



## **SOUTH AFRICA AND MOZAMBIQUE – THE N4 TOLL ROAD**

### **Case Study (Transportation)**

#### **Project Summary:**

It has long been recognized that economic development is tied to efficient transportation options. Many developing countries struggle with the challenge of how to finance one of the most expensive types of infrastructure projects, even while recognizing the potential economic and social benefits. South Africa and Mozambique, however, have developed a major infrastructure project which, if successful, will increase the efficiency of product transport, sparking regional and global trade, and provide additional economic opportunities to their citizens. One crucial element of this project is the N4 Toll Road connecting Pretoria, South Africa to Maputo, Mozambique.

Rehabilitation of a transport route between the two countries began in 1996, shortly after both South Africa and Mozambique held their first democratic elections. Increased political stability in the region allowed the South African Development Community (SADC) and the South African Government to propose new initiatives that focused on economic development, trade and regionalization.

To facilitate the cross-border project, South Africa's Department of Transportation organized the South African National Road Agency Limited, and Mozambique's Department of Roads and Bridges created the Administração Nacional de Estradas. These two new agencies were developed to work with a concessionaire who would design, upgrade, construct, operate and maintain a new toll road. After an open-bidding process, a consortium of South African and Mozambican companies, won the contract to develop the road and associated infrastructure.

The contract was based on a Build-Operate-Transfer model. No government subsidies were provided to the concessionaire for the project. The rehabilitation of the N4 was financed through equity and debt that was negotiated by the concessionaire. Operations and maintenance costs were to be paid for by revenue generated through the collection of tolls. Traffic volume on the toll road is dependent upon the economic development of communities along the route, so the concessionaire has a high stake in other related projects as well.



In the beginning, the project lacked public support. This led the concessionaire to agree to reduce tariffs for regular users and to begin providing services, such as twenty-four hour road patrols to assist motorists, to justify the cost to local commuters. The government has continually shown strong support for the toll road and attempted to appease residents adversely affected by the project. Use of the highway has steadily increased over the years, showing an acceptance of this public-private partnership.

### **Project Objectives:**

Rehabilitation of the N4 Toll Road is one part of the Maputo Development Corridor (MDC) Project. The corridor runs from the Johannesburg region in South Africa to Maputo, the capital of Mozambique. In 1995, the ministers of transport of Mozambique and South Africa met to discuss the development of the transportation axis between the port of Maputo and the industrial center of South Africa (Gauteng Province). The MDC's objective is to reconstruct a cross-border economic relationship that developed during the industrialization of the area in the late 1800s. Years of unfavorable political conditions, in both countries, lead to the deterioration of this key transport route that connected South Africa's heartland to an export harbor. Neither country had sufficient resources to invest in the failing infrastructure, but each wanted to foster stronger transport and trade links. The philosophy behind the MDC is straightforward: create a favorable climate for investors and then encourage the private sector to improve the infrastructure, create jobs and increase trade and further investment.

There are five integral components to the MDC initiative.

- **Port of Maputo:** The micro-region's ultimate objective is to connect with the global economy, so the Port of Maputo is a crucial infrastructural component. Its renewal and upgrading will enable it to play a vital role in reducing transport-related costs for exporters, thereby improving their global competitiveness and increasing profitability.
- **Railway links to Maputo:** Three railway lines run to the port of Maputo and form the rail arteries of the micro-region: the Goba line from Swaziland, the Limpopo line from Zimbabwe and the Ressano Garcia line from South Africa. In principle, a joint venture between the four countries will eventually be established, ensuring the viability of efficient rail lines systems. Currently, only the South Africa-Mozambique line has made progress toward a concession agreement.
- **A one-stop border facility:** To facilitate easy access and the flow of goods and people between South Africa and Mozambique, a single border facility has been developed at



Komatipoort/Ressano Garcia. This facility reduces cross-border bottlenecks by providing a one-stop border control procedure.

