Rail Transport

Framework for Improving Railway Sector Performance in Sub-Saharan Africa

Vasile Nicolae Olievschi

SSATP
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Policy Program

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Acronyms and abbreviations

CAMRAIL	Concession Cameroon National Railway
DRC	Democratic Republic of the Congo
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse gas
IBRD	International Bank for Reconstruction and Development
IDA	International Development Agency
IFC	International Finance Corporation
IFI	International Financial Institution
MADARAIL	Railway operating under concession transport in Madagascar
MOF	Ministry of Finance
MOT	Ministry of Transport
OECD	Organization for Economic Cooperation and Development
PPP	Public Private Partnership
PSC	Public Service Contract
PSO	Public Service Obligation
SITARAIL	Railway Company operating under concession transport in Côte d'Ivoire and Burkina Faso (Société Internationale de Transport Africain par Rail)
SNCC	Société Nationale des Chemins de Fer du Congo
SSA	Sub-Saharan Africa (this name is used in the present document to define the railways in the region excluding South Africa Railways)
TAC	Track Access Charge
TRANSGABONAIS	Railway Company operating under concession transport in Gabon
TRANSRAIL	Railway Company operating under concession transport in Senegal and Mali
TRC	Tanzanian Railways Corporation
TU	Traffic Unit (passenger-kilometer and ton-kilometer)
UIC	International Union of Railways

Preface

The African continent has been making regular headlines with double digits growth economies, an emerging middle class, an explosion in mobile communications, and huge untapped mineral resources. Still, the spread of this new wealth is slow and the benefits of this significant growth are marred by persistent structural issues, among them and often cited is the poor level of infrastructure. Road, rail and port network is still ill adapted to the continent's expansion and the economic development. Rail in particular has suffered from decades of low direct investment, poor infrastructure management and inefficient train operations. Although the issue has been addressed by governments and development agencies, and despite local improvements, the revival of African railways has not happened. Considering the significant role railways have played historically in land transportation, trade facilitation and economic and social development, why is it that a continent the size of Africa – with more than 20 landlocked countries – still struggles to deliver capacity and reliability on its existing rail network?

At the turn of the century, a number of African states which were facing declining railways performance, and were looking to meet the critical need for rail infrastructure investments, decided to increase private participation in the operation and management of the state-owned railway networks, and to enter public-private partnerships ranging from management contracts to concession contracts. Although in some cases, this process was implemented with relative success (Madagascar, Côte d'Ivoire and Cameroun), keeping the railway systems operational and helping overcome the penalizing inefficiencies of the state-owned infrastructure and state-controlled railways operations, it seems that private concessionaires themselves failed to tackle some of the recurring operating challenges. These include changes in the market structure and demand, increased competition as well as governance issues. The new operators have also had to face additional challenges related to under-capitalization, rising infrastructure management costs or weak government regulation.

To the credit of SSATP partners and countries, it was as a result of the SSATP Program's 2010 Annual Meeting in Kampala, that the present study assessing the state of affairs of the railway sector in Sub-Saharan Africa was commissioned. Its objective was to address the issues affecting railways performance, and draw some lessons from

the most recent experiences in railway sector, in order to prepare the frameworks for further decisions and the implementation of relevant policies by SSATP countries.

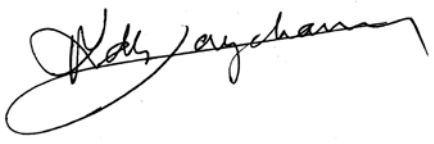
These difficulties have already been studied and documented by the World Bank in two important papers the *Sub-Saharan Africa Review of Selected Railway Concessions* (2006) and the *Africa Infrastructure Country Diagnostic* (2009).

While the prognosis outlined in this study will look familiar to those with some experience in the railways industry in Africa, the analysis is yet fundamentally new, as the performance of the railways are re-examined in limelight of the considerable changes happened in the transport and logistics industry in the last two decades, which have affected the African continent as well as the rest of the world.

Vasile Olievschi's methodology is focused on identifying issues – and possible improvements – at the level of government policies: what are the policies and framework required to restore the competitiveness of the rail networks? What are the improvements that are needed in terms of managing railways assets, restoring train operations reliability and financial sustainability of this sector? The author finally draws the lessons to be learned regarding ownership, partnership and financial responsibility of the public and private actors.

The result makes fascinating reading, with a number of both detailed insights and broader perspectives, and reveals that the sub-Sahara African railway network has a future as a successful transport mode. The paper illustrates that a railway network should and can contribute to the development agenda, and that it is possible to draw constructive lessons, not only from past failures but from successful concessions or train operations, from Côte d'Ivoire to South Africa.

Vasile Olievschi doesn't pretend to deliver dogmatic and wide-ranging solutions, quick-fixes or even a miracle remedy of some sort; he highlights the most urgent problems facing the rail transport sector and provides a set of recommendations that would help both public and private interests to partner constructively in the revitalization of the sub-Saharan African rail network.



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Preamble

The present paper includes a number of tables and charts generated by using data available on sub-Saharan African railways until December 2011. For each specific set of data presented there is an indication (footnotes or direct explanations in the text) about the source of information.

It was not the scope of the present work to duplicate existing information by collecting new data from various concessionaires or conceding authorities in sub-Saharan Africa, but to use the existing information to develop an analysis of potential new ways for improving the performance of railways in sub-Saharan Africa.

The major sources of statistic data are drawn from previous World Bank documents referenced in the bibliography and from periodical reports received by the World Bank on the status of the various railways concessions in sub-Saharan Africa. For benchmarking sub-Saharan African railways against railways from other regions of the world, the author used selected information from the statistic data provided by the International Union of Railways for the year 2010.

Learning from recent experiences in the sub-Saharan African railway sector, the author tried to devise policies that could address the issues currently affecting railway performance in sub-Saharan Africa, including the development of better approaches for more successful concessions.

The preparation of the present work was supervised by Henry des Longchamps serving as task team leader. Peer reviewers amongst World Bank and SSATP staff, particularly Jean-Noel Guillossou and Camilla Israel Lema, provided valuable contribution for its finalization. Special thanks to Pierre Pozzo di Borgo for his comments and recommendations and for providing valuable background materials and data. A special thanks also to Pierre Simon Bertrand for reviewing all the graphic materials and Monique Desthuis-Francis for publishing the manuscript.

Executive summary

In most of the sub-Saharan African[1] (SSA) countries railways have played, throughout history, a key part in the economic development maintaining a dominant role in transporting freight and passengers at low costs. During the last 50 years, the road transport in the region as throughout the world, has expanded rapidly due to the aggressive development of the automobile industry. African governments have invested mainly in road infrastructure improvement, neglecting railways. The liberalization in road transport and the slow response of railways to adapt to the new market conditions resulted in dramatic traffic decline in rail transport. By 1990 most of the sub-Saharan African railways were in virtual bankruptcy, requiring permanent cash injection and large investments in infrastructure and rolling stock.

To address the crisis, many governments have considered concessions as a solution, and between the mid-1990s and 2010 most of the railways were concessioned. Currently, more than 70 percent of the rail transport activities in the region (excluding South Africa) are managed by private operators. The World Bank Group (IDA and IFC) has supported most concession processes through grants and loans, investing since 1996 more than one billion dollars to support the efforts of the governments and private operators.

The concessions might have solved a number of problems in sub-Saharan railways, bringing some improvement in the financial performance of companies that had accumulated losses before the concession, and a certain stabilization of freight volumes in some countries that had been losing market share in an accelerated rhythm. In many cases these results were achieved in the context of reducing the dependency on public funds. Taking into consideration the specific conditions of the transport market in the region and the accelerated degradation of the railways during the last decade that have not been concessioned, it is hard to imagine a better alternative for the development of the sector than the private-public partnership.

[1] Important note: The assessment of the railway transport sector and the recommendations developed here do not include railways from South Africa. The reference to South African railways is only used for comparison purposes. As a consequence, when the expressions *sub-Saharan Africa* or *SSA* appear in the text, South Africa is excluded.

However, and in spite of limiting the negative trend, these concessions are still fragile. Although railway companies actually survived during the last two decades with the support of the private sector and the international financial institutions (IFI), the expected revival of railways did not happened. Chronical weaknesses, especially financial, did not allow for the required rehabilitation of the network, the renewal of rolling stock, the setting up of better quality of services, and eventually for a larger transport market share for railways.

Africa has shown since 2001 a very modest increase of 7 percent in freight transport, and a drop of the same percentage in passenger services, while the worldwide railway transport for freight and passengers has increased by more than 40 percent during the same period. These modest results show that the development of the railway system in sub-Saharan Africa still faces serious barriers.

Inadequate railway infrastructure. With a total length of about 56,000 km, the railway network of sub-Saharan Africa represents only 2 percent of the total length of the railway lines operated worldwide. Most of the sub-Saharan railway infrastructure is dilapidated and ill-suited for the requirements of modern operation of traffic. Many structures and even some of the track work are over 100 years old. The old-fashioned railway infrastructure in most of the SSA railways faces major issues associated with: (i) aging track (insufficient ballast, rail wear, deteriorating earthworks), (ii) poor condition of most structures, and (iii) obsolete signaling and telecommunication or lack of spare parts. Speed restrictions over long sections have dramatic effects in reducing railway competitiveness and rolling stock productivity. It is very difficult for the railways to compete with modern road networks increasingly being developed on major corridors.

Low traffic volumes making the railways non-competitive. The railway network of the whole continent operates only 2 percent of the total volume of freight and passengers transported by railways worldwide; and sub-Saharan Africa operates only 11.6 percent of the freight volumes and 1.7 percent of passengers transported in Africa. By operating such a small market, the Sub-Saharan railways cannot benefit from the economies of scale which characterizes this mode of transport. Average traffic density attained in 2010 was less than 1 million traffic units per rail-route-km, four times lower than the African average, and six times lower than the intensity achieved by railways in South Africa. It makes the costs of operation for railway transport services three to ten times higher than the operating costs of railways in Russia, China or the United States.

Low productivity of assets. The sub-Saharan railways have a three times lower productivity of rolling stock compared with that of South Africa and five to ten times lower than that of most efficient railways in the world. This is mainly due to the poor technical state of the fleet, having as direct consequences on a lower availability of wagons and frequent derailments. The chronic lack of locomotives in the region limits the capacity of train formation and of moving additional volumes of freight, resulting in a negative impact on the costs efficiency of railways.

Low labor productivity. For railways, as service-oriented companies, a good utilization of staff is essential for cutting the operating costs and for maintaining the competitiveness of the company. The sub-Saharan African railways have an average labor productivity of only 37 percent of the African average, while the South African railways operate in the same region and achieve a staff productivity seven times higher compared to the African average[2]. The increased average age of railway staff, as a consequence of a no-hiring policy during the last decades (due to the decaying of rail operations in general) is one of the reasons for low productivity. The aging staff is a serious issue that will become an additional barrier to the revival of the railway sector unless it is addressed properly.

The experience of more than 15 years in railway concessions in SSA has proven that the current low volumes and reduced density of traffic cannot produce sufficient revenue to pay taxes and concession fees, to generate profit to the concessionaire, and to cover the costs of transport operations, of the renewal of the depleted rolling stock, and of the large investments necessary to rehabilitate a heavily deteriorated infrastructure. The weak financial performance of the concessions is a major threat to the development of the railway sector in SSA. The financial fragility of existing concessions and the fact that the historical weaknesses (depleted infrastructure, poor assets and low volumes of traffic) still exist after two decades of operations under concessions illustrate that the current approach could solve only the short-term objectives of railways surviving, but cannot address the systemic problems of the sector[3]. The analysis of the existing concessions confirms the findings of previous studies by the World Bank regarding the common mistakes in setting up the concession agreements: (i) the

[2] These are average values. Some railways in SSA under concession, like CAMRAIL or SITARAIL, obtain for general freight transport services staff productivity comparable with that of South African railways when excluding the coal lines in South Africa.

[3] The second-generation concessions put recently in place in SSA with the support of the World Bank implemented a new approach which may change the current negative trend in rail concession. The recommendations of the present publication are elaborated taking into consideration the value-added of the second-generation concessions.

overoptimistic estimates of traffic evolution taken as basis for the prediction of revenues and concession fees while ignoring the low availability of rolling stock and the poor quality of infrastructure affecting the quality of services and the competitiveness; (ii) under-estimation of investment needs by neglecting the real status of depleted infrastructure and rolling stock; and (iii) under-capitalization of concessions induced by the overoptimistic assessment of the market growth and the under-estimation of the costs for upgrading the assets.

All existing concessions in SSA have been developed on the same pattern, Unachievable levels of concession fees and taxes were agreed to be paid based on the illusion of rapid increase of revenues. During the first 3-5 years of concession, as long as the associated international financial support still existed, the results were closer to the expectations. However, after the termination of the associated loan, the concessionaire discovered that the existing traffic did not generate sufficient revenue and as a result, they would have to pay a significant percentage of their revenues (in extreme cases, 35 to 50 percent) through concession fees and taxes, leaving no room for investments. In many cases the governments neglected to cover their obligations in financing infrastructure or passenger services, and the situation of the concessions started to deteriorate irreversibly. Frustrations appeared on both sides, with governments having to absorb most of the cost of financing the infrastructure they had initially transferred to concessionaires, while agreeing to take additional loans from IFI's to finance medium- and long-term rehabilitation works.

