFRICA
D P R U

Foreword

The Development Policy Research Unit (DPRU), located within the University of Cape Town's School of Economics, was formed in 1990 to undertake economic policy-oriented research.

The aim of the unit's work is the achievement of more effective public policy for industrial development in South and Southern Africa.

The DPRU's mission is to undertake internationally recognised policy research that contributes to the quality and effectiveness of such policy.

The unit is involved in research activities in the following areas:
- Trade and Industrial policy
- Technology policy
- Labour market policy
- Industrial organisation

These policy briefs are intended to catalyse policy debate. They express the views of their respective authors and not necessarily those of the DPRU.

They present the major research findings of the **Industrial Strategy Project** (ISP). The aim of the ISP is to promote industrial development in the *Southern African Development Community* (SADC) through regional economic integration and cooperation. It is a three-year project that commenced in August 1998 and is funded by the International Development Research Centre (IDRC). Ultimately, this project will identify the policies and programmes that support regional interactions that contribute to the industrialisation of SADC national economies.

This policy brief is a shortened version of the following DPRU Working Paper:

The impact of the Maputo Development Corridor on freight flows: an initial investigation
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Introduction

The aims of this policy brief are:

- to present a picture of current flows along the Maputo corridor;
- to examine the likely impact of the Maputo Development Corridor (MDC) on road freight transport costs;
- to explore some of the other factors that mediate the relationship between investment in infrastructure and economic development in the case of the MDC

Ultimately the goal is to illuminate the workings of the relationship between investment in infrastructure and economic growth, in the context of a particular set of infrastructure investments aimed at realising regional integration and industrialisation.

Significance of the MDC

The MDC is widely recognised as an initiative with far reaching significance. Some of the reasons for this are that:

- it represents a new approach within the Southern African Development Community (SADC) to development corridors.
- it is seen as an important practical move towards regional integration, which can provide practical lessons for other corridors in the region. Transport infrastructure in particular is seen to play an important role in regional integration, and has even been termed "the engine of regional integration" (Lipman 1997: 85).
- one of its key elements is the region's first major public-private partnership (PPP).
- it heralds a new era in the relationship between Mozambique and South Africa.
- it represents an opportunity to examine the relationship between infrastructure and economic growth.

At the core of the MDC is a series of projects to upgrade the infrastructure that makes up the transport route from Gauteng to Maputo. This includes four major elements:
- the road,
- the railway line,
- the border post and
- the port of Maputo.

It is envisaged not only that the flow of goods along the route will be re-established, but that the investment in infrastructure will crowd in further investment.

The Context: South Africa and Mozambique

The MDC takes place in the context of the relationship between South Africa and Mozambique. It is useful to look briefly at some of the major current economic features of this relationship, as well as how the MDC relates to other priorities and initiatives in each country.

South Africa looms far larger in the Mozambican economy than vice versa, as a market for exports, as a source of imports, as a source of investment, as a source of employment, and as a

source of tourists. This is hardly a new insight, but it is worth repeating here since it bears directly on

Major economic features of South Africa and Mozambique

	South Africa	**Mozambique**
Population	40 million	18 million
Gross domestic product	$130 billion in 97*	$2 billion in 97**
GDP per capita	$3 000	$100

*(SADC 1999)
**(*Business Day* 26.06.98)

the impact of the MDC.

- South Africa is one of Mozambique's major trading partners, while Mozambique accounts for a small proportion of South Africa's trade.
- South Africa has become a major investor in Mozambique.
- Mozambique has a significant migrant and working community in South Africa. Apart from mineworkers, many Mozambicans travel to South Africa in search of work, often illegally.
- South Africa is also an important source of visitors for Mozambique's rapidly growing tourism industry. Revenues from tourism in 1998 were 70% greater than in 1997.
- It is also worth noting that Mozambique's harbours and railways have always handled more international freight than national freight .
- The area of Mozambique that forms part of the MDC is just one small part of the country. The city of Maputo and Maputo Province are also the wealthiest part of Mozambique.
- From South Africa's point of view, the MDC is the flagship of the government's Spatial Development Initiatives (SDI) programme. The SDI programme, which began in 1996 with the MDC, is aimed at unlocking the economic potential of particular areas of the country, through investment in infrastructure and anchor projects in those areas. The approach used in the SDI programme is being extended to other development corridors in the region.
- The MDC also fits into the Department of Transport's recently developed **Moving South Africa** strategy. One of the key requirements identified by Moving South Africa for the freight transport system is to consolidate and build density along particular corridors. One of these is the Maputo corridor.

Key infrastructure elements of the MDC

This section gives some basic information about transport infrastructure investments that form the core of the MDC.