- **Economic Sector Investments:** There are a number of very large investment projects associated with the MDC that are planned, under construction or completed. Notable among these are the Mozal aluminum smelter near Maputo (the initial phase was completed in 2000), the Pende gas extraction project, an aluminum processing plant in Maputo and a heavy minerals project adjoining Red River near Tzaneen in the Northern Province.
- **The N4 Toll Road:** This is the most extensive infrastructure project in the MDC and the focus of this case study.

The N4 Toll Road runs from Pretoria, South Africa's administrative capital, to Maputo in Mozambique. With road transport being the dominant form of transportation in Africa, and recognizing the relationship with economic growth, the governments of South Africa and Mozambique are attempting to maintain a reliable and efficient road transportation system. Although the road is in both South Africa and Mozambique, it is treated as a single entity by the two countries and acts as a cross-border link within the micro-region. The contract for the toll road project was tendered in 1996 following the Build Operate Transfer (BOT) format. Private sector involvement was encouraged in order to limit the long-term debt burden on the public. This public-private partnership quickly adopted the "user pays" approach to ensure continual funding for maintenance and repairs.

There are several objectives associated with the N4 project, i.e., to:

- Foster trade between South Africa and Mozambique
- Direct products to the Port of Maputo and facilitate regional and global trade
- Develop tourism within the region
- Further develop major exporting industries in the region
- Reduce the cost of transportation, by improving the efficiency of roadways, and finally
- Foster broader economic activity, empowerment and development of communities within both countries.



## **Project Description:**

### **1. Partners**

The South African Department of Transport (DoT) and the Department of Roads and Bridges (DNEP) in Mozambique, together with their respective governments, entered into a Protocol Agreement in order to establish an Implementing Authority (IA) for the proposed cross-border toll road. The IA developed the necessary concession contract documents and initiated a tender process for the project. In addition, the DoT in South Africa created the South African National Road Agency Limited (SANRAL) and the Mozambican DNEP created the Administração Nacional de Estradas (ANE), which serve as the government authorities that oversee and provide public management of the N4 Toll Road.

The concession was awarded through an open and competitive bidding process. A consortium of South African and Mozambican companies, was awarded the contract in December 1996. The Sponsor Shareholders, who together own 40% of the consortium, are two South African road contractors and an international construction company that is one of the prominent road builders in the world. The concession agreement was signed in May 1997.

### **2. Implementation Environment - Legislative and Administrative**

Several key events provided the stimulus for rehabilitating a transport route between Mozambique and South Africa. In Mozambique, the end of civil war in 1992 and the peace agreement in 1993 brought increased stability. The democratic transformation in South Africa and the election of a majority government in 1994 shifted the South African government's focus toward those areas of the country that were less developed. Finally, initiatives promoted by the SADC and the South African Government facilitated the establishment of the N4 Toll Road.

The SADC was founded in 1980 by nine Southern African countries, including Mozambique. The four guiding objectives of SADC were to reduce Member States dependence on apartheid South Africa, to implement programs and projects with national and regional impact, to mobilize Member States' resources to promote collective self-reliance and to secure international understanding and support. In 1992, the SADC evolved into a political community, emphasizing regional cooperation and integration. South Africa joined the SADC in 1994 when its democratically-elected government came to power.



In 1996, the SADC ratified two protocols that helped establish the environment for the formation of the MDC agreements. The Trade Protocol of 1996 called for the elimination of trade barriers among the member countries by 2005. The Protocol on Transport, Communications and Meteorology encouraged private sector involvement, public-private partnerships and regional integration for the: revitalization of regional transport/trade links; rehabilitation/improvement of transport infrastructure; deregulation of ports, railways, road agencies and airlines/airports; harmonization of transport rules and trade regimes; and streamlining and facilitation of border controls through one-stop border posts and cross-border road transport agencies.

