



Dutch Buses for Ghana

Case Study in the Evaluation of the ORET Programme 2007-2012

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Executive Summary

Introduction and Methodology

This report presents the results of the evaluation of the delivery of 500 city and commuter buses to Ghana and technical and management support of the newly created public bus company, Metro Mass Transit (MMT). The case study concerns four related and follow-up ORET transactions, i.e. GH00020, GH00029, GH00039 and GH/ID070056, covering 500 buses during the period 2005-2010. The Dutch company VDL was the applicant and responsible for the delivery of chassis, bodies, spare-parts and technical support. Technical assistance was part of all four transactions. This included the involvement of the city of Amsterdam which seconded two managers of its public transport company (GVB) to function as managing director of MMT in the period 2005-2010.

The four transactions have the same five objectives: 1. Improve public transport in Ghana, notably in the major cities, in terms of efficiency and reliability (by adding better-quality buses to the fleet and replacing unreliable and unsafe buses); 2. Create a sustainable public transport company MMT (through technical and management support); 3. Reduce the congestion in major urban areas such as Accra and Kumasi (by providing an alternative for the minibuses (*trotros*) and taxis); 4. Save on fuel; 5. Reduce emissions (through cleaner engines). Combined, the transactions aimed to enhance sustainable mobility of citizens in Ghana and contribute to socio-economic development and poverty reduction.

Twenty-five buses from the first consignment were allocated to another state bus company (STC), the remaining 475 VDL buses were added to the MMT fleet, sometimes replacing older buses. About half of the buses are now used in the country's two largest metropolitan regions: Accra and Kumasi. In the case of Accra, buses are stationed in neighbouring towns such as Tema, Winneba and Swedru. Other buses operate from stations in smaller or more remote towns such as Tamale, Takoradi, Sunyani, Cape Coast and Bolgatanga. Most MMT buses do not operate a scheduled bus service but instead, like minibuses, only leave the terminal when sufficient passengers are on board. As the 475 buses form only half of the fleet of MMT it was difficult to allocate the benefits of the transactions to the end users (passengers).

The evaluation is based on: i. Relevant documents from the ORET archives, the Dutch embassy in Ghana and the Division of the Ministry of Foreign Affairs, MMT and other stakeholders in Ghana; ii. Various academic papers on the development of public transport in Ghana; iii. Interviews with stakeholders in the Netherlands and Ghana in April, May and June 2014; iv. Site visits to various locations in Ghana (Accra and Kumasi) in April and June 2014; v. A survey of passengers of six bus lines across Ghana carried out in July 2014.

The impact of the intervention was assessed qualitatively and quantitatively, reconstructing a counterfactual, a study of all relevant documentation, measuring the results of the transactions by surveying beneficiaries, carrying out in-depth interviews with stakeholders, and assessing MMT's performance. The aim of the survey was to identify major user groups of MMT buses, to quantify the economic, social and environmental impacts of their use of the buses and to extrapolate those impacts to national level. Following a pilot done in June 2014, six bus lines were selected from the three types of MMT bus lines (city, rural-urban, intercity) and by balancing bus lines centred on coastal regions with lines connecting the Northern and Southern regions. These lines serve different user groups such as market traders (mostly women), market visitors, business people, schoolchildren and visitors to health facilities. During the survey, which was done in July 2014, passengers were asked to provide information about the starting point and destination of their journey, employment status, age, purpose of the trip, frequency of use, availability of alternative transport and perceived advantages and disadvantages of the MMT bus compared to other available modes of transport.

The Client

The client was Metro Mass Transit (MMT), a company that provides public transport services in all regions of Ghana. Founded in 2003 to replace the bankrupt Omnibus Service Authority (OSA), its shares are owned by the government (45%) and a number of "state and private

investors". Except for Prudential Bank Ltd, the private investors are also largely owned and/or controlled by the Government. As a result, MMT has a high level of government involvement, directly and indirectly.

Financing of the ORET Transactions

The four transactions add up to a total amount of € 73.6 million with € 27.6 million covered by ORET grants. The first two transactions had a grant share of 35%, whereas the last two transactions had a grant share of 39% to cover the additional costs of longer-term technical assistance after introduction of that facility within ORET (see **Error! Reference source not found.**). The required non-grant funds were financed by export credits (commercial loans) from ING Bank to the Government of Ghana (with the Ministry of Transport as responsible line department and the Ministry of Finance as contract party).

Efficiency

Application. The appraisal stage (which started with one transaction that evolved gradually into a project with four transactions) took somewhat longer than the average ORET transaction, but for good reasons. Initially FMO rejected the application because it was unclear which organisation would operate the buses. The originally intended client, the Ghana Private Road Transport Union of private commercial transport operators, would have created an unstable institutional setting. In December 2002 a renewed application was received for 250 buses for the newly created MMT; it was split into two transactions to manage the risks. It included the appointment of a managing director and a technical manager from the Netherlands to secure professional management in the start-up stage of the new bus operator. A price/quality check was done during the appraisal stage. Starting with the second transaction, the remaining 400 buses were assembled at the Neoplan factory in Kumasi using imported chassis, bodies and parts, thereby providing additional local employment. With an estimated net price per bus of € 135,000 (excluding costs of transportation), the price of a VDL bus manufactured at Neoplan was comparable to the prices of imported buses of competing European suppliers. In comparison with Asian competitors, VDL offered higher quality buses that were more suitable for Ghanaian roads for a higher price. This was reflected in the higher purchase price, which included the delivery of spare-parts.

Implementation. In general, the implementation of the four transactions went smoothly, apart from recurrent problems with customs clearance and securing exemption of duties on imported equipment. In total 500 buses were delivered to Ghana: 25 buses from the first batch to STC and the remaining 475 buses to MMT. In March 2013, 452 buses of the ORET programme (VDL Neoplan) were still owned by MMT, of which 327 were in service; 125 buses were no longer operational, either because they required repairs or because they were about to be scrapped, resulting in an operational percentage of 66.7% for VDL-ORET buses. These buses accounted for 41% of the operational fleet, 45% of the routes, 38% of the passengers carried and 45% of MMT's annual mileage. The first managing director and his technical manager had to build up the bus company from scratch. Data show a rapid increase of passengers in the period 2003–2006. From a maximum of 55 million transported in 2006, the number gradually declined to under 30 million in 2009, mainly due to the shift from city to intercity and urban-rural transport (lower frequencies, longer distances, fewer passengers but higher net revenues). Since then passenger numbers have remained stable at between 30 and 40 million per year.

Effectiveness including Impact

MMT's bus operations have had substantial positive longer-term economic, social and environmental effects on Ghana. The key longer-term effect not attained, however, is mitigating rising congestion in Ghana's major cities, which may have been an unrealistic goal from the outset. This challenge was further complicated by the difficult political environment in which MMT had to operate. The Government created MMT with a view to it playing a major role in passenger transport in Accra. This met with intensive resistance from *trotro* owners, who considered the government support of MMT as unfair competition. The grant agreement between FMO / ORET.nl and the Ghanaian government included the condition that separate bus lanes should be constructed in order to avoid the buses being held up in traffic. To date, these bus lanes have not been realised. Although the construction of separate bus lanes was

included in the public transport master plan for Accra, this stipulation in the agreement was not realistic because it went far beyond the leverage of the ORET transaction

The reason the ORET transactions did not result in the expected number of passengers was MMT shifting from city to rural-urban and intercity bus lines around 2007. This shift to bus services other than city was forced upon MMT in the face of unsustainable financial shortfalls generated by loss-making city lines and strong pressure from the powerful unions of *trotro* drivers on MMT to leave the cities. Although city lines generated high passenger totals, it was the rural-urban and intercity lines that were bringing in most of the gross revenues. VDL buses also had a much greater capacity for luggage than other buses in the fleet. Luggage transport has become a significant source of income for MMT – especially since the buses were redesigned for that purpose, allowing market women to transport their goods at an affordable price. This cross-subsidization assisted MMT to remain financially viable while still enabling it to run city bus services, though at a reduced scale.

Direct employment at MMT gradually increased to a total of 4500 in 2013. Despite declining passenger numbers after 2009, staff numbers rose until 2012 and only decreased slightly in 2013. Given the 40% share of VDL-ORET buses in the MMT fleet and revenues their contribution to employment was estimated at 1810 jobs in 2013, which is less than the 2612 jobs for 475 buses foreseen. MMT's management has made a conscious effort to hire more women, including for functions traditionally not held by women in Ghana, such as drivers. Jobs created by MMT are dispersed throughout Ghana, partly as a result of the shift away from city transport. The evaluation estimates that MMT's bus operations created about 1000 more jobs than they displaced from competing *trotro* drivers. In addition to direct employment at MMT, the ORET transactions also contributed to new employment at the Neoplan site: an estimated 200 temporary jobs for a six-year period. Thereafter the majority of jobs disappeared again due to a lack of new orders even though the Government of Ghana remains the majority shareholder of both MMT and Neoplan. Some knowledge transfer to the workers who Neoplan dismissed, has spilled over to a neighbouring area with workshops for metal engineering and vehicle repairs.

The estimated financial gain to the passengers using the six MMT bus lines studied add up to € 0.5 million per year in wage income and € 4.5 million in market sales. On all 6 lines except the Tamale-Damongo intercity line in North Ghana, market earnings facilitated by MMT services were far larger than wage earnings. In Ghana as a whole, MMT bus services are estimated to facilitate about € 28.4 million in annual earnings from wage income and an additional € 123 million from market sales by bus passengers. Besides this economic impact, various positive social and gender impacts can be attributed to MMT's services. MMT has created opportunities for market women to earn an income and provided access to jobs previously not held by women in Ghana. Qualitative evidence from the interviews supports the claim that MMT offers a bus service with better road safety than the alternative minibuses and in addition, for women, a ride free from the risk of sexual harassment.

MMT offers this relatively safe and reliable transport in all regions of Ghana at prices consistently and often substantially below alternative transport modes. MMT's main customers are Ghanaians with low income though not below the poverty line. Schoolchildren are another group that benefits, often free of charge. In some remote regions the MMT bus is the only means for children to travel to school, thereby making the difference between being able or unable to get an education. The cheaper fares of MMT result in considerable cost savings for passengers. Field research reveals that in 2014 the price differential between MMT and the next alternative (i.e. mini-buses) was between 30% and 53%, with even larger differences in the rainy season or during festivals, when minibus operators raise their prices. Extrapolating estimated cost savings from the six bus lines to the national level, it is estimated that MMT bus services save their passengers close to € 9 million in transport cost per year. It can therefore be concluded that the goal of offering an affordable transport option to the people of Ghana, especially the poorer segments, has largely been achieved.

MMT buses are significantly more fuel-efficient than alternative transport modes. On the six bus lines, fuel savings are estimated at 8.5 million litres of diesel per year, worth about € 6.8 million against the 2014 diesel price in Ghana. The CO₂ emissions saved per year as a result of MMT's bus operations amounted to almost 23,000 metric tons per year. Tentative extrapolations of these estimates to the national scale suggest fuel savings worth about € 50

million per year from all MMT's bus operations and CO₂ emission savings close to 170,000 metric tons (1.87% of national emissions).

While the impacts discussed above refer to MMT as a whole, they can to a large extent be attributed to the four ORET transactions. Both the delivery of 475 buses and the technical assistance played a key role in the creation of MMT, which might not have come into existence without the project. The positive financial end result depended crucially on revenues generated by the buses supported by ORET and the Belgian government, which could access the less accessible regions of Ghana much better.

Sustainability

Financial. The shift from city to intercity transport was a financial necessity but also a blessing in disguise for MMT which could otherwise have succumbed to its chronic revenue shortfalls. MMT has now been able to regain financial stability. The original set-up of a financially stable city bus company may have been unrealistic from the outset because even under more favourable circumstances, city bus transport tends to be less profitable than regional or intercity bus transport. Hence the ORET transactions have helped MMT to become a viable public transport company. In recent years MMT has even been able to buy some new Tata buses from retained profits, albeit a fraction of the total investments required and arguably a suboptimal choice in terms of technical sustainability. MMT does have concrete intentions to purchase a small number of VDL buses, to be financed from retained profits.

Technical. Though accounting for only a small part of the budget for each transaction (up to 4%), Dutch management and technical support have been crucial for the development of MMT. They have resulted in a transfer of knowledge and business practices that are still being implemented or built upon. It has even been suggested that without the technical manager MMT would have failed to maintain its buses properly. Benefiting from these policies, the current managing director and his Ghanaian predecessor have succeeded in keeping the buses reasonably well maintained. Of the total of 475 VDL/DAF buses supplied under ORET to MMT, 327 were still in service in March 2013. Many stakeholders attested to the robustness and durability of the VDL buses that have sustained MMT operations. Though the 25 buses sent to STC wore out in four years due to lack of maintenance, they were used almost non-stop and clocked up over a million kilometres. Skills and knowledge transfer for continuous in-house maintenance by MMT have, however, not been developed adequately as MMT still subcontracts some maintenance services. MMT's current lack of qualified staff in technical and engineering functions could affect the future use of buses.

Institutional. The Ghanaian successors were assisted by the Dutch technical manager who remained in charge of maintenance after his ORET-funded contract ended (in 2012). The policy of recruiting young "high potentials" to the administrative staff has not been sustained, with the hiring of management staff increasingly being influenced again by political appointments. The current management of MMT has launched a five-year strategic plan that holds much promise for institutional sustainability if implemented successfully. In view of its political and financial ties, MMT can never operate as private bus operator. It remains dependent on financial contributions from the government for investment and is still influenced by other politically motivated interventions, such as the way the rapid bus transport corridors in Accra and Kumasi are being developed, or the expected provision of social services. Being exempted from paying profit tax is seen as a form of compensation for MMT's provision of these "social" services. This implies that MMT is more or less forced to continue to operate less profitable routes, to provide free bus services for schoolchildren again (now officially abolished), to operate rural routes on bad roads, etc. Most of these are public services that offer good returns from a development perspective.

Relevance

The improvement of public transport has been a key priority of the Ghanaian government since the outset of the project, and this has been reflected in various other transport initiatives. The role of MMT in urban-rural transport remains critical as the provider of affordable and safe public transport. There is no doubt that ORET transactions have facilitated this role, notably by designing Africa-tailored buses that are able to cope with the most challenging road conditions.

The relevance of the ORET transactions for developing mass urban transit and reducing congestion in cities has been much more limited, primarily because the government has not taken adequate measures to prevent the growth of *trotros* and to stimulate the use of mass transit systems. In a sense there was an overreach of the perceived leverage of the project. The political environment in which MMT had to operate was underestimated, whereas the commitment of the Ghanaian government to assist the development of MMT was overestimated. In practice, MMT's role in city transport turned out to be a difficult proposition. Most bus terminals and other infrastructure of its predecessor OSA in Accra and Kumasi had been taken over by minibuses operators and in many cases never returned to MMT. This resulted in a lack of bus stops and access to terminals in areas with high customer demand. Government plans for creating dedicated bus lanes or even a fully developed Bus Rapid Transit (BRT) system for Accra have not been carried out to date, except for one BRT corridor in Accra. Without dedicated bus lanes or other measures that enable buses to avoid traffic jams, large buses have limited added value in densely built-up urban areas, because they are held up with the rest of the traffic. Arguably, the implementation of BRTs and the role of MMT in this were never very realistic from the outset, in view of the very high infrastructure cost, and VDL buses are not very suitable for a BRT system. MMT was more or less forced out of urban transport into intercity and rural-urban transport by politically better connected actors. Though not a deliberate policy, it became an unintended positive consequence, including from a development perspective.

Additionality

The additionality of the project is positive: without the grant from the Dutch government, Ghana would have been unable to purchase buses of the same quality as VDL. Instead, MMT could have bought inferior buses from Tata or Yaxing which have been shown to have a shorter lifespan. These buses do not generate employment in local assembly and consume more fuel (resulting in lower net revenue for MMT). Cash-strapped bus operators in developing countries, however, tend to favour these upfront low-cost alternatives rather than considering the total cost of running the bus service. The ORET transactions also generated a substantial number of jobs (mostly temporary) at Neoplan. More importantly, in contrast to the Belgian export development programme that only co-financed the delivery of the VDL Jonckheere buses fully assembled in Belgium, it provided a transfer of technical know-how.

Coherence

The ORET bus project is to some extent coherent with another project implemented in Ghana: the World Bank Urban Passenger Transport (UPT) project. That project enabled the rehabilitation of roads throughout Ghana, literally paving the way for MMT's buses and the regulation of the transport markets in Ghana.

The ORET grant contributed to VDL's ability to deliver buses to a market considered less accessible to Dutch export products. Previous experience with Neoplan and in delivery of buses to Ethiopia through an earlier ORET transaction gave VDL a level of familiarity with the Ghanaian context, in relation to the institutional and technical challenges of delivering buses capable of operating under far more difficult conditions than in developed countries. Feedback from MMT and staff at Neoplan about the performance of the ORET buses in Ghana allowed VDL and Neoplan to further adjust bus specifications to local conditions. As a result, Neoplan was able to construct buses better adapted to Ghanaian and sub-Saharan African conditions than buses assembled in the Netherlands; a spin-off was that later a bus company in Burkina-Faso put in a commercial order for these buses.

In all four ORET transactions, the export credits from ING were insured (ECI) by Atradius DSB against the risk of non-payment, with the finance cost consisting of the bank fees for the commercial loans and the insurance premiums co-financed from the grants.

1. Introduction

This case study evaluates the export of 500 Dutch buses and financial, technical and management support to Ghana, supported by the Dutch ORET programme. This Development-Related Export Transaction programme¹ is a facility funded by the Ministry of Foreign Affairs, aiming "to promote sustainable economic development and to improve the business climate in developing countries by facilitating investments in their economic and social infrastructure"². The present report serves as an input for the evaluation of the ORET programme covering the 2007 – 2012 period and beyond.

The evaluation is based on the following sources of information:

- Relevant documents in the ORET archives administered by ORET.nl such as progress reports, feasibility studies, technical reports and evaluations.
- Documents of the Dutch embassy in Ghana
- Documents and data provided by the bus company MMT and other stakeholders in Ghana
- Various academic papers and reports on the development of public transport in Ghana
- Interviews with stakeholders in the Netherlands and Ghana in April, May and June 2014
- Site visits to various locations in Ghana (Accra and Kumasi) in April and June 2014
- A survey among end-users carried out in July 2014

The team that evaluated the Ghana buses project was composed of the following persons: Dr Alexander Otgaar (senior researcher at RHV, Erasmus University Rotterdam, and coordinator of this case study), Mr Mawunyo Agradi (independent consultant), Jan-Jelle Witte (junior researcher at RHV, Erasmus University Rotterdam) and Otto Genee (senior evaluator at IOB).

The structure of this report is as follows. After this short introduction the second chapter describes the four transactions, the context in which these transactions took place (the development of public transport in Ghana) and the main stakeholders. The third chapter comprehends an explanation of the results chain and the method to evaluate the results. The subsequent chapters assess the transactions by looking at efficiency (chapter 4), effectiveness (chapter 5) and sustainability (chapter 6). Relevance, additionality and policy coherence are discussed in chapter 7. Chapter 8 summarizes the main findings.

¹ In Dutch: *OntwikkelingsRelevante Export Transacties*

² http://www.oret.nl/docs/ORET_brochure_eng.pdf, p. 4.

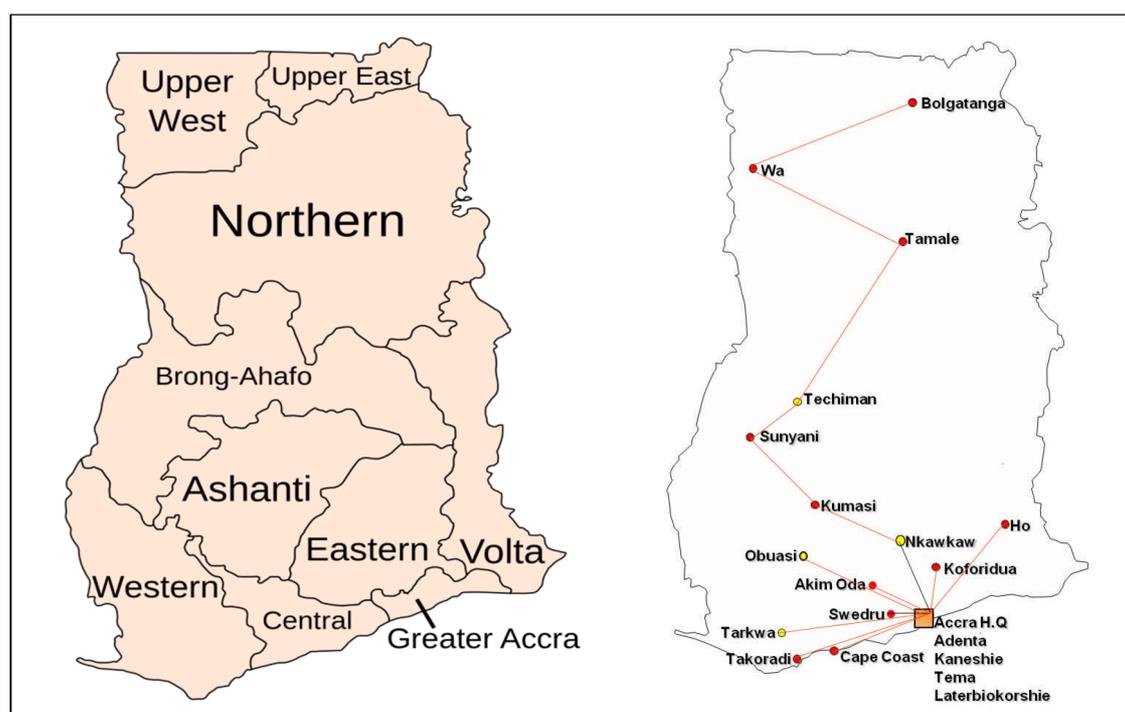
2. Project Overview

2.1 Country

Ghana has a population of around 25 million inhabitants, of which 70 per cent live in the southern part. Between 2000 and 2010 the population increased with annual growth rates between 2.4 and 2.7 per cent³. Most of this growth has been accommodated by urban areas, with more than half of the population living in cities nowadays⁴. Demographic models predict a further increase of the urban population to a share of 63 per cent in 2025⁵. As in other African countries, urbanization is raising the need for public transport modes with higher capacities ("mass transit"), in view of the increasing congestion caused by private transport and mini-buses (*trotros*).

Ghana is divided into ten administrative regions, as depicted in Figure 1 **Error! Reference source not found.**. The two largest cities are Accra (capital of Ghana) and Kumasi (capital of the Ashanti region) both with a population of around 2 million. Although the project initially mainly targeted these two metropolitan regions, the project has also influenced development in other regions as illustrated in figure 2.2 which shows the bus services operated by the recipient MMT⁶.

Figure 1: Administrative Regions of Ghana and Bus Services of MMT



Sources: Wikimedia Commons and Metro Mass Transit (MMT)

Ghana recently (in 2009) attained the status of "lower middle-income country", and qualified as non-LDC (Least Developing Country) during the project. The country basically exports primary products to the international world. Ghana is endowed with a lot of natural resources including gold, diamond, bauxite, timber and manganese. Besides, Ghana has discovered oil and gas in commercial quantities in June 2007 and started commercial production of crude oil on December 15, 2010. The country has realized revenues of US\$470 million, US\$567 million,

³ Ghana Population Stabilisation Report (National Population Council, 2011)

⁴ Source: <http://www.indexmundi.com/ghana/>.

⁵ Ghana Population Stabilisation Report (National Population Council, 2011)

⁶ This map only presents an overview of the main routes.

US\$730 million and US\$400 million from oil production in 2011, 2012, 2013 and the first half of 2014 respectively⁷.