Finding an exit to the present vicious circle cannot be repeating the same scenario. The over-optimistic expectation of governments that the simple transfer of administration of railways to the private sector will generate miraculous flows of revenues and solve all problems of the sector is an illusion. Concessions are useful instruments when governments want to encourage activities that the free market does not provide on its own. It means the governments have also some financial and regulatory obligations to create the environment and the conditions to accompany this strategy.

The major weakness of the current approach in the railway concessions in sub-Saharan Africa is it somewhat short-term vision and narrow objectives. The concessions in SSA should cease to be perceived as an isolated mean to an end, such as finding international financial support and bringing a private investor to save the operation of transport services on a line that otherwise would be closed.

This approach ignores two essential aspects: (i) it neglects the long-term objectives of the development of the transport system and does not conceive the role of the conces-

sions in this perspective (economic sustainability), and (ii) it disregards the importance of creating a friendly business environment for all modes of transport, promoting fair competition in an undistorted market (regulation). In this context, each concession should be defined as part of a broader strategy for the development of the transport system. To overcome the problems, the governments have to rightfully play their role as policy makers, regulators, owners of transport infrastructure, and client of transport services. This requires strengthening the governance capacity.

The enhancement of the governance is a foremost target in SSA, not only for the improvement of quality of activities in the railway sector. It would be a major mistake to believe that it will be possible to build an efficient railway system benefiting from strong governance, long-term vision, successful concessions, smooth re-negotiations between partners in a win-win approach, in a country where these practices are not widely spread. Achieving good governance requires strong political will, clear accountability of public employees, political stability, and continuous fight against corruption. Without these governance enhancements, the results of new approaches on railway management will remain fragile and short-lived.

Only better governance based on a long-term strategy for the railway sector will create the appropriate environment for the governments to identify resources and possible partnership with the private sector or funds from donors. Only a reliable governance framework, a credible rail strategy and a strong business plan will appeal to public or private investors.

Putting in place an efficient railway transport system will help governments to achieve important targets beyond the sector. Due to their low carbon performance, railways are an important factor in achieving sustainable mobility and in developing green transportation. Currently, the companies operating worldwide produce less than 1 percent of total CO_2 emissions (IEA, 2011). In the European Union, railways produce 0.7 percent of greenhouse gas (GHG), while the road transport is accountable for more than 70 percent of emissions. In SSA, setting up conditions for a sustainable railway sector in parallel with the development of a transport policy which is not road-biased will create the appropriate environment for achieving a more balanced transport market share between road and rails, reducing CO_2 emissions generated by the transport system.

In this general framework, the improvement of the railway sector performance should be based on the following major targets.

Governments must develop long-term strategic plans for the rehabilitation and development of transport infrastructure. Considering the dilapidated status of railway infrastructure, it is highly recommended to elaborate a comprehensive assessment of long-term requirements for sustainable (and reliable) railway systems that are fully integrated in the national and regional transportation market. This assessment should be the basis for a strategy which favors a staging of project, based on credible business plans and solid projections of the governments' financial capacity. The role of the railways should be defined in a harmonized approach with the road infrastructure strategy and should assess: (i) what will be the transportation needs of the country in a span of 20-25 years, (ii) what is the market share targeted for the railways for the long-term, considering the economic, environmental and social benefits, (iii) how much of the predicted volumes could be taken by the existing infrastructure and what additional capacities are potentially required. The various concession agreements must include clear and specific tasks for the concessionaire, compliant with the goals of the designed strategy.

SSA countries could enlarge the rail market by a better utilization of the regional corridors for transport. Railways are very effective on longer distances of transport. Developing harmonized regional strategies for creating corridors of transport, addressing the problems of border stations, and developing adequate logistic centers will support the growth of the volumes transported by railways and will sustain the economic development of the region. The international corridors should be developed based on financial and economic evaluations, balancing the medium- and long-term interests in the region. The programs must be realistic and focused on addressing the specific needs of the existing transport market. Regional coordination of strategies and synchronization of implementing investment programs between neighboring countries are mandatory steps in this framework.

The governments must develop unbiased policies for land transport. Government policies in transport must be restructured to become fully transparent and unbiased. New policies should include financing, but also equitable regulatory framework. With often road-biased public financing of infrastructure, significant tax evasion by truck companies, over-loaded lorries exceeding the legal weight restrictions, and the lack of safety standards on roads, the rail is also confronted with market distortions which creates additional barriers for its development. By putting the rail and road transportation on a more balanced footing, the governments will allow the shippers and freight-forwarders to inform better their modal decisions.

Governments must be financially involved in the construction and long-term maintenance of land transport infrastructures. Adequate legal framework must be put in place to secure resources for long- term government financing of railway infrastructure in a similar approach as that is used for roads. The creation of railway funds similar to the existing road funds (or replacing existing road fund by a *land transport infrastructure fund)* could be considered by governments for to achieve a better balance in financing road and rail infrastructures. Similarly, the fuel excise tax collected from road and rail fuel users (trucks and locomotives) could be used for feeding this *land transport infrastructure fund*.

Governments must implement non-biased systems for charging the users for the utilization of transport infrastructures. They could develop adequate policies for using similar instruments for financing road and rail infrastructures. In the same context, the readiness of government to finance the social benefits of railway transport (environmentally friendlier, economically cheaper, and socially safer) must also be taken into consideration when defining the instruments for financing the development of transport infrastructures. The principle that the providers of transport services should pay for using the transport infrastructures at their real cost, is an important step towards this goal. Depending on the specific conditions of traffic, and or specific strategy for local or regional development, national government can always politically motivates the design of the cost ratio between the state and the users.

The States must remain involved in the ownership and financing of railway infrastructure. The states should continue to own the railway infrastructure (as is the case for road infrastructure) and they should plan their investments on longer terms, independent of the duration of concession agreements. The concession agreements will include the obligations of the private operator as far as contributing to the financing of the costs of the infrastructure; depending on the specific conditions of each railway line (traffic intensity, technical status of line), and on specific concession clauses (operating passenger trains as part of local or regional strategy), the concessionaire would cover the full costs of infrastructure or only a part of it. In all cases, the main rule should be that all costs of railway infrastructure must be fully covered by the concessionaire and the government. Four elements are vital to this approach: (i) accurate estimation of the costs of maintaining the infrastructure when putting in place the financing system for the concession agreement, (ii) the setting up by independent regulator of a fair share paid by the concessionaire, (iii) accepting a flexible approach to the concession fee (positive or negative) based on a fair, independent and transparent evaluation of the financial results of the concession, and (iv) leaving the full responsibility of executing the rehabilitation works to the private operators.

The goal of the rehabilitation of railway infrastructure is to make railways competitive when compared to road transport. For achieving the competitiveness goal it is necessary to rehabilitate the existing narrow gauge network with an axle load of a minimum of 18 tons/axle. This usually offers the required transport capacity for the existing and projected traffic in SSA. Although there are currently discussions in a number of countries about the necessity of changing the gauge from narrow to standard, these debates are not strongly supported financially and mostly ignore the economics of such large investments. Transition to a new gauge would require replacing all existing infrastructure (track, bridges, tunnels, shops, depots, stations loops, etc.). Additionally it would include the replacement of the entire rolling stock fleet, and transport services would require higher operating costs during two-three decades of transition when working with two different gauges (mixed fleet of locomotives, coaches and wagons, mixed facilities for maintenance and operation, etc.). Finally, and unless a global and regional approach is taken, changing a rail gauge will isolate a system from its neighbors, and therefore will lose the economic leverage of a regional market. For all its technical attractiveness, the standard gauge can hardly justified the additional financial burden on the public budgets and should be set aside in order to avoid the risk of confusing potential donors and investors, and delaying the major decisions for rehabilitation of railway infrastructure.

The need of implementing appropriate framework for successful PPP's in the railway sector. Concessioning railways should be used by governments as a mean to stimulate the private sector to contributing in developing rail transport. Governments legitimately want to transform some loss-making and overstaffed structures into efficient and modern companies providing higher quality transport services for the benefit of the country. Beyond that, governments wish to trigger private funding for the expansion of the existing railway network. As the free market does not necessarily offer the corresponding attractive conditions, the governments must create the adequate incentives for the private sector by adopting relevant changes in the fiscal, business and property laws. The goal would be to ensure a flexible leasing of rolling stock, the divestment of stranded railways assets to finance governmental financial obligations for railway infrastructure, the securing of resources for long-term government financing of railway infrastructure in a similar approach as for road infrastructure, and the securing of private management of investment in railway infrastructure. If the governments want to achieve their long-term objectives, they must refrain from imposing non-commercial obligations that may put in danger the successful operation of transport services or limit the commercial behavior of the concessionaire (e.g. constrains in leasing of assets, inappropriate policies based on excessive control of railway fares, delays in payment of compensations, transfer of surplus staff).

Governments need to develop adequate regulatory framework. Putting in place and consolidating some sound, independent, and accountable regulatory structures, is vital for the improvement of concessions' performance. Currently, many of the functions of regulatory entities are included as provisions of each specific concession agreement. However, the concession agreements, no matter how professionally developed, cannot include provisions for all potential future situations the government and concessionaire will face during the whole duration of the concession. Powerful and independent regulatory structures would create a good environment for solving the unforeseen problems that may appear during a concession. This would offer more flexibility in managing the concession agreements and more predictability of decisions for all participants in the process. Institutional arrangements are necessary for the accomplishment of the major policy and regulatory functions: (i) development of railway sector, (ii) economic regulation, (iii) safety regulation, (iv) technical standards, and (v) accident investigation.

Put in place a strong and transparent set of rules for monitoring the concessions taking advantage of the lessons learned. The government and the concessionaire must cooperate for addressing the potential challenges during the execution of the concession agreement by finding win-win solutions for achieving their goals. For this purpose it is paramount to establish a clear set of rules for monitoring the concession in order to prevent undesirable developments. The concessionaires should provide on a regular basis and in pre-defined forms, detailed financial and operational information to the regulator for calculating vital indicators (e.g. rate of return on equity and fixed assets, economic rate of return). This will allow the transparent calculation of the public contribution for the financing of railway infrastructure, and the flexible update of the concession fee (positive or negative). The obligation of independent annual audits of the concessionaire's financial and operational performance transmitted to the railway regulator at a precise deadline should be also included.

The fair compensation for passenger services is mandatory. By adopting the concession approach, the governments in SSA have introduced the commercially-driven concept for railways. As most of the passenger transport services are not commercially viable and the private sector cannot operate loss-generating services, the concessionaire is entitled to receive compensation for providing these services. The concept of Public Service Contracts sets up the relationships between the government as contractor of a volume of transport services for social purposes, and a railway operator as provider of contracted services. In this way the private sector will be incentivized to operate passenger services, and the social need will be fulfilled with the lowest public contribution, while railway transport remains commercially-driven. The proper addressing of

this important issue requires a cultural change in the way governments act in their capacity as clients of transport services; the timely payment of the agreed compensation is paramount for solving the problem of passenger services.

The concession of passenger services should be addressed separately from the freight concession and backed by guarantee instruments (Partial Risk Guarantees). There are very few common aspects in operating freight and passenger services (different markets, different assets, different operating practice, etc.). Depending on the local conditions of each market, the concession of freight and passenger services could be awarded to the same concessionaires or to separate entities. In any of these situations, the operation of the passenger services must be addressed through separate provisions in the agreement concerning duration of concession, specific targets and conditions of achieving the targets, compensation of services, etc. The cross-subsidy of passenger services through the freight concession agreement is unacceptable.

Taking action for better utilization of international financial support. The development of the railway transport sector requires important financial resources and due to limited governmental funds it is highly dependent of international aid. The current trend of supporting the direct rehabilitation of railway infrastructure through IFI funds could be diversified by new programs, including support of maintenance of infrastructure in the framework of an agreed long-term strategy, support for setting up leasing industry for rolling stock, political risk insurance for private investments in railways, etc. Financing instruments for sustaining the development of capacities for designing the strategies in transport, for setting up the adequate regulatory framework, for implementation of safety standards, or for putting in place adequate public service contracts could be useful for creating the environment appropriate for private investments in railways in sub-Saharan Africa.

The recommendations suggested in the present document are based on a comprehensive approach for improving the performance of the railway sector in parallel with the enhancement of the governance of the transport sector. The rhythm of implementation of such a complex set of recommendations may vary from country to country depending on local conditions and will require – in any case – a long period of time. Nevertheless, the dramatic status of the railway transport sector in SSA requires rapid actions. In this respect, the present work includes a selected list of most urgent recommendations to be implemented in the first stage. The way ahead for improving the performance of railways in sub-Saharan Africa is a complex endeavor that cannot be achieved without the strong involvement of the private sector. The political class should put at the top of their agenda the creation of the long-term confidence in so-

cio-political system and instituting stable commitment of the private sector for sustaining investments in the region. The international support from IFI's and the private sector can support the process, but the main role should be played by the governments which in turn must prove their long-term willingness to accomplish a very complex agenda.

1. General considerations about the evolution of railway transport in Africa

The need for railway transport in the competitive transport market. In most of the African countries railways have had, throughout history, a key role in the economic development. For many years, railways maintained a dominant role in transporting freight and passengers at low costs and enabled the growth of mining and agriculture. The aggressive competition with the road transport starting from 1950 became a serious challenge for railways in Africa, as has been the case everywhere else on the globe. For more than four decades many railways from various continents have implemented structural changes, adapting with flexibility to the new demands of the market. The last decade added additional challenges to the transport market worldwide given the rising fuel prices and the increasing importance of protecting the environment. Today's modern economies ask for greater mobility of citizens and the movement of larger volumes of freight at lower costs, in safer conditions, and with minimum negative impact to the environment. These new challenges offer railways the chance to provide a valid alternative to other modes of transport. What is the answer of sub-Saharan railways to these challenges?