The element of the infrastructure upgrade which has seen the most progress so far is the road.

The road

The concession for the Witbank-Maputo toll road was awarded to *Trans African Concessions* (TRAC). TRAC is responsible for upgrading the road and maintaining it, in return for revenue earned from tolls

at five points along the road. After 30 years, the asset (the road) will be transferred back to the governments of South Africa and Mozambique (who may decide on a further concession agreement).

There will ultimately be five toll plazas along the route, three in South Africa and two in Maputo. The three in South Africa (Middelburg, Machado and Nkomazi) have already been opened. The Moamba toll plaza in Mozambique opened in June 2000 and the Maputo toll plaza is scheduled to open in early 2001.

The railway line

There are three railway lines that link the port of Maputo to its hinterland:

- the 78km Ressano Garcia line to South Africa,
- the 63km Goba line to Swaziland, and
- the 521km Limpopo line to Zimbabwe.

As with the rest of Mozambique's railway lines, these lines are currently owned and operated by CFM, Mozambique's rail and port parastatal. A 15-year concession for the upgrading of each line is envisaged. In late 1997, a Spoornet-led consortium was identified as the preferred bidder for the Ressano Garcia line. (A Portuguese-led consortium, Consortia 2000, was identified for the other two lines.)

The Spoornet consortium submitted a bid to CFM, and negotiations on the terms of the concession began. However, negotiations broke down early this year, and the bid has been shelved.

The port

The port of Maputo has terminals for containers, sugar, citrus, steel, general cargo, cereals, fuel, and coal. The combined capacity of the port is 15 million tons a year. The operation of the citrus, sugar, coal and container terminals was contracted out to the private sector in the mid-1990s. "These concessions have improved the efficiency, security and throughput of the port" (SA Transport Business Special 1997: 14).

By far, the bulk of container traffic is made up of consumer goods for domestic consumption in Mozambique (in other words not exports from or imports to South Africa). Two international shipping lines, Macs and Maersk, make regular calls at the container terminal, linking Maputo to Europe and more recently the Far East. There is something of a chicken-and-egg situation here that is important to understand: In order to attract more container traffic, the port needs to attract more shipping lines, but in order to attract more shipping lines, there has to be more cargo.

General port and upkeep services are to be concessioned to the private sector. However, the Mersey Docks consortium is reluctant to finalise the concession until more progress has been made with the concession for the Ressano Garcia railway line. Mersey Docks wants to be sure that Spoornet is involved in the railway line, since Spoornet would have the ability to re-route goods from other lines to the Maputo port.

The stalemate surrounding the port and rail concessions has resulted in unexpected delays in the upgrading of these key elements of the MDC's infrastructure.

The border post

A new, twenty-four hour, one-stop border post is being planned. At the moment, passengers and vehicles going through the border post have to go through two separate sides. The border post closes at 7 p.m., so anyone arriving after that time has to wait there until the next morning. The new border

post should reduce these times dramatically. The new Lebombo border post is being seen as a pilot project. If it is successful, the same model will be implemented at other border posts in the region.

Freight, vehicle and passenger flows along the Maputo corridor

Freight flows

There are two major cross-border freight flows between South Africa and Mozambique.

- ***road freight***, involving goods from Gauteng destined for consumption within Mozambique.
- ***bulk rail freight***, involving bulk goods from Mpumalanga destined for export through the port of Maputo;

Road freight flows

Road freight flows through the Lebombo border post are small from South Africa's point of view.

In 1997, just over 29 000 tons of goods passed through the Lebombo border post by road (compared to 1.2 million tons through Beitbridge, for example).

Of the 29 000 tons of cross-border road freight between South Africa and Mozambique in 1997, 26 000 tons of goods went from South Africa to Mozambique, and 3 000 tons went from Mozambique to South Africa.

The main single road freight flow between South Africa and Mozambique consists of basic consumer goods and construction materials going from South Africa to Mozambique.

Rail freight flows

Mozambique-South Africa cross-border rail freight flows are far greater than Mozambique-South Africa cross-border road freight flows.

Whereas Mozambique accounts for only a small proportion of cross-border road freight flows between South Africa and neighbouring countries, Mozambique accounts for a significant proportion of cross-border rail freight flows between South Africa and neighbouring countries.

The flow of goods from South Africa to Mozambique far outweighs the flow of goods in the opposite direction.

Vehicle and passenger flows

Data on vehicle flows on the Witbank-Maputo toll road is available from TRAC, but at this stage only for South Africa. At the moment, approximately 10 000 light vehicles and 1 000 heavy vehicles go through the Middelburg toll plaza every day. The figures for the Machado toll plaza are approximately 5 000 light vehicles and 900 heavy vehicles per day.