Ghana has about 15,360 km trunk road infrastructural network (as of 2013). Since 2010, the percentage of roads with a surface condition classified as "good" (by the Ministry of Transport) increased from 29 to 58. The country used to have a railway system connecting Tema, Kumasi and Takoradi but the only functioning railway at the moment that carries passengers is from Tema to Accra. Apart from the international airline connections, the country also has domestic airlines that connect some of the major cities such as Accra, Kumasi, Tamale and Takoradi. There are three domestic airline companies: Antrak Air, AfricaWorld Airlines and Starbow Airlines.

2.2 The Client

The client was Metro Mass Transit (MMT), a public bus company that provides services in all regions of Ghana (see Figure 1). Founded in 2003 to replace the Omnibus Service Authority (OSA) of which it took over the physical asset, its shares are owned by the government (45%) and a number of "state and private investors" as shown in Table 1. Except for Prudential Bank Ltd, the private investors are largely owned and/or controlled by the Government of Ghana. The government directs investments into MMT through the purchases of buses for MMT and grants import duty exemptions on imported vehicles and spare-parts for MMT. The government appoints key management staff like the Managing Director and Board Chairman. The share of the government has been 45% from the very beginning of the project (the purchase of buses by the government has no influence on this percentage). As a result, MMT has a high level of government involvement, directly and indirectly.

Apart from the initial shareholder contribution to MMT, the private investors have not made subsequent contributions to MMT. However, these private investors sell various services or products to MMT to facilitate their operations: GOIL sells petroleum products to MMT, SIC provides insurance cover for all MMT buses, SSNIT provides a pension scheme for all permanent employees of MMT while Prudential Bank Ltd (PBL), National Investment Bank (NIB) and Agricultural Development Bank (ADB) are the bankers of MMT. These services are provided to MMT at the same (standardized) prices as other customers of the companies except for GOIL which gives some discount to MMT for purchases of fuel from the company.

MMT started operations with 17 second-hand Fiat-Iveco buses, donated by the Italian government and 75 buses bodied by Neoplan in Kumasi, using DAF chassis delivered through the Dutch ORET programme. Additional buses have since then been ordered from Yaxing (China) and Tata (India), but also more buses have been built at Neoplan on chassis of DAF and VDL and co-financed by ORET. Currently, MMT has a fleet of more than 1000 buses.

Table 1: The Shareholders of MMT

| Shareholder | Nature Contribution | Amount GH¢ | % Shares |
|---|---------------------|------------------|----------------|
| Government of Ghana | Fixed assets | 2,443,821 | 45.00% |
| State Insurance Company (SIC) | Cash | 314,921 | 5.83% |
| National Investment Bank | Cash | 502,600 | 9.33% |
| Ghana Oil Company Ltd (GOIL) | Cash | 414,000 | 7.50% |
| Agricultural Development Bank Ltd | Cash | 903,882 | 16.67% |
| Social Insurance & National Insurance Trust (SSNIT) | Cash | 621,000 | 11.50% |
| Prudential Bank Ltd | Cash | 97,821 | 1.67% |
| In Trust (Held by NIB) | Cash | 132,198 | 2.50% |
| Total | | 5,429,613 | 100.00% |

⁷ Source: <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=314026>

Source: Five-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report (ING Consult 2013)

MMT operates three types of services⁸:

- 1) **Intra-City** Bus Services, mainly in the highly congested urban areas of Accra, Takoradi, Kumasi, Cape Coast, Sunyani and Tema. These routes are relatively short (<39 km). These operations with a high frequency and many stops cover about 36% of all services.
- 2) **Inter-Urban or Rural-Urban** Bus Services, linking rural areas to urban centres. These services (with low but constant frequency and distances between 40 and 139 kilometres) can be found in more remote regions such as the Upper West, the Upper East, the North, Ashanti and East. Higher frequencies apply to so-called Shuttle Bus Services between the city outskirts and central bus terminals, such as the one between Tema-Accra. The share in total operations is 32%.
- 3) **Inter-City** Bus Services, low-frequency services connecting two cities over distances of more than 140 kilometres. For example between Accra and Ho. Or between Tamale and Kumasi. Share: 32%.

2.3 The Transactions

As shown in Table 2 below, the project consists of four transactions, one of which was only recently completed. The project not only involves the delivery of chassis and knock-down materials for locally assembled bodies, but also management and technical support and the delivery of spare-parts. Technical assistance was included in all four transactions.

The four transactions add up to an amount of around €73.6 million, with €27.6 million covered by ORET grants. While the first two transactions received a grant of exactly 35% - the maximum for non-LDCs - the last two transactions received a grant of up to 39%. Ghana succeeded in applying for additional grant funds to cover the costs of technical assistance, in response to a modification to the programme in 2006. The remaining non-grant amount has been financed by export credits (commercial loans) from ING Bank to the Government of Ghana (with the Ministry of Transport as responsible line department and the Ministry of Finance as contract party). In all four transactions, export credits from ING were provided that used export credit insurance (EKV) against the risk on non-payment. ORET compensated - to a varying degree - the finance costs (bank fees and EKV insurance premium for the export credit) from the grants. The finance costs amounted to an average share of 10.5% of the non-grant part). In all four transactions direct sourcing to VDL was applied because ORET was a tied-aid programme in non-LDCs. The Dutch content share in the four transactions varies between 57.4% (GH00039) and 62.0% (GH00029), with an average of 59.9% for the four transactions.

Table 2: The ORET Transactions

| Trans-action | Buses | Delive-red in | Com-pleted | Transaction Amount | ORET Grant | Grant % | One-off Finance Costs* |
|--------------|------------|---------------|------------|--------------------|--------------------|---------------|------------------------|
| GH00020 | 100 | 2005-2006 | 2008 | €12,766,085 | €4,468,130 | 35.0% | 11.5% |
| GH00029 | 100 | 2006 | 2007 | €14,693,000 | €5,142,550 | 35.00% | 8.8% |
| GH00039 | 150 | 2007-2008 | 2011 | €23,150,000 | €8,948,781 | 38.7% | 10.8% |
| GH/ID07056 | 150 | 2009-2010 | 2014 | €22,982,186 | €9,042,312 | 39.3% | 10.4% |
| Total | 500 | | | €73,591,211 | €27,601,773 | 37.51% | 10.5% |

Source: ORET. * Share of the non-grant amount

The four transactions have the same five objectives:

⁸ Five-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report (ING Consult 2013)

- 1) to improve public transport in Ghana, notably in the major cities, in terms of efficiency and reliability (by adding quality buses to the fleet; replacing unreliable and unsafe buses);
- 2) to help create a sustainable transport company (through technical and management support);
- 3) to reduce congestion in major urban areas such as Accra and Kumasi (by providing an alternative for *trotros* and taxis);
- 4) to save on fuel; and
- 5) to reduce emissions (through cleaner engines). All together, the transactions aim to enhance the sustainable mobility of citizens, and contribute to socio-economic development and poverty reduction in Ghana.

Photo 2: VDL Neoplan Bus



Photo 1: Tata Bus



Source: MMT

The VDL buses have been gradually added to the MMT fleet, sometimes replacing older buses. About half of the 500 buses are now used in the country's two largest metropolitan regions⁹: Accra and Kumasi. In the case of Accra these buses are often stationed in neighbouring towns such as Tema (162,000 inhabitants), Winneba (62,000 inhabitants) and Swedru (68,000 inhabitants). However, a large share of the buses operates from other stations in smaller and more remote towns such as Tamale (562,000), Takoradi (445,000), Sunyani (250,000), Cape Coast (228,000) and Bolgatanga (70,000).

2.4 Stakeholders

Apart from MMT and its shareholders, we can distinguish several other direct and indirect stakeholders in the project.

2.4.1 Ministry of Transport

The Ministry of Transport formulates overall national transport policy and implements policy together with other Ministries, departments and agencies like the Ministry of Roads and Highways, Departments of Urban Roads and Feeder Roads, and the Ghana Road Fund. Although incorporated as a limited liability company, MMT is considered an agency under the Ministry of Transport. As regards the delivery of buses under the ORET Programme, the Ministry of Transport entered into a sales and purchase contract with VDL for the delivery of the chassis. The Ministry gave authorization for the release and delivery of buses and spare-parts to MMT and STC in Ghana. The Ministry also applied to government and Parliament for the waiver of import duties on buses and spare-parts for MMT, which was indeed granted.

2.4.2 Ministry of Finance

The Ministry of Finance and Economic Planning works with various development aid agencies. With regard to the ORET programme, the Ministry was instrumental in processing the ORET

⁹ Detailed information on the spatial distribution is available for the first, second and third transaction. For the fourth transaction, the information is less detailed.

Grants and guaranteeing the Export Credit Facility (Loans) from ING Bank N.V to finance the purchase of the chassis and bodies. The Ministry was expected to repay the loans within seven years. In addition, the Ministry also arranged the release of other donor funds from various accounts including the HIPC Fund for the acquisition of other types of buses (e.g. Yaxing).

2.4.3 VDL

VDL Groep is an international industrial company, with headquarters in The Netherlands, focused on the development, production and sale of semi-finished products, buses & coaches and other finished products and the assembly of cars. Buses and coaches are produced in various European countries, including the Netherlands. VDL was the applicant of the four ORET transactions (under the name of Daf Bus International in the first transaction) and responsible for the delivery of chassis, bodies, spare-parts and technical support. The chassis and bodies for the ORET transactions were manufactured in Eindhoven, the Netherlands. VDL successfully applied for a similar development relevant export programme of the Belgian Government, which resulted in the delivery of VDL Jonckheere buses that were fully manufactured in Roeselare, Belgium.

2.4.4 City of Amsterdam/GVB

The City of Amsterdam has a long-standing cooperation with Ghana and Accra. It got involved in ORET with the secondment of two managers to function as managing director of MMT in the period 2005 – 2010. These managers had experience as director in the municipal public transport company (GVB).

2.4.5 Neoplan

Neoplan Ghana Ltd is a public/private company which specializes in assembling and building of bodywork for buses/coaches. It originates from Germany but is currently owned by the government of Ghana and an investor from Lebanon. The company operates from Kumasi, the second largest city of Ghana, but has also a workshop in Accra. Before the delivery of chassis by the ORET programme, Neoplan Ghana built buses for OSA, some universities in Ghana, S.O. Transport Ltd, and DEBAG Ltd, Burkina Faso. All the chassis and body materials imported from the Netherlands under the ORET programme were assembled by Neoplan Ghana Ltd. The company still has the capacity to assemble buses but currently only carries out the reconstruction of bodies of MMT buses which were involved in accidents. Due to the lack of new orders the factory currently operates far below capacity and had to fire valuable technical staff.

2.4.6 Mechanical Lloyd

Mechanical Lloyd is an auto-mechanic company. Mechanical Lloyd helped the Government of Ghana during the application stages for the delivery of chassis and also assisted in customs clearance of buses and spare-parts for the MMT. Until 2009 the company provided storage space for chassis and buses. Now, the company does not offer any of such services to MMT.

2.4.7 STC

STC was established in 1909 as a state company for public transport, connecting different towns and cities (inter-city). In 2000, it was decided to (partly) privatize the company; assets were purchased by a consortium of firms known as Vanef. Although STC is not an official partner in the ORET transaction, the company did receive 25 buses of the first ORET transaction (100 buses) because MMT was not able to take up all buses in its services right from the start. None of the buses are currently operational. Today, the company is owned by the Government of Ghana (20%) and the Social Security & National Insurance Trust (SSNIT) (80%), which is also one of the shareholders of MMT, and is struggling to survive in the competition with private companies in the intercity services market.

2.4.8 Accra Metropolitan Assembly (AMA)

AMA is one of the Local Government administrative MMDAs¹⁰ in Ghana. The assembly plays a significant role in urban planning, design and regulation of transport in the city of Accra. AMA

¹⁰ Metropolitan, Municipal and District Assemblies.

is also an important actor in managing congestion in the city of Accra and plays a key role in the allocation of bus terminals for both MMT and other transport operator unions. AMA has an Urban Passenger Transport Unit, which regulates and monitors passenger transport. The Unit has a database of all transport operators, but MMT is not involved in this (see 7.4).

2.4.9 GPRTU

The Ghana Private Road Transport Union (GPRTU) is the largest union of private commercial transport operators in Ghana. The Union comprises private commercial vehicle owners and drivers in Ghana. The members of GPRTU operate mini-buses (*trotros*) that provide intra-city, inter-city, inter-urban, and rural-urban transport services. The Union has branches in all ten regions of Ghana. The GPRTU is a major competitor to MMT in the urban transport market and the operations of MMT are often influenced by that of the politically well-connected members of GPRTU and vice versa. The other competing private commercial transport providers are Co-operative, Protoa, STC, VIP Bus Operators, OA Transport and Imperial Transport. In the first transaction GPRTU was supposed to be the client, but the Ministry of Transport decided to distribute buses among MMT and STC.

2.4.10 GAPTE

The Greater Accra Passenger Transport Executive (GAPTE) is an agency under the Ministry of Local Government and Rural Development which has recently been established to regulate urban passenger transport in Accra and Tema. A precursor organization known as pre-GAPTE was funded as part of a substantial transport sector loan from the World Bank and has been instrumental in developing and preparing for the pilot Bus Rapid Transit (BRT) on four major transport corridors in and out of Accra. The agency viewed MMT as a potential key stakeholder in the BRT project.

2.4.11 Ministry of Roads and Highways

The Ministry of Roads and Highways is responsible for all classes of roads: trunk roads, urban roads and feeder roads. The Ministry formulates policies on construction and maintenance of roads and implements such policies together with other agencies and departments like Department of Feeder Roads, Urban Roads Department, Ghana Highway Authority, Ghana Road Fund and the MMDAs.

3. Methods of the Evaluation

3.1 Theory of Change

The (intended) inputs, activities, outputs, outcomes and long-term results of the project are summarized in Table 3. This results chain has helped us to formulate a “theory of change” for the project.

Table 3: Results Chain

| Inputs | Activities | Outputs | Outcomes | Long-term Results |
|--|--|---|--|---|
| Financial: ORET, loan (Ministry of Finance, FMO, ING Bank, Atradius) | Financing the delivery of chassis, body kits and spare-parts (shipping) | 500 Neoplan (DAF/VDL) buses | Improved public transport reliability, safety, security, comfort, speed of travel, waiting time, affordability, etc. | Increased mobility and accessibility: more (ability to) travel (given budget constraints) |
| Technical: Chassis, body kits and spare-parts (VDL) | delivery of chassis, body kits and spare-parts (shipping) Assembly of buses (Neoplan) | | Local employment at Kumasi (Neoplan) | Increased access to employment opportunities |
| | Renovation of workshop and storage | Renovated workshop and storage | Change in the modal split (more people using the bus) | Improved financial health of public transport supply |
| Consultancy: Management time/technical staff (knowledge) (City of Amsterdam, VDL, Connexxion ¹¹) | Training drivers and mechanics | Trained drivers and mechanics | Less use of fuel | Less congestion |
| | Technical assistance (maintenance by Mechanical Lloyd) | Technical assistance (tools and knowledge) provided | Lower emissions | Less accidents in traffic |
| | Management assistance | Management assistance provided | More efficient management of public transport | A cleaner environment |

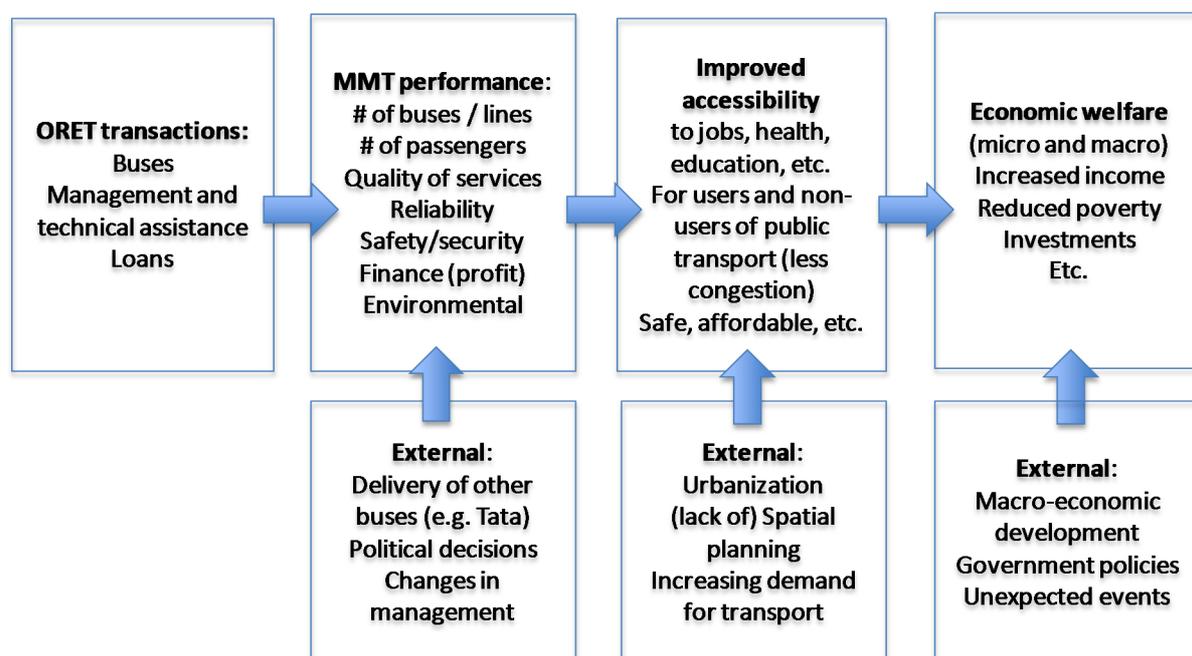
The theory of change is visualised in Figure 2. It presents an overview of the main causal relations that we will investigate.

First, the project is assumed to enhance the performance of MMT, the company that operates the buses. However, various performance indicators are also dependent on numerous external factors, such as the delivery of other types of buses and (political) decisions and changes in management at MMT. Most importantly, the 500 buses delivered through ORET make up only half of the fleet, making it difficult to allocate benefits of the transactions on the level of end-users (passengers) to the transactions. Passengers may not even be aware of the differences

¹¹ Dutch bus operator Connexxion sent a rostering and time tabling expert to MMT as part of the the technical assistance, as can be read in the documents on the 2nd transaction (GH00029). The company’s role in the project is small.

between various types of buses, although these differences are potentially relevant for users (in terms of comfort, safety, reliability, luggage space, etc.).

Figure 2: Theory of Change



Second, an enhanced performance of MMT adds to improved accessibility: a better access to jobs, healthcare, education and social networks. Also for this causal link, various external influences need to be controlled for. MMT is only one supplier of (public) transport, competing with other (mini)bus companies and other modes of transport (e.g. taxis, private transport). While the share of VDL buses in the fleet of MMT is quite substantial (around 50%), the share of MMT in the delivery of public transport is limited. Presumably the causal relation between the ORET transactions and improved accessibility and reduced congestion is relatively weak, the more so because of other external factors such as growing urbanization, the increasing demand for transport and the lack of spatial planning.

Third, improved accessibility contributes to economic welfare. This causal relation needs to be isolated from other external influences such as macro-economic development, government policies and unexpected events (e.g. the discovery of oil and gas in 2007).

3.2 Defining the Counterfactual

Ideally an ex-post evaluation identifies an outcome of interest that is measurable. The causal relation between outputs and outcomes can only be tested if it is possible to control for other factors. The question then becomes whether it is possible to define the counterfactual: what would have happened without the intervention?

Economic welfare is definitely an outcome of interest but since there are many other external influences, it is advisable to choose an indicator more to the left in the theory of change (Figure 2), notably because the causal relation between improved accessibility and economic welfare is considered to be strong and indisputable. One extra step to the left brings us to MMT's performance, which is not an outcome of interest, but rather a sub-objective to reach improved accessibility.

So, improved accessibility could in theory serve as the outcome of interest in a model that evaluates the impact (result -/- counterfactual) of the intervention (the four transactions). In practice, however, this turns out not to be possible, for the following reasons.

1. Accessibility should be defined as the number of jobs and/or amenities that can be reached within a certain amount of time. Such data is not available in Ghana. A survey could at best provide some insight in the "perceived accessibility".
2. It is not possible to define the counterfactual, which is an absolute condition for a true impact analysis. How to identify a control group (of individuals) which is comparable to the treatment group? They live in different places with different socio-economic conditions and densities. People who live in the same area cannot be excluded from the treatment (access to the bus). Also a comparison in time (before and after the treatment) seems problematic, due to the absence of a base line study and the limited ability of respondents to recall perceptions they had in the past.
3. The model should control for many factors that are either not measurable or for which data is not available (and could only be collected at high cost).

In view of the complications listed above, the impact of the intervention will be assessed in a more qualitative way, reconstructing the counterfactual and measuring the results of the transactions through a survey of beneficiaries, in-depth interviews with stakeholders, and an assessment of MMT's performance.

3.3 The Survey

3.3.1 Selection of Bus Lines

The aim of the survey was to identify the major user groups of MMT buses, and as much as possible to quantify the economic, social and environmental impact of their use.

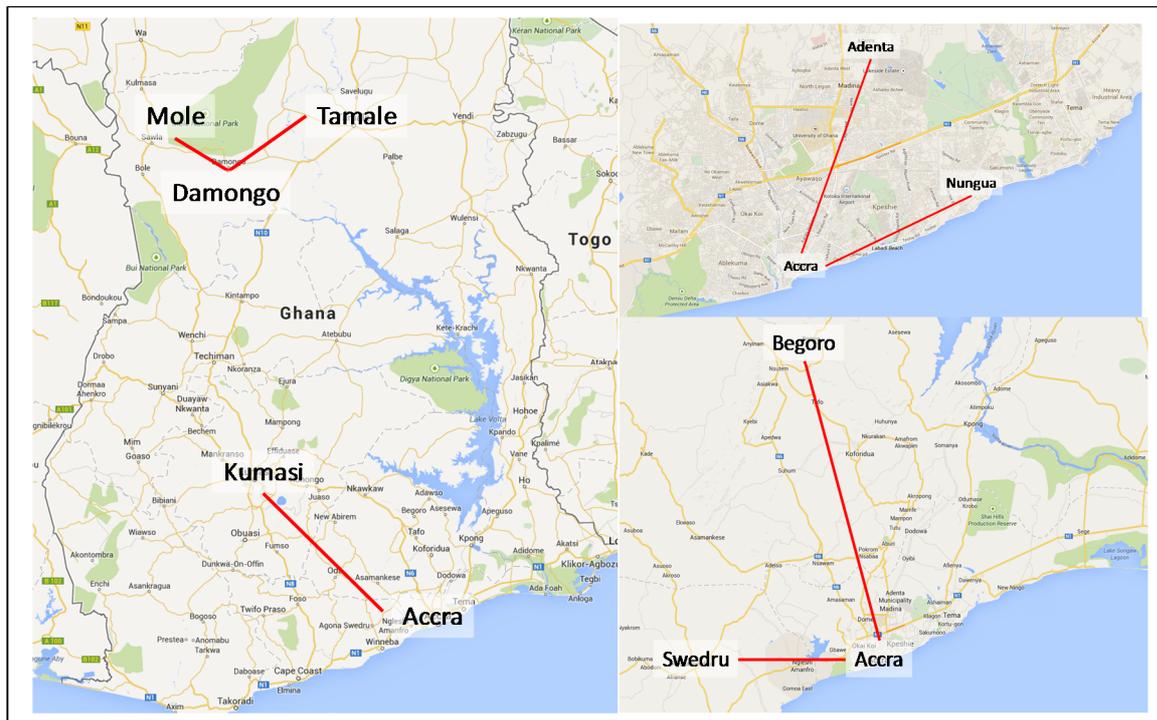
The bus lines (see Table 4 and Figure 3) were selected in a manner that all three types of bus lines identified by MMT (intra-city, rural-urban, inter-city) were represented, and with the goal of balancing the number of bus lines centred on the coastal regions of Ghana with lines that connect the Northern and Southern regions and lines centred on the Northern region. Furthermore, the six bus lines serve different user groups such as school children, market traders (mostly women), market visitors, business people, visitors of health facilities, etc. The selection has been constructed on the basis of interviews with MMT managers and experts, and through desk research and other information sources (e.g. site visits). Note that most MMT buses do not operate a scheduled bus service but instead, like mini-buses, only leave the terminal when sufficient passengers are on board.