The restructuring of the railway sector in Africa started later than in other regions of the world. During the last 50 years, in Africa as throughout the world, governments invested predominantly in road infrastructure improvement neglecting railways, as the road transport expanded rapidly due to the aggressive development of the automobile industry. The liberalization in the road transport and the slow response of railways to adapt to the new market conditions, resulted in a dramatic traffic decline in rail transport. By the 1990s most of the African railways were in bad shape, requiring large investments in infrastructure and rolling stock, and a new business-oriented approach to their activities. To address the crisis, many governments considered concessions as a possible solution, and between the mid 1990s and 2010 most of the sub-Saharan railways were concessioned. The scope of the current work is to analyse the status of the sub-Saharan railways after almost two decades of experience in concessions and to propose recommendations for further improvements of the performance of the sector.

Concession – the preferred solution for restructuring the railway sector in SSA. More than 70 percent of the railway transport activities are currently managed by private operators, as a result of a sustained policy of railway concession in the region, started in the early 1990s. The World Bank Group has supported most concession processes through the International Development Agency (IDA) and the International Finance Corporation (IFC). The two members of the World Bank Group have been involved, case-by-case, in technical assistance during concession processes, personal retrenchment, or investments in infrastructure and rolling stock rehabilitation or maintenance, as presented in Table 1. Since 1996, IDA has provided about 1 billion dollars to support the efforts of the governments in this process. Each concession is a specific case with its own problems, achievements and weaknesses. In many cases, frustrations have accumulated on the government side, in the private sector or with clients of transport, as the development of the railway sector was not running exactly as expected. However, considering the local conditions in the transport market in SSA, it would be difficult to imagine presently a better alternative for the development of the railway sector than some sort of private-public partnership. In this context, before drawing any conclusion about the results of concessions it is important to point out that the financial and operational status of railways not concessioned has worsened dramatically during the last decade[4]. The analysis of the concessions in SSA does not aim at criticizing concession as solution of railway restructuring, but at identifying ways to improve the efficiency of this approach.

The growth of the railway transport market in SSA is much lower than that of the rest of the world. Since 2001, the volumes transported by railways recorded a consistent growth worldwide; in 2010, rail carried about 9.3 trillion ton-km and 2.8 trillion passenger-km. In spite of the volume losses in 2008-2009 due to the financial crisis, in 2010 the rail transport for freight and passengers increased worldwide by more than 40 percent compared with 2001 (see Figures 1 and 2). The trend varies for the different regions. The most dynamic growth was achieved in Asia (74 percent for freight and 67 percent for passengers), while America and Europe registered sound increases in freight transport (25 and 40 percent respectively) and limited increase for passengers (103-106 percent). Relevant for the purpose of our paper is that since 2001 Africa has shown a very modest increase of freight transport of only 7 percent and a drop of 7 percent in passenger services. Considering the robust increase of the transport market worldwide during the last decade, the contrasting trend in Africa signals that the development of the railway system in Africa still faces serious barriers.

[4] Exceptions are the railways in South Africa and the countries adjacent to it.

In developing the analysis of the concessions in SSA, an important element must be to understand why the rail is viewed as a less attractive transport mode.

Table 1 List of Railways under concession in sub-Saharan Africa

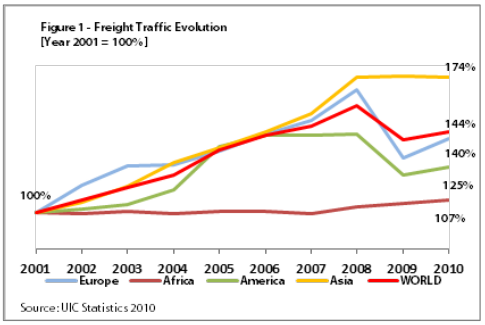
Company Name	*Country*	*Year of Concession*	*Network Length**	*Total Support***	
				IDA	*IFC*
Sitarail	Cote d'Ivoire, Burkina Faso	1995	1,254	21	none
Beitbridge Bulawayo Rail (BBR)	Zimbabwe	1999	317	none	none
Camrail	Cameroon	1999	1,104	113	none
Central East African Railway Co (CEAR)	Malawi	2000	797	10	none
Railway of Zambia (RSZ)	Zambia	2002	1,273	35	none
Madarail	Madagascar	2003	681	65	none
Transrail	Senegal, Mali	2003	1,546	45	none
Companhia dos Caminhos de Ferro da Beira (CCFB)	Mozambique	2005	725	110	none
Transgabonais	Gabon	2005	814	0	none
Nacala Railway	Mozambique	2005	600	20	none
Kenya Railway Co (KRC)–Zuganda Railway Co (URC)	Kenya – Uganda	2006	2,454	74	32
Tanzania Railway Co (TRC)	Tanzania	2007	2,722	35	44
Societe Nationale des chemin de fer du Congo (SNCC)	Democratic Republic of Congo	2011	3,641	380	n.a.
CFCO	Congo	2012 (Plan)	885		
NRC	Nigeria	2012 (Plan)	3,505		
TOTAL				908	76

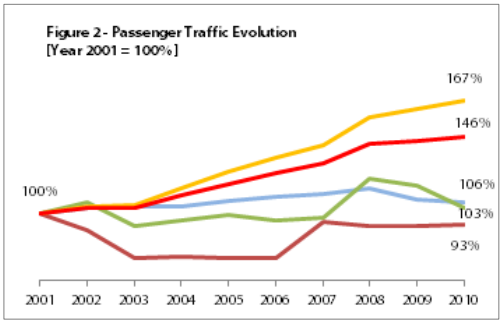
** in kilometer

** in million USD

Efficient railways versus competitive railways. It is apparent that sub-Saharan rail concessions have solved a number of lingering problems, including the improvement of the financial performance of companies which had been accumulating losses before, and have brought a certain stabilization of freight volumes. It is important to mention that in many cases these results have been achieved in the context of a reduced dependency on public funds. However, increasing the volumes of traffic is not sufficient to make a railway system financially viable: it is also necessary to make it competitive. This means providing quality transport services (price, speed, availabil-

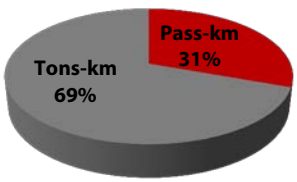
ity, punctuality, etc.) which are ultimately superior to the competition; only then can railway systems become an attractive option for shifting part of the existing road traffic to rail, or for putting on rail the new volumes of freight generated by the economic development of the countries. Providing better quality services depends on many factors: quality of infrastructure, age and condition of rolling stock, mechanization of activities, operations performance, regulatory framework, etc. Finding the solutions to reverse the negative trend of railway traffic in sub-Saharan Africa during the last decade requires an accurate assessment of the actual positioning of the railways in the framework of the entire transport system, and defining a realistic approach for development and improvement.





Benchmarking as an instrument to identify the directions of enhancing the performance of sub-Saharan railways. The traffic structure in sub-Saharan Africa illustrates that the railways in the region are predominantly dedicated to freight movements (see Figure 3). In theory, this could turn into an advantage as the freight railway transport can become profitable business when it is efficiently operated. Successful rail freight operations share common characteristics concerning the volume of traffic operated, the density of traffic, and their operational performance. The comparison with a selected number of successfully operating railways from different regions of the world may be useful for identifying the reasons of the poor performance of the railway sector in sub-Saharan Africa. Benchmarking is not an easy exercise in the case of sub-Saharan railways due to the lack of complete and accurate data and the difficulty to find relevant characteristics for comparison. The conclusions from the international comparisons must be cautiously evaluated, and the analysis should be developed based on the correlation of

Figure 3 - Ratio of Traffic Types in SSA [%]



various indicators and bearing in mind the local conditions of each railway[5]. Considering these restrictions, the following basic indicators have been used for comparison:

(i) Railway network length
(ii) Annual volumes of transport
(iii) Traffic density on infrastructure[6]
(iv) Rolling Stock Productivity[7]
(v) Labor productivity in transport operations[8]
(vi) Average haulage for freight

[5] Although the international benchmarks are a useful tool for measuring the necessary improvement of the performance of railways, it is important to be aware that even for similar railway network dimensions, the comparisons must be carefully evaluated as the geographical position, the structure of traffic, the market conditions, and many other specific factors differ from one railway to another.

[6] Traffic Density: traffic units (ton-km + passenger-km) operated annually divided by the network length.

[7] Rolling stock productivity: volume of traffic units (ton-km and/or passenger-km) operated annually divided by the number of units of certain category of rolling stock (coaches, wagons, locomotives).

[8] Labor productivity: traffic units (ton-km and/or passenger-km) operated annually divided by the number of staff.

2. Two major constraints of railway transport market

The railway network in Africa is very small and does not display a density similar with that in other regions. On a global scale, the railway infrastructure is a very large network with more than 1 million km of tracks. With a length of around 54,000 km, the network of Africa represents only 5 percent of the worldwide network (see Figure 4). The total length of the network in Africa is lower than the railway infrastructure in individual countries like Canada, Russia, India, China or the United States. The railway network of the sub-Saharan Africa represents no more than one third of the African railway network. Figure 5 shows that sub-Saharan Africa (excluding South Africa) operates about 35 percent of the railway network existent in Africa, representing a very small network compared with the rest of the world (about 2 percent of the worldwide railway network). The very limited length of the railway network is one of the major reasons of the current limited share that railways hold in the transport market in SSA.

Figure 4. Lengths of lines in the world (km)

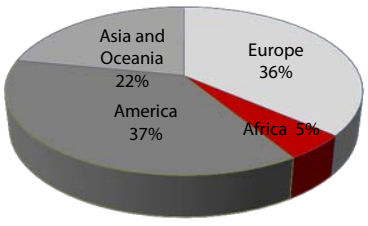
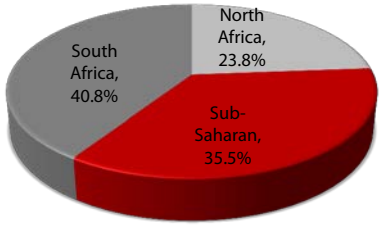


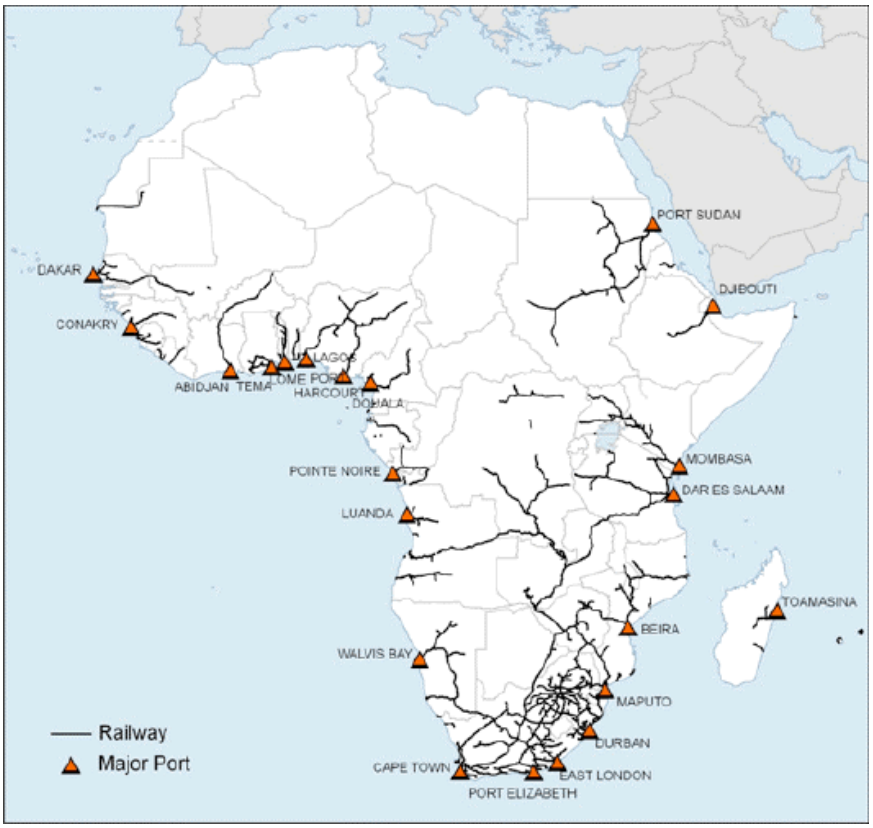
Figure 5. Length of lines in Africa (% of Africa network)



Source: UIC Statistics – 2010

Most of the lines are inherited from the main rail corridors opened during the colonial period, connecting the hinterland centers with the ports to maritime corridors.

Figure 6. Main railway lines in Sub-Saharan Africa



Source: AICD Database

The technical condition of railway infrastructure is very poor. The governments and national railways in sub-Saharan Africa have neglected to invest in rehabilitation or renewal of the infrastructure[9]. A large part of the structural buildings and tracks are over 100 years old. Railways have also suffered from various conflicts and long periods of civil unrest[10], and are consequently damaged or unable to operate. Altogether, and with the exception of South-Africa, most of railways are in very poor technical condition, and in some cases the deterioration is terminal[11]. The railway infrastructure is often ill-suited to the requirements of modern train operations and would re-

[9] This does not refer to South African railways.

[10] It is the case of the central and northern network of Mozambique, or railways in Angola, Ethiopia, Eritrea, Congo, and Côte d'Ivoire.