Projects like the MDC are part of the South African Government's larger Spatial Development Initiative (SDI). SDIs are attempts by the South African state, with the active support of the private sector, to unlock inherent economic potential in specific regions in southern Africa. SDIs focus support in areas where socio-economic conditions require concentrated government assistance and where the potential for economic growth clearly exists. The SDI program is based on the view that certain areas within South Africa were disadvantaged by the industrial policy pursued during Apartheid. The previous government's policy of import substitution promoted investment in services for domestic requirements, but concentrated on Gauteng Province, the principal white domestic market. These same substitution policies also hindered other parts of the country in developing export-oriented activities.

The SDI program began as an interdepartmental investment strategy led by the national Departments of Transport (DoT) and Trade and Industry (DTI). Through SDI projects, areas that are underdeveloped will be able to engage in sustainable economic empowerment through investments that help to stimulate small, medium and micro-enterprises (SMME) economic activities. Program objectives include stimulating global competitiveness, job creation, infrastructural development and socio-economic uplift. The initiative provides opportunities in the agricultural, mining, tourism, environmental, forestry, infrastructure and port sectors. The principal mechanism underpinning the SDI program is private sector investment that will be encouraged by public sector interventions. SDIs are currently reconfiguring whole areas of South Africa and neighboring states, constructing effective micro-regions of economic activity.

### **3. Financial Agreement**

The contract for the N4 Toll Road is for 3 billion Rand (1996 value = US\$ 660 million) over thirty years, with a total of 1.5 billion Rand allocated for the initial three and a half years. There were no government subsidies provided for this project. The toll road was financed from twenty percent equity and eighty percent debt. The three construction companies who are the Sponsor



Shareholders contributed ten percent worth of equity, with the rest of the capital provided by the South African Infrastructure Fund and six other investors. The debt investors include South Africa's four major banks and the Development Bank of Southern Africa. The Governments of South Africa and Mozambique provide joint and severable guarantees of the project debt and, under certain conditions, guarantee the equity as well.

After the construction phase of three and a half years, the costs associated with upgrading, maintaining and operating the road are covered by project revenues from tolls collected at strategically-located tolling plazas. The concessionaire faced demand risk – would cars pay to use this road when less well-maintained but free alternative routes exist? Traffic volumes continue to depend on increased regional trade and economic growth in the region. There was also considerable user payment risk because residents in poor communities were unable or unwilling to pay high toll fees.

#### **4. Contract Provisions**

The original contract signed in 1997 required the concessionaire to design, construct, upgrade, rehabilitate, operate and maintain the N4 from Witbank, South Africa to Maputo. The contract also included the construction of five toll plazas and other facilities along the route. In 2004 the contract was amended to extend the concessionaire's responsibilities to include the section of N4 that runs between Witbank and Pretoria. However, the length of the agreement was not changed – thirty years beginning in 1997. After the thirty-year period, control and management of the road reverts back to the governments. An excellent track record, a greatly improved risk profile, established traffic patterns and sound market conditions provided the ideal opportunity for the concessionaire to refinance the project in 2005. Refinancing not only reduced the financial risk for the business, but it also allowed the concessionaire to begin expansion work earlier than anticipated while continually improving the service that it provides to road users.

The roles and obligations of the various parties involved in the concession agreement are well defined in the documentation drawn up for the contract. The concession contract and twenty-three annexes cover a range of subsidiary contracts, rules and requirements. The concession contract differs from conventional contracts in that it primarily makes use of performance specifications (rather than design specifications) for pavement quality and the concessionaire's ability to manage the capacity of the road, while level of service and related geometric standards provide the control for new construction. With the addition of the Pretoria section of N4, the concessionaire now manages 630 kilometers of toll road in two countries, operates six main line toll plazas and four ramp plazas, maintains several feeder roads and manages eighteen load



control centers (weighbridges) to protect the road and region against overloading. The contract also specifies that the pavement must have a reasonable amount of life left at the end of the concession period, and this will be evaluated based upon inspections over the last three years of the concession period.