Table 4: Bus Lines Selected for the Survey

| Bus Line | Type | Distance (km) | Region(s) | Return Trips per Day |
|---------------------|-------------|---------------|-------------------------------|----------------------|
| Accra-Nungua | Intra-city | 17 | Greater Accra | 9 |
| Accra-Adenta | Intra-city | 20 | Greater Accra | 32 |
| Swedru-Accra | Rural-urban | 75 | Central/Greater Accra | 12 |
| Begoro-Accra | Rural-urban | 124 | Eastern/Greater Accra | 1 |
| Tamale-Damongo-Mole | Inter-city | 230 | Northern | 1 |
| Kumasi-Accra | Inter-city | 253 | Ashanti/Eastern/Greater Accra | 3 |

Source: MMT

Figure 3: Bus Lines Selected for the Survey



3.3.2 The Pilot

Before the survey was implemented, a pilot was carried out to test the question items and learn about any practical challenges that may be encountered during data collection. The pilot took place on 23rd and 24th June 2014, with teams of two interviewers spending a full day of survey implementation on one intra-city line (Accra-Adenta) and one rural-urban line (Swedru-Accra). Given the multilingual character of Ghana, the interviewers who were selected are fluent in the languages expected to be most common on the bus lines under study. Moreover all interviewers are fluent in English. Before survey implementation, the Ghanaian consultant and the research team from the Netherlands together discussed translation issues with the interviewers, making sure the interviewers knew how to translate the English survey into other languages such that the meaning and intention of the original questions were preserved.

Interviews were carried out either at designated waiting areas at bus terminals, or on the bus itself. The interviewers were instructed to only interview passengers traveling on the bus lines under study, and to confirm this with the respondents. The intra-city pilot resulted in 67 valid responses, while the rural-urban pilot produced 85 valid responses. The survey teams reported very low non-response rates, with over 90% of the bus passengers they invited to participate in the survey being willing to do so. Based on the outcomes, a number of small changes were made to clarify survey questions and interview instructions.

3.3.3 The Questionnaire

The final version of the questionnaire - including instructions for interviewers - is included in Appendix A1.

Users were asked to provide information about the start and destination of their journey, their employment status, their age and the purpose of their trip. For several purposes an additional question was asked to get an indication of the economic impact of the trip. Subsequent questions dealt with the frequency of using the bus, whether or not for the purpose as specified before, the availability of alternatives on the route of the bus and the (dis)advantages of the MMT bus in comparison with other modes of transport.

3.3.4 Implementation

After corrections following the pilot research, the final survey was implemented in the period from 14 to 19 July 2014. Six teams of two interviewers each were selected, and each assigned to one bus line. The teams spent four or five full days implementing the survey, with the instruction to travel back and forth on the designated bus line and to invite all passengers to participate in the survey.

3.4 Interviews and Site Visits

Apart from the survey, interviews were conducted with various stakeholders. A research team visited Ghana twice: from 11 to 15 May 2014, and from 22 to 29 June 2014. Field visits were used to inspect the terminals and the buses, also to explore the conditions for the implementation of the survey and the selection of lines. The second round of interviews was combined with the implementation of the pilot survey and included a visit to the NEOPLAN assembly and maintenance site in Kumasi.

Interviews were semi-structured. Prior to the interview, discussion partners received a short explanation of the aim of the evaluation study. A complete list of discussion partners is included in Appendix A2. This list includes all key stakeholders identified in section 2.4.

Interviews were used to collect relevant data and to explore the impact of the ORET transactions following the evaluation criteria as specified in the Terms of Reference and using the theory of change (figure 3.2) as evaluation framework. Data includes metrics on the performance of MMT, e.g. regarding the fleet size and composition, passenger numbers, safety, fuel consumption, etc.

4. Efficiency

In this chapter we discuss the efficiency of the project. Efficiency measures how economically inputs have been used to generate the outputs as agreed, e.g. the delivery of buses and technical assistance. The present evaluation not only pays attention to the question if outputs have been realised as foreseen, but also if these outputs were realised on time and at the lowest costs.

4.1 Appraisal

The application for the first transaction took longer than normal: 1.5 years. Several reasons explain this delay, one being the rejection of the initial application. The initial application was rejected by FMO mainly because it was unclear which organization would operate the buses, with OSA still to be dismantled. The assessment of the first transaction (GH00020) also refers to the problems with getting the approval of the OECD Consensus participants, concerning tied aid, as well as to discussions on the financial and commercial feasibility of the project. There were also some questions about the institutional settings in which the project had to be implemented and the technical requirements for the goods to be delivered. It was advised to solve this issue in a new application, and moreover to split up the original application of 250 buses into applications for smaller amounts, thus reducing the risks for ORET.

In December 2002 a renewed application was received, which dealt with the issues mentioned above. This application included more concrete government plans for the restructuring of OSA into what would become MMT, with 45% of the shares owned by the government and 55% by private companies. Moreover the initial transaction of 250 buses would be split up in two transactions as a form of risk management. That the two transactions would be followed up by two additional transactions was not yet clear at this time.

In addition, the application included the appointment of a managing director and a technical manager from the Netherlands, in order to secure professional management in the start-up stage of the new bus operator. It was agreed to hand over the 100 buses in the first stage to the Ghana Private Road Transport Unit (GPRTU), which would become responsible for distributing the buses among several small metropolitan and city bus companies taking care of intra-urban transport. Later, the Ministry of Transport decided to distribute the buses among MMT and STC, as will be explained below.

In sum, the appraisal stage of the project (which started with one transaction and evolved gradually into a project with four transactions) took somewhat more time than the average ORET transaction, but there were good reasons to reconsider the design of the project. The initial rejection is understandable in view of the assessment criteria, with (financial) sustainability being rated low due to the uncertain and unstable institutional setting, especially having GPRTU as the counterpart.

4.2 Implementation

According to the evaluations of the first transaction (GH00020) that was formally completed, the transportation and handling of goods went well, apart from some problems with clearing the goods in the port of Accra. Clearance not only caused (minor) damage to the chassis of some buses (some scratches) but also took more time than expected due to bureaucracy. Nevertheless, the buses were taken into operation soon. The final evaluation of the third transaction (GH00039)¹² reports that the chassis were delivered in time and that the assembly of the buses went well. It concludes that "lessons have been learnt from the two previous transactions", which is confirmed by the interviews with MMT. The problems at the port were not completely solved, however. The clearance process still took a lot of time, making the chassis vulnerable to theft and damage.

In progress reports concerning the fourth transaction (GH/ID0756)¹³, VDL signals serious delays after the presidential elections in 2008. The Ministry of Transport was split up in two

¹² Eindevaluatie vastgestelde ORET-projecten 2011 (Oret.nl, 2011)

¹³ Oret.nl

ministries (with one ministry for Roads and Highways) which caused some confusion about responsibilities for this project. As a consequence the clearance of goods (which includes exemptions for import tariffs) at the port took more time than foreseen. In a progress report by VDL covering the period January-July 2009, we read that the payment of an invoice for technical assistance by VDL was delayed, because the Ministry of Finance didn't respond to a draw-down request.

The bureaucratic problems identified in the progress reports of VDL are confirmed by local stakeholders. It often took more than one month to get a letter from the Ministry to waive customs clearance, while the goods could only be stored in the port for one month. Apart from bureaucracy, one interviewee also refers to problems with communication: MMT was sometimes not informed beforehand about the planned arrival of goods. The communication between the Ministry of Transport and MMT could have been better, allowing MMT to be better prepared for the arrival of buses. MMT was not notified on when and how many buses they should prepare for. Initially, MMT did not have sufficient space for parking the buses and therefore had to park them at the premises of Mechanical Lloyd Company.

4.3 Outputs: Delivery of the Buses

In total 500 buses have been delivered to Ghana. In contrast to the first application, however, buses have not been handed over to members of GPRTU. A rapid increase of gas prices in 2003 caused an acute need for additional buses in the highly congested Accra metropolitan area. Of the 100 buses of the first transaction, the Ministry of Transport decided to transfer 25 to STC and 75 to MMT. At that time, MMT was not yet ready to take all 100 buses into operation. The remaining 400 buses delivered through the second, third and fourth transaction were all taken into usage by MMT.

4.3.1 STC

The 25 buses that were handed over to STC in the first transaction are not in use anymore because their engines broke down after four years. With an average mileage of 1 million km, the performance was nevertheless satisfactory. According to STC the buses were used very intensively while maintenance by STC was sub-optimal, partly because after-sales support started later than foreseen (e.g. the delivery of spare-parts). It is important to note that STC made a small change to the VDL buses, putting smaller tires on them to have better stability, but possibly making them more vulnerable to potholes. Usage by STC was not foreseen, possibly explaining the lack of technical support. The desk evaluation of the first transaction¹⁴ also mentions that technical support was not optimal yet; this improved significantly in the second transaction with the arrival of the Dutch technical manager from VDL. The impact of the decision of the Ministry of Transport to hand over 25 buses (5% of 500) to STC on the output and outcome of the project is marginal. The current evaluation mainly focuses on the impact of the 475 buses taken into usage by MMT.

4.3.2 Geographic Distribution of the Buses

Buses have been allocated to depots in the major cities – Accra (36) and Kumasi (14) – but also to depots in secondary cities such as Takoradi (10), Tamale (10) and Kumasi (14)¹⁵. The 100 buses of the second transaction were distributed among Kumasi (40), Accra (25) and smaller cities such as Bolgatanga, Wa, Tamale and Ho¹⁶. The 150 buses of the third transaction were allocated to even more depots in various regions of Ghana¹⁷. The overall conclusion is that buses delivered through the ORET programme are not only used in the two major cities (Accra and Kumasi) but also in various other cities and regions. This finding is supported by interviews with MMT and recent data on its fleet. A database on the current routes, supplied by MMT, provides some insight in the geographic distribution of buses among various depots. The conclusion is that VDL Neoplan buses are distributed all over the country, with operations in every region.

¹⁴ Eindevaluatie vastgestelde ORET-projecten 2009-2010 (Oret.nl, 2010)

¹⁵ One bus was involved in a serious crash and had to be taken out of service. Source: Eindrapportage ORET/Miliev GH00020 (VDL, 2006)

¹⁶ Eindrapportage ORET/Miliev GH00029 (VDL, 2006)

¹⁷ Eindrapportage ORET GH00039 (VDL, 2010)

4.3.3 Operational Buses at MMT

In March 2013, 452 buses of the ORET programme (VDL Neoplan) were still owned by MMT, of which 327 were actually in service (see Table 5).

The numbers in Table 5 correspond to some extent with the numbers in Table 2 (the four transactions). The 75 DAF buses are all part of transaction GH00020. The second transaction (GH00029) involves the delivery of 100 city buses. The third transaction (GH00039) covers 150 city and commuter buses, and the fourth transaction (GH/ID07065) 150 city and commuter buses. In the MMT database 225 VDL/DAF buses are registered as commuter buses and 251 as city buses¹⁸.

Table 5: Fleet of MMT

| Bus Type | Received since 2002 | Scrapped | Available in March 2013 | In Service in March 2013 |
|---------------------------------------|---------------------|------------|-------------------------|--------------------------|
| DAF | 75 | 23 | 52 | 23 |
| VDL Neoplan City | 251 | 1 | 250 | 189 |
| VDL Neoplan Commuter | 150 | 0 | 150 | 115 |
| Total VDL/DAF (Dutch/ORET) | 476 | 24 | 452 | 327 |
| VDL/ Jonckheere Comm. | 215 | 5 | 208 | 150 |
| VDL/ Jonckheere City | 148 | 0 | 148 | 130 |
| Total VDL/Jonckheere (Belgium) | 363 | 5 | 356 | 280 |
| Total VDL/DAF | 839 | 29 | 808 | 607 |
| Fiat-Iveco | 291 | 291 | 0 | 0 |
| Yaxing | 400 | 399 | 1 | 1 |
| Tata | 90 | 1 | 89 | 44 |
| Tata Marco Polo | 50 | 0 | 50 | 47 |
| Ashok Leyland | 100 | 0 | 100 | 87 |
| Total | 1,770 | 720 | 1,048 | 786 |

Source: MMT

Table 6: Capacity of Different Bus Types (2013)

| Bus Type | Sitting Capacity | Standing Capacity | Total Capacity |
|-------------------------------|------------------|-------------------|----------------|
| VDL Neoplan Commuter 1st Gen. | 65 | - | 65 |
| VDL Neoplan Commuter 2nd Gen. | 64 | - | 64 |
| VDL Neoplan City 1st Gen. | 34 | 70 | 104 |
| VDL Neoplan City 2nd Gen. | 34 | 70 | 104 |
| VDL Jonckheere Commuter | 63 | - | 63 |
| Tata Commuter 1st Gen. | 60 | 30 | 90 |

Source: Press release Metro Mass Transit bus types and their capacities (MMT, 2010)

MMT makes a distinction between first and second generation buses of both types, which gives an indication of the year of construction and the transaction in which each bus was involved. In 2010 MMT published an overview of bus types and capacities (Table 6), showing the main

¹⁸ In most of the overviews provided by MMT, Daf buses are registered as VDL Neoplan City (1st Generation) buses.

difference between city and commuter buses: city buses – meant for intra-city services – operate with standing capacity. In this press release MMT explains that “the buses with standing capacity are those buses that operate within the cities since they ply short distances. We hope you notice therefore the difficulty MMT goes through when commuters like those you might have encountered force themselves onto the buses without standing arrangements”. Interviewees indicate that Ghanaians don’t like to stand in the bus, which explains the resistance against using city buses with standing capacity.

The data reveals that 125 buses are not in service anymore, which means they need to be repaired or are about to be scrapped. The percentage of buses in service is 66.7%, which is lower than for the more recently acquired buses of VDL Jonckheere, Ashok (2012) and Tata (type Marco Polo, 2012), but significantly higher than for the Tata Commuter first generation buses (41.9%) that were acquired in 2006/2007¹⁹. VDL buses are generally recognized to be of a better quality than Tata, and more reliable, which is confirmed by the performance data if we compare with the buses delivered in 2006/2007. According to MMT, VDL Neoplan buses currently generate 43.8% of their revenues, which is higher than their share in the operational fleet.

Performance indicators of the different bus types (Table 7) give an indication of the role of VDL Neoplan buses in the current fleet and the contribution of the transactions to MMT’s performance. Buses delivered through ORET take a share of 40.9% in the operational fleet, 45.4% in the number of routes, 38.3% in the number of passengers and 44.8% in the total distance travelled. Nearly all Italian Iveco and Chinese Yaxing buses have been scrapped, with only one Yaxing bus still being operational (also see Table 5).

Table 7: Performance Indicators per Bus Type (2013)

| Bus type | Share in Routes | Share in Operational Fleet | % of Buses in Service | Share in Number of Passengers | Share in Total Distance Travelled | Fuel (litre) Consumed per 100 km | Share in Revenues |
|----------------|-----------------|----------------------------|-----------------------|-------------------------------|-----------------------------------|----------------------------------|-------------------|
| VDL Neoplan | 45.4% | 40.9% | 66.7% | 38.3% | 44.8% | 33.24 | 43.8% |
| VDL Jonckheere | 29.9% | 37.9% | 75.2% | 42.0% | 34.0% | 35.25 | 35.8% |
| Tata | 11.9% | 10.3% | 58.4% | 10.1% | 8.1% | 34.15 | 8.0% |
| Ashok | 12.5% | 10.9% | 72.6% | 9.5% | 13.0% | 29.10 | 12.4% |

Source: MMT, percentages calculated by authors

The overall impression is that VDL Neoplan buses are used more than proportionally for long-distance routes, in view of this type’s relatively large share in distance travelled, low share in passenger numbers and low fuel consumption in comparison with VDL Jonckheere. With an average yearly distance travelled of 95,000 km, VDL Neoplan buses apparently are used more often for longer-distance routes than VDL Jonckheere (78,000 km) and Tata (69,000 km) buses. The average annual mileage of Ashok buses is somewhat higher though: 104,000 km.

4.3.4 Spare-Parts

From the documents associated with the transactions, consignments of spare-parts, their delivery and clearance by Mechanical Lloyd (see paragraph 2.4.6) are evident. Spare-parts were supplied together with the chassis and bodies, which clearly distinguished VDL from other suppliers such as Tata and Yaxing. Most stakeholders appreciate this approach, although it must be said that Mechanical Lloyd also received spare-parts that were rarely needed.

¹⁹ Table 4.1 presents an overall indicator of the buses of Tata, which is a weighted average of the Commuter buses (2006/2007) and the Marco Polo buses (2012).

4.4 Institutional Support

Two Dutch expats, seconded and paid by the City of Amsterdam, have managed MMT for more than five years. The first Dutch MD started in January 2005 and left the company in May 2007. His successor managed the company until August 2010. The first MD was accompanied by a technical manager on behalf of VDL. His salary was – in contrast to the salary of the managing director – paid from the transaction’s budget. The first technical manager at MMT was replaced by the current technical manager in 2006. Progress reports by VDL indicate that on-the-ground technical support started later than foreseen, as was also expressed by STC. In the first transaction technical support was limited to checking the quality of the buses and ensuring repairs if needed. The current technical manager was financed from ORET technical assistance funds until October 2012. When the budget for technical assistance ran out, VDL decided to keep the technical manager in Accra at their own expense, for at least two more years. Interviews with both former managers give insight in their contributions to the firm’s performance and the conditions in which they had to work.

4.4.1 Start-up Problems

The first MD and his technical manager had to build the company from the ground up. This literally meant cleaning out the new premises of MMT (Kaneshie workplace). Hundreds of families living in discarded buses and people using the area as a market place had to be removed. The premises had to be renovated completely; there was no power, some buildings had no roofs, and there was no office furniture inside. Another challenge was to make the MMT premises - located in a valley - less vulnerable to floods. It took some time before the managers could actually start working, for one thing because they had to arrange their own housing and work permits, but also because the Ghanaian part of the budget (the loan) had not been made available to MMT yet. When the management team arrived, only 30 buses delivered in the first transaction were operational, but nobody knew on what lines. They were driving through Accra at random. Spare-parts for the buses had already rusted away at the depot, but still had to be paid.

Photo 3: MMT Buses at the Kaneshie Depot, Accra



Source: Authors

There were also problems with the city buses to be used in Accra and Kumasi on Bus Rapid Transit (BRT) lines²⁰. First, the BRT-concept was not being implemented because no dedicated bus lanes were constructed, so the buses got stuck in traffic. Second, it turned out that Ghanaians are not used to standing in a bus, meaning that the capacity of the city bus with standing places could not be fully used. Third, terminals and bus stations in the city center could not be used by MMT anymore. They used to belong to OSA, but were left unused when OSA broke down. GPRTU took them over, and refused to give them back to MMT. Thanks to the strong political lobby of GPRTU (especially at the Accra Metropolitan Assembly) it was very difficult to revert to the old situation, and MMT was effectively kicked out of the inner-city bus routes.

²⁰ BRT involves the introduction of scheduled services with dedicated bus lanes and/or priority at intersections.

MMT received a similar treatment in Kumasi where the MMT allocation at the Kumasi Kejetia Station was re-allocated to GPRU after a major renovation was carried out on the Kejetia Terminal by Kumasi Metropolitan Assembly (KMA). KMA Transport Committee only justified the decision by saying the weight of the buses was destroying the floors of the Kejetia Terminal. Alternative terminals allocated to MMT by KMA turned out to be a piece of land near a virtually deserted market at the outskirts of the city which MMT considers to be unprofitable for its operation. MMT in Kumasi therefore have to load most of the passengers of their buses from the MMT yard.

Only in Tamale, MMT managed to defend its ownership of the terminal. Also the idea to have regular, scheduled bus services in the city was not feasible. People in Ghana accept that the bus does not leave the terminal before it is quite full of passengers. In the end MMT decided to shift activities more towards inter-city services.

4.4.2 Theft

Another issue to be tackled was theft. In the beginning about 50% of all revenues were stolen by drivers and conductors. To counter this revenue leakage, the Dutch management introduced ticket sales at the terminal and regular checks of the cash registers, with mobile brigades of ticket enforcers. Hundreds of workers were fired because of theft. The labour union supported this policy in exchange for good labour conditions (pay relatively good wages, provide education, support measures for drivers in financial trouble, and amenities like toilets and ventilated waiting areas at bus terminals). Theft was one of the reasons why MMT reoriented itself towards inter-city services, as theft can be easier prevented at more orderly organised inter-city terminals.

Theft also was a problem at the Kaneshie yard. When the Dutch management team arrived, MMT had a strong bond with the local technical school. This school and OSA had both been created through German development aid. Students of the technical school did their internship at MMT, which basically worked well. However, there was a lot of unrequested use and theft of MMT property by the technical school. The MD decided to construct a wall between MMT and the school, and to end the influence of the school's head at MMT.

4.4.3 Institutional Environment

During their work the Dutch management team also encountered problems with the institutional environment. One of the main issues was the dominant role of the Ministry of Transport (at that time the Ministry of Roads and Transport), for example in hiring managers, buying other types of buses, selecting suppliers of goods and services, etc. For example, the Ministry ordered Chinese buses without informing the MD of MMT beforehand. Also it turned out to be very difficult to scrap the old Iveco buses because many people were against destroying this gift from the Italian government. Moreover, the Italians kept on sending second hand Iveco buses to MMT, for which they had to pay a fixed amount of 1,000 dollar for the custom's clearance, which in some cases exceeded the actual value of the bus.

The Ministry of Transport was subject to increasing political influence, as different regions wanted to be connected to the MMT system. The result is a highly dispersed system, with services in every region. As discussed above, political influence also explains the reorientation of MMT towards inter-city services, given the strong lobbying power of GPRTU. This wider geographic scope of MMT resulted in better access for people in rural areas, but a lower contribution to accessibility in urban areas, as will be discussed in the chapter on effectiveness.

Furthermore political involvement made it difficult to raise ticket prices. In 2006 the Ministry even decided that MMT should provide free bus transport for school children in uniform, without giving the company any compensation for this except for the repayment of the loans connected to the ORET transactions. In the end this resulted in a conflict between the Dutch MD and the Minister, and the decision of the MD to step down.

4.4.4 Financial Problems and Reorienting MMT

Also the second MD had to tackle serious problems. In 2007 the company was nearly bankrupt. It was decided to further reduce intra-city bus transport ("the biggest money drain"), and to focus more on profitable inter-city services. MMT came to the conclusion that

the infrastructure in Accra (and Kumasi) was not suitable for the kind of urban bus transport they initially had in mind (high frequency, fast, affordable). Buses were often stuck in traffic jams, while trotros could criss-cross through the traffic. Besides that, trotros were much faster in practice, because they didn't have to stop at fixed bus stops, and often broke traffic rules (driving much too fast in the city centre, finding short-cuts to get through traffic jams). So within the city, buses could not compete with trotros. The only customers for MMT were the poorest, who couldn't afford to take the trotro (MMT bus tickets were about 25% cheaper than taking a trotro).