Bearing in mind the relative sizes of the South African and Mozambican economies, it is likely that levels of traffic on the Mozambican side of the road are lower. According to a member of the Lenders Team for the toll road (made up of all the organisations that have contributed to the loan financing for the road), more than 90% of the revenue from tolls is expected to come from traffic on the South African part of the road.

For vehicle flows, cross-border traffic is a small proportion of total traffic along the route. (Most of the traffic is either within South Africa or within Mozambique.) According to data from the South African Revenue Service (SARS) office at the Lebombo border post, the average number of vehicles going through the border post every day is around 800.

Based on figures from SARS, the average number of passengers per vehicle over the whole time period was 2.3. The average number of passengers per vehicle in the 1997 survey done by Kennedy et al. (1998) was 3.9.

It seems that passenger flows by rail are much smaller than passenger flows by road between South Africa and Mozambique.

The impact of the MDC on freight flows

The discussion below looks at some of the factors that influence road freight transport costs along the Maputo corridor (since the road is the part of the corridor's infrastructure that is most developed), and then at some of the broader factors which influence the impact of the MDC.

Road freight transport costs

Road freight operators face the following costs:

- *Fixed costs* are capital and finance for vehicles, depreciation, insurance, staff, administration, licences, and scheduled maintenance.
- *Variable costs* are fuel, lubricants, variable maintenance, and tyres.
- For *light delivery vehicles***,** the biggest contributors to total costs are staff and vehicle costs. These vehicles would seldom be used for long-distance journeys.
- For *heavy vehicles*, diesel and staff costs are the biggest contributors to total costs.
- The extent of *backhaul opportunities* also impacts on the costs of a road freight operator, in other words, the extent to which trucks can carry loads in both directions. At the moment, trucks often carry a load from South Africa to Mozambique, and then return empty. Only one half of the journey generates revenue for the freight operator.

There will be cost reductions.....

The upgraded Witbank-Maputo road will undoubtedly be a better road than the old road, and it will be 20km shorter. These two factors together will make the *journey time shorter*, and *reduce costs such as fuel and maintenance costs.*

Once the new streamlined border post is in place, the journey time will be further reduced.
The 24-hour border post will allow more *flexibility* in planning trips, and may allow for additional trips to be made.

There will also be less directly calculable *cost savings*, for example from improved security along the road in the form of patrols and SOS phones. For fragile cargo, such as fruit and bottles, the better quality road will mean less chance of damage – another cost saving.

..... in return for substantial toll tariffs
However, in return for all these benefits, users of the route now have to pay tolls. (Note that local residents and commuters are eligible for discounts.) The toll tariffs at the toll plazas in Mozambique have yet to be decided on.

Toll tariffs for normal users on the Witbank-Maputo toll road

Toll plaza	Class 1	Class 2	Class 3	Class 4
Middelburg	R20.00	R40.00	R60.00	R80.00
Machado	R30.00	R80.00	R120.00	R170.00
Nkomazi	R21.00	R44.00	R65.00	R92.50
Total	**R71.00**	**R164.00**	**R245.00**	**R342.50**

Class 1: Light vehicles (cars and bakkies, including trailers and caravans)
Class 2: Medium heavy vehicles
Class 3: Large heavy vehicles
Class 4: Extra large heavy vehicles

***Source*: Information supplied by TRAC**

Accounting for the decrease in traffic at toll plazas
Figures from TRAC show that the opening of the first two toll plazas led to substantial *reductions* in the number of vehicles using the road.

Most of the decrease in traffic is accounted for by trip diversion
Only about 2% of the decrease in traffic is due to trip suppression (in other words, to fewer trips being made). It is also related to related to the attractiveness of alternative local routes around each toll plaza.

Will the costs of the tolls be compensated for?
Whether freight operators are avoiding the toll plazas or not does not necessarily tell us anything about whether the costs of the tolls are being compensated for, since of course road users who are not used to paying tolls on a particular route are not going to be happy about the introduction of tolls on that route.

- The extra cost of the tolls may be felt more directly than cost savings from improved quality of the road.

- Also, this is the first time in Southern Africa that there are tolls that reflect the full cost of the investment in and maintenance of road infrastructure. Tolls on other roads, including notably the N3 between Johannesburg and Durban, are still subsidised.

- Mozambican companies interviewed seemed to think that the improvements in the quality of road and the accompanying benefits would compensate for the cost of the tolls (The research did not attempt to deal with the potential reactions of local residents in Mozambique).

- According to the South African Road Freight Association (RFA), approximately 70% of the cost of the tolls is compensated for by improved quality and reduced journey times.