[11] It is the case of railways lines in Guinea, Sierra Leone, North-East network in DRC, and some short lines in Angola.

quire significant rehabilitation or repairs before any operation can commence. Signaling systems are often mechanical or even manual, based on train drivers orders, and therefore prone to human errors; this eventually generates serious safety concerns. Most of the SSA railways face major issues associated with (i) aging track (insufficient ballast, rail wear, deteriorating earthworks), (ii) poor condition of most structures, (iii) obsolete signaling and telecommunication, and lack of spare parts. Speed restrictions over long sections have a dramatic effect in reducing railway competitiveness and rolling stock productivity. It is very difficult for the railways to compete with modern road networks that are increasingly being constructed on major corridors.

Figure 7 - Volume of freight transported by rail in 2010 [% of total ton-km]

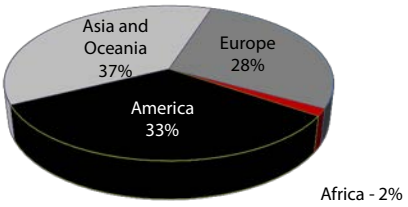


Figure 8 - Passengers transported by rail in 2010 [billion pass-km]

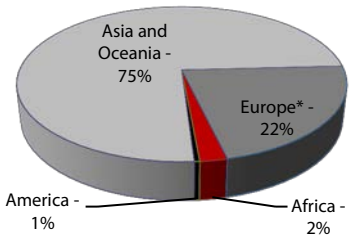


Figure 9 - Freight Traffic in Africa in 2010 [share in %]

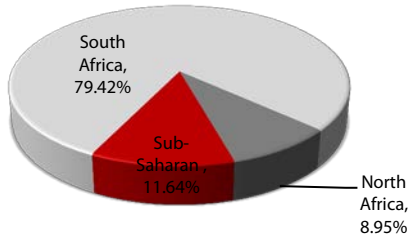
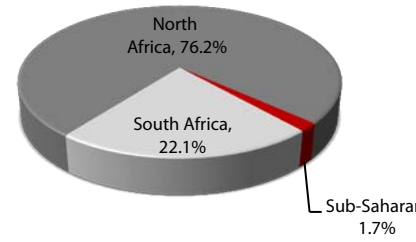


Figure 10 - Passenger Traffic in Africa in 2010 [share in %]



Africa operates a very limited volume of traffic compared with the rest of the world. Railways have a competitive advantage to other modes of transport on large volumes of traffic. Africa only operates about 2 percent of the world volume of freight and passenger rail traffic (see Figures 7 and 8), whilst sub-Saharan Africa operates only 11.6 percent of the freight volume and 1.7 percent of passengers (see Figures 9 and 10) of this share. This illustrates the reduced size of the railway market in sub-Saharan Africa - one of the main reasons for the financial fragility of the railways in the region. Sub-Saharan railways cannot take advantage of the economic benefits coming from the density characterizing other railways in other parts of the world,

which means that the costs of operation for railway transport services in sub-Saharan Africa are comparatively high and in many cases are not competitive.

The inter-country trade in SSA is very limited. The development of the railway transport is subject not only by the structure of the railway network, but also to the reduced volume of trade between neighboring countries. The structure of commodities transported by rail mirrors the economic structure of African countries and as such, it is mostly based on mining products (coal, stone, copper, manganese, iron), and other raw "natural resources" (timber), or agricultural exports (cocoa, coffee, cotton, cereals). The percentage of inter-African export exchanges is still low as most SSA countries are still economically dependent on overseas markets, both for exports and imports. The railway pattern is still mainly oriented on exporting the resources to other continents, and less on regional trade. Although the development of trade between African countries would be eventually a key factor for increasing the volumes of traffic on railways, current pattern suggests that railways performance should focus on moving cargo to and from the port, which are the gates to international markets.

3. Short evaluation of the performance of railway operations in SSA[12]

High traffic density is an essential factor for making railways competitive in the transport market. As the railway infrastructure produces revenue only when trains circulate, its financial sustainability depends critically on loads, because any empty train represents a potential loss. The fixed costs of railway infrastructure are rarely under 70 percent of the total costs (including capital and maintenance costs for track, engineering structures such as bridges and tunnels, train signaling, communications systems, power supply in electrified sections, and terminals). Due to the high percentage of fixed costs of infrastructure, a low traffic density makes the railway transport more expensive and less successful when competing with the road transport. Average traffic density in Sub-Saharan African railways achieved in 2010 was less than 1 million traffic units per rail-route-km—a very poor value, representing another major

Figure 11 - Traffic Density Benchmark in Africa [traffic units/km of track]

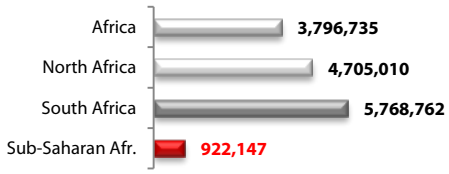
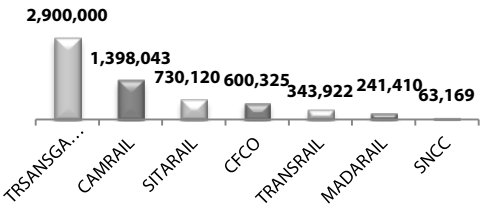


Figure 12 - Traffic Density in various sub-Saharan Railways [traffic units/km of track]



reason for the lack of competitiveness of the railway transport services in the region. As illustrated in Figure 11, the average traffic density on the infrastructure of sub-Saharan railways is four times lower than the African average, and six times lower than the intensity achieved by the railway system in South Africa. The traffic density on individual railways varies from 2.9 million traffic units per km (which is a strong value) at Transgabonais to under 0.1 million traffic units per km at SNCC (see Figure

[12] All charts in the present chapter use data processed from the UIC Statistics – 2010 and statistic data about concession railways in SSA collected yearly by the World Bank staff and managed by Pierre Pozzo di Borgo.

12). The current trend of reduction of railway transport market volumes in some sub-Saharan railways has a direct impact in higher costs of railway operations; it will impose higher tariffs for covering the costs creating a vicious circle with the risk of further diminishing the railway market due to deterioration of its competitiveness. It is very clear that due to low traffic density, many railways in SSA cannot cover the full costs of investment and operations from their own revenues and state support is necessary for financing the infrastructure. As traffic density is not the only factor defining the financial performance of a railway, there is no precise figure to make the distinction between railways that need and those that do not need state support. Figure 13 presents the traffic density in the selected railways for comparison. The vertically integrated freight companies in the United States, China, Russia, and India are examples of railways able to cover the capital, maintenance, and operating costs for infrastructure and rolling stock from their own revenues due to a very intense utilization of their networks. Railways with good traffic density as those in Germany or Morocco cover the full cost of maintenance (infrastructure and rolling stock) and operations, but may receive part of the capital costs (infrastructure and in some cases passenger rolling stock) from their governments. The low traffic density on the railway in sub-Saharan Africa is a long shot to ensure its financially sustainability, as the performance of other railways have proved. It also requires a clear commitment regarding the national governments' contribution into the railway sector, in order to develop financially sound transport systems.

Figure 13 - Traffic Density Comparison [traffic units/km of track]

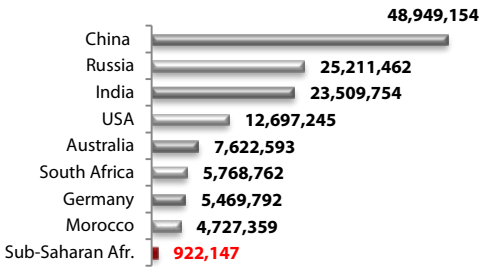
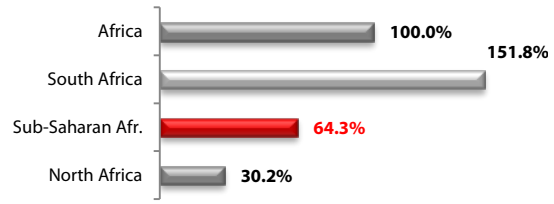


Figure 14 - Wagon Productivity in various regions of Africa [Africa = 100%]



The productivity of wagons illustrates the efficiency of operations and has a direct impact on costs. In any railway operator, high utilization of rolling stock and high fleet availability for operation are key indicators for improved quality services and enhanced market responsiveness. Sub-Saharan African railways have an average wagon productivity of about 64 percent of the average productivity of African railways. They are far behind the South African railways achieving a productivity of 152 per-

cent compared with the African average (see Figure 14). The best wagon productivity in sub-Saharan Africa (based on current data) was achieved by Transgabonais, which has a value comparable with the international average (see Figure 15); all other railways have much lower utilization of the fleet. Extending the comparison to the selected railways from the rest of the world, most of the sub-Saharan railways are very far away from the international performance (see Figure 16). The selected railways for comparison achieve wagon productivity up to ten times higher. Obviously, those railways operate with much lower costs and are highly efficient, attracting more traffic and making room in their budgets for the renewal and maintenance of the fleet. Poor utilization of wagon fleet at sub-Saharan African railways may indicate a lower efficiency of operating practice and/or a lower availability of wagons due to their poor technical condition. A lower productivity of wagons therefore requires comparatively larger fleet to achieve the same volume of freight, or, alternatively, will limit the capacity of the operator to move additional volumes of traffic. Both situations have a negative financial impact on the company's results. The improvement of the performance of concessions in sub-Saharan railways is tightly linked with the accurate estimation of the capital cost associated with a reliable fleet, tuned to the existing traffic levels. The accurate evaluation of the capital cost for rolling stock is an essential element in developing a realistic business plan at the beginning of the concession.

Figure 15 - Wagon productivity in various sub-Saharan Railways [traffic units/wagon]

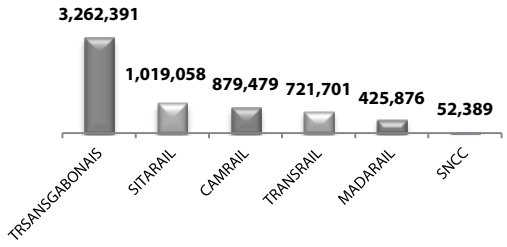
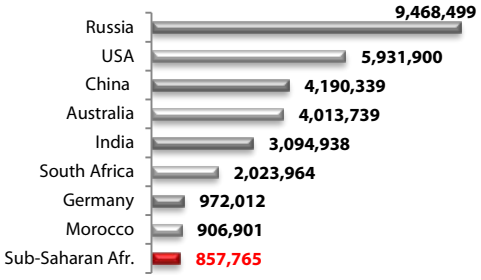


Figure 16 - Wagon Productivity Benchmark [traffic units/wagon]



Labor productivity is essential for the operational and financial performance of railways. As service-oriented companies, railways have to allocate an important part of their revenues to cover the cost of staff. In this respect, a good utilization of staff is essential for cutting the operating costs and for maintaining the competitiveness of the company. Figure 17 shows that sub-Saharan African railways have an average labor productivity of only 37 percent of the African average, while the South African railways achieve a staff productivity seven times higher This means that on average,

for the operations executed by seven staff members at sub-Saharan railways, South African railways use only one person, with an obvious impact on costs. The comparison between the sub-Saharan railways illustrate that Transgabonais is the only railway with competitive labor productivity for a freight railway (see Figure 18). The low labor productivity resulting in a need for more staff at sub-Saharan railways may be related with low mechanization of operations, bad operating practice, lack of modern technologies, or over-staffing imposed by governments for social reasons. Further comparison of South African railways with the self-financing railways selected for international benchmark shows that in the sub-Saharan Africa region it is perfectly possible to achieve world class performance (see Figure 19).

Figure 17 - Labor Productivity compared to African Average [%]

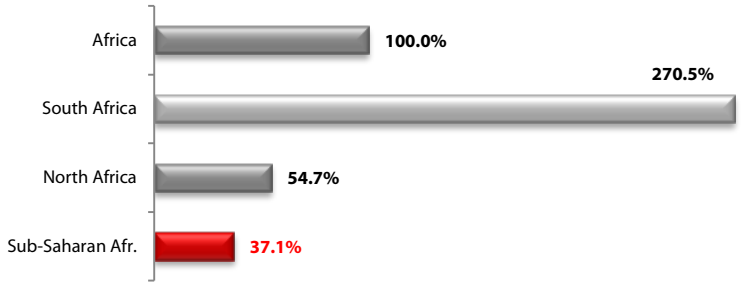
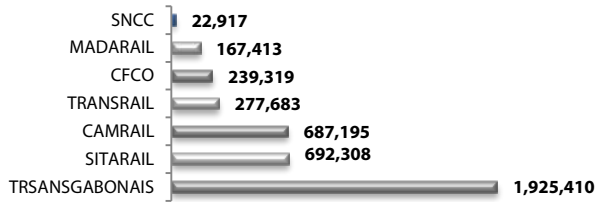


Figure 18 - Labor Productivity in various sub-Saharan Railways [traffic units/staff]



Railways are more efficient on medium and long distances of freight transport. The sub-Saharan railways have a good average haulage, adequate for developing efficient freight railway transport. With an average of about 500 km (see Figure 20) the sub-Saharan railways achieve better performance than important railways selected for comparison and which have a proven financial record (Germany, Australia, Morocco). The detailed data for the sub-Saharan railways (see Figure 21) reveal excellent average haulage for all railways, especially for Transrail and Sitarail. From the point of

view of transport distance, the market in sub-Saharan Africa offers good conditions for developing a sustainable railway transportation system.