Moreover, urban bus transport was mostly done with Chinese Yaxing buses, not with VDL Neoplan buses. They were more geared towards intra-city transport than the sturdy Dutch buses (that could better deal with the potholes in the poor roads outside the cities), but the quality was low and after-sales support was virtually non-existent (spare parts could not be delivered in time). As a consequence it was difficult to keep the Yaxing buses in service.

4.4.5 Efficiency

The Dutch management kept fighting the leakage of revenue. To avoid wastage of funds, expenses were checked on efficiency. Expenses had to be personally approved by the MD and were only approved if they increased revenue or saved cost. In order to reduce theft, the company started an awareness programme for employees, basically explaining them how important the continuation of MMT was for their daily lives, and making a direct link between passengers buying tickets and buses being able to continue to service their village. Mystery guests were introduced to check the behaviour of drivers and conductors: do they carry an ID-sign, do they keep the buses clean, and do they handle ticket sales correctly? When this was going well, MMT took the next step with "operation: show your ticket". This made passengers rather than drivers/conductors responsible for having a valid ticket. MMT instated a fine of 15 times the ticket price if passengers couldn't show a valid ticket. Furthermore, ticket inspections were intensified.

Another pillar of the strategy was to improve fuel efficiency and driving behaviour. At that time (2007) wages were so low that fuel rather than wage costs were MMT's main costs. So fuel efficiency was the key to success or failure of the company. MMT took draconic measures to reduce fuel use: they made a ranking of bus drivers, so every month drivers could see how they were doing. The worst performing drivers were warned at their work evaluation meetings, and if they couldn't improve their performance they were fired after three months. Fuel efficiency in terms of the number of kilometres driven per litre of fuel used improved almost 30%, purely because of the new way of driving.

4.4.6 Communication and Safety

The new strategy to develop more inter-city lines, forced upon MMT by competitors, turned out to be a blessing in disguise and paid off in the end. MMT also became known as a reliable supplier of public transport with a good safety record and affordable prices. While trotro drivers tended to increase the prices when demand is high, MMT had a policy of fixed prices. In the competition with trotros MMT designed a communication campaign which promoted MMT as "the safe option". This campaign was clearly linked to other initiatives such as the development of a high quality driving school, the introduction of "the new way of driving" (reducing fuel use but also raising comfort for passengers), the introduction of female bus drivers and the development of a tyre registration database for monitoring tyres from their entry into the company to their exit.

4.4.7 Human Resources Management

The second Dutch MD also invested a lot of his time in improving the management of the human resources. Essentially he tried to change the system in which appointments were based on political connections and age rather than skills and knowledge. Gradually managers in critical positions were replaced by younger people. He took advantage of a mandatory social service that students who study at university at state expense need to do for ten months after their graduation. At that time, MMT employed about 100 of such graduates every year, and several of them are now in the middle-management of the company.

4.5 Price/Quality Ratio

A price/quality check has been done during the appraisal stage²¹. With an estimated net price per bus of €135,000 (excluding costs of transportation), the price of a DAF/VDL bus manufactured at Neoplan was comparable to prices of competing imported buses of European suppliers. A chassis with a different body wouldn't change the price either.

VDL indicated that production at Neoplan was not cheaper than in the Netherlands because lower labour costs were offset by higher costs of quality checks and technical assistance in Ghana. VDL had to send three ex-pats for guiding and monitoring assembly at Neoplan. However, as discussed in section 5.2, assembly at Neoplan also generated downstream benefits in the form of local employment and skill-building.

Buses from Chinese and Indian manufacturers (Yaxing, Tata) are significantly cheaper but also inferior in quality. Several interviewees confirm this. VDL buses are appreciated because of their material quality, but also because of the good after sales services (including technical assistance, warranty, supply of spare-parts, etc.) that VDL provided. In comparison with the Asian competitors, VDL offers higher quality, though obviously for a higher purchase price, which included the costs of spare-parts.

It was difficult to keep the VDL Neoplan buses running all the time but this applies even more to other types of buses. Because each delivery of VDL-buses had different specifications, they also had their own issues. It sometimes took more than six months to find out what the issues were and how to solve them. For different bus types, spare parts had to be available, preferably at various depots throughout the country. If parts were missing, it took some time to get them from Europe. This is one important explanation for the fact that so many buses are not operational (see Table 5). Overall, however, VDL Neoplan and VDL Jonckheere perform better than Yaxing and Tata, notably because of the higher quality of the buses, good contacts with the supplier (VDL) and good management of the entire supply chain.

4.5.1 Subcontracting

For the second transaction (GH00029) there is an overview (prepared by VDL) of how the costs can be allocated among various actors²². It shows that that VDL takes a share of only 14% in "own production", leaving 47% to components that mainly (more than 50%) originate from The Netherlands. This implies that the Dutch content share amounts to more than 60%, as required by the 2005 ORET regulation and versions before that. The foreign content in this project (defined as companies of which more than half of the shares are owned by non-Dutch holders) takes a share of 22.8% and is mainly taken by Neoplan²³, a German/Ghanian company of which the Government of Ghana is the major shareholder. Other local costs add up to 16.6% of the budget, but Ghanaian subcontractors have not been specified by name. As discussed above, the choice to assemble buses at Neoplan has not affected the price/quality ratio compared to importing the buses. Taking lower labour costs offset by higher costs of technical assistance and control into account, the assembly and maintenance in Kumasi has had a considerable spin-off in Kumasi in providing employment and creating skilled mechanics.

²¹ Evaluation of the ORET transaction: delivery 150 buses to Ghana (HTM Consultancy, 2003).

²² Bijlage B bij eindrapportage GH00029 (VDL, 2007).

²³ Neoplan's share is 17.7%.

5. Effectiveness

This chapter evaluates the effectiveness of the ORET transactions for the delivery of buses to MMT. Effectiveness is understood as the extent to which the outputs created by the transactions have contributed to the achievement of the transaction's expected results or objectives in terms of the outcomes for the beneficiaries, the Ghanaian economy and VDL. The evaluation covers both short- and intermediate-term impacts, as well as long-term effects that the transactions created or contributed to. It covers economic, social and environmental impacts. Where possible, the impacts will be quantified.

5.1 Project Design and Overall Effectiveness

Before analyzing the impact of the ORET-MMT transactions in more detail, this section first addresses the overall expectations formulated as part of the project design. Two feasibility studies provide detailed overviews of expectations and are used as the basis for comparison in this chapter. The first study was done by NEI²⁴ and focuses on the first transaction (GH00020), while the second study by Ecorys²⁵ looks at the second transaction (GH00029).

Both studies have in common that they expect the support to MMT to alleviate the congestion and environmental burden caused by inefficiencies in Ghana's urban transport system, specifically the dominant role played by minibuses and taxis. The argumentation goes as follows: if MMT buses replaced a significant number of these less efficient vehicles, congestion would be reduced, fuel savings would be realised, emissions would be reduced, and the quality and affordability of transportation would improve for the relevant beneficiaries (the inhabitants of Ghana living in areas to be serviced by MMT buses).

These expected impacts depend firstly on the ability of MMT to transport significant numbers of passengers. NEI estimates that 100 buses will generate 690 million passenger kilometres a year, assuming an average capacity of 69 passengers, a 100% occupancy rate and annual mileage of 100,000 kilometres per bus. Moreover NEI expects 100 buses to transport 1,380,000 passengers a year (200 days * 69 passengers * 100% * 100 buses), which would correspond with 6,555,000 passenger kilometres to be serviced by 475 buses (the total project).

Ecorys argues, however, that it is not realistic to expect buses to reach this kind of annual mileage. They reason that the average speed of a bus is only 18-20 km/hour, which would imply that a bus needs to be operational 18 to 19 hours a day, which is inefficient and maybe even infeasible (also because passenger demand in non-peak hours is too low). The average speed seems to be based on an intra-city bus; average speeds for other types of buses will be higher, road conditions permitting. According to Ecorys, 100 buses produce "only" 367.2 million passenger kilometres, assuming an average capacity of 102 and a 90% occupancy rate. Remarkably, Ecorys claims that the 100 buses will be able to transport 22 million passengers a year, without explaining how they calculated this number. It would imply that each bus carries 220,000 passengers a year (22 million divided by 100), which is a number that maybe can only be reached with a bus rapid transit system, but not with a regular bus service. Multiplying this number by 475 gives an estimate of more than 100 million passengers for the entire project (475 buses) per year.

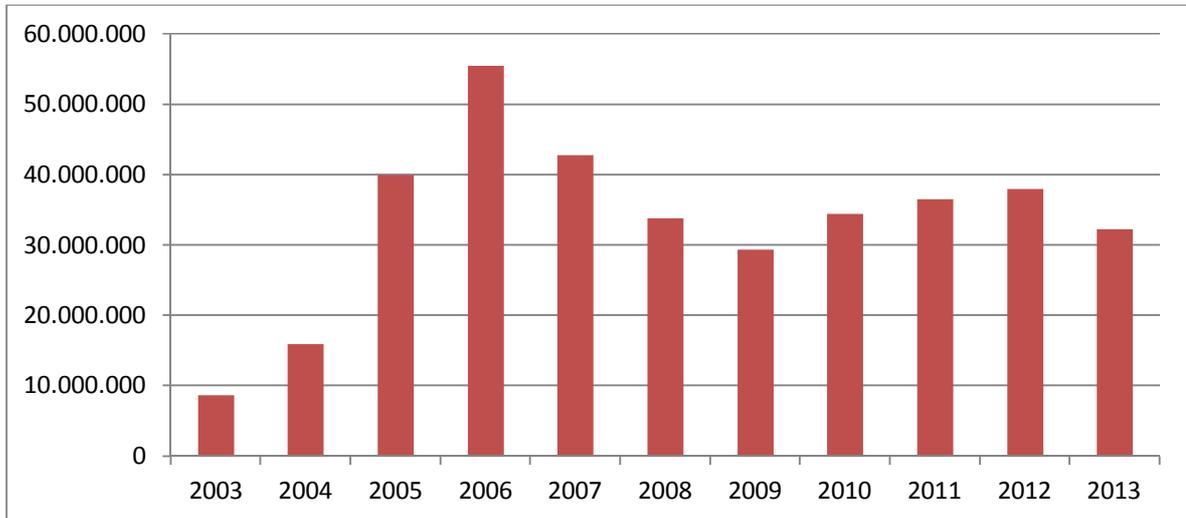
²⁴ Feasibility study 100 buses for Ghana (NEI, 2000).

²⁵ 100 City Buses for Accra, Ghana (Ecorys, 2003).

5.1.1 Distance Travelled and Passengers Carried

The total number of registered passengers²⁶ carried by MMT buses per year is available from 2003 to 2013 (see Figure 4)²⁷.

Figure 4: Total Number of Passengers Carried by MMT Annually, 2003-2013



Source: MMT

The data show a rapid increase of passenger numbers between 2003, the first year of operation, and 2006. From a maximum of about 55 million passengers transported in that year, the number gradually declined to under 30 million in 2009, mainly due to the shift from intra-city to inter-city and urban-rural transport (lower frequencies and longer distances but higher net revenues). Since then passenger numbers have remained stable between 30 and 40 million per year. Only part of these passenger totals is made directly possible by the ORET transactions. Table 8 shows a breakdown of the passengers carried by MMT in 2013, distinguishing three bus types: the VDL-Neoplan buses delivered through ORET, the VDL-Jonckheere buses subsidized by the Belgian government, and all other bus types.

Table 8: Passengers carried by MMT in 2013 per Bus Type

| Bus Type | Passengers Carried | Share |
|----------------|--------------------|--------|
| VDL-Neoplan | 12,356,481 | 38.4% |
| VDL-Jonckheere | 13,539,644 | 42.0% |
| Other MMT | 6,325,532 | 19.6% |
| Total | 32,221,657 | 100.0% |

Source: MMT

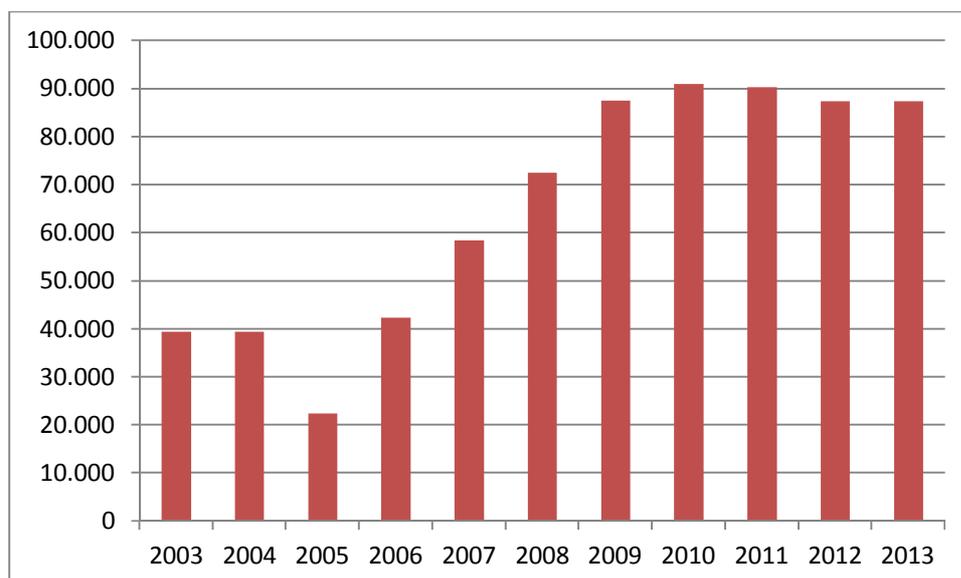
The data shows that about 12.4 million, or 38% of all passengers transported by MMT in 2013, can be attributed to the VDL-Neoplan buses delivered through ORET. A similar but slightly higher percentage was carried by VDL-Jonckheere buses, while the remaining bus types only account for one fifth of the total. This suggests that the buses delivered through ORET play an important role for MMT. The total of 12.4 million passengers exceeds the expectations of the feasibility study for the first transaction (6.55 million), but falls short of the number expected by the second study (100 million). It seems that the study by NEI was more realistic and even conservative.

²⁶ Registered passengers comprehends passengers who buy a ticket and passengers who are allowed to use the bus for free (e.g. school children in particular years).

²⁷ Data on leakage and non-paying customers has not been made available by MMT, but in the interview they claim that the number of non-paying customers is declining.

To understand the shortfall in passengers carried by ORET buses in comparison with the somewhat optimistic Ecorys study, Figure 5 shows the average distance (in kilometres) travelled annually per MMT bus between 2003 and 2013.

Figure 5: Average Distance Travelled Annually per Bus at MMT, 2003-2013



Source: MMT

The average distance travelled by MMT buses shows the opposite trend to the number of passengers carried, with a low point in 2005 and a strong increase between 2006 and 2009. Since then the average distance travelled has remained at a high of close to 90,000 km per bus. Table 9 provides a breakdown of the distance travelled per bus as well as the number of passengers carried per bus for the year 2013, distinguishing all types of VDL-delivered buses.

Table 9: Distance Travelled and Passengers Carried per Operational Bus per Year, 2013

| Bus type | Average Distance per Bus | Passengers per Bus |
|---------------------------|--------------------------|--------------------|
| VDL Neoplan City 1 | 70,188 | 40,834 |
| VDL Neoplan City 2 | 69,715 | 55,710 |
| VDL Neoplan Commuter 1 | 64,125 | 37,451 |
| VDL Neoplan Commuter 2 | 135,689 | 34,038 |
| VDL Jonckheere City 1 | 40,876 | 63,579 |
| VDL Jonckheere Commuter 1 | 108,078 | 40,115 |
| Average all bus types MMT | 87,426 | 45,479 |

Source: MMT

Comparing the expected to the realized figures for the VDL-Neoplan (city 1) buses shows two things. Firstly, the distance traveled per bus per year (70,000 km) is substantially higher than expected by Ecorys (40,000 km), but lower than foreseen by NEI (100,000 km). Second, the number of passengers carried per bus per year (40,834) is much lower than expected by Ecorys (220,000), but higher than estimated by NEI (13,800). The Neoplan City 2 buses show somewhat higher passenger numbers, while the Commuter 1 and 2 buses show lower figures. It has to be kept in mind that these data refer to 2013, when the buses delivered in the first two transactions (the one referred to in the feasibility studies quoted above) were between 6 and 7 years old.

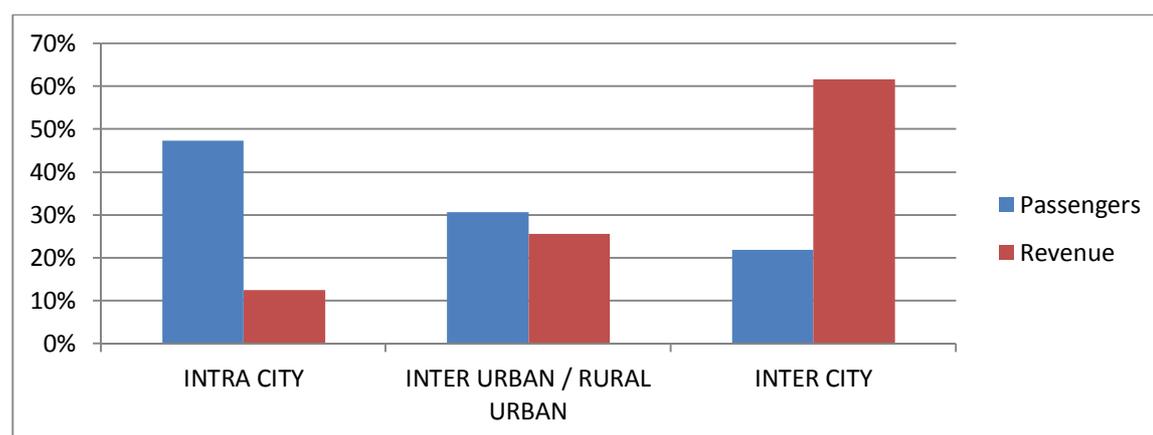
Both feasibility studies expected the buses to be used for intra-city services, which particularly becomes clear in the study by Ecorys as it assumes a high number of passengers, a short

average distance per passenger and a low average speed. From the very beginning, however, buses have also been used for other types of services (inter-city and rural-urban). Around 2007, MMT even had to take the decision to expand its inter-city and rural-urban bus services, at the cost of less intra-city services (see section 4.4). Intra-city bus routes tend to have shorter distances, allowing buses to drive at higher frequencies. As a result, the same number of buses can transport more passengers per year when they are used on intra-city routes. A shift to inter-city and rural-urban routes would be expected to result in higher numbers of kilometres driven per bus per year and lower numbers of passengers carried per bus per year, as is found in the actual data.

Alternative explanations are not likely. Lower than expected occupancy rates would produce lower passenger numbers per bus per year, but statements by MMT as well as findings from the survey suggest that occupancy rates were in the order of magnitude expected in both feasibility reports. Higher than expected congestion would result in both lower passenger numbers and lower distances driven per bus per year, but distance driven was found to be higher rather than lower than expected by Ecorys.

The shift to bus services other than intra-city was undertaken in the face of unsustainable financial shortfalls generated by intra-city lines. While intra-city lines generated high passenger totals, rural-urban and inter-city lines were bringing in most of the gross revenue. Figure 6 shows gross revenue and passenger totals for the three types of bus lines operated by MMT, with data for the most recent year (2013)²⁸.

Figure 6: Passengers Carried and Revenue Generated by Service Type, 2013



Source: MMT

It is clear from the figure that intra-city bus lines transport the highest number of passengers (close to half of the total), while bringing in a disproportionately small share of the total revenue (about 12% of the total). For rural-urban lines, passenger numbers and revenue are more in line, while inter-city lines generate over 60% of MMT's revenue by carrying only just over 20% of the total passengers. There are three reasons why inter-city transport contributes more to net revenues:

1. Intra-city buses consume more fuel than inter-city and urban-rural buses (2.48 km per litre versus 3.01/3.14 km per litre);
2. Passengers are willing to pay more per kilometre (total ticket sales per kilometre are 1.44 Cedi for intra-city versus 1.60 and 1.78 for the two other types of buses);
3. Luggage revenues are significantly higher on long-distance routes (around 8 million Cedi on inter-city services versus 1 million on intra-city services).

In conclusion, the ORET transactions have not attained the expected overall effectiveness in terms of the number of passengers carried as assumed by Ecorys. This was caused by a shift from intra to rural-urban and inter-city bus lines by MMT around 2007. However, this shift appears to have been necessary for assuring the financial sustainability of the company, due to the low profitability of intra-city transport in Ghana. Cross-subsidization from the more profitable rural-urban, and especially inter-city bus lines has enabled MMT to remain financially viable, enabling the company to still offer intra-city bus services but at a reduced scale. This

²⁸ Data is only available for 2012 and 2013, and the results are similar.

cross-subsidization depends crucially on the revenues generated by the ORET and Belgian government supplied buses. Having provided a general overview of MMT’s operations, the next section discusses the specific characteristics of the passengers carried by MMT as well as the impact MMT’s bus services has on their livelihoods and environment.

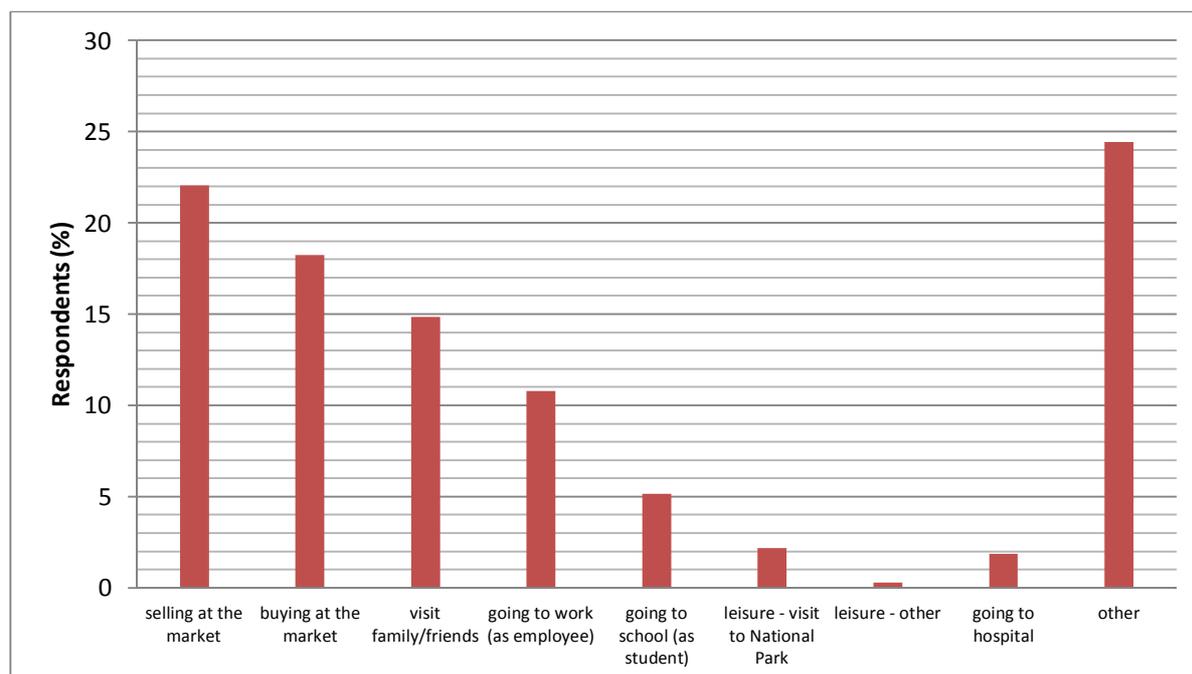
5.2 Outcomes in Ghana

This section provides more insight into the characteristics of passengers carried by MMT. Based on the findings from the passenger survey, the annual number of bus passengers is estimated for six representative MMT bus lines, distinguishing the most important target groups served by these lines. Moreover several indicators are estimated to quantify the impact of these MMT bus lines, specifically the economic impact, social impact and environmental impact. The focus of the analysis is on the impacts generated by the six bus lines studied in the survey. Additional estimates of the total impact of all MMT bus operations are presented where possible. These national-scale estimations necessarily require more assumptions to be made, and are therefore more tentative in nature than the findings on the six case study bus lines. Appendix A4 provides more detail on the assumptions behind the national-scale impact estimations.