- Some members of the RFA are passing on the full cost of the tolls to their customers (in effect billing their customers directly for the tolls, in spite of cost savings due to the improved quality of the road). It is not clear whether all operators are doing this. Over time, because of competition between operators, any net increases in cost resulting from the tolls might be absorbed by the operators.

- It should be noted that there is a concern amongst Mozambican freight companies that South African road operators may start operating in Mozambique, and with greater financial and other resources at their disposal, displace Mozambican operators.

Overall, **the combined effect** of the upgraded Maputo corridor road and the new border post will be

- to make the journey between Maputo and Johannesburg ***quicker, safer, and less wear-and-tear-inducing***.
- to ***decrease freight transport costs***, assuming that increased efficiency and reliability will lead to increased volumes in both directions over time
- to pass ***cost savings on to customers***, because of the competitive nature of the road freight industry.

Broader factors

Arguably more important than direct transport costs along the MDC are a number of broader factors that will influence the impact of the corridor. These include:

- the price of the tolls on the N3 to Durban;
- how the port of Maputo fits into global shipping networks;
- the evolution of the port system on Southern Africa's east coast.

Increased tolls on N3 to Durban will boost Maputo corridor route
When it comes to imports to and exports from South Africa, the Maputo corridor route is in many ways a competitor with the route between Johannesburg and the Durban port. Even though Maputo is physically slightly closer to Gauteng than Durban is, the travelling time to Maputo is still greater. Once the new border post is in place, and the road upgrade is completed, the journey time to Maputo will compare much more favourably with the journey time to Durban. (It will still be a while though before this happens.)

At the same time, the tolls on the N3 to Durban are set to increase. These tolls are currently at subsidised levels. This will provide a further boost for the Maputo corridor route.

The Durban port is better connected to global shipping networks than the Maputo port
The port of Durban is congested (and its expansion is physically constrained by lack of land), but its size means that it is better connected into global shipping networks than the port of Maputo. Far more shipping lines call far more regularly at the Durban port than at the Maputo port. As highlighted previously, there is a chicken-and-egg situation involved here. Unless more cargo comes to the Maputo port, shipping lines will be reluctant to call there; unless more shipping lines call, cargo owners will be reluctant to send their cargo there.

The Maputo port is not a likely candidate for the hub-and-spoke system
However, even without the chicken-and-egg problem, it would not be easy for the Maputo port to compete with Durban for shipping lines, because of the nature of the global shipping system. Over the last decade at least, the trend in world shipping has been towards a *hub-and-spoke system*.

In the past, container ships would call at all ports along a particular route. With increasing ship sizes and other changes in the shipping industry, it now makes more sense for ships to call at <u>one</u> port along a coastline (the so-called hub port), and for goods to be transhipped from there to the smaller ports along the coastline (the so-called feeder ports). Although for various reasons this hub-and-spoke system has not been fully implemented in Southern Africa, it is only a matter of time before it is. Of the ports along Southern Africa's east coast, Durban seems the most likely candidate as a hub port for container shipping.

Opportunitites for return loads dependent on import levels through the Maputo Port
It seems that the port of Maputo's status as a niche port for bulk goods from Mpumalanga is secure. One of the most significant ways of reducing road freight costs along the Maputo corridor route is increased opportunities for return loads, and this will depend crucially on the level of imports destined for Gauteng (or other inland locations) that come through the Maputo port.

Conclusions and recommendations

The ***improved quality of the upgraded road, combined with reduced journey times, is likely to lead to decreased road freight costs*** over time, in spite of the cost of the tolls on the road.

The ***other major factor that will influence road freight costs is the extent of return haul opportunities***. This will be affected by the growth of the Mozambican economy, and by the level of imports to South Africa through the Maputo port.

The role of the Maputo port as a niche bulk port for goods from Mpumalanga is secure. However, ***if the container terminal is to develop substantially, all the road- and border post-related infrastructure needs to be in place, and competition with the Durban port is involved.*** This takes place within the context of the move towards a hub port system on Southern Africa's east coast.

It is important to be ***realistic about time frames*** when one is thinking about the impact of development corridors in SADC. Large infrastructure investments take time, and that their impacts will not be felt overnight.

The most rapid response to the MDC has come from a traditional area of strength along the corridor route: bulk exports from Mpumalanga. This is an area in which the MDC is re-establishing an old relationship rather than building a new one.

Breaking new ground (for example, container imports to South Africa via the Maputo corridor) is proving more intractable.

The ***impact of the MDC will be partly determined by factors outside of the MDC itself***, notably the future of the N3 to Durban and developments in international shipping, although there are probably others as well.

Thirdly, freight, vehicle and passenger movements may be useful indicators of impacts, and of wider factors at work. ***Ideally a regional freight database should be developed***.