Tolls paid on the N4 are used to maintain, expand and rehabilitate the route. Maintenance includes repairing and upgrading the road surface, road signs and drainage system, as well as the removal of debris and cleaning of the entire road reserve. Expenditure on the road and ensuring proper use of the funds collected is carefully managed by the SANRAL and ANE. According to the contract, tariffs are set jointly by the concessionaire, SANRAL and ANE and can only be increased annually in line with consumer price inflation. Any errors in bidding or increases in construction price can not be offset by increases in tariffs. In 2004 new N4 toll route tariffs, calculated in terms of the prevailing South African Consumer Price Index (CPI), increased tolls between 1.64 and 3.33% depending on the type of vehicle. In 2006 tolls increased between 20.7 and 23.4% because the Mozambique Metical depreciated against the South African Rand and all of the project's debt is financed in Rand. The concessionaire justified the increase stating that improvements to the road demonstrate that the toll fees are being used for their intended purpose. In 2007 drivers using the N4 in South Africa saw a slight increase in tolls (in line with the CPI), however there was no increase for N4 users in Mozambique due to positive changes in the exchange rate over the previous year.

## **5. Implementation Metrics**

Initially the project involved the rehabilitation and upgrading of an existing 390 kilometer route from Balmoral (20 kilometers west of Witbank) to Moamba, and the construction of a new 50 kilometer-long route from Moamba to Maputo. This new route cut 150 kilometers off the trip between Gauteng Province and Maputo, shortening the traveling time to four hours. The actual road varies from two-lane single carriageways to four-lane freeways, but the renovation of single lane segments included considerable widening to accommodate vehicles hauling large cargo. 5,677 jobs were created during the initial phase and in total, about 13,000 casual, temporary and permanent jobs have been created by the project, facilitating the development of communities situated along the route. The concessionaire currently employs 400 full-time staff and maintains subcontracts to over 60 local small subcontractors.

Toll prices on the N4 are determined by the type of vehicle being driven. There are four categories of vehicles listed for the purpose of toll pricing: Light Vehicles (no heavy axles), Medium Heavy Vehicles (at least one heavy axle), Large Heavy Vehicles (three to four axles,



where at least one of the axles is a heavy axle) and Extra Heavy Vehicles (five or more axles, where at least one of the axles is a heavy axle). The tolls are collected at six main line toll plazas and four ramp plazas. Only two of the toll collection plazas are located within Mozambique. Tariffs collected on the Mozambican side have little impact on total project revenue, meaning South African road users are effectively subsidizing Mozambican users of the toll road.

Traffic volumes depend on increased regional trade and economic growth, which has not been as high as the financiers projected, however, the concessionaire feels the traffic has been acceptable, at a growth rate of five to seven percent per year. This confirms that the rehabilitation/development of the infrastructure was necessary. The consistent increase in traffic volume has also justified the concessionaire's use of innovative equipment. The Traffic Incident Data System (TIDS), which the concessionaire was instrumental in developing, has significantly improved road safety. In 2007, the concessionaire began testing a camera system at the Maputo Toll Plaza, upgrading their methods to prevent corruption. They are also testing dedicated toll lanes at Maputo Toll Plaza to relieve traffic congestion and are considering the use of electronic toll collection for the future.

## **Commentary:**

### **1. Methods for Overcoming Impediments**

There were two major impediments that had to be overcome to make the N4 Toll Road a successful project: ensuring that the local financially disadvantaged could afford the tolls and preventing overloading of heavy vehicles. Toll pricing was the subject of much controversy prior to implementation. On the South African side, road users were discontented that they had to pay for using a road that was previously free. On the other side, contending with widespread levels of poverty as well as the residual legacies of the ruling party's previous push toward socialism, most Mozambicans were hostile to the whole public-private partnership concept.