Figure 19 - Labor Productivity Benchmark [traffic units/staff]

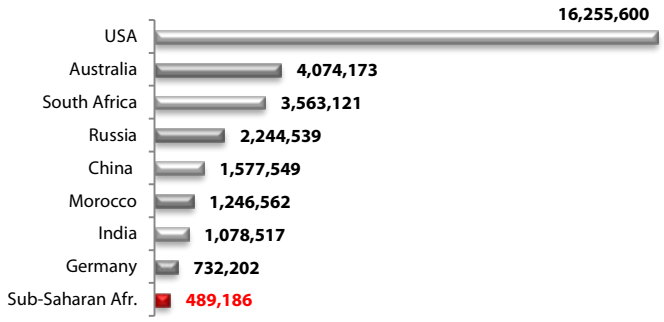


Figure 20 - Average Distance of Freight Transport [km]

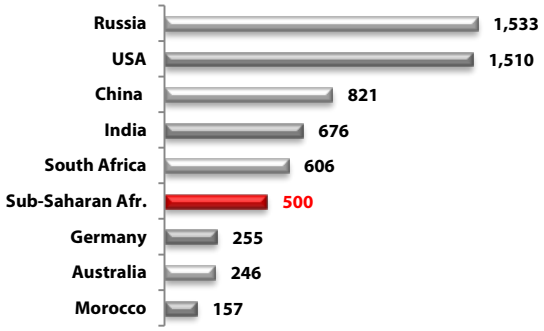
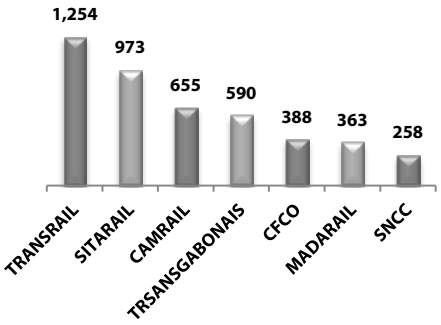


Figure 21 - Average Haulage at various sub-Saharan railways [km]



Conclusions related to the international benchmark. There is no universal set of rules to define successful railway companies. It is generally accepted that railways have a competitive advantage for *large volumes of transport* on specific markets: (i) freight on medium and long distance, and (ii) passengers for commuter services in metropolitan or regional area and on fast long distance services, up to four hours transport duration. A railway operating such services has better chances to become financially sustainable, and to cover most of its capital, maintenance and operating costs, and possibly to obtain a reasonable profit for the owner. The sub-Saharan transport market offers adequate conditions from the point of view of distances. However, the low traffic density and productivity ratios are definitely major hurdles for a sound development of the rail transport in the region. Although these elements must be addressed properly in order for the rail to deliver higher efficiency, they are not the only difficulties to be overcome.

4. Short analysis of concessions in SSA[13]

Data scarcely available for assessing the financial performance of SSA railways. Financial data are not readily available as public data. The concession agreements (especially for the first generation concessions) do not always contain a clear obligation of the concessionaires to present a comprehensive set of information in a harmonized approach for making data comparable from year to year and from one concession to another. In most cases, the absence of regulatory body plays against transparency and accountability in that matter. As a consequence it is hard to develop a comprehensive analysis of concessions and the conclusions should be evaluated with care. This is a serious difficulty, mainly for the governments that do not have access to reliable information and cannot correctly monitor the concessions. The dissymmetry of information between the government or regulatory agencies and concessionaires is a major source of frustration and tensions during the implementation and the monitoring of the concessions and offers an additional complication when it comes to rapidly solve contractual or operating issues. The present chapter presents a short analysis of selected concessions in SSA, based on the collected information in the framework of the projects financed by the World Bank.

Private companies are the majority shareholders of all concessions in SSA. The shares of the state vary between 10-20 percent of Sitarail, Transail, or Camrail, 25 percent of Madarail, and 49 percent in cases of Mozambique or Tanzania. Two major types of private investors prove to be interested in concession of SSA railways:

a) Operators interested in vertically integrating their distribution chains by controlling the production and transport activities. In this case the involved operators are flexible in accepting a lower rate of return from rail transport as long as the vertical integration (production and transport) provides sufficient benefit. The best example of this type of operator is Bolloré Group, one of the most important shareholders in railways and port concessions in Africa and an important freight forwarding company.

[13] All charts in the present chapter use data processed from the UIC Statistics – 2010 and World Bank Data Base of concession railways in SSA created by Pierre Pozzo di Borgo.

b) Operators specialized in specific railway transport activity are exclusively interested in railway activities, investing in transport operations and trying to make profit solely from operating railway transport services.

Figure 22 - TRANSRAIL - Evolution of freight traffic and revenues [Year 2004 = 100%]

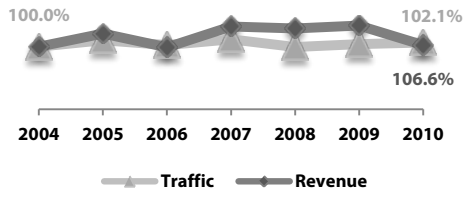


Figure 23 - CAMRAIL - Evolution of freight traffic and revenues [Year 1999 = 100%]

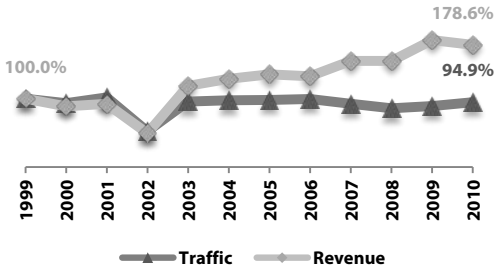


Figure 24 - MADARAIL - Evolution of freight traffic and revenues [Year 2004 = 100%]

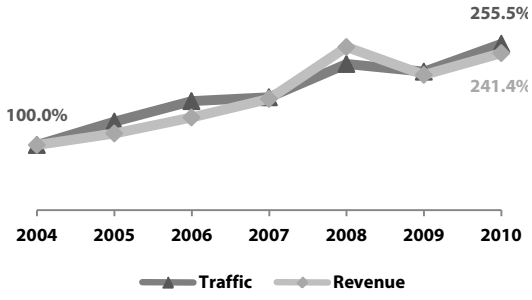
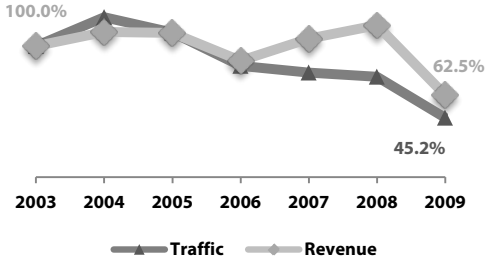


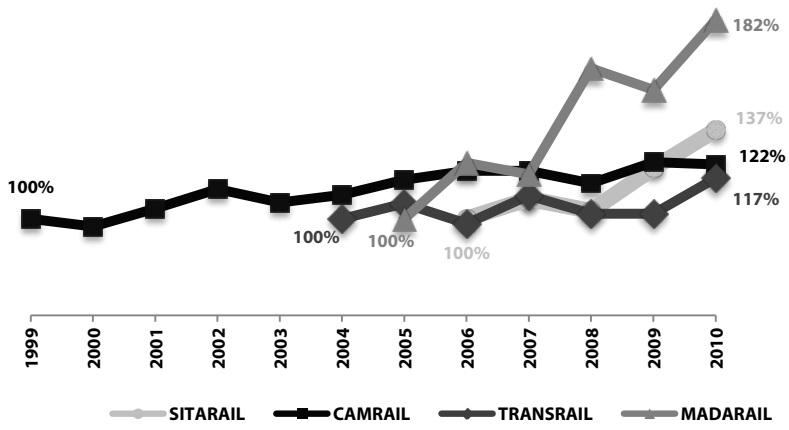
Figure 25 - SNCC - Evolution of freight traffic and revenue [Year 2003 = 100%]



Railway concessions stopped the decline of the freight transport on railways in sub-Saharan Africa. The major achievements of the concessions are as follows: stopping the accelerated decrease in freight volumes, reducing the dependency of railways on public financing, covering the minimum necessary costs for maintaining the infrastructure in operation, and increasing the financial performance of companies. The figures 22-24 present the evolution of volumes of freight traffic and of the revenues of three rail concessions (Transail, Camrail, and Madarail) since the beginning of their concession. This demonstrates that after concession all three railways had a positive evolution of traffic, and also have been successful in increasing their revenues. These results illustrate a promising development of railway activities based on a new business approach resulting in market stabilization or even expansion and a robust increase of revenues (especially for Madarail). A contrasting picture is presented in Figure 25, illustrating the continuous degradation of rail operations that were operated

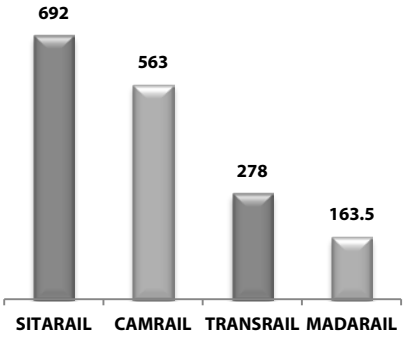
in the same interval of time (2003-2009) by the national railways (SNCC). SNCC lost more than 50 percent of traffic since 2003 and its revenue thawed by about 40 percent during the same interval; the concession at SNCC then started in 2011.

Figure 26 - Evolution of labor productivity [Starting Year of Concession = 100%]



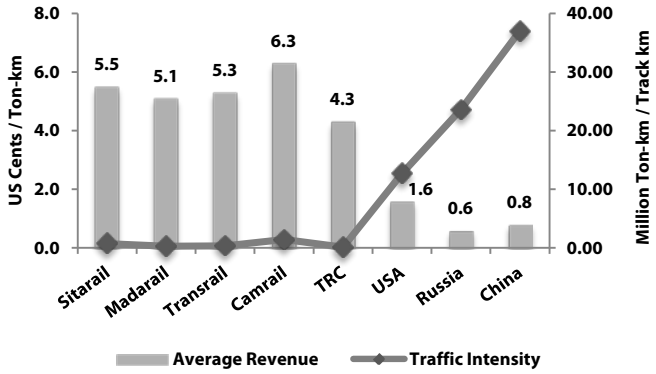
The labor productivity increased steadily at some of the rail concessions. The data available illustrate a robust increase of labor productivity at Sitarail, Madarail, Transail, and Camarail (see Figure 26). The most significant increase of labor productivity was registered by Madarail (82 percent in five years), but it started from a very low figure and its current achievement is still below the performance of the other three concessions (see Figure 27). In any case, the private management of railway operations has shown its capacity to improve internal business practice. It has enhanced operational performance and generated a positive impact in cost structure.

Figure 27 - Labor Productivity in 2010 [Thousand Traffic Units/Staff]



Railway transport costs in SSA are very high compared with other regions. It is not easy to obtain precise information about the transport tariffs for specific commodities, but based on total revenues we may estimate the level of charges. Pozzo di Borgo

Figure 28 - Average revenues and traffic density comparison



made a detailed analysis[14] of financial performance of selected railway concessions in SSA revealing that the average revenue (unit revenue in US cents / ton-km) in SSA are significantly higher than those at the most important railways in the world (see Figure 28 based on average revenues estimated by Pozzo di Borgo and the traffic density updated based on UIC Statistics for 2010). The chart illustrates the impact of underutilization of the infrastructure in the operating costs. The SSA railways charge for the transport of one ton-km from three to ten times more than U.S., Russian, or Chinese railways. The unfavorable cost structure of SSA railways is a serious barrier for higher efficiency in operation. It is interesting to extend the analysis to the general environment of the land transport market for better understanding on how the railways can afford to overcharge their clients (see chapter on Short considerations on road transport as the main competitor for railways, Table 3).

The general performance of the concessions in SSA is mixed. In spite of the facts presented above (stable traffic, good collection of revenues, improved labor productivity, overcharging of clients), the financial performance of concessions in SSA is not always very encouraging. The Table 2[15] below presents in a very concise mode the current operational and financial performance of the SSA concessions. Pozzo di Borgo proposed in his analysis a ranking system for the operational and financial performance of concessions. The operational performance is ranked as follows:

a) A = Best in class
b) B = Average performance
c) C = Below average performance

[14] Review of selected railway concessions in SSA, Pierre Pozzo di Borgo, June 2006.
[15] Information of Table 2 is extracted from a presentation of Pierre Pozzo di Borgo, the Program Coordinator for Africa at the Transport Week of the World Bank (March 2011).