5.2.1 Characteristics of Beneficiaries

To understand the characteristics of the beneficiaries of the ORET transactions, we first look at what kind of passengers benefit from MMT’s bus services. Bus passengers surveyed in the six bus lines were classified in target groups based on their trip purpose.

Figure 7: Bus Passengers Classified by Purpose of Travel for Six MMT Bus Lines



Source: Own research

As can be seen from Figure 7, the most important user groups of MMT bus services were found to be people going to the market to sell (22%) or to buy (18%) goods. In other words, 40% of the passengers on the six bus routes under study use the bus to go to the market. The third most important target group is formed by people who take the bus to visit family or friends (close to 15%), followed by employees who take the bus to work (11%). Smaller target groups are students going to school (5%), tourists (just over 2%) and hospital visitors (2%). A significant number of respondents used the bus for a different option than the ones listed here. An investigation during the pilot phase learned that some of the most common other trip purposes are church attendance, funerals, and visiting a government institution.

As discussed in section 3.3, the survey covered six bus lines which together are expected to be representative for the range of environments in which MMT operates. Hence the composition of target groups shows a wide diversity among the bus lines under study. Table 10 shows the first, second and third most common trip purpose for the six bus lines studied in the survey.

For most bus lines, selling and buying goods at the market are among the most common trip purposes. Most Ghanaians depend on open markets for all or most of their daily necessities, as well as durable goods. At the same time selling goods at these markets provides a livelihood to a large share of Ghana's population, particularly to Ghanaian women. MMT buses are particularly suitable for traveling to the market because of their capacity to hold large amounts of luggage (see Photo 4: VDL Neoplan Bus Carrying Luggage in AccraPhoto 4). It is common for market saleswomen to load all their goods (e.g. dried fish, fresh vegetable) onto an MMT bus, which takes them from the countryside into the country's major cities such as Accra and Kumasi. On arrival at the market, often within range of the bus terminal, they offload their goods and remain there until all goods are sold, after which they take the MMT bus home.

Table 10: First, Second and Third Most Important Travel Purposes per Bus Line

| Line | First | Second | Third |
|----------------|----------------------|----------------------|----------------------|
| Accra-Adenta | Market buying (33%) | Market selling (21%) | Job at company (19%) |
| Accra-Nungua | Other (31%) | Market selling (31%) | Market buying (19%) |
| Swedru-Accra | Other (34%) | Family/friends (34%) | Market buying (9%) |
| Begoro-Accra | Market selling (39%) | Family/friends (26%) | Market buying (13%) |
| Tamale-Damongo | School (20%) | National Park (19%) | Family/friends (17%) |
| Kumasi-Accra | Other (35%) | Family/friends (24%) | Market selling (19%) |

Source: own research

Taking the bus to work is only one of the most common trip purposes for the Accra-Adenta line, which is a relatively short intra-city line in the capital. The Tamale-Damongo line, a long-distance bus line (230 kilometres) in Northern Ghana, differs from the other lines by having students going to school and tourists visiting the local National Park as the most important trip purposes. The economic impact generated by the transportation of these various target groups will be quantified in the remainder of this section.

5.2.2 Displacement

Besides the transportation of substantial numbers of passengers, attainment of the expected impact of the ORET bus transactions also depends on the ability of MMT-buses to displace other transport modes with less beneficial characteristics. An appendix to the Ecorys feasibility study²⁹ estimates that bus passengers transported by MMT are likely to consist mostly of former passengers of minibuses or "trotros" (86%), with the remaining being formerly taxi passengers (14%).

²⁹ 100 City Buses for Accra, Ghana (Ecorys, 2003).

Photo 4: VDL Neoplan Bus Carrying Luggage in Accra



Source: authors

Displacement of these less affordable, less fuel efficient and more polluting transport modes is expected to lead to beneficial impacts of the ORET transactions on the people, the economy and environment in Ghana. The estimates quoted above refer to the original project design that aimed for MMT to focus on intra-city transport. The partial shift to rural-urban and inter-city transport may have changed the type of passengers serviced by MMT, including their former modes of transport. Table 11 shows the most common alternative transport modes mentioned by passengers in the six MMT bus lines studied. Respondents were asked which mode of transportation they would have used if the MMT bus had not been available to them. This was also taken as an indication of the transportation modes that were possibly displaced by MMT's bus services. The table also shows the percentage of respondents (under no alternative), who could not identify any feasible alternative transport mode, and responded that they had not made their trip if the MMT bus had not been available .

Table 11: Alternative Transportation Modes per Bus Line

| Line | First | Second | Third | No Alternative |
|----------------|-------------------|------------------|-------------------|----------------|
| Accra-Adenta | Minibus (92%) | Private car (3%) | Taxi (2%) | 2% |
| Accra-Nungua | Minibus (87%) | Taxi (5%) | Other (1%) | 4% |
| Swedru-Accra | Minibus (90%) | Other coach (5%) | Private car (3%) | 1% |
| Begoro-Accra | Minibus (76%) | Other coach (2%) | Private car (2%) | 20% |
| Tamale-Damongo | Minibus (54%) | Other coach (6%) | Private car (5%) | 32% |
| Kumasi-Accra | Other coach (50%) | Minibus (40%) | Private car (<1%) | 11% |

Source: own research

In line with the expectations formulated in the Ecorys feasibility study³⁰, the vast majority of passengers at all but the Kumasi-Accra line indicated the minibus or trotro as the transport mode they would have used if MMT buses were not available to them. On the intra-city and rural-urban lines (Accra-Adenta up to Begoro-Accra), the minibus constitutes the travel alternative for 76% to 92% of passengers. At the longer-distance Kumasi-Accra line other coach operators compete with MMT, and constitute the more expensive major transport alternative for MMT passengers. The taxi and private car are an alternative for only a small minority of MMT passengers, probably due to their higher cost. Commercial and private

³⁰ 100 City Buses for Accra, Ghana (Ecorys, 2003).

motorcycles were also included in the survey, but don't constitute a major transport alternative at any of the lines studied. Finally, a significant percentage of MMT passengers indicates not having any realistic transport alternative, and would have been unable to travel if the MMT bus had not been available to them. Particularly on the Tamale-Damongo line in Northern Ghana, and the line from rural Begoro to Accra, a large fraction of passengers strongly depends on MMT services. On the intra-city lines and the shorter rural-urban line Swedru-Accra almost all passengers have available and affordable transport alternatives.

Based on these findings, the displacement of other transport modes by MMT's bus services can be estimated. Estimates by line and by vehicle type are provided in Table 12. The assumptions behind these and other estimates reported in this chapter are discussed in Appendix A4.

Since most passengers indicated using the MMT-bus instead of a minibus, the estimated displacement effects from MMT bus services are predominantly at the expense of minibuses. The 25 MMT buses operating on these six lines are expected to displace a total of 57 minibuses, almost two-thirds of which is accounted for by the intra-city line Accra-Adenta and the busy rural-urban line Swedru-Accra. These two lines are also estimated to displace a significant numbers of taxis and private cars, with lower figures for motor taxis and private motorbikes. Finally a number of respondents indicated that they would have walked or used a bicycle as an alternative to the MMT bus. This would have resulted in less rather than more congestion and emissions (but arguably more time loss, discomfort and insecurity for passengers). This relatively small group is also taken into account in the following estimations.

Table 12: Estimated Number of Vehicles Displaced by MMT Buses, per Type and Bus Line

| Line | Minibuses | Other coaches | Taxis | Private cars | Motor taxis | Private motor bikes |
|----------------|-----------|---------------|----------|--------------|-------------|---------------------|
| Accra-Adenta | 19 | <1 | 2 | 16 | 1 | 2 |
| Accra-Nungua | 7 | <1 | 2 | 1 | <1 | 1 |
| Swedru-Accra | 17 | <1 | <1 | 7 | <1 | 2 |
| Begoro-Accra | 2 | <1 | <1 | <1 | <1 | <1 |
| Tamale-Damongo | 2 | <1 | <1 | 1 | <1 | 1 |
| Kumasi-Accra | 10 | 2 | <1 | <1 | <1 | <1 |
| Total | 57 | 2 | 4 | 25 | 1 | 6 |

Source: own research

5.2.3 Economic Impact

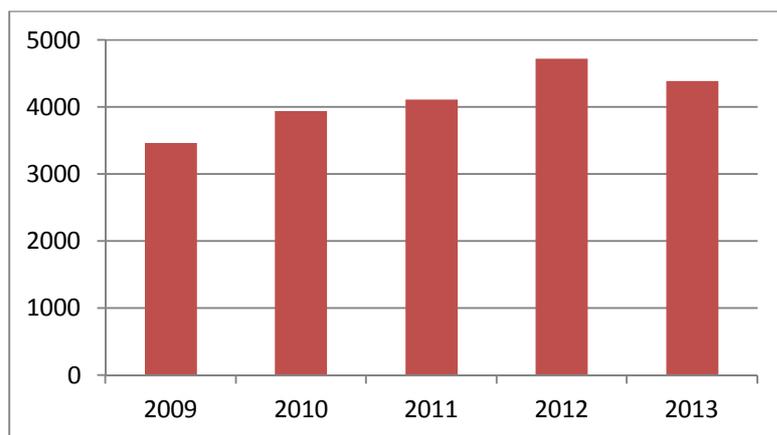
Two forms of economic impact will be analyzed here. Firstly the direct employment generated by MMT's own bus operations, and the employment caused by assembly and maintenance of MMT buses at Neoplan in Kumasi, Ghana. Secondly the indirect economic effects on livelihoods facilitated by MMT's bus services are estimated.

Employment

Direct employment at MMT has gradually increased to a total of around 4500 in 2013. Figure 8 shows the trend in employment for the years 2009-2013. Employment at MMT increased from 3466 in 2009 to 4725 in 2012, at which point the numbers appear to have temporarily stabilized. Even though the number of passengers decreased after 2009 the number of staff rose until 2012 and only decreased a little in 2013. In August 2013, when employment totaled 4526 staff, 80% of these jobs were classified as traffic operations, which include bus drivers, conductors and personnel at bus terminals. Another 8% were technical functions such as bus maintenance, and 6% financial functions such as handling sales revenue. The remaining 6% of jobs are mostly white-collar functions in management and administration³¹.

³¹ ING Consult (2013), 5 year strategic plan for Metro Mass Transit LTD (MMT), strategic and organizational assessment report

Figure 8: Employment at MMT, 2009-2013



Source: MMT

As discussed in section 4.4, MMT’s management makes a conscious effort to hire a substantial number of women, also in functions which traditionally are not held by women in Ghana. As a result, by August 2013 a total of 1078 or about 24% of MMT’s staff was female. Functions commonly held by women at MMT include finance but also traffic operations (mainly bus drivers). However the policy of hiring female workers shows different results in the different regions of Ghana. While in most regions in southern Ghana, which includes the capital Accra and Ghana’s other main urban centres, female workers make up a quarter or more of the total workforce, the northern region centred around Tamale, with a majority Muslim population, shows a percentage of only 11%.

Partly because of the shift away from intra-city transport, jobs created by MMT are dispersed throughout Ghana. Table 13 provides an overview of employment by region in August 2013.

Table 13: Employment at MMT per Region, August 2013

| Region | Employment | % |
|----------------|------------|------|
| Greater Accra | 1,759 | 38.9 |
| Central Ghana | 988 | 21.8 |
| Eastern Ghana | 579 | 12.8 |
| Northern Ghana | 559 | 12.4 |
| Western Ghana | 326 | 7.2 |
| Southern Ghana | 315 | 7.0 |
| Total | 4,526 | 100 |

Source: Five-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report (ING Consult 2013), own calculations

The capital region of Greater Accra shows the highest number of MMT jobs: about 39% of total employment. The relatively developed central Ghana that includes the second city of Ghana, Kumasi, makes up another 22% of the total. The other relatively wealthy region, southern Ghana, makes up 7% of MMT employment. While jobs in the most developed parts of Ghana constitute a majority of the total, there are still sizable numbers of jobs created in the less prosperous regions. Together the relatively peripheral northern, eastern and western parts of Ghana make up almost a third of total MMT employment.

The Ecorys feasibility report³² expected the creation of 550 structural jobs for 100 buses. Due a share of VDL Neoplan buses in the fleet and the revenues of around 40%, the current (2013) contribution to employment is estimated to be 1810 jobs. This number is lower than foreseen (2612 jobs for 475 buses), but we need to take into consideration that jobs were also created

³² 100 City Buses for Accra, Ghana (Ecorys, 2003).

in the years before and some buses are no longer operational or have been scrapped. Overall, the direct employment created by the ORET transactions is substantial and more or less in line with expectations.

Besides direct employment at MMT, the ORET transactions have also contributed to employment at the NEOPLAN assembly site near Kumasi, Ghana. This company carried out assembly of the buses delivered through ORET, which were shipped from The Netherlands as chassis and separate parts. Assembly at Neoplan created about 200 temporary jobs at Neoplan, for a period of six years (more detailed employment numbers were not available to the research team). This number exceeds the expectations of NEI (150), but is lower than estimated by Ecorys (500).

After completion in 2010 of the assembly of the buses delivered through the fourth ORET transaction, the majority of jobs created at Neoplan disappeared again. The company has assembled small numbers of buses for local universities and for other coach operators, and acquired one assignment from Burkino-Faso to build buses with a similar specification to the VDL-Neoplan buses. However, since 2010 a total of only 6 buses per year were assembled there. One important reason was the VDL Jonckheere buses were not assembled by Neoplan because the Belgian government insisted on keeping those activities and the accompanying jobs in Belgium. The government of Ghana, being the major shareholder of MMT and Neoplan, nevertheless decided to make this policy choice, leaving most of the production capacity at Neoplan idle. Besides this, Neoplan continues to carry out some repair work for MMT. Through these assignments, as of June 2014, Neoplan had managed to sustain about 65 of the jobs that were originally created through the assembly of ORET buses. A large part of the workers that could not be retained by Neoplan, have set up independent workshops in the nearby Suame-Magazine district. This has become one of the most important clusters of small-scale car repair and minibus conversion companies of Ghana. The skills and experience gained from among others the assembly of ORET buses makes these former Neoplan-workers highly sought-after employees. Many of them became successful independent entrepreneurs.

Besides positive impacts, MMT's bus services are also expected to lead to some negative impacts on employment. MMT is expected to displace a substantial number of minibuses, and smaller numbers of taxis and motor taxis. It is an open question whether MMT's services actually lead to previously operated minibuses, cars and motorbikes being taken out of service altogether, or rather prevent competing vehicles from entering into service on routes on which MMT is active. In either case, due to MMT's bus services a number of taxi jobs that would most likely have existed in the absence of MMT, are not currently available to Ghanaians. A tentative estimate for the number of displaced jobs puts the total on 128 jobs for the six bus lines studied in the survey, and 3492 in Ghana as a whole (see appendix for the assumptions used). If these estimates are correct, MMT's bus operations created just under 1000 more jobs than they displaced. However it should be kept in mind that these estimates, particularly those for Ghana as a whole, are tentative and should be interpreted carefully.

Interviews have been conducted with representatives of two of the affected sectors, namely GPRTU (the largest 'union' or cooperative of minibus drivers) and STC (the competing public coach operator). These interviews confirm that minibus and coach operators indeed experience negative impacts from MMT's bus operations on their business. The minibus operators (active in Accra) state that they make very small margins, mostly due to an oversupply of trotos but also partly due to MMT buses servicing the same routes as they do. Some claim that MMT buses also constitute unfair competition, firstly because of the subsidies it receives from the Ghanaian government but also because MMT is allegedly less strictly monitored by the traffic police for traffic violations and picking up or unloading passengers at non-authorized stops. Minibus operators state that if MMT were to expand their bus services, this would indeed displace minibus drivers. These drivers often belong to the poorest in Ghana because of their service conditions. Most minibus drivers are not the owner of their vehicle, operate on a commission basis without a minimum wage guarantee and have to hand over most of their revenue to the absentee vehicle owners (who tend to be relatively wealthy). Finally, representatives of STC, the competing coach operator, confirm that MMT is partly operating in their niche, which is focused on inter-city transportation. However STC, like MMT, also receives financial support from the national government. Moreover the financial challenges faced by STC can be traced back to the period before MMT came into existence and to continuing mismanagement, and hence cannot be attributed to displacement by MMT.

Impact on Livelihoods

Besides employment at MMT and Neoplan, the ORET transactions contributed to a variety of improvements in livelihoods facilitated to some extent by MMT's bus services. As discussed above, two of the main user groups of MMT bus services are employees traveling to their workplace, and small-scale merchants bringing their goods to market. Of the employees sampled in the survey about 70% were male and 30% female. For merchants traveling to market the opposite was found, with 77% female and 23% male. Based on survey findings on the trip purpose and income earned by bus passengers estimations have been made of the total amount of annual income earnings (in Euros) that were facilitated by the six MMT bus lines studied. Table 14 provides these estimates in euros.

Table 14: Estimated Earnings Facilitated by MMT Buses

| Line | Jobs in Companies | Market Sales in Euros |
|----------------|-------------------|-----------------------|
| Accra-Adenta | 373,766 | 1,934,950 |
| Accra-Nungua | 76,199 | 476,055 |
| Swedru-Accra | 6393 | 407,760 |
| Begoro-Accra | 4550 | 115,752 |
| Tamale-Damongo | 17,872 | 15,392 |
| Kumasi-Accra | 28,267 | 1,584,504 |
| Total | 507,047 | 4,534,413 |

Source: own research

The table shows that the estimated income earnings facilitated by the six MMT bus lines studied add up to about half a million euro per year in wage income and about 4.5 million euro in market sales. Thanks to a combination of high passenger numbers and relatively high earnings per person, the intra-city lines Accra-Adenta and Accra-Nungua, and the inter-city line Kumasi-Accra, show the highest estimated income earnings by MMT bus passengers. On all lines, except for the Tamale-Damongo inter-city line in northern Ghana, market earnings facilitated by MMT services were far larger than wage earnings.

However, the Tamale-Damong-Mole line contributes to people's livelihoods in a different way. The second most important trip purpose mentioned by passengers of this line, just after students going to school, is constituted by tourists who travel to Mole National Park near Damongo. This park is Ghana's largest wildlife refuge with important populations of elephants and antelopes. Due to insufficient public funding, the park depends on entry fees and expenditures by visiting tourists for most of its income. Most of these tourists come by MMT's daily bus services. Based on estimates of the number of MMT passengers visiting Mole National Park and total expenditures during their visit, this study estimates that MMT's Tamale-Damongo bus line generated about 293,767 euro in income from tourists visiting the national park. Of this sum, about 35,619 euro is expected to go to the park directly (jobs at the park), in the form of ticket sales and a 5% charge on all hotel revenue of the park hotel. The remainder of the estimated income, about 258,148 euro, is expected to benefit the local community in the form of wages and sales of goods and services to tourists (jobs around the park). About 40,000 people live near the borders of the national park, two-thirds of whom have an income below the Ghanaian poverty line. Poverty continues to drive some from the local community to poaching and illegal logging in the park³³. Income from visiting tourists not only contributes to the livelihoods of the local community but is also likely to contribute to halting poaching and illegal logging.

So far the economic impact of MMT's bus services has only been estimated for the six lines studied in the survey. For income earnings from wages and market sales it is possible to also make a tentative estimation at national scale. The assumptions needed for this national-scale extrapolation are described in the appendix. The result is that in Ghana as a whole, MMT bus services are estimated to facilitate about 28.4 million euro earnings in wage incomes, and an additional 123 million euro in market sales by bus passengers. This adds up to a total economic impact of about 151.4 million euro. When compared to the most recent estimates for

³³ <http://v-c-a.org/files/VCA-1308002-GH-MOLE-PROPOSAL.pdf>

Ghana's national GDP (2013 estimates, revised in April 2014³⁴), this represents about 0.39% of GDP.

5.2.4 Social Impact

Besides the economic impact of MMT's bus services, there are also social impacts that can be attributed to the company, and hence to a large extent to the ORET transactions. Firstly, MMT creates opportunities for women to earn income by giving access to jobs that were not previously commonly held by women in Ghana. Moreover, there is some qualitative evidence from the interviews that supports the claim that MMT offers higher road safety than other transport operators. Crash data is not specific enough to confirm or reject this claim. Another often mentioned advantage of MMT is that their buses offer a safer ride for women in terms of harassment compared to the minibuses, taxis and motor taxis that tend to be exclusively operated by men. In the predominantly Muslim region of northern Ghana the bus is also a more socially acceptable way for women to travel unaccompanied, particularly in areas where commercial motorbikes are the only alternative.

Another form of social impact is the extent to which the poorest have access to MMT's bus services. If bus tickets are still unaffordable to the poorest, the overall economic impact of MMT may still be significant but the distribution of benefits would be unequal. Table 15 shows the shares of income categories (based on estimated daily income) among MMT bus passengers on the six lines studied in the survey. Only passengers earning wage income or income from market selling were included in the comparison. The value of less than 1.25 dollar per day is the current World Bank international poverty line, while less than five dollar per day corresponds with the bottom 20% of wages in Ghana.

Table 15: Bus Passengers Classified per Income Category per Bus Service

| | Intra-city | Rural-Urban | Inter-City | Total |
|-------------------------------|------------|-------------|------------|-------|
| Less than 1.25 dollar per day | 1.1% | 4.1% | 5.6% | 2.4% |
| Less than 5 dollars per day | 22.8% | 27.6% | 31.5% | 25.1% |
| More than 5 dollars per day | 77.2% | 72.4% | 68.5% | 74.9% |

Source: own research

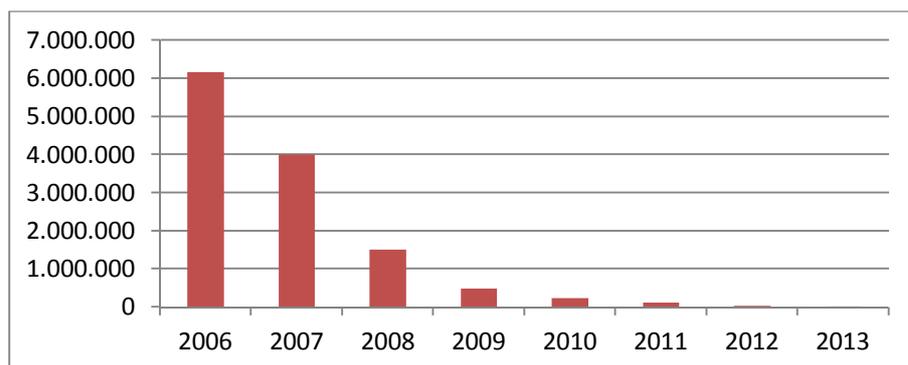
The data shows that only a very small percentage of MMT's bus passengers on the six lines are below the World Bank poverty line. According to the most recent estimates by UNICEF, about 28.6% of Ghanaians live below the international poverty line of 1.25 dollar per day, but this is true for only 2.4% of MMT bus passengers.³⁵ The percentage is marginally higher if we look only at the inter-city bus lines studied in the survey, where it reaches 5.6%. The percentage of passengers earning less than five dollar per day is substantially higher, at about 25.1% overall and 31.5% for the inter-city lines. Since this corresponds to the bottom 20% of wages in Ghana, this category of low wage earners is overrepresented among MMT bus passengers. In other words, Ghanaians with a relatively low income but not below the international poverty line, appear to be the main customers of MMT's bus services.