When the concessionaire submitted their bid for the concession, they based it on average toll road charges in South Africa of 0.20 Rand per kilometer for light vehicles and 0.50 Rand per kilometer for heavy vehicles. In addition, they did not change the cost of a trip from the South African border to Maputo. Tolls on the Mozambican side replaced a 600 Rand duty fee along with other normal charges incurred at the border. However, due to protest by local communities, the concessionaire also introduced a system of discounts for commuter and local users which is below (in some cases substantially below) normal fares.



A major concern for the concessionaire was road damage caused by overloaded vehicles. Unfortunately the concession agreement did not specify regulations on truck loads. In order to prevent rapid road deterioration, the concessionaire began assisting both the South African and Mozambican governments in establishing axle load control measures. The project to prevent overloading has been in full operation since 2002. The backbone of the project is a set of six traffic-control centers, each equipped with a twenty-two meter long, four-segment scale capable of weighing long trucks in one operation. The second element is three mobile units that can be dispatched to any of eleven lay-bys situated on alternative routs surrounding the N4. These lay-bys consist of a weighbridge with one deck and a small holding yard. A third element is software and a network of measuring points that make use of weigh-in-motion equipment. This equipment is not sufficiently accurate for prosecution purposes, but it serves to identify a possibly overloaded truck to a weighbridge operator in advance of its arrival.

When a truck is found to be overloaded, it is placed in a holding yard where the load has to be rectified. The load can be distributed more efficiently over the axles or the owner can dispatch another truck to share the load. The percentage of overloaded vehicles fell from twenty-three percent in 2001 to nine percent in 2004. In 2007 a new state-of-the-art overload control center was launched east of Pretoria. The center, which will operate twenty-four hours a day, seven days a week, features vehicle testing and an electronic tagging facility. The weighbridge has three satellites that enable traffic officers to detect overloaded vehicles and non-roadworthy vehicles. The Departments of Transport and Justice are also upgrading guidelines for public prosecution to ensure stiffer penalties for offenders.

Road-side vendors posed a smaller challenge for the concessionaire. Initially, local rural women trying to sell fruit to travelers were chased off the N4. Their activity was not only illegal, but a safety hazard. Originally, the local council suggested that such activities be licensed and formalized, and the women moved to a planned mini-market. The local women felt that this would deprive them of potential customers. In a compromise, the concessionaire agreed to pave slip-off areas along the N4 where the women could sell their products.

The South African government has also made a number of gestures to show their support for the project and decrease inconveniences incurred by citizens. Toll hikes increased the burden on families with school-aged children who use the N4 to travel between home and school. In response, the DoT agreed to distribute a million bicycles to rural and urban schoolchildren by 2015. The aim was to encourage cycling as an alternative mode of transport that was not only cheaper, but promoted a healthy lifestyle and was better for the environment. The department will also set up bicycle repair shops as soon as more than two hundred bicycles are donated



within a particular area. Finally, highway water run-off caused local residential flooding during heavy rains. The run-off was caused by inadequate municipal storm-water drains and the government promised compensation to those affected and immediately began correcting the problem.

## **2. Key Points for Success or Failure**

There are four key points to the success of this project.

- The commercial risk has been shared between a range of partners.
- Subsidization from the more affluent South African users (through more numerous tolling locations) and substantial discounts for regular users helped to reduce the user payment objections.
- The road facilitated further private sector investment in depressed areas, which in turn raised traffic volumes.
- A detailed contract that focuses on performance (not design) specifications and outlines specific responsibilities has helped the parties to avoid conflict.

Conditions that may hinder the future success of the N4 project:

- The slow manner in which the port at Maputo has been renovated presents a problem. This has had a negative impact on the flow of traffic using the N4, with huge implications for the short-term financial success of the project.
- The “fast-track” approach promoted as an integral part of SDI projects presents another potential problem. This stipulation which allowed the N4 project to move from the requests for proposal stage to the selection of bidders in eight months, ignores serious or in-depth engagement with stakeholders outside of the financial sector. A few impediments have already been overcome, but there is no guarantee that other issues will not arise in the future.