The financial performance provides a combined measure of net cash flow generation capacity, net income level and level of indebtedness, as follows:

A = strong positive cash flow and net income (>5% of turnover) and sustainable debt load

B = Positive cash flow and net income (<5% of turnover) and average debt load

C = Positive cash flow (<5% of turnover), negative net income and higher than average debt load

D = negative cash flow and net income and high debt load

Table 2 – List of Railways under concession in sub-Saharan Africa

Concession	Countries	Year of concession	Current performance		Investment responsibility		Canceled concessions
			Operational	Financial	Infrastructure	Rolling Stock	
Sitarail	Côte d'Ivoire, Burkina Faso	1995	**A**	**C**	Public	Private	
Camrail	Cameroon	1999	**B**	**A**	Public	Private	
CEAR	Malawi	2000	**D**	**D**	Private	Private	
RSZ	Zambia	2002	**C**	**C**	Private	Private	X
Madarail	Madagascar	2003	**B**	**C**	Public	Private	
Transrail	Senegal, Mali	2003	**C**	**D**	Private	Private	
CCFB (Beira)	Mozambique	2005	**C**	**D**	Private	Private	X
TransGabonais	Gabon	2005	**B**	**C**	Public	Private	
Nacala	Mozambique	2005	**C**	**D**	Private	Private	
KRC-URC	Kenya-Uganda	2006	**C**	**D**	Private	Private	
TRC	Tanzania	2007	**D**	**D**	Private	Private	X
SNCC	DR Congo	2011	**D**	**D**	Public	Private/Public	

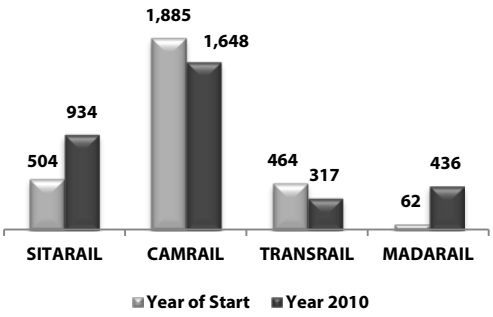
Table 2 illustrates the high number of concessions in financial difficulties (ranked D on financial performance). It is important to point out that for most of the concessions it was agreed that the responsibilities for the long-term investments in infrastructure belong exclusively to the private sector. If the responsibility for the acquisition of new rolling stock must be exclusively in the hands of the freight transport concessionaire, the investments in railway infrastructure is a much more complex issue. The experience of more than 15 years in railway concessions in SSA has proven that the low volumes and the reduced density of traffic on the concessioned lines in SSA cannot produce sufficient revenue to pay taxes and concession fees to governments, to cover the costs of transport operations, as well as the renewal of the depleted rolling stock, the large investments necessary to rehabilitate a heavily deteriorated infrastructure, and to generate profit to the concessionaire.

5. Major challenges of existing concessions in SSA

The weak financial performance of concessions in SSA is the major threat to the future development of the railway sector. The railway sector in SSA cannot achieve the development goals expected by governments as long as the railway companies are financially non-viable. Various analyses developed by the World Bank during the last years lead to the following major challenges that have generated the current unsustainable financial status of railway companies.

The first major challenge for the concessions in SSA: overoptimistic expectations on the potential of growth of freight volumes. In most cases, traffic gains have been much lower than the estimated figures used in the business plans elaborated as basis for the signing of the concession agreements. Figure 29 presents the evolution of the annual tonnage of freight transported by selected railways in 2010 compared with the year of the beginning of the concession. It is obvious that the traffic growths are not very impressive (Sitarail concession started in 1996, Camrail in 1999, Transrail and Madarail in 2003). The concessionaires have been able to stabilize the volume of transported freight, but they have failed to attract more traffic (new markets or shifting freight from roads). The reasons are complex and are related to factors both internal and external to railways. The major internal factors are the poor quality of rolling stock inducing low availability of wagons or lack of locomotives, and the poor quality of infrastructure generating speed restrictions, unpredictability of arrival, low safety and many derailments. The poor quality of rolling stock and infrastructure resulted in modest financial performance of concessions in SSA; constrained by the reduced market, the concessions did not generate sufficient revenue to overcome these internal difficulties, and the situation is worsening with every day of operation on the same pattern. The external factors are related with the general framework of the land transport in SSA, biased to road transport (free access for truckers to road infrastructure, no regulations, fiscal evasion, overloading of vehicles, etc.) raising additional barriers to railways. These

Figure 29 - Volume of freight transported by selected railways compared with the begining of the concession [thousand tons]



internal and external factors make the railways an uninteresting service provider for new clients and limit their capacity to reverse the existing trends in the sub-Saharan Africa transport market, heavily oriented on roads.

The second major challenge for the concessions in SSA: underestimated investment needs. The concession of SSA railways has produced in many cases important investments for the first time after many years. The investments took place mainly in infrastructure, by bilateral and multilateral lending agencies. The investment plans have been focused mainly on the first five years after the concession transfering to the concessionaires the responsibility for long-term needs of capital for the rehabilitation of infrastructure and the renewal of the depleted rolling stock. The investment needs proved much larger than anticipated, the traffic evolution did not generate the necessary resources for investments, and the governments were, in many cases not ready to be involved in the financial support of railway infrastructure. In most cases, governments had unrealistic expectations of the capacity and willingness of the private sector in being involved in significant and long-term investments in infrastructure. As we have already showed in the present work, the size of the markets in sub-Saharan Africa is too small to generate enough cash for financing both infrastructure and rolling stock. Rough estimates indicate an average annual need of investment in infrastructure and rolling stock in SSA of about 200 million USD. Considering a backlog of at least 15 years, this results in a combined program of necessary investments of about 500 million USD for the first 10 years, droping to 200 million USD after that[16]. According to some recent evaluations, most railway concession in sub-Saharan Africa accumulate an average yearly revenue of about 35 million USD. It becomes very clear that the investment needs are well beyond the capacity of railways to self-finance. However, compared with the annual allocation in the region for road infrastructure rehabilitation, the estimated annual budgets for railway infrastructure rehabilitation seem to be affordable. State financial support, large concessional loans, and international grants are the options to be explored, by using a different approch than the current one, for addressing this vital issue for the revival of sub-Saharan railways.

The third major challenge for the concessions in SSA: operation of passenger transport services. In spite of the steady economic growth of most of the sub-Saharan countries during the last decade, the increase in passenger services in railways is not visible. In fact, passenger traffic has stagnated or declined in most of the railways,

[16] AICD Background Paper 17, Off Track: Sub-Saharan African Railways, Richard Bullock, November 2009. See the detailed rationale of indicative investment needs in sub-Saharan railways at page 24 of the referred document.

losing the competition with road transport. In most cases these services are cross-subsidized by the freight transport, creating additional barriers for the development of freight transport. Due to unclear provisions in concession agreements and the lack of commitment of governments to pay the compensations, the concessionaires are not interested in operating passenger services. As a consequence, their quality has continuously decreased and the marked is diminishing. The passenger services currently represent only 1.7 percent of the total passenger transport services in Africa. The sub-urban services consist mainly of morning inbound and evening outbound trains with little services at other times[17]. The long distance passenger trains, which were historically the only practical mode of transport in the region, are less and less competitive; the road networks are improved and the busses provide strong competition. The road networks are improved in SSA and buses provide strong competition. Passenger trains need to be operated at average speeds of 60-80 km/h in order to compete with modern buses. The costs to maintain track and signaling systems for operating passenger traffic competitively at such speeds are higher than for freight transport. The passenger services cannot produce the necessary revenues to achieve such goals; in the best cases, passenger revenues cover the costs of operations, but do not support the renewal of rolling stock and do not cover any of the costs of infrastructure. Governments control the fares for passengers on rail, at rates almost invariably below cost. In a few cases, public service obligation agreements are part of the concession, but governments rarely provide timely compensation. As a result, most passenger services are on a downward spiral of deteriorating conditions and financial losses. The compensation of public service obligations is the source of many misunderstandings between the governments, concessionaires, and the passengers. Although in most cases the passenger services represent only 10-15 percent of the total rail revenue, they are responsible for the majority of frictions between the governments and rail concessionaires.

The fourth major challenge for the concessions in SSA: undercapitalization of concessions. The overoptimistic assessment of the market growth and of the costs for upgrading the infrastructure or rolling stock technical status has generated another risk in the concession process. The companies created for this purpose have been endowed with far too limited a capital base to address the operating issues. Shortly after the concession, they discovered that the estimated positive cash flows did not occur because the traffic growth did not happen as predicted, the need of investments for continuing operations are higher than estimated in the business plans, and the bur-

[17] A completely different situation can be found in South Africa where railways operate the majority of suburban services in Africa.

den of the long-term debt inherited from the on-lending of donors became unbearable. Consequently, the concessionaires continue to manage the railways limiting their costs to expenditures that are absolutely necessary for survival. It is an operational approach without horizon, with no chance for the development of new business or the increase in quality of the existing business. On the contrary, the quality of services decreases in time due to accumulated backlogs in maintenance and investments, and after a number of years the concession must be cancelled or restructured.

The vicious circle of the failing concession agreements in SSA. Currently, the railway sector in SSA is trapped in a vicious circle and the exit cannot be found by repeating the same scenario. All existing concessions in sub-Saharan Africa have been developed based on a common pattern; they have started with over-optimistic expectations (see the four major challenges presented above). During the first five years of the concession, as long as the associated financial support still existed, the results were closer to the expectations (investments in infrastructure and/or rolling stock, better quality services, lower dependency on public finance, etc.). After the termination of the associated loan, the concessionaire discovers that the existing traffic does not generate sufficient revenue to continue the investments, that the governments neglect to cover their obligations in financing infrastructure, that passenger services becomes unbearable, and the situation of the concessions starts to deteriorate irreversibly. On the other side, the current over-optimistic forecast of traffic and revenues, and the disregard for the long-term investment needs create unrealistic expectations for the governments. Based on the illusion of rapid increases in revenues, unachievable levels of concession fees and taxes are requested to be paid to the governments; in 3-5 years after the agreements are signed the concessionaires are often in the situation to pay a significant percentage of their revenues (in extreme cases 35 to 50 percent) through concession fees and taxes to governments. As a consequence, frustrations appear on both sides (concessionaire and government), renegotiations must take place, the governments have to assume most of the debts of the concessionaires and new loans are necessary for the continuation of the operation for the next 3-5 years. The experience of the last 15 years illustrates that repeating this approach again and again does not solve the problems, and the railway systems barely survive in the market.

Is the concession the right choice for saving the railway sector in SSA? In spite of the achievements regarding market stabilization and improved operational performance, it is obvious that the concessions in the railway sector in SSA have failed to address the major issues of the existing reduced market share, low traffic density, poor technical status of infrastructure and rolling stock, fragile financial efficiency, and low competitiveness in front of road transport. Under these circumstances it is a legiti-

mate question to ask if the concession process is the right choice, or even if the railway industry has any future in SSA:

a) *There is no doubt that concessions are the only solution for improving the railway transport sector performance in SSA.* There is wide evidence that the private sector is more efficient than public companies in managing commercial activities with lower costs and higher efficiency. This is confirmed in the rail sector where the most efficient railway companies are privately operated. The state-owned national railways achieving performances comparable with those of private railways operate in countries where the legal and institutional frameworks allow non-discriminatory rules for state-owned and private companies. Regardless of ownership, all companies in those countries face competition equally and risk bankruptcy without any exemption. The states do not interfere in any managerial decisions of state-owned companies and do not create exceptions for them when financial difficulties arise. Such an environment cannot be created only for railways; it has to be the general approach for all state-owned companies defining the functionality of the market economy in a country. The countries in SSA are not yet at that standard. In any case, the state-ownership for railways is not an option for the future as even in countries operating under the principles of free market economies, the overall trend is to encourage privatization of railways.

b) *The railway sector in SSA has the same future as railways anywhere else.* The solutions to solve the issues of the rail transport cannot be different in SSA than in the rest of the world. Adopting concession as a solution for implementing commercial rules in operating rail services is only part of the answer. The international experience proves that in most countries full infrastructure cost recovery cannot be generated by the own revenues of railway operators. But similarly, full cost recovery is neither possible nor expected for the entire length of the national road networks, for example. In all cases, the government must develop consistent strategies for the development of infrastructures aiming to achieve a rational balance between land transport modes, *based on economic sense*. It is not easy to achieve inter-modal consistency; it includes standards and regulations, safety and environment rules, and accurate benchmarks for public investment performance.

For all these reasons, the SSA countries must continue with the concession policies for the railway industry, but also introduce a new approach. It should include not only the simple revision of the provisions of the concession agreements. The new approach should envisage a holistic vision for the development of the transport sector

(road and rail) using similar policies and procedures and implementing a real partnership between the government and the private sector, based on risk sharing in financing transport infrastructures.

6. External factors affecting the performance of railways in SSA

The railway sector must be assessed as part of the transportation system of SSA. Apart of factors specific to the railway sector, in SSA there are general adverse factors affecting all modes of transport, and adding difficulties to railways as part of the system. A quick review of the general constraints faced by the entire transport system is useful for identifying the most effective actions for the revival of railways as part of the transport system. The sector is not only in competition, but it also needs to cooperate with other modes of transport (road, ports) as part of logistic chains. More adequate rules for managing the entire transport sector and better governance practice will help create a reliable transport system, and this will also benefit the railways.

Logistic performance in African countries is very low. The political and economic conditions in Africa did not allow the development of modern logistic systems that have stimulated trade and economic growth in the other regions of the world. According to the World Bank Logistic performance Index (LPI), with the exception of South Africa, the African countries perform very poorly on infrastructure quality and in all main aspects of logistics. Main weaknesses are:

a) Poor functionality of rail-ports connections due to conflicts between rail and port authorities related with the control of rail activities in port areas;

b) Lack of institutional and operational connectivity between neighboring railways and difficult border crossing procedures;

c) Customs and transshipment barriers that limit the performance of regional corridors;

d) Lack of transport safety due to poorly maintained vehicles and infrastructure;

e) Failures of governance due to corruption of police allowing laws to not be enforced;

f) Ill-equipped transport infrastructure, poorly managed, operated, or maintained.

The market for all modes of transport is distorted by the national fragmentation. The independence of African countries coincided with national fragmentation inducing in some cases wasteful investments, creating barriers for scale economies, and

raising the costs of development. Lack of trust and suspicions between neighboring countries jeopardized economic collaboration. For all modes of transport, the systems connecting various countries were fragmented and administrative barriers have been introduced, jeopardizing the transport development. This raises significantly the costs of transport services in SSA in comparison with other regions of the world.