School children are another group that potentially benefit from MMT's services. In some regions of Ghana the MMT bus is the only means for children to travel between home and school, which could make the difference between being able to get an education or not. Starting in January 2006, MMT introduced – after a political intervention of the Transport Minister – a policy of offering free transport to school children in uniform. Figure 9: Number of School Children Carried by MMT for Free, 2006–2013. Figure 9 shows the annual number of school children that were offered free transport by MMT between 2006 and 2013.

³⁴ Ghana Statistical Service (2014), Gross Domestic Product 2014, available online at http://www.statsghana.gov.gh/docfiles/GDP/GDP_2014.pdf [accessed 7th October 2014]

³⁵ Unicef, Population below international poverty line of US\$1.25 per day, available online at http://www.unicef.org/infobycountry/ghana_statistics.html [accessed 7th October 2014]

Figure 9: Number of School Children Carried by MMT for Free, 2006-2013



Source: MMT

The figure shows a very high number of school children transported for free in 2006, the first year when the policy was introduced. However, from this peak of over 6 million school children carried, the number dropped quickly to about 1.5 million in 2008, and to almost insignificant numbers after 2010. The reason for this trend is that MMT was not compensated for its free transport by the national government, and faced heavy losses from school children taking up the seats that, given the high demand for transport in Ghana, would otherwise largely have been occupied by paying customers. For this reason, MMT's management attempted in 2007 to have the policy reversed. Due to heavy resistance from the Transport Minister, MMT was unable to fully abolish the policy but could scale it down to a minimal level. According to MMT (supported by the survey findings presented below), the actual number of school children transported for free in recent years was higher than the negligible figures reported in Figure 9 since many MMT bus drivers have stopped to systematically record the number of school children they transport. As of 2014, a full return of the policy of free transport for school children is again under discussion.

In spite of the changes in policy, MMT buses continue to transport significant numbers of school children, albeit mostly for a fee. Based on the survey data we can distinguish students or school children going to school or university, from all other types of passengers. It is not possible to distinguish between students and (primary or secondary) school children. All passengers going to school were asked whether they were allowed to travel for free or were asked to buy a ticket. Table 16 shows the percentage of students or school children for the three types of lines, and distinguishes paying from non-paying children. The data refer to the six lines studied through the survey.

Table 16: Students and School Children on the six MMT Lines (paying and non-paying)

| | Intra-City | Rural-Urban | Inter-City | Total |
|-------------------------|------------|-------------|------------|-------|
| School children | 3.4% | 1.5% | 13.0% | 5.2% |
| ..of which for free | 24% | 14% | 10% | 15% |
| ..of which not for free | 76% | 86% | 90% | 85% |
| Other passengers | 96.6% | 98.5% | 87.0% | 94.8% |

Source: own research

The figures show that on the six lines studied in the survey about 5% of passengers were students or school children going to school. On the inter-city lines the percentage is substantially higher, with about 13% of all passengers. Overall the vast majority (85%) of students or school children stated that they were not allowed to travel for free on this particular trip. Some differences by line type are visible, though they are based on very small numbers of respondents and should not be over-interpreted. In sum, even though MMT has mostly suspended its policy of providing free transport for school children in uniform, some students continue to benefit from free transport. Even for those school children who now have to purchase a ticket, the MMT bus services still offer a relatively affordable, and sometimes the only available transport option.

A final social impact of MMT's bus services is in generating cost savings for its passengers, since its fares are in most cases cheaper than all alternative transport options. An appendix to the feasibility Ecorys study³⁶ estimates that MMT fares will be between 0% and 23% cheaper than the most ubiquitous alternative, the minibus. Desk and field research reveal that as of 2014, the actual price differential is between 30% and 53%, with even higher differentials observed when minibus operators hike up their prices in the rainy season or during festivals. On some inter-city lines passengers also have the option of traveling with other coach operators. For example on the line Kumasi-Accra both VIP and STC offer competing luxury (air-conditioned) bus services, but there too MMT's fares are 44% cheaper. Other alternatives, including taxis, motorbikes and private cars, are also substantially more expensive than the MMT ticket fare. Based on survey findings on the alternative transport options available to MMT passengers (see Table 11) and price differentials between MMT and those alternative transport modes, the overall cost savings generated by MMT for its passengers can be estimated.

Table 17: Estimated Cost Savings per MMT Bus Line, per Year and per Trip

| Bus Line | Savings per Year including Taxis and Private Cars | Per Trip | Savings per Year excluding Taxis and Private Cars | Per Trip |
|----------------|---|----------|---|----------|
| Accra-Adenta | 212,735 | 0.34 | 116,704 | 0.19 |
| Accra-Nungua | 184,725 | 1.04 | 111,145 | 0.63 |
| Swedru-Accra | 367,776 | 1.30 | 281,066 | 0.99 |
| Begoro-Accra | 1,000,967 | 3.54 | 935,255 | 3.30 |
| Tamale-Damongo | 644,884 | 27.34 | 538,838 | 22.84 |
| Kumasi-Accra | 444,304 | 12.11 | 361,824 | 9.86 |
| Total | 2,855,391 | | 2,344,832 | |

Source: own research

The estimates in Table 17 show that MMT's bus services created significant benefits for its passengers. Savings would range from 34 eurocent per trip on the intra-city Accra-Adenta line to about € 27 per trip on the northern Tamale-Damongo line. The latter figure is particularly high because the few alternatives available to passengers on that line are several times more expensive than the MMT fare. The total savings generated by these six bus lines are estimated at about 2.9 million euro per year. The figures for the inter-city lines Tamale-Damongo and Kumasi-Accra are higher than expected. These savings could be overestimated if passengers identified the travel alternatives unrealistic because they are prohibitively expensive. For example, a bus passenger on the Tamale-Damongo line may have indicated that he would have taken the taxi if the MMT bus had not been available. However, on this line a taxi would cost about 25 Ghana cedi or 6.2 euro per person assuming two passengers, which may actually be prohibitive to most of these passengers. To account for this, estimates are also provided assuming that passengers, even if they indicated the taxi or private car as travel alternative, would actually end up using the cheapest alternative (minibus). This correction lowers the estimated annual cost savings generated by the six bus lines to about € 2.3 million and the savings per trip at Tamale-Damongo to just below € 23. When the results are extrapolated to the national level, it is estimated that MMT bus services generated close to € 9 million in savings for its passengers.

5.2.5 Environmental Impact

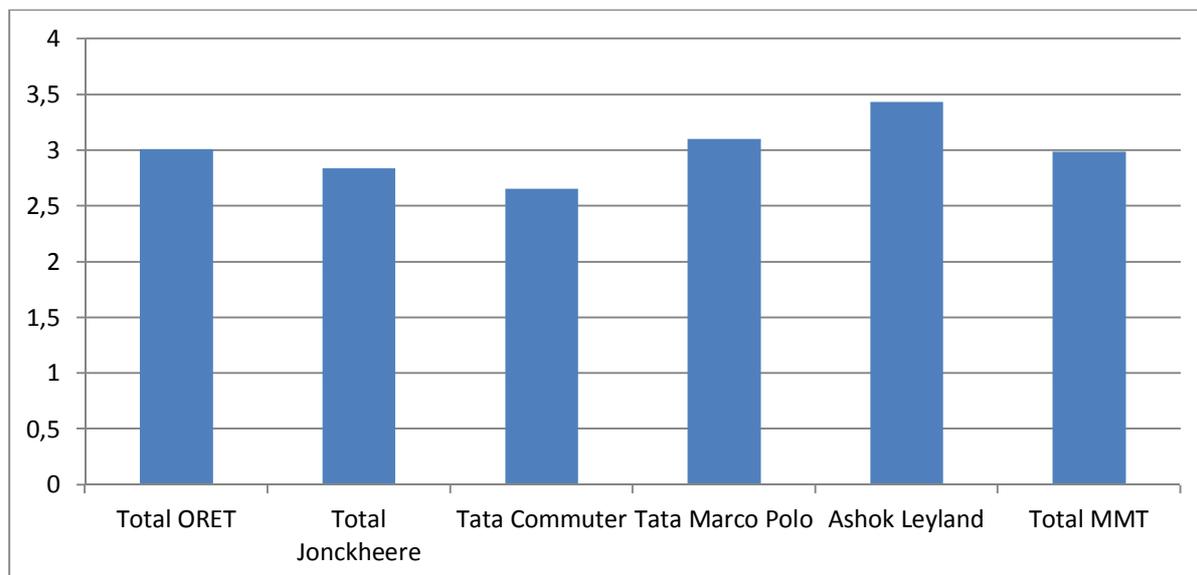
The final type of impact studied in this chapter is the environmental impact of MMT's bus services. As discussed earlier in this section, MMT buses are significantly more fuel efficient than the alternative transport modes. When MMT buses are compared to minibuses, taxis, motor taxis and private cars or motorbikes, most of the efficiency differential stems from the fact that MMT transports more passengers per vehicle. Even when MMT buses are compared to

³⁶ 100 City Buses for Accra, Ghana (Ecorys, 2003).

similarly large buses operated by competing companies, MMT buses were found to be more fuel efficient.

The feasibility study for the ORET transactions estimates that the buses delivered to MMT will have a fuel efficiency of about 2.5 kilometres per litre of diesel. Figure 10 shows the actual fuel efficiency of MMT buses in 2013 in kilometres per litre of diesel, distinguishing the ORET-delivered buses, the newer buses delivered through Belgian development assistance (Jonckheere), the two types of Tata and Ashok Leyland.

Figure 10: Fuel Efficiency of MMT Bus Types (in Kilometres per Litre of Diesel, 2013)



Source: MMT

The figure shows that with a fuel use of about 3 kilometres per litre of fuel, the buses delivered through the ORET transactions actually perform better than expected. This is in spite of the fact that at the time of measurement, the majority of the VDL-buses were already up to seven years old. The more recently acquired Jonckheere VDL buses delivered through Belgian development assistance performed slightly weaker in fuel efficiency, with just over 2.8 kilometres per litre. As one would expect, the recently acquired buses of Tata and Ashok consume less fuel per kilometre. However, the most interesting benchmark for the ORET buses are the Tata Commuter buses that were added to the fleet in the same years as most of the VDL Neoplan buses. With a fuel efficiency of 2.6 the Tata Commuter bus performs significantly weaker than the average ORET bus. For MMT the total fuel savings of using VDL Neoplan buses instead of Tata commuter buses are estimated at nearly € 1 million³⁷.

Based on the fuel efficiency reported by MMT, fuel savings have been estimated based on the alternative transport options indicated by MMT passengers and the efficiency differential that MMT has compared to these alternatives. Table 18 provides the estimated fuel savings expressed in the Euro value of the saved fuel and in prevented CO₂ emissions because of the difference in fuel efficiency. The estimates suggest a substantial beneficial environmental impact from MMT's bus operations. On the six bus lines studied in the survey, fuel savings are estimated to amount to about 8.5 million litres of diesel per year, which at the most recent diesel price in Ghana (80 eurocents per litre) is worth about € 6.8 million³⁸. The amount of CO₂ emissions prevented per year from MMT's bus operations on the six lines studied amounted to almost 23,000 metric tons per year.

³⁷ Savings are calculated by comparing the litres per kilometre performance of different bus types of VDL Neoplan with the Tata commuter bus at the current diesel price of 0.80 euro/litre. The differential varies between 0.014 to 0.062 litre/kilometre.

³⁸ In previous years fuel savings were probably lower because of lower diesel prices.

Table 18: Estimated Fuel Savings and Prevented CO₂ Emissions of MMT Buses

| Line | Fuel Saved per Year (euro) | CO ₂ Emissions Prevented per Year (metric tons) |
|----------------|----------------------------|--|
| Accra-Adenta | 328,557 | 1,108 |
| Accra-Nungua | 275,810 | 930 |
| Swedru-Accra | 1,140,956 | 3,847 |
| Begoro-Accra | 1537730 | 5,185 |
| Tamale-Damongo | 1475785 | 4,976 |
| Kumasi-Accra | 2034070 | 6,859 |
| Total | 6,792,908 | 22,905 |

Source: Own research

These estimates can again be tentatively extrapolated to the national scale. As discussed further in appendix A4, this requires the assumption that the six lines under study are together representative for MMT's national bus network. It also requires assuming that in case of unavailability of MMT buses, MMT passengers would indeed have used the alternative transport modes they identified in the survey. If passengers would instead have cancelled (some of) their trip(s), rather than using an alternative means of transport, then fuel savings attributable to MMT bus services would in fact have been lower than estimated here. Estimates at the national scale suggest fuel savings worth about € 50 million per year from all MMT's bus operations combined. This would constitute about 0.13% of the most recent GDP estimate for Ghana.

At the national scale, CO₂ emission savings are estimated at close to 170,000 metric tons. Compared to the latest World Bank estimates for the total CO₂ emissions in Ghana (2010)³⁹, these savings would constitute about 1.87% of total national CO₂ emissions from all sources. In light of the discussion above, these estimates need to be treated with due care and are more likely to be overestimated rather than underestimated.

5.3 Longer-Term Effects on Ghana

Having provided and discussed a range of indicators estimating the overall effectiveness of MMT, and its economic, social and environmental impact, this section takes stock of the effectiveness of the ORET transactions.

One of the key goals of the ORET transactions was to help Ghana's major cities combat their heavy congestion, by facilitating a shift to a more efficient transport system. Meeting this goal would have required MMT to transport large numbers of passengers in Ghana's main cities. As a result a substantial number of less efficient commercial vehicles would be displaced, resulting in lower congestion. While precise indicators to measure the trend in congestion are not available, the field and desk research as well as the expert interviews result in a clear conclusion, namely that congestion in Ghana's major cities has strongly increased rather than decreased as a result of increasing urbanization and more mobility related to economic growth. Because of MMT's shift away from intra-city transport towards rural-urban and inter-city transport, its market share in the main cities is limited. For example in the capital Accra MMT has a market share in the order of only 10%. This is not sufficient to seriously address congestion. However as discussed above, the shift from intra- to inter-city transport was a financial necessity for MMT, which otherwise would likely have succumbed to its chronic revenue shortfalls. As a mainly inter-city transport company, with a small and heavily cross-subsidized intra-city service, MMT has been able to regain financial stability.

³⁹ World Bank, CO₂ emissions (kt), available online at <http://data.worldbank.org/indicator/EN.ATM.CO2E.KT/countries/GH?display=default> [accessed 7th October 2014]

It can be argued that the original set-up of creating a financially stable intra-city bus company may have been unrealistic from the start. Even under more favourable circumstances, intra-city bus transport tends to be less profitable than regional or inter-city bus transport, not only in Ghana but also elsewhere⁴⁰. However some specific factors were identified in the fieldwork that made intra-city transport an even more difficult proposition for MMT. Plans for creating dedicated bus lanes or even a fully developed Bus Rapid Transit system have not been carried out nor was their implementation very realistic from the start in view of the very high infrastructure cost. Had these plans been carried out by the Ghana authorities, intra-city transport had been more likely to be financially sustainable. Dedicated bus lanes would have given the bus a strong competitive advantage vis-a-vis its rivals, through fast and dependable service schedules. In the absence of these measures, MMT buses operating on urban lines frequently get stuck in traffic jams, lowering their earning capacity and service quality.

Another issue discussed in section 4.4 is related to the institutional environment in which MMT has been operating. Before the start of MMT, many of its bus terminals and other infrastructure had been taken over by minibus operators. The strong political force of minibus collectives has meant that MMT in many cases could not retake the assets it formally held title to, leading to a lack of space for bus stops and bus terminals in areas with high customer demand. These issues were again most severe in the case of intra-city bus lines.

A second key goal of the ORET transactions was to offer an affordable transport option to the people of Ghana, especially for the poorer sections of the population. This goal has mostly been achieved. MMT offers relatively safe and reliable transport in all regions of Ghana, at prices that are consistently and often substantially lower than those of alternative transport modes. In this way MMT has improved the livelihoods of large numbers of workers and market saleswomen, who otherwise would have either lost a much larger share of their earnings to transportation, or may not have been able to sustain their livelihood altogether. While free transport for school children has mostly been suspended, substantial numbers of school children still benefit from the bus as a relatively affordable transport option.

The findings from the survey cast some doubt on whether the poorest in Ghana do in fact have access to MMT's transport services, since people with an income below the international poverty line constitute a smaller than expected share of MMT passengers. However people with a relatively low income (the bottom 20% of wages in Ghana) are strongly represented among MMT's passengers, suggesting that at least the moderately poor have good access to its services.

The relatively affordable services of MMT allow substantial savings for bus passengers. Transportation tends to be a heavy burden on household budgets in Sub-Saharan African countries, with families commonly paying 10% or more of their income on transportation⁴¹.

⁴⁰ Before MMT came into existence, its predecessor OSA only operated in cities and was unprofitable, while STC operated the (potentially) profitable inter-city lines. For an earlier ORET project in Ethiopia VDL also proposed inter-city buses, but ORET insisted on city buses since these are generally not profitable. VDL indicates that even in the Netherlands intra-city transport tends to be loss making, while regional/inter-city transport can be profitable. Also see: "Study of Urban Public Transport conditions in Accra" by IBIS Transport Consultants Ltd, 2005.

⁴¹ (2014 йил 24-6). Retrieved 2014 йил 9-9 from GhanaWeb: <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=314026>

Ecorys. (2003). *100 City Buses for Accra, Ghana*.

HTM Consultancy. (2003). *Evaluation of the ORET-transaction: delivery 150 buses to Ghana*.

Index Mundi. (2014). Retrieved 2014 йил 9-9 from Index Mundi: Source: <http://www.indexmundi.com/ghana/>

ING Consult. (2013). *FiveFive-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report*.

MMT. (2013). *Strategic & Organizational Assessment Report*. Accra, Ghana.

Reducing the bill for this large expenditure category is likely to make an important contribution to alleviating poverty. Moreover, the availability of affordable bus transport has allowed the government of Ghana to gradually abandon its fuel subsidies, without making transport unaffordable.

While the impacts discussed above refer to MMT as a whole, they can to a large extent be attributed to the ORET transactions. Firstly, the ORET project played a key role in the creation of MMT. Several interviewees indicate they doubt if MMT had come into existence without the project. Secondly, the buses delivered to MMT through ORET have enabled the company to add profitable inter-city lines to its network, cross-subsidizing the rest of its operations. The other buses available to MMT, mostly from India and China and of lower quality standards, are largely unable to run these long-distance routes, often crossing lower quality roads or even gravel. Moreover, the buses delivered through ORET, as well as those delivered through Belgian development aid, have a much larger capacity to transport luggage and have been redesigned for that purpose. This has become a significant source of income for MMT (luggage revenue made up 9% of MMT's total revenue in 2013), and also makes it possible for market saleswomen to transport their goods by MMT bus at an affordable price. If MMT had received a similar number of buses without the ORET specifications (not sturdy enough to travel on lower quality roads, and unable to transport large amounts of luggage), MMT's financial sustainability and economic impact would likely have been far lower.

In sum, MMT's bus operations have substantial beneficial longer-term economic, social and environmental effects on Ghana. Most of these impacts can be attributed – at least partly – to the ORET transactions. The key longer-term effect that has not been attained, however, is the mitigation of rising congestion in Ghana's major cities. This goal may have been unrealistic in the first place but was further complicated by the political environment in which MMT has been operating.

MMT. (2014). *Five-Year Strategic Plan*. Accra (Ghana).

National Population Council. (2011). *Ghana Population Stabilisation Report*.

NEI. (2000). *Feasibility study 100 buses for Ghana*.

Sietchiping, R., Permezel, M., & Ngomsi, C. (2012). Transport and Mobility in sub-Saharan African Cities: an overview of practices. *Cities*, 29, 183-189.

VDL Groep. (2014). Retrieved 2014 йил 9-9 from <http://www.vdlgroep.com>

5.4 Outcomes and Long-Term Results for VDL

Besides outcomes for the beneficiary, this report also considers the outcomes for the Dutch contractor VDL. The ORET grant contributed to VDL's ability to deliver buses to a market that may be considered less accessible to Dutch export products.

VDL and its predecessor DAF Trucks already had experience with the African market in general, and the Ghanaian market in particular. In the early 1990s DAF Trucks delivered buses to OSA, the predecessor to MMT. Moreover, DAF Trucks has worked with Neoplan, the assembly site for the ORET buses, since the 1980s. These previous experiences gave DAF Trucks and its successor VDL a level of familiarity with the Ghanaian context, both the institutional and political challenges and the technical challenges of delivering buses able to operate under far more difficult conditions than in developed countries (such as lower quality roads and far less regulated markets). Besides its experience in Ghana VDL could also draw on previous experience in Ethiopia, where many of the same challenges are present. VDL's bus delivery to Ethiopia was also part of an ORET transaction in the period 2000-2005.

Acting as contractor for the ORET transactions allowed VDL to deepen its knowhow for operating in the Ghanaian market. Feedback from the Dutch technical managers at MMT and from the staff at Neoplan about the technical performance of the ORET buses in Ghana allowed VDL to further adjust its bus specifications to local conditions. As a result, at the end of the ORET transactions, Neoplan was able to assemble VDL-buses that were better adapted to Ghanaian, and arguably sub-Saharan African conditions than buses assembled in the Netherlands. This is reflected by the order of Neoplan-VDL buses by a bus company in Burkino-Faso shortly after the ORET transactions, as this customer specifically asked for buses with the same specifications as those delivered to MMT. However, since the end of the assembly of ORET buses around 2010, much of the accumulated knowhow at Neoplan was lost because the company was unable to find enough assignments to retain the staff that gained experience and skills through working with VDL.

From the above one can conclude that VDL benefited from previous experience with the Ghanaian market, which most likely helped the company in its application for the ORET grant. At the same time the ORET grant was necessary for VDL to be able to finance the buses for MMT. Dutch bus manufacturers and European bus manufacturers in general, face heavy competition from Asian manufacturers, who tend to offer buses of significantly lower quality but also at substantially lower purchase prices. Cash-strapped customers in developing countries tend to favour these low-cost alternatives, as is the case in Ghana, rather than consider the total cost to run the bus service.

As argued in the previous section, the sturdiness and luggage capacity of the ORET-delivered buses was crucial for MMT to access profitable inter-city lines in less accessible regions, and hence assure financial sustainability, while on intra-city lines technical specifications of the buses could not solve MMT's problems with congestion due to the absence of dedicated bus lanes. However, since MMT largely depends on the Ghanaian government (specifically the Ministry of Transport) for the purchase of new buses, purchase decisions tend to be made not for technical or business strategic reasons, but rather on short term financial gains and sometimes also diplomatic grounds. The ORET grant allowed VDL to offer a sufficiently attractive package of price, quality, longer-term technical assistance and financing as a result of which the Ghanaian government was willing to purchase them, even though the buses were more expensive to purchase than the competing Asian products.

Since the end of the ORET transactions MMT has largely returned to purchasing, through the Ministry of Transport, Asian buses at lower purchase cost. However concrete intentions exist to also purchase small numbers of VDL-buses, financed from the retained profits accumulated by MMT. Although less relevant from a Dutch point of view, it is worth mentioning that the Belgian Jonckheere branch of VDL, which delivered buses through Belgian development assistance, has since acquired an assignment to deliver buses to Gambia on commercial terms. Although this contract doesn't create jobs in the Netherlands, it confirms the statement of a VDL representative that the delivery through ORET helped the company strengthen its reputation in Africa, and forms a strong reference that helps in approaching other potential African customers.

6. Sustainability

In this chapter we discuss the sustainability of the project, essentially addressing the question if the activities (providing bus services and maintaining the buses) can be continued when the contract between the supplier (VDL) and the customer (MMT) covered by the ORET transaction ends. Because the fourth transaction has just been concluded in May 2014), we cannot yet draw final conclusions about a situation without any relation between the supplier and the customer. Nevertheless, we will be able to discuss the sustainability of the effects identified in Chapter 5. Below, sustainability will be analysed along three dimensions: technical, financial and institutional.

6.1 Technical Sustainability

Provisions were made in the transactions to cater for maintenance, after-sales services and the supply of spare-parts. The Dutch expatriate service engineer/technical manager has been instrumental in providing adequate training of workers and maintenance services for the buses. The technical manager took charge of all the workshops of MMT in Ghana and ensured that buses were in good condition.

Several interviewees indicate that the presence of the expatriate managers has brought important benefits to MMT. Some even suggest that without the technical manager MMT would have failed in maintaining the buses properly. The Dutch management support has resulted in a transfer of knowledge and business practice policies which are still being implemented or built upon by the current management.

MMT does minor in-house maintenance with the support of the expatriate technical manager and outsources major maintenance such as reconstruction of bodywork to Neoplan Ghana. Skills and knowledge transfer for continuous in-house maintenance by MMT have not been developed adequately as MMT still subcontracts some of its maintenance services. The cooperation with the technical school could have enhanced skills and knowledge transfer, but this partnership broke down under the first Dutch MD, mainly due to his quest to protect ORET supplies and property of MMT from being borrowed or stolen through the school. However, the school continued to send a few students to MMT for traineeships. The new MD has revived the cooperation between MMT and the school. As a result, the school facilitates training of MMT drivers, repairs some MMT buses and as of June 2014 has about five students as interns at MMT. Currently, the technical school only sends few interns to MMT because the company has insufficient in-house equipment.

Although the expatriate staff has already left Ghana, the Neoplan site in Kumasi still has the capacity and necessary knowledge to assemble VDL-style buses; the only problem is the lack of orders to actually continue this work. Besides, the knowledge transfer to Neoplan has spilled over to the neighbouring Suame Magazine, an industrialized area with workshops for metal engineering and vehicle repairs. In this area previous workers from Neoplan are carrying out maintenance of passenger vehicles and some have set up their own mechanic repair shops.

Of a cumulative total of 475 VDL/DAF buses supplied under the ORET programme, 327 out of 452 buses owned by MMT were still operational in March 2013. During the interviews many of the stakeholders attested to the robustness of the buses and their durability thereby sustaining MMT operations. The 25 buses sent to STC wore out in just four years due to a lack of proper maintenance but ran over a million kilometres each since they were used intensively almost non-stop.

6.2 Financial sustainability

The transactions have helped MMT to become a viable company. VDL Neoplan buses generate 43.8% of current revenues, but from the interviews it becomes clear that the impact of ORET on the development of MMT has been much larger. One could even question if the company had survived without the ORET-funded buses and transfer of knowledge. The fact that the company has been able to purchase Tata buses without ORET-like grants illustrates the success of the transactions/project in terms of financial sustainability, although one could still argue that the technical sustainability of the newly acquired buses is suboptimal.

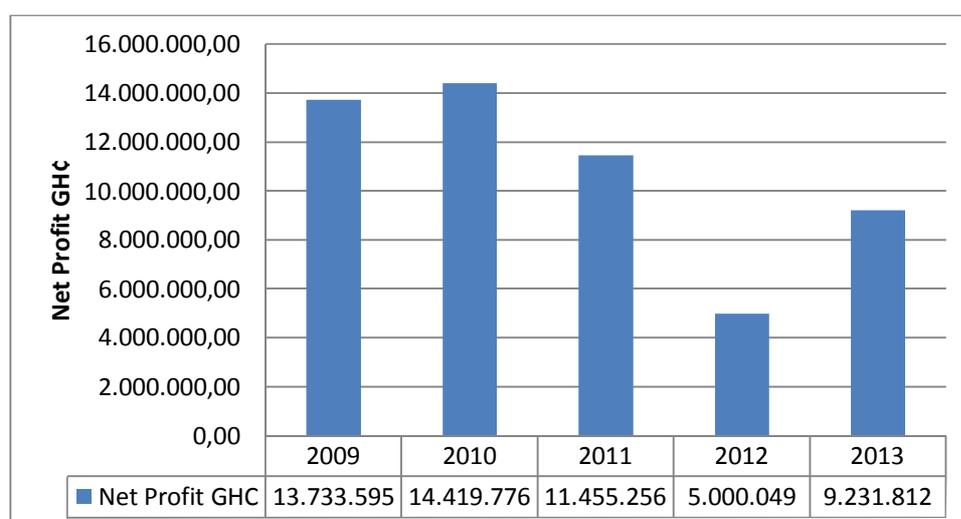
Table 19: MMT Profit and Loss Account (in millions of GH¢)

| | 2009 | 2010 | 2011 | 2012 |
|---|-----------|-----------|------------|------------|
| Operating income | 49 | 62 | 82 | 106 |
| Capital grant amortized | 20 | 24 | 26 | 27 |
| Total income | 68 | 86 | 108 | 133 |
| Operating expense | -52 | -66 | -87 | -115 |
| Gross operating profit | 16 | 19 | 20 | 18 |
| General and administrative expenses | -7 | -10 | -12 | -16 |
| Operating profit | 10 | 10 | 8 | 2 |
| Other income | 4 | 5 | 3 | 4 |
| Profit before interest & tax | 14 | 15 | 12 | 5 |
| Bank charges & interest | 0 | 0 | 0 | 0 |
| Profit before tax | 14 | 15 | 11 | 5 |
| Taxation | - | - | - | - |
| Profit after tax | 14 | 15 | 11 | 5 |

Source: Strategic & Organizational Assessment Report (MMT, 2013)

Between 2009 and 2012, the company was “profitable”, although it must be noticed that, without a government grant (Capital grant amortized), MMT would have made a loss each year (see Table 19). In other words, the viability and financial sustainability of the company was and is highly dependent on the contributions from the government. With this annual grant in the form of buses purchased by the government for the company and amortized (charged as income) over time, and added to operating income as total income, the company consistently realised increasing total income between 2009 and 2012. However, profits after tax seem to have been dwindling, especially between 2011 and 2012. This is due to increasing operating expenses over the period, particularly in 2012. It seems the company is also exempted from paying profit tax as a form of government compensation for the social services it provides. This implies that MMT is more or less forced to operate less profitable routes, to provide free bus services for school children (until these services were abolished), to operate rural routes on bad roads, etcetera.

Table 20: Net Profit of MMT including the Government Grant



Source: Five-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report (ING Consult 2013)

Moreover, as a side effect of the subsidy relation, the government sometimes demands “kind but unprofitable or inefficient gestures” from the management of MMT by allowing them to hire buses at subsidised rates or without payment for political rallies. The current MD lamented this behaviour of the government and indicated that MMT would not continue such practices. Payment will be demanded for all such service usage by the government, though often at a discount. Whether this policy can actually be implemented in practice, remains to be seen.

6.3 Institutional Sustainability

MMT is fully responsible for the operation and maintenance, and accountable for the use of the delivered buses, spare-parts and knowledge. The company was well-managed by the two Dutch Managing Directors from the City of Amsterdam and the technical manager from VDL respectively as spelt out in the sales and purchase agreement. Many of the policies instituted by the Dutch MDs (discussed in chapter 4) worked to turn the dwindling fortunes of MMT until their departure.

Benefiting from some of the policy frameworks of the Dutch predecessor managers, the current MD and his Ghanaian predecessor succeeded in keeping the buses well-maintained. They were assisted by the Dutch technical manager who remained in charge of maintenance after his ORET-funded contract ended (in 2012). In fact the condition of including expatriate management support and an after-sales service engineer into the transactions’ sales and purchase contract had a significant impact on MMT and ensured its survival.

The problem, however, is that MMT currently has few qualified staff members in technical and engineering functions. This could affect the future use of buses negatively. Labour unions press MMT to pay bus drivers relatively good wages, but pay conditions of technical staff receive relatively little attention, probably because they are too few in number to be an interesting constituency. This translated in relatively low wages for technical workers. As a consequence, MMT has problems in retaining technical workers and hiring new ones, even if quality of such human resources is crucial for the buses to remain operational and last longer. It is also difficult to find an in-house replacement for the technical manager. There are fewer concerns about the availability of good drivers, also due to various in-company training programmes. Nevertheless, the driving behaviour of bus drivers remains an issue, despite the laudable policy to hire more female drivers who are said to show better driving behaviour.

Another issue is that the hiring of management staff is still influenced by political appointments. The policy to recruit young “high potentials” has clearly not been sustained.

The current management of MMT has launched a five-year strategic plan as shown in Box 1. The plan holds a lot of promise for the institutional sustainability at MMT if implemented successfully. Many of the strategic goals derive from the initiatives taken by the expatriate Dutch managers, with new ideas infused to make them workable. Some efforts are already under way to achieve the strategic goals. For example, there is a newly inaugurated ICT control room for monitoring the use of buses, and their fuel efficiency.

Box 1: The five-year Strategic Plan of MMT

With a vision of being “a world class mass transport company in the sub-region” providing reliable, safe and efficient mass transport services by road, MMT’s 5-year strategic plan has the following seven strategic goals:

1. Improve the safety of passengers and staff with the core strategy being:
 - Develop and promote a “Safety First” Culture.
2. Improve customer service with core strategies being:
 - Develop and implement a customer service improvement plan
 - Establish and monitor customer service standards on reliability, affordability, safety, timeliness, convenience and comfort
3. Expand access to MMT services with core strategies being:
 - Increase active fleet of buses
 - Increase schedules on existing and viable inter-city and rural-urban routes
 - Reorganize schedules on intra-city routes
 - Open and develop new inter-city and rural-urban routes
 - Diversify passenger bus services
4. Establish a great workplace with core strategies for achieving this goal including:
 - Deploy HR Management software with a comprehensive database to track each staff member from recruitment to exit
 - Evaluate jobs and develop job descriptions for all job roles
 - Develop and implement a training and development plan
 - Refine performance appraisal system and check staff indiscipline
 - Enhance conditions of service and disengage “excess staff”
 - Improve physical work environment
5. Increase profitability and attain financial sustainability with core strategies including:
 - Reduce fleet downtime, and review fares
 - Reduce fuel consumption, plug revenue and materials leakages
 - Expand depot KPIs and restructure depots as business units
 - Reduce losses on intra-city services, and review profitability of routes on a continuous basis
 - Save costs on procurement, and develop/deliver value added products
6. Adopt environmentally friendly practices with core strategies on this goal including:
 - Establish an Environment Unit
 - Develop and implement an environmental management programme
7. Attain ISO Certification
 - Attain ISO 9001 certification by 2018

Source: Five-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report (ING Consult 2013)

7. Relevance and Policy Coherence

In this chapter the relevance of the project will be assessed, looking at the project's contributions to a viable public transport company and public transport/accessibility at large. This is followed by a discussion of the plans for developing a (quasi) bus rapid transit system for the Greater Accra region.

7.1 Contribution to a Viable Public Transport Company

The four transactions of the ORET bus project have been crucial for the development and transformation of MMT into a viable public transport company. As discussed in Chapter 4, and summarized in Table 8, VDL Neoplan buses make a significant contribution to MMT, with around 40% of the share in routes, buses, passengers, distance travelled and revenues. Through a similar deal with the Belgian government - clearly inspired by the success of the ORET project - MMT could add to its fleet more than 350 VDL Jonckheere buses, produced in Roeselare, Belgium. Combined the VDL buses take a share of 80% in MMT's operations.

Interviewees stated that without development programs such as ORET, MMT can only buy lower-quality buses, e.g. from Tata or Yaxing. These buses have a more limited lifespan, generate less local employment in assembly and consume more fuel (resulting in lower net revenue per bus). They referred to STC as an illustration of what could have happened with MMT (and Ghana) without the ORET project, with its additional activities included. After STC had used up their VDL/DAF buses, they only had Chinese buses left. At first the number of Chinese buses was considerable, but high repair costs forced STC to cannibalize its fleet and ultimately reduce its fleet size. Without ORET funds, public transport in Ghana would only be provided by a poorly managed STC with a limited number of poorly maintained Chinese buses. The story of STC confirms the importance of knowledge transfer - technical and management assistance should complement the delivery of buses - and the poor financial and technical performance of Chinese buses, i.e. high maintenance costs and a low contribution to net revenues.

As discussed in Chapter 5, the ORET transactions generated a substantial number of, mostly temporary, jobs in Neoplan, but more importantly also a transfer of technical knowhow. This contrast with the Belgian programme which only involved the supply of fully completed buses, spare-parts and some technical support. While the technical and management support only took a small part of the budget for each transaction (up to 4%), it was critical for the development of MMT. Many policies introduced and implemented by the Dutch expatriate staff continue to exist under the new management, as explained in Chapter 6.

Some even argue that MMT would not have come into existence if the ORET transactions had not taken place. Its financial sustainability, however, strongly depended on being able to make the shift from intra to inter-city and rural-urban lines. This was not foreseen by the initial application which mainly focused on intra-urban transport. MMT was more or less forced out of urban transport by better politically connected actors and not the result of a deliberate policy shift. However, this turned out to be a blessing in disguise, an unintended positive consequence. As a result of this shift, MMT went from net losses to net profits in 2007. Since then it has been to sustain a small net profit, though this includes considerable subsidies from the government of Ghana⁴².

On the one hand one could raise the question why the project didn't focus on inter-city services and on opening up remote and poorer regions of Ghana from the very beginning. VDL indicated that ORET wanted to subsidise city buses only, essentially because of the condition of non-commercial viability; intra-city services are generally considered not to be profitable. On the other hand, the ORET project, and the Belgian development assistance that followed later, did facilitate the shift unintentionally by supplying buses that could be used on less accessible inter-city and rural-urban routes. Some of these roads were in poor condition, especially in the earlier years of MMT operations.

⁴² Five-Year Strategic Plan for Metro Mass Transit Ltd; Strategic and Organizational Assessment Report (ING Consult 2013).

Another comparative advantage of the VDL buses is related to their ability to transport large amounts of luggage. Revenues for luggage transport are responsible for 9% of MMT's total revenue. In other words, without the ORET buses and those funded by the Belgian government, the cross-subsidization of intra-city transport from inter-city and rural-urban transport would not have been possible. While the application mainly focused on buses for intra-city transport, many buses have actually been deployed in inter-city and rural-urban transport of passengers and luggage. This deviation from the original proposal was, however, necessary to secure the financial sustainability of MMT, and to meet some demand for intra-urban transport though with less buses.

In recent years MMT has also been able to buy some new buses from its own retained profits, albeit a fraction of what is required. From these observations and from statements by MMT representatives, we conclude that the ORET transactions have played a crucial role in building up MMT as a relatively viable transport company that can cover its operational costs, but which is still dependent on subsidies and grants from the Ghanaian government when it comes to replacing worn-out buses.

7.2 Contribution to Accessible Public Transport

Particularly the first transaction made an important contribution to the development of public transport in Ghana after the predecessor OSA had collapsed. The 100 buses - operated by MMT and STC - were critical to meet the acute need for affordable transport, caused by the rapid increase of gasoline prices.

At present, MMT is an important provider of affordable and safe public transport. In some peripheral areas, people actually depend on MMT for getting to work, school, the market or health facilities, since only the large VDL buses can deal with the bad road conditions. For mini-buses the roads are simply too bad. Expectations are that if the roads were to be improved, which remains to be seen, MMT could lose its de facto monopoly as other suppliers may enter the market. One of the interviewees said: "When there are better roads, the other transport operators will come". Currently, however, the role of MMT in urban-rural transport remains critical and the ORET programme has, without any doubt, facilitated this role, notably by designing buses that are able to cope with the most challenging African road conditions.

For inter-city transport, the situation is different. While urban-rural and intra-urban transport are not profitable and require government subsidies, bus lines connecting major cities (e.g. Accra and Kumasi) generate sufficient revenues to cover the costs and make a profit. As a result MMT has to compete with private operators on these routes. Hence, one could conclude that the contribution of MMT to inter-city transport has been less critical. On the other hand, however, MMT is still known as the most affordable option on these routes, because the company is able to reach more lower income groups than its competitors due to its lower fares. Competing bus firms on the intercity routes also use more luxurious air conditioned coaches, while many of the buses operated by MMT (including the VDL Neoplan buses) offer less comfort but at a lower price.

In contrast with the expectations in the original application, the contribution of MMT to intra-urban transport has remained limited. Demand for transport has increased dramatically, which has resulted in ever increasing numbers of trotros and taxis. Residents are starting to move to new suburbs and (illegal) settlements at the periphery of cities, but jobs and markets so far mostly remain within city centers. As a consequence the pressure on the transport system remains high, or increases even further. Large buses only cater for a small fraction of the transport demand, although it can be argued that without MMT buses the number of trotros and taxis would have increased even more. In other words, some VDL buses have been deployed to mitigate the autonomous growth in the number of trotros and taxis, but the impact on the modal split in urban areas (and hence, on CO₂ emissions and fuel consumption) has been marginal.

The limited relevance of the ORET bus project for intra-urban transport is due to the fact that the government has not taken adequate measures to prevent the growth of trotros and to stimulate the use of mass transit systems. There was an overreach of the leverage of the project. Conditions in the grant agreement required the Ghanaian government to take measures to this end (a vehicle tax, a route licensing system, relocation of terminals, the

development of bus-only lanes, etcetera). Most of these measures, especially costly infrastructural works, have not been implemented on time or not all, often due to lack of budget. An effective mass transit system (BRT) has also not been introduced yet. The number of trotros has increased. There is no system in place in cities to regulate the competition between large buses and mini-buses. In retrospect and with hindsight, these conditions set by ORET can be classified as unrealistic.

Interviews, site visits and the survey (see Chapter 5) confirm that MMT buses are competing with trotros for the same passengers. This is particularly true in Accra, where terminals of MMT are often situated next to terminals of the private trotro operators (GPRTU). In competition with trotros, the buses of MMT even sometimes stop in unauthorised places on the side of the road to unload or pick up passengers.

In Kumasi, the situation is a bit different. Terminals of MMT are located at the borders of the city, mainly providing inter-city and urban-rural services, while mini-buses take care of intra-city transport. This division of work between transport providers did not evolve as the result of a strategy to create an integrated public transportation system, but as the result of a political battle. The strong lobbying power of GPRTU was the main reason why the terminals of MMT had to be relocated to the periphery of the city. As a result, a large part of the city is now only served by mini-buses, not by high-capacity buses. Moreover, operators of mini-buses do not (always) act as feeders to the terminals.

Hence, we conclude that in practice the relevance of the ORET transactions for developing mass urban transit and reducing congestion in cities has been very limited. In contrast with the original plans, many buses of MMT are actually used for inter-city and urban-rural transport rather than intra-city transport. Moreover, without bus-only lanes or other measures that enable buses to avoid traffic jams, large buses have limited added value in densely built-up urban areas. It is questionable if such lanes are feasible in Ghana, considering the physical integration in densely built-up cities and the high costs of construction.

7.3 Coherence with Other Policies

The improvement of (public) transport has been a key priority of the Ghanaian government since the very beginning of the project, which is also reflected in various other initiatives. The ORET bus project is to some extent coherent with another project that was implemented: the World Bank Urban Passenger Transport (UPT) project. This project has enabled the rehabilitation of roads throughout Ghana, which literally paved the way for MMT's buses. UPT also helped to introduce the permit and registration system for operators of commercial vehicles, which is an important condition for developing an integrated transport system. And last but not least, UPT funds have been used to develop corridors for buses, known as type B BRT, though only one BRT corridor in Accra is operational at this stage.

While on paper ORET and UPT are coherent, there are some practical issues that potentially reduce synergy between the programmes. First, the investments in roads make it also possible for other operators to provide services, e.g. in remote areas. According to interviewees, this is a potential threat to MMT as it may lose its competitive edge with buses especially made for these poor road conditions. MMT needs the most profitable inter-city lines to cross-subsidise less profitable inter-city lines and intra-city lines. Competitors could cherry-pick the most profitable inter-city lines as soon as good roads are opened, and ignore the rest of the country. If that would force MMT out of the market, the result would be less accessibility in more remote areas lacking good roads and in the cities (any line that is currently being cross-subsidised within MMT's network).

Second, MMT has not (yet) been involved in the UPT project. Their buses are not included in the permit and registration system because MMT has not yet paid the required fee⁴³. It is questionable whether MMT is able to take advantage of the type B BRT corridors now being developed. If MMT is willing to pay the fee, they can also bid in the competition to get access to the corridors in greater Accra, just like their competitors.

⁴³ MMT would have to pay a relatively large amount for the registration of its entire fleet. According to UPT, they offered MMT a discount but this offer has not yet been accepted by MMT. According to MMT, the system was not well communicated by UPT and they haven't received a request to register and apply for access to type B BRT lanes.

However, the buses of MMT (including VDL Neoplan) are not adequate for usage in a “real” BRT system. Such a system requires buses with a low-entrance that enables fast entry and exit of passengers, and is also accessible for wheel-chairs. The buses to be delivered by Scania do meet these requirements⁴⁴. These buses will be leased by Scania to trotro operators who collectively will have to establish a limited liability company. Ironically, this was also foreseen in the original application of the ORET project, and rejected as unsound.

It is unclear who carries the financial risk in this lease construction, and it remains to be seen whether this collective ownership concept of loosely organised trotro drivers will actually work. On the one hand, it is questionable if trotro operators are able to finance and operate scheduled bus services with large buses in an efficient and safe manner which was the reason why the initial application was rejected by ORET. One has to take into account that the trotro owners will be also competing with these buses in the same passenger market because most of their trotos will stay in business. On the other hand, this solution may produce a better fit with the current local political situation: trotro unions have proven to be extremely powerful. Bypassing them by supporting MMT led to the problems that plagued MMT's intra-city transport: being kicked out of city centre terminals; bad relations between MMT and the AMA transport unit/GAPTE, and exclusion from the first BRT corridor.

⁴⁴ Scania is investing in Accra's BRT to gain a foothold in West-Africa. Some interviewees suggested it is even commercially viable now.

8. Conclusions

In the previous chapters we evaluated the project "500 buses for Ghana" by reviewing the four ORET transactions and their impact on MMT and Ghana. The overall impression is that the project has been successful in delivering the intended outputs and (long-term) outcomes for Ghana. The project can be qualified as efficient and effective, despite some delays in the phases of appraisal and implementation, and modifications in the project design such as the more intensive use of buses for urban-rural and inter-city transport. Technical, financial and institutional sustainability are sufficient, although some challenges remain, such as MMT's strong dependence on the government and its influence on daily operations and purchase of new buses and the difficulties in finding qualified labour.

The bus project has generated significant positive economic, social and environmental outcomes in Ghana, with hundreds of permanent and temporary jobs. It improved access for women and the poor, especially from previously inaccessible areas of Ghana. It also generated considerable savings on fuel and prevented CO₂ emissions. In terms of relevance, the four transactions played a critical role in the development of MMT as a viable public transport company that "serves the nation" (the slogan of MMT). The contribution of the ORET transactions to nationwide connectivity is indisputable: millions of passengers benefit from VDL Neoplan buses every day. The additionality of the project is also positive: without the grant of the Dutch government, Ghana would not have been able to purchase buses of the same quality.