Corruption is affecting the sound development of the transport market. The corruption cost is estimated at more than 25 percent of the gross domestic product of Africa. It is one of the major barriers to the development of a sound transportation system and a serious source of inefficiency. The corruption in the road transport (overloaded trucks, tax evasion) has a direct impact on the development of the railway transport due to the distortion of the market.

Civil wars and social unrests affected negatively the transport capacity in the region. The African states are fragile and risks of interruption of transport services for long periods of time due to civil wars or social unrests are high. The transport links, specially the railways (bridges, stations, tracks) are common targets in civil wars. Wars and civil disturbances in sub-Saharan Africa have hindered railways directly through the destruction of assets (Angola, Eritrea, Ethiopia, Mozambique), or indirectly by cutting inland railways off from their ports (Burkina Faso, Malawi). These created serious constraints in the development of railway transport; currently many kilometers of lines are still not operational as a direct consequence of previous wars.

Institutional barriers. Concessions require transparent economic and safety regulations. Difficulties are generated by poor legal and institutional framework, reduced capacity to set up clear roles for the state as (i) policymaker in addressing the issues of transport policy, (ii) owner of railway infrastructure for financing it, (iii) regulator of transport market, and in some cases (iv) client of railway services. In many cases the unclear separation of functions created conflicts of interest and jeopardized the development of transport services.

The lack of trade facilitation and the poor border crossing coordination is a serious barrier affecting the quality of services for all modes of transport, predominantly for railways. As an example, along the main North-South corridor from Democratic Republic of Congo and Tanzania to South Africa, the rail transit time from Republic of Congo to Durban takes 38 days (9 for travel and 29 for interchange and border crossing), while the average duration of a truck transit on the same route takes 8 days in total (4 days at border crossing).

7. Short considerations on the road transport as the main competition for railways in SSA

Road transport is the main competitor for railways. In any case, road and rail have more than share the transport market: they have to partner to build efficiency on large volumes and long distances, or on specific "intermodal" products (containers). In this context, the regulatory framework and the conduct of road transport companies have an important role in influencing the behavior of railway concessionaires on the market.

Roads are the main transport system in SSA. Roads dominate the transport sector in Africa, handling 80-90 percent of the total volume of traffic. The size of the classified road network is estimated at about 1,052,000 kilometers. In total, only 1,600 km of classified roads have been concessioned to the private sector under management contracts (compared with almost the entire railway network operated under concession).

The traffic density on roads is generally low. The average daily traffic on the primary networks varies from 50 vehicles in the Republic of Congo to about 7,000 in Mauritius or South Africa. The country weighted average is 1,198 vehicles and the median is 829[18], a relatively low traffic volume according to international standards. This low volume of traffic is currently considered by most governments in SSA as the major barrier to implementing tolling systems. Currently, the potential for tolling is limited to about 8 percent of the classified roads (less than 9,000 km) with traffic higher than 10,000 vehicles per day, which is the threshold to make toll roads economically viable[19]. As a consequence, the governments have an understanding that the users of roads are not able to cover the cost of road infrastructure from their own revenues.

Road transport is heavily sustained by public funds. The financing of maintenance and capital costs of roads are mainly covered by the road funds and by public funds. The available funds are mainly dedicated to capital expenditures and maintenance is

[18] Africa's Transport Infrastructure – Mainstreaming Maintenance and Management – Ken Gwilliam.

[19] Africa Infrastructure Country Diagnostic (AICD) – Railways in Sub-Saharan Africa, World Bank Report No 49193, June 2009.

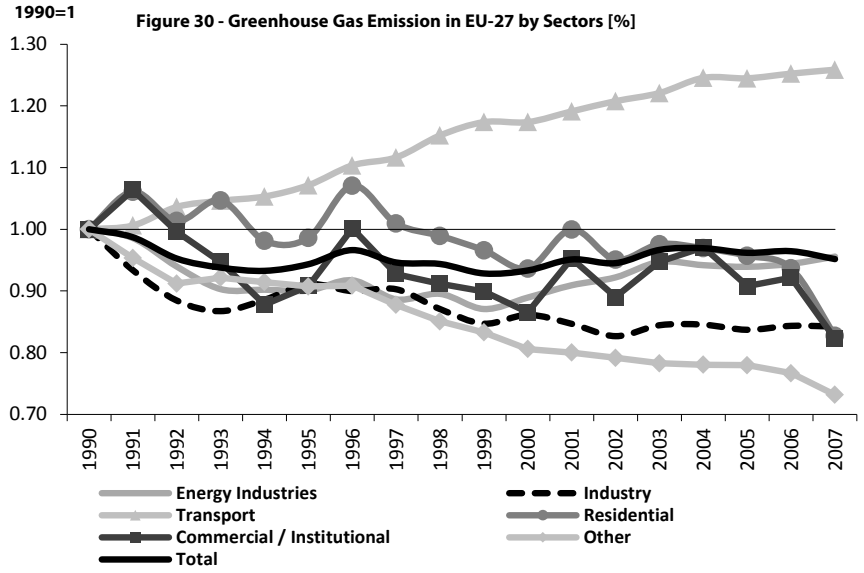
in general neglected. The public financing for the capital cost of roads is highly dependent on international aid which induces a certain volatility of public investment in the sector. The limited evidence available indicates a heavy dependence on foreign funding ranging from just over 50 percent in Senegal to almost 90 percent in Rwanda[20]. Large maintenance backlogs exist for the road infrastructure in some countries of the region. It is estimated that in general African countries need around 2 percent of their GDP for preserving the existing classified road network, on the condition of spending these resources wisely (based on efficient unit cost)[21]. Under these circumstances, the obligation of railway operators to cover the costs of infrastructure from their own revenues is creating a serious distortion of the transport market considering that the road users do not have similar obligations.

Table 3 – Road versus Rail tariffs along selected rail corridors

	Rail Operator	Average Tariff per Ton-km (US Cent)		Road vs. Rail Price Overcharge
		Road	Rail	
Senegal-Mali	Transrail	7.9	5.3	49%
Côte d'Ivoire-Burkina / Mali	Sitarail	7.9	5.5	44%
Cameroon–Chad	Camrail	11.2	6.3	81%
Mozambique	CCFB/CFM	10.0	5.5	82%
Tanzania-Great Lakes	TRC	13.5	4.3	213%

[20] Africa's Transport Infrastructure – Mainstreaming Maintenance and Management – Ken Gwilliam.

[21] Data estimated by using the Road Network Evaluation Tools (RONET) model designed, developed, and adjusted to satisfy the specific needs of the AICD study by Rodrigo Archondo, Senior Highway Engineer, World Bank. See Africa's Transport Infrastructure – Mainstreaming Maintenance and Management – Ken Gwilliam (pages 50-60).



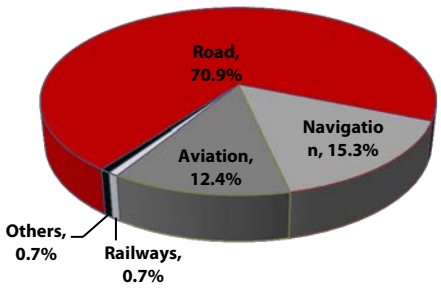
Freight transport tariffs on roads are rather high in Africa. The average transport price per ton-km on international corridors varies between 4 to 5 cents in Southern Africa, 6 to 8 cents in West and East African corridors, and 10 to 25 cents in the Central African corridor[22]. It is not the scope of the present paper to analyze the reasons for these high prices (mainly inappropriate market regulation based on bilateral transit treaties with quotas, freight allocation and queuing system leading to creating cartels, bribing, and poor quality services, eliminating incentives to improve efficiency). But the level of tariffs on roads is relevant for the comparison with the rail tariffs. In general railways should have lower tariffs than truckers with at least 15 percent for covering the extra costs of local road pickup at origin and delivery at destination. At the same time, railways have to operate with an additional reduction of tariffs to compensate for the lower quality of services. Table 3 below containing data extracted from an analysis developed in 2006[23] illustrates the comparative tariffs on rail and road for selected African corridors. It is important to point out that in spite of many adverse factors (low utilization of vehicles, aging fleet, unbalanced trade between countries, etc.), trucking companies in SSA can afford to charge high prices and have sizeable profits. Eliminating any form of protectionism in road transport and implementing a new approach for the railway concession could reduce significantly the

[22] Teravaninthorn and Raballand (2008) referred in Africa's Transport Infrastructure – Mainstreaming Maintenance and Management – Ken Gwilliam (see pages 74-75).
[23] Review of selected railway concessions in SSA – Pierre Pozzo di Borgo, 2006.

transport costs on both modes with significant impact on the economic development of the region.

Highly preponderant road transport in SSA has a negative environmental impact. The transport policies in SSA have to be adjusted to address the major issue of environment protection by promoting green transportation concepts. According to the International Energy Agency (IEA), the transport sector is currently responsible for nearly 23 percent of energy-based CO_2 emissions worldwide, mainly due to road traffic. Transport CO_2 total emissions have constantly increased since 1990; the statistics of the European Union illustrate that all economic sectors have diminished their green gas emissions (GHG) since 1990 with the exception of the transport sector which has increased by about 25 percent (see Figure 30). All modes of transportation, with the exception of railways have increased their GHG emissions from fuel combustion (IEA, 2011) worsening the carbon footprint of the transportation system on the whole. Currently, the railway companies operating worldwide produce less than 1 percent of total CO_2 emissions (IEA, 2011). According to the statistics of the European Commission, the railways in the 27 countries are accountable for 0.7 percent of GHG emissions while road transport generates more than 70 percent (see Figure 31). Due to their low carbon performance, railways are an important factor to reach sustainable mobility and to develop green transportation. The governments must adopt adequate transport policies for supporting the development of railway transport for the benefit of their countries. Continuation of the railway concessions in an improved approach in parallel with the development of a transport policy non-biased to roads will create the appropriate environment for achieving a more balanced transport market share between road and rails, diminishing the CO_2 transport emissions.

Figure 31 - Greenhouse Gas Emission in EU-27 by Modes of Transport [%]



8. Conclusions on the status of railway concessions in SSA

The poor performance of railways in SSA is tightly related to the pattern of transport networks in the region and the structure of the economies. The railways operate in an unfriendly environment marked by:

a) obsolete, non-functional infrastructure;

b) reduced connectivity between the countries in the region;

c) very low traffic for the existing railway network;

d) unsatisfactory agreements for operating passenger transport services with negative impact on the financial stability of operators;

e) chronic lack of resources to finance the maintenance and rehabilitation of infrastructure inducing the vicious circle of continuous decrease of quality of services;

f) lack of competitiveness compared to road transport.

The vicious circle of continuous decrease of quality of services became a barrier in attracting new traffic. The adverse conditions of operating railway transport services mentioned above induced the vicious circle of continuous decrease of quality of services. The lack of competitiveness of railways is mainly generated by the unsatisfactory frequency of services, low speed, low level of predictability of arrival time, and poor safety and security records. The railway operating lines, built about one hundred years ago to modest technical standards and non-modernized, are unprepared to compete for time-sensitive traffic. The rapid development of modern roads and the new and larger trucks have captured the higher-value general freight. Currently the railway traffic is limited to bulk mineral and agricultural freight and semi-bulk freight such as fuel. The continued decrease in revenue of railways has created large backlogs in maintenance of infrastructure and replacement of depreciated assets. As a direct consequence, the poor quality of services prevents railways from taking higher value traffic from roads (such as containers, for example), and aggravates the vicious circle of railways in SSA.

The expectation of governments that the concession of railways alone will set up the framework for substantial private investments in infrastructure is not realistic. To

date there is no proven case that after receiving grants or soft loans for starting the concession, any of the SSA railways will be able to finance long-term infrastructure renewal from their internally generated returns. Currently the concessionaires have proved their capacity to cover the operating costs, the cost of maintenance of infrastructure and rolling stock for continuing the railway transport operations, and to pay the taxes and the agreed fees to governments. The funding of long-term assets renewal is not a solved issue for most SSA railways. The detailed analysis of the traffic density, costs of operation and revenues of railways in Africa developed by Richard Bullock[24], shows that the rehabilitation of infrastructure cannot be achieved by lines with a traffic density below 2-3 million net-tons. According to this rationale, from the total 56,000 km of track in SSA, less than half of the lines would have enough traffic to justify the expenditure needed to keep them in operation. Funding the track overhaul exclusively from the operating revenue of the railways would absorb all potential surpluses for many years, creating the risk of accumulating a new backlog immediately after that effort. The states, as owners of transport infrastructure must define solutions for co-financing the railway network, by implementing unbiased policies for supporting the land transport infrastructures (road and rail) in their countries.

[24] AICD Background Paper 17, Off Track: Sub-Saharan African Railways, Richard Bullock November 2009.

9. Recommendations for a new approach in developing the sector in SSA

What are the main challenges for the new approach for sustainable concessions? The main problem for the governments in SSA is not being able to find more funds to finance the railways; the money is only the instrument to put in place a consistent program for the development of the railway transport as part of the coherent vision and strategy for the development of national and international transport in Africa. If a credible strategy exists, the money will come naturally. Concessions in SSA should not be a collection of isolated projects started by different countries for solving limited objectives. Each concession must be part of a broader strategy for the development of the transport system in Africa. The right questions for putting in place sustainable railway concessions should be:

a) How to enhance the governance capacity for managing the transport sector?

b) How to define and implement a long-term vision for the development of the railway system as part of the transport sector?

Enhancing the governance - mandatory for implementing the new approach

Developing a sustainable railway transport system in SSA is not possible if the states are not effective in fulfilling their roles. Sub-Saharan Africa has limited experience in market-oriented economy; many countries have experienced different political models, especially during the early post-colonial period. In several states, business management skills were not the main criterion for the selection of managers of economic activities. The railway concessions started two decades ago represented an important step in the right direction. Being aware of the governance weaknesses, the administration of the railway sector has been transferred to the private sector. While this proved to be a good solution for operating transport services, the private sector could not replace governments in addressing the strategic issues of the railway sector. To overcome the problems of the railway sector in SSA, the governments have to rightfully play their role as policy makers, regulators, owners of transport infrastructure, and client of transport services. This requires strengthening the governance capacity, or

the vicious circle will continue. All recommendations presented in the current chapter concerning the long-term strategic vision—states' involvement in financing the railway infrastructure, in the regulatory framework, public service contracts for passengers, - require strong governance. *The enhancement of the states' institutional capabilities in SSA remains the major challenge for the consolidation of the relative strength of the private sector present in railways.*

New culture in governance is necessary in SSA. It is important to point out that the enhancement of the governance is a foremost target for the whole region and for all sectors of society, not only for the improvement of quality of activities in the railway sector. It would be a major error to believe that it will be possible to put in place an efficient railway transport sector benefiting of strong governance, long-term vision, successful concessions, smooth re-negotiations between partners in a win-win approach, in a country where these habits are not the general rule. Railways are part of society as a whole, and depend on the general behavior of all institutions and all citizens. The enhancement of the governance is not a task easily accomplished; it requires strong political will, accountability of public employees, political stability, rule of law, and continuous fight against corruption. Naturally, the appropriate human resources are necessary for implementing such ambitious goals. All these aspects are beyond the scope of the present paper, but the enhancement of governance is essential for achieving a new quality in the railway transport services in SSA. The key element in this respect is to implement a new culture in the new structures that should be created for putting in place and monitoring the new approach for the development of railways. If the governance enhancement will not be achieved and the old habits will continue to be present, the results of implementing the proposed new approach for managing the development of the railway transport sector in SSA are highly questionable.

The need for consistent strategy for the development of railway infrastructure

Governments must develop long-term strategic plans for the rehabilitation and development of transport infrastructure. Considering the dilapidated status of railway infrastructure in most of the sub-Saharan countries, it is highly recommended to elaborate a comprehensive assessment of long-term needs for creating a reliable system, fully integrated in the national and regional transportation markets. Such an evaluation should be the basis for a long-term strategy (20-25 years), defining a vision about the envisaged role of the railways in the transportation system of the country. The long-term strategy for railway infrastructure should be developed in a *harmonized approach with the road infrastructure* strategy and should propose variants and

priority lists of projects to be financed based on the available financial resources and on answers to the following questions:

a) What will be the transportation needs of the country in the next 20-25 years, taking into consideration the predicted annual growth of GDP and considering that the transportation needs will increase at a higher percentage rate than the GDP?

b) What is the transportation market share in the country targeted for the railways for the next 20-25 years, taking into consideration the economic criteria and environmental and social aspects such as climate change, mobility needs, trade and logistic chains, traffic safety, and land utilization?

c) How much of the predicted transportation volumes in the next 20-25 years could be taken by the existing infrastructure? What additional capacities are potentially necessary?

d) How should the low-density traffic lines necessary for economic and social reasons be financed?

The various concession agreements must include – for the railway infrastructure given in operation to the concessionaire—clear and specific tasks compliant with the goals and modes of financing defined in the elaborated strategy.

Governments must develop unbiased policies for land transport. Government policies in transport must be restructured to become fully transparent and unbiased. In many countries road transport is treated favorably in that at least part of the infrastructure cost is covered by the governments. The biased public financing of road infrastructure, the tax fraud by truck companies, the over-loaded trucks exceeding the legal weight restrictions, and the lack of safety standards on roads are factors generating distortions in the transport market and creating additional barriers to freight railway sector. Putting the rail and road transportation on an equal footing will allow the shippers to make the right choice between the two modes for each expedition. No matter how well a concession agreement will be negotiated, the railway sector will stand no chance of attracting traffic from roads if the government will not put in place an equivalent regulatory framework. The clear rules of licensing for the truck companies, the technical requirements for a vehicle to operate transport services, the licensing of truck drivers, the strict rules regarding the allowed time of driving, the safety standards, the periodical technical revision of vehicles, and the fight against tax evasion and corruption in transport are the minimum rules to be put in place and strictly controlled for creating equal chances for road and rail transport.

Governments must be involved in the construction and maintenance of land transport infrastructures. Governments should develop adequate policies for using similar instruments for financing road and rail infrastructures. The unbiased policies for financing the construction, rehabilitation, and maintenance of road and rail infrastructure are essential for preventing distortion of the transport market. In the same context, the readiness of government to finance the social benefits of railway transport (environmentally friendlier, cheaper, and safer) must also be taken into consideration when defining the instruments for financing the development of transport infrastructures. The low traffic on road infrastructure should not be used as an excuse for not introducing tolling system on roads, at least for the freight transport. The intensity of railway traffic is also very low compared with the international standards and the concessionaires have responsibilities in financing the infrastructure. It is obvious that due to the reduced traffic density the market cannot bear the full costs of infrastructures (road or rail). However, the principle that the providers of transport services should pay for using the transport infrastructures is an important one to be implemented, even if they will pay only a fraction of these costs. Depending on the specific conditions of traffic on each road or railway line, the state should elaborate a realistic approach for the ratio of cost coverage between the state and the users. The tools defined by the European Commission (track access charge, vignette, and tolling system) offer the governments in SSA the framework for defining and implementing balanced policies in financing the transport infrastructures. These policies can be implemented in one of the following ways: (i) equivalent taxation of users of transport infrastructures (tolling systems for roads and charges for using the railway infrastructure), (ii) equivalent participation of the state with public funds in financing the road and railway transport infrastructures, and/or (iii) mixed methods.

The European Union makes progress in developing policies for fair charging of users of road infrastructure. In 2006 the Directive 21 on the charging of heavy goods vehicles for the use of certain infrastructures (Eurovignette Directive) was amended by Directive 2006/38/EC of the European Parliament and of the Council. The updated legal framework allows the Member States operating tolls to extend the tolls to trucks with a weight between 3.5 and 12 tons; starting in 2012 all vehicles above 3.5 tons must be included. Member States are allowed to vary fees on the basis of day of the week and time of day, and are obliged to vary fees on the basis of 'Euro' emission classes or PM / NOx emissions. In June 2011 the European Parliament gave its final approval to charge the polluters for the external costs of the pollution they generate. The new framework gives Member States the option to charge heavy lorries to cover the **costs of air and noise pollution** from traffic emissions, in addition to charges to cover the cost of the infrastructure. At the same time it gives Member States the possibility to charge higher tariffs during peak periods and lower tariffs during off-peak periods in order to better manage traffic and reduce **congestion**. The EU's "Eurovignette directive" sets out a transparent list of costs that can be charged for heavy goods vehicles; for private cars, there are no such rules. The Commission expresses a clear preference for **distance-based toll systems** as being inherently fairer and more effective in sending price signals than a time-based "vignette sticker" system. In practice, the external cost charges would represent 3-4Eurocent/km depending on the Euro class of the vehicle, the location of the roads and the level of congestion. The **charge will have to be collected by the electronic systems** foreseen to be fully interoperable at EU level in the near future, and a receipt clearly stating the amount of the external cost charge will be given to the haulers so that they can pass on the cost to their clients. Even if road transport costs would increase, the benefits from internalization would lead to a favorable net impact on the economy, especially if revenues are used in an efficient way. The introduction in Switzerland since 2001 of the federal tax levied on the basis of total weight, emission level and the kilometers driven (Swiss Heavy Duty Vehicle Fee) confirms this, Switzerland still being the most competitive economy in Europe (World Economic Forum, 2007).

The governments in SSA should cooperate to harmonizing their programs of developing the railway international corridors. Long-term strategies should be agreed upon and followed by the SSA countries, working in coordinated and synchronized programs for financing the railway infrastructure, allowing for the completion of long-term objectives step by step. It is important for the states in SSA to harmonize and synchronize their programs for the development of railway corridors. The international corridors should be developed based on economic evaluations, balancing the medium- and long-term interests in the region. The programs should be realistic and focused on addressing the specific needs of the existing transport market. The temptation to define the policies in railway transport by looking at external models is welcomed as long as the analysis takes into consideration all factors involved. The railways in SSA are predominantly freight oriented and they have to adapt their infrastructure to serve their clients as best as possible. Predominantly freight railways require a high capacity of transport with low costs.

There were many attempts to develop continental corridors for interconnecting the landlocked countries and to expand the connectivity of the existing lines in SSA. A very ambitious project developed in 1976 by the African Railways Union to develop 26,000 km of new lines was revised several times, and in 2005 was simplified to only three major transcontinental routes:

a) Libya–Niger–Chad–Central African Republic–the Republic of Congo–the Democratic Republic of Congo–Angola–Namibia (6,500 km);

b) Senegal–Mali–Chad–Djibouti (7,800 km);

c) Kenya–Tanzania–Uganda–Rwanda–Burundi–the Democratic Republic of Congo, with possible extensions to Ethiopia and Sudan (5,600 km).

Some other proposals with much clearer economic focus have been recently formulated, mainly the projects sustained by China for getting access to oil and precious minerals in Angola, Democratic Republic of Congo, and Zambia.

The model to be studied is that of North America, Australia, or South Africa. The life cycle costs (LCC) illustrate that the rail networks in the United States operate with three times lower costs than other railways. The European railways, due to a high proportion of passenger services have to invest much more in infrastructure for achieving the speed, comfort, and safety levels required by the passenger transport. It is clear that freight railways do not need the same standards; the freight-oriented railways adjust their investments and maintenance costs to allow for high axle load and relatively low speed. These are determinant elements for a successful freight railway, and they should be the objectives for the development of the SSA railways.

A new approach to finance the railway infrastructure

The states must remain involved in the ownership and financing of railway infrastructure. Concessions cannot solve all problems of the railway system in SSA; they have started to revitalize many railways but which cannot survive long-term without further injections of public investments. As proven in the present document, the low density of traffic on most lines renders them unsustainable; however, many lines may be socially and economically valuable. It is obvious that the underused infrastructure is not justified to be financed by the private sector alone. The states should continue to own the railway infrastructure (as is the case for the road infrastructure) and they should plan their investments on longer terms than the duration of concession agreements. The state ownership of railway infrastructure will solve the conflict between the medium-term interest of concessionaires and the long-term interest of the governments. As owner of railway infrastructure the state will elaborate the long-term

Change of railway gauge—a false solution for solving the railway efficiency issues in SSA. Most of the lines of sub-Saharan Africa have "Cape Gauge" (1,067 mm) or meter-gauge. There are debates in the region that introducing standard gauge (1435 mm) would help to reinforce the role of railways. The gauge is not an essential element for superior operational and financial performance of freight railways. The South African railways are a perfect example that the narrow gauge offers the same conditions as any gauge for developing sound operations for freight transport. It is no doubt that Japan, the country that developed an impressive high speed train network operating on standard gauge infrastructure has sufficient resources for the modernization of railway infrastructure; however Japan continues to operate freight traffic on the narrow-gauge rail system existent before the construction of high speed rail. SSA railways already have serious difficulties to finance the costs of maintenance and investments for bringing the existing infrastructure to normal operational parameters within the limits of the current gauge. Transition to a new gauge would have a significant impact in the investment costs of replacing all existent infrastructure (track, bridges, tunnels, shops, depots, stations loops, etc.), and in the operating costs during the two-three decades of transition working with two different gauges (mixed fleet of locomotives, coaches and wagons, mixed facilities for maintenance and operation, etc.). The considerable additional cost for changing the gauge without obtaining measurable advantages for the transport system in the SSA countries would be an unjustified burden to the public budgets for many years. There are no economic, financial or technical reasons proving that changing gauges in SSA is sustainable or will bring higher efficiency in operation.

objectives for operation, maintenance and development, and will create conditions for their implementation. The concession agreements will include the obligations of the private operator for contributing in financing the costs of the infrastructure (maintenance and investments) depending on the specific conditions of the line (traffic density, technical status of line). Case-by-case analyses will assess the proportion of infrastructure costs to be covered by the concessionaires and by the states. In all cases the main rule should be that all costs of operations and investments for railway infrastructures must be fully covered from these two sources; neglecting this rule will perpetuate the current situation of depleting the infrastructure and diminishing the role of railway transport in the region. On the contrary, by implementing this rule the state will get the guarantee that the railway infrastructure is preserved in good operational status, transferring part of the costs to the private sector. The private sector will be in charge of executing the maintenance and implementation of the capital expenditure program under the supervision of the government.

Developing a sound system for the public financing of the railway infrastructure. The states must define the appropriate financing system of infrastructure for each case of railway concession, based on a fair system of mixed public/private financing. The concessionaire will pay his part in the form of a fixed and/or floating concession fee, including a charge for infrastructure usage, and the government will cover the

Multi-annual Contracts for Rail Infrastructure Quality (MAIC) represent a medium-term financing arrangement used in the European Union for infrastructure maintenance signed by the state (owner of railway infrastructure) and the railway *infrastructure manager (administrator)*. It includes performance and productivity objectives, monitoring provisions and sanctions in the event set indicators are not reached. The MAIC describes the policy goals of the state for railway infrastructure and the necessary activities for achievement of these goals, the level of infrastructure charges, the contractual obligations of the infrastructure manager regarding the quality of the network, and the budget provided