On the other hand, it must be noted that the project has not been successful in reducing congestion in Ghana's major cities (Accra and Kumasi). ORET expected the government to create the necessary infrastructure and a policy environment in which MMT buses would get preferential treatment (e.g. through the development of bus-only lanes and measures to reduce the number of trotros). This assumption turned out not to be feasible and - in retrospect - also unrealistic. The strong lobbying power of GPRTU explains why such a public transport system could not evolve, at least not without the support of minibuss operators. The current plans to develop a (quasi) private bus rapid transit system are promising, notably because of GPRTU's involvement. However, it remains to be seen if a diverse group of operators will be able to set up and run efficient BRT services, do electronic ticketing and be profitable at the same time. MMT may get a second chance in intra-city transport by participating in some of the new BRT corridors yet to be developed in the metropolitan areas.

| | | |
|-----|---|-----|
| Q5e | <p>[only ask this question if respondent makes this trip to visit a hospital or clinic or health facility (see Q4)]</p> <p>What will you do at the hospital or clinic?</p> <ul style="list-style-type: none"> (1) Visiting a friend or relative (2) Receiving a health check (3) Receiving a treatment (4) Receiving medicines (5) Other purpose <p>Continue to Q6</p> | V13 |
| Q6 | <p>How frequently do you ride on this bus line? Which answer describes you best:</p> <ul style="list-style-type: none"> (1) This is the first time (2) A few times per year or less (3) About once a month (4) About once a week (5) Several times a week (6) Every day | V14 |
| Q7 | <p>How frequently do you ride this bus line for the same purpose as today? (see answer for Q4)</p> <ul style="list-style-type: none"> (1) This is the first time (2) A few times per year or less (3) About once a month (4) About once a week (5) Several times a week (6) Every day | V15 |
| Q8 | <p>What if today the MMT buses were not available on this line, what would you do?</p> <ul style="list-style-type: none"> (1) Travel by trotro / minibus (2) Travel by different coach / large bus (VIP, STC, other operators) (3) Travel by taxi (4) Travel by privately owned car (5) Travel by commercial motor cycle (Okada) (6) Travel by privately owned motor cycle (7) Travel by foot or bicycle (8) Travel by a different form of transport (9) Not make this trip → go to Q11 | V16 |
| Q9 | <p>Why did you choose to take the bus, instead of a different mode of transport? What was the most important reason?</p> <ul style="list-style-type: none"> (1) The bus is more affordable (2) The bus is safer (3) I can bring more luggage on the bus (4) The bus is more comfortable (5) The bus is faster (6) Other reason (7) I had no other choice | V17 |
| Q10 | <p>When you compare the MMT bus with the other mode of transport you could have used today (see answer for Q8), do you agree or disagree with the following statements:</p> | |

| | | |
|--|---|-----|
| | The MMT bus is cheaper (1) Agree (2) Disagree (3) Indifferent | V18 |
| | The MMT bus is safer (1) Agree (2) Disagree (3) Indifferent | V19 |
| | In the MMT bus I can bring more luggage (1) Agree (2) Disagree (3) Indifferent | V20 |
| | The MMT bus is more comfortable (1) Agree (2) Disagree (3) Indifferent | V21 |
| | The MMT bus is faster (2) Agree (2) Disagree (3) Indifferent | V22 |
| Q11 | What is your age? (1) Under 18 years (2) Between 18 and 25 years (3) Between 26 and 35 years (4) Between 36 and 45 years (5) Between 46 and 55 years (6) Between 56 and 65 years (7) Older than 66 years | V23 |
| QUESTIONS TO BE FILLED IN BY THE INTERVIEWER: | | |
| Q12 | Gender of respondent: (1) male (2) female | V24 |
| Q13 | Write down which bus line this passenger is traveling on now: V25 | |
| Q14 | Write down the date (Month / Day) and interview number (every day start counting at 1): Date: V26/ V27 Interview number: V28 | |
| Q15 | Name of interviewer: V29 | |
| Q16 | Language of interview: V30 | |

Appendix A2: List of Interviewees

- Mr Jehiel Akoto, Planning and research manager at MMT
- Mr Frank Yeboah-Koranteng, Traffic Operations Manager at MMT
- Mr Sackey, Head of Marketing Division at MMT
- Mr Marnix Segers, Policy Advisor Trade and Private Sector Development, Netherlands Embassy in Ghana
- Mr Samuel Nuamah Donkor, Managing Director at STC
- Mr Edward Tetteh Laryea, Principal of Government Technical Training Centre
- Mr Issah Duol, Operations Manager of NEOPLAN
- Kumasi Metropolitan Assembly, Transport Committee
- Mr A. S. Abukari, Regional Manager Kumasi at MMT
- Mr Samson N. Gyamera, GAPTE, Head of Pre-GAPTE Unit (Ministry of Local Government & Rural Development)
- Mr Cas van Eerden, former MD of MMT (2005-2007)
- Mr Pierre Claes, Sales Manager at VDL
- Mr Henk Visschers, former MD of MMT (2007-2010)
- Mr Samuel Obeng Asiamah, Senior Planning Officer at the National Road Safety Commission
- Mr Noble Appiah, Managing Director of MMT
- Mr Osei Attakora Dickson, Finance Manager at MMT
- Mr Nana Osei-Bonsu, CEO of Private Enterprise Federation
- Mr Godwin J. Brocke, Director in charge of Policy and Planning, Ministry of Roads and Highways
- Mr Noah Tetteh Matey, Greater Accra Regional Manager, Driver & Vehicle Licensing Authority (DVLA)
- Mrs Mabel Asi Sagoe, Director of Planning, Monitoring & Evaluation, Driver & Vehicle Licensing Authority (DVLA)
- Mr Lawrence Kumi, Ministry of Transport
- Ms Korama Ocran, Head of Accra Metropolitan Assembly Urban Passenger Transport Unit
- Mr Henry Cher, Ministry of Finance and Economic Planning
- Ms Isidore Komi, Ministry of Finance and Economic Planning
- Mr Franklin Agbanator, Director of Ghana Road Fund Secretariat
- Prof. George Owusu, Department of Geography & Resource Development, University of Ghana.
- Mr Ernest Agyemang, Faculty of Social Studies, Department of Geography and Resource Development at University of Ghana
- Mr Ad van den Heuvel, Technical Manager at MMT

Appendix A3: Descriptive and Results of the Survey

Descriptives

Six bus lines were selected to be studied through the survey. Table A1 lists these six lines, as well as the type of line.

Table A1: Selected Bus Lines for Data Collection

| Name | Type |
|----------------|-------------|
| Accra-Adenta | Intra-city |
| Accra-Nungua | Intra-city |
| Swedru-Accra | Rural-urban |
| Begoro-Accra | Rural-urban |
| Tamale-Damongo | Inter-city |
| Kumasi-Accra | Inter-city |

Source: own research

In 6 days of surveying, between 14th and 19th July 2014, 1972 usable responses were collected. Unusable response refers to survey reports with incorrectly or incompletely coded answers, but these were insignificant in number. Of the 1972 surveys collected, 20 surveys had missing values on the question of trip purpose. Because this question plays a key role in this research, these 20 surveys have been omitted. The end result was a database with 1952 entries, referring to individual bus passengers. Care has been taken to prevent the same passenger from being interviewed multiple times. Response rates were high, with about 90% response reported. Table A2 shows the number of valid response and its distribution over the six lines and three line types studied.

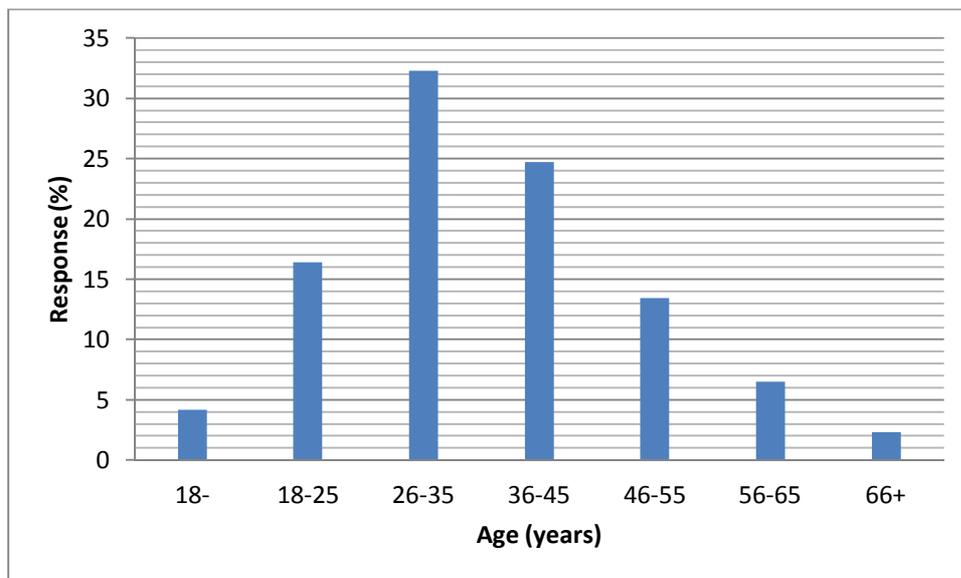
Table A2: Valid Responses per Bus Line and Type

| Bus Line | Valid Response |
|--------------------------|----------------|
| ...Accra-Adenta | 511 |
| ...Accra-Nungua | 505 |
| Total intra-city | 1016 |
| ...Swedru-Accra | 245 |
| ...Begoro-Accra | 230 |
| Total rural-urban | 475 |
| ...Tamale-Damongo | 222 |
| ...Kumasi-Accra | 239 |
| Total inter-city | 461 |
| Total all lines | 1952 |

Source: own research

Some descriptive statistics are provided to assure the representativeness of the survey sample. Figure A1 shows a breakdown of respondents by age category.

Figure A1: Percentage of Respondents per Age Category



Source: own research

The figure shows the expected distribution pattern, with the highest number of respondents in the 26-35 years age category, and lower numbers in the youngest and oldest age categories. Next, table A3 shows the distribution of respondents by gender.

Table A3: Response by Gender (non-response rate: 0.9%)

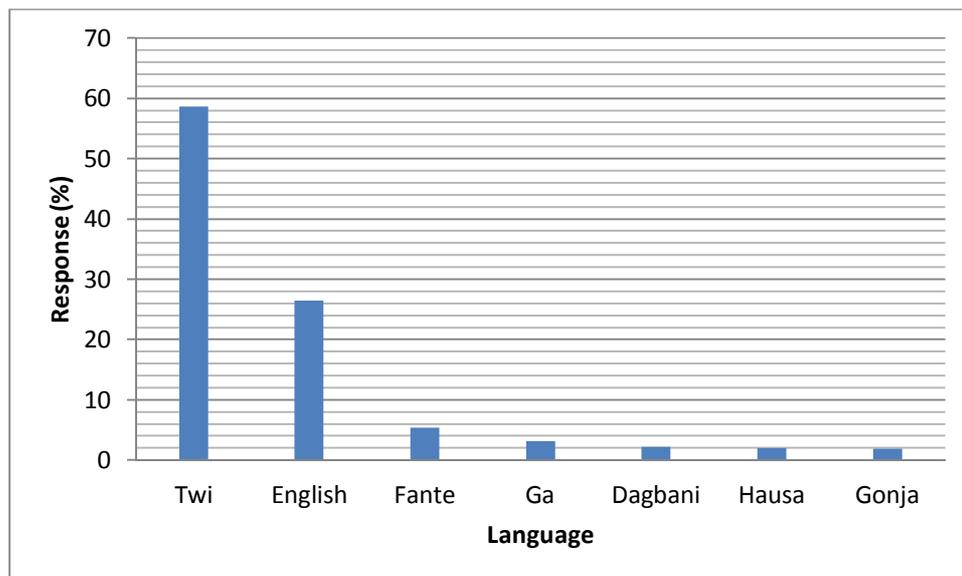
| Gender | Number | Percentage |
|--------------|-------------|--------------|
| Male | 868 | 44.9 |
| Female | 1067 | 55.1 |
| Total | 1935 | 100.0 |

Source: own research

The survey sample shows a more or less equal distribution of respondents by gender, with slightly more female than male respondents. This is to be expected, since market sellers are among the largest user groups of MMT bus services, and the great majority of them are women.

Figure A2 shows a breakdown of the different languages used during the survey. Ghana is a strongly multilingual country, and whenever possible interviews were carried out in the language respondents were most comfortable with. Most importantly, while English is commonly spoken in Ghana, a large part of the population is only partly fluent in this language. Using the respondent's primary language enables them to more clearly express their opinions. For each bus line, surveyors were selected who are fluent with the languages most commonly spoken by passengers traveling these lines.

Figure A2: Response by Language Group during Interviews



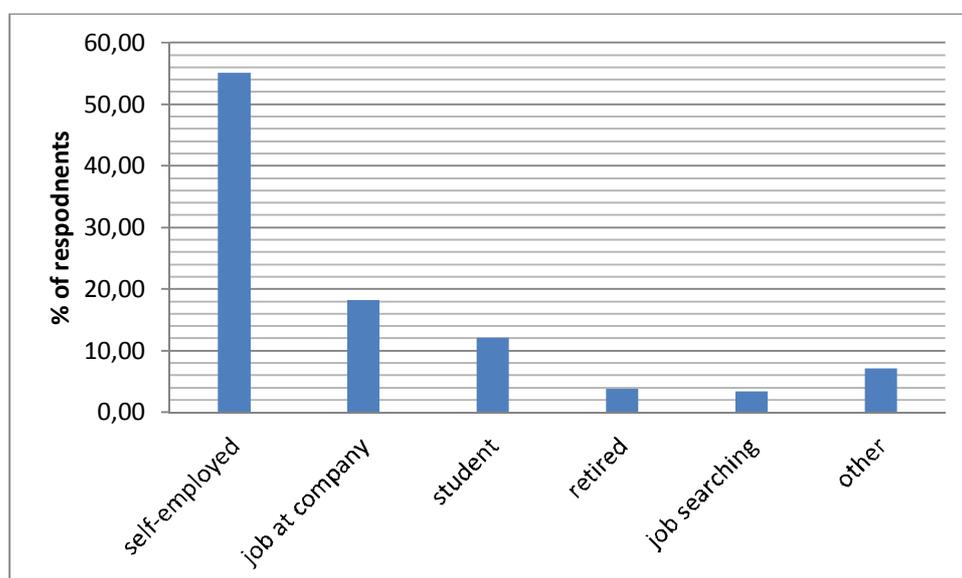
Source: own research

About a quarter of the respondents still opted to do the interview in English, most of them in the Accra metropolitan region. About two thirds opted for either Twi or Fante, the most commonly spoken languages in Ghana. The remaining 10% of respondents are distributed among the other languages.

Results

Figure A3 continues with a breakdown of respondents by their employment status.

Figure A3: Respondents by Employment Status (percentage of total)



Source: own research

The figure shows that self-employed is by far the most common employment status stated by respondents of the survey. This is to be expected in a country with a large informal sector. The second most common employment status is being employed at a company, followed by students, retirees and people searching for employment. The 'other' category is relatively small, and is expected to consist mostly of female homemakers (housewives) who are voluntarily out of employment. The final descriptive provided is a break-down of respondents

by trip purpose stated (table A4). The trip purpose refers to the specific trip during which the respondent was interviewed.

Table A4: Respondents per Trip Purpose

| Trip Purpose | Number | Percentage |
|------------------------------------|-------------|--------------|
| Selling goods at the market | 431 | 22.1 |
| Buying goods at the market | 356 | 18.2 |
| Visiting family or friends | 290 | 14.9 |
| Going to work (as employee) | 211 | 10.8 |
| Going to school (as student) | 101 | 5.2 |
| Leisure – visit to a National Park | 43 | 2.2 |
| Leisure – other | 6 | 0.3 |
| Going to hospital | 37 | 1.9 |
| Other | 477 | 24.4 |
| Total | 1952 | 100.0 |

Source: own research

The table shows that selling and buying goods at the market together account for about 40% of all respondents. This is to be expected since most Ghanaians depend on open markets for most of their daily food and non-food purchases. A large part of the self-employed respondents in figure A3 were indeed using the bus to sell goods at the market. Other common trip purposes were visiting family or friends, going to work as employee, and going to school. The category 'leisure', distinguishing visits to a National Park from other leisure activities, was added to identify visitors to Mole National Park on the Tamale-Damongo line. Besides this specific case, the category was not often picked as main trip purpose (probably because it can overlap with 'visiting family or friends'). Going to a hospital was also rarely stated as main trip purpose. About a quarter of respondents stated a different trip purpose than the ones listed here. During the pilot phase these other trip purposes were analyzed, and the most commonly mentioned were church attendance, attendance of funerals, and visiting a government institution for example to register a new car.

Appendix A4: Estimation Methods and Results

This appendix provides tables of estimates and explanations of the assumptions made as part of the estimation method. Table A5 shows the estimation of passengers carried per line per year. As MMT does not systematically record these statistics (theirs are counted by district rather than by line), the following estimates were made.

Table A5: Estimations and Assumptions for Passengers Travel on the six Bus Lines

| | Type | Return Trips Per Day | Operating Days Per Week | Estimated Average Occupancy | Estimated Passengers Per Year |
|----------------|-------------|----------------------|-------------------------|-----------------------------|-------------------------------|
| Accra-Adenta | Intra-city | 32 | 6 | 50% | 628,992 |
| Accra-Nungua | Intra-city | 9 | 6 | 50% | 176,904 |
| Swedru-Accra | Rural-urban | 12 | 6 | 60% | 283,046 |
| Begoro-Accra | Rural-urban | 1 | 6 | 60% | 23,587 |
| Tamale-Damongo | Inter-city | 1 | 7 | 80% | 36,691 |
| Kumasi-Accra | Inter-city | 3 | 7 | 80% | 110,074 |

Source: MMT and own research

The number of return trips per day per line was calculated from MMT data on the number of buses operated per line, and the number of return trip per bus per day for each line. The number of operating days per week was also supplied by MMT. The capacity of each bus is 63. Assumptions for the average occupancy percentage per line were made in consultation with MMT, and with additional field research by the local consultant. A large number of MMT buses are completely or nearly full on leaving the bus terminal, and some bus drivers have the habit of waiting on the terminal until all seats have been filled. However during lunchtime and at the end of the evening, buses were observed to have low occupancy rates. Long-distance bus routes only offer one or a few return trips per day, and tend to be fully booked. For this reason the long-distance Tamale-Damongo and Kumasi-Accra lines are assumed to have a high average occupancy of 80%. This percentage can still be considered conservative given that a high number of buses actually have occupancy rates close to 100% (confirmed by observations and interviews with MMT). Shorter lines with a higher operating frequency per day are more likely to include buses with low occupancy rates at quiet hours of the day. The intermediate-distance routes have been assigned an average 60% occupancy rate, while the short-distance intra-city routes are assumed to have an average occupancy of 50%. Again these figures are relatively conservative, such that the resulting estimates are more likely to be underestimates rather than overestimates. The resulting estimated number of passengers carried per year is reported in the table, ranging from about 23.6 thousand passengers at Begoro-Accra, to almost 630 thousand at the busy Accra-Adenta line⁴⁵.

Estimations of displacement effects relied on the survey question that asks respondents what they would have done if the MMT bus had not been available today. Possible answers included cancelling the trip, or making use of an alternative mode of transport. This results in an estimated number of trips per year that would have been made with these alternative modes of transport had MMT bus services not been available. To come to an estimate of the number of vehicles displaced by MMT, assumptions were made on the number of trips each mode of transport has to service in order to maintain in operation. It was assumed that for minibuses, taxis and motor taxis this number equals 1.5 times the frequency of trips offered by MMT on the same line. In other words, if MMT operates 8 trips per day on a busy bus line, it is assumed that due to their smaller vehicle size minibus and taxi drivers require 12 trips per day

⁴⁵ For each line the estimated number of passengers per year equals to the capacity (63) * the occupancy rate * 2 (return trip) * number of return trips a day * operating days a week * 52 (weeks).

on that line to make enough profit to stay in business⁴⁶. When the number of jobs displaced by MMT is calculated, an employment multiplier is estimated. This equals 1.05 jobs per vehicle for taxis and motor taxis, and 2.05 jobs per vehicle for minibus and other coach operators. The latter always have one driver and one conductor or “driver’s mate” per vehicle, while taxis and motor taxis only have a driver. It is assumed that transport operators of all types have an overhead of administrative and repair workers of 1 per 20 vehicles, or 0.05 per vehicle.

Based on information provided by MMT, the coach companies VIP and STC, and both desk research and field research by the local consultant, estimates of the average fuel efficiency of the different types of vehicles were made. These estimates of the amount of fuel per kilometre traveled were then converted into fuel per kilometre per passenger. For this calculation the number of passengers per vehicle was estimated. Table A6 provides the assumptions used, and the resulting estimates.

Table A6: Estimation of Fuel Efficiency for All Types of Vehicles

| | Fuel (litre) per km | Number of Passengers Per Vehicle | Fuel per km Per Passenger |
|----------------------------------|---------------------|----------------------------------|---------------------------|
| MMT bus | 0.334 | 63 | 0.005 |
| Other coach | 0.848 | 63 | 0.014 |
| Minibus | 0.283 | 8 | 0.035 |
| Taxi / private car | 0.235 | 2 | 0.118 |
| Commercial or private motorcycle | 0.05 | 1 | 0.05 |

Source: own research

It was assumed that other coach operators have the same passenger capacity as MMT, namely 63 passengers per vehicle. Minibuses transport on average eight passengers per vehicle, taking into account both the capacity of the vehicle and the occupancy rate. Taxis and private cars are assumed to carry on average two customers per vehicle at all times, which can be considered a conservative estimate given that single customers are also not uncommon. Finally motorcycles are only able to hold a single customer.

Besides effects for specific bus lines, tentative estimates have been made of the combined effect of all MMT bus services. For making these estimates it is necessary to assume that the six lines studied through the survey are representative for MMT’s national bus services. The precise assumption is that Accra-Adenta and Accra-Nungua are together representative for MMT’s 97 intra-city lines; that Swedru-Accra and Begoro-Accra are together representative for MMT’s 94 Rural-Urban lines; and that Tamale-Damongo and Kumasi-Accra are together representative for MMT’s 137 inter-city lines. These extrapolations are tentative, and should be interpreted with due care. The number of passengers per type of line was given by MMT for the year 2013, and hence did not have to be estimated. Table A7 shows the resulting estimates of wage and market income for the three line types, which sums up to the total for Ghana as a whole.

Table A7: Estimation of Income Earnings Facilitated by MMT Bus Services

| | Number of bus lines | Job at company | Market selling | Total |
|------------------|---------------------|-------------------|--------------------|--------------------|
| Intra-city | 97 | 9,757,562 | 46,517,740 | 56,275,302 |
| Rural-urban | 94 | 1,310,324 | 31,821,520 | 33,131,844 |
| Inter-city | 137 | 17,280,616 | 44,724,302 | 62,004,918 |
| Total MMT | 328 | 28,348,502 | 123,063,562 | 151,412,064 |

⁴⁶ This frequency may not be sufficient to transport the same number of passengers, but this is irrelevant for calculating the job displacement effect.

Source: own research

Finally, table A8 shows the estimates per line type and for Ghana as a whole for savings due to MMT's lower ticket prices, fuel savings and CO₂ emissions saved.

Table A8: Estimates of Ticket Expenditures Saved, Fuel Savings and CO₂ Emissions Prevented

| | Ticket Expenditures Saved/Year (Euro) | Fuel Saved/Year (Euro) | CO ₂ Emissions Prevented/year (tons) |
|------------------|---------------------------------------|------------------------|---|
| Intra-city | 5,344,134 | 7,332,988 | 24,726 |
| Rural-urban | 2,339,831 | 21,662,963 | 73,046 |
| Inter-city | 1,293,385 | 20,963,240 | 70,686 |
| Total MMT | 8,977,350 | 49,959,191 | 168,458 |

Source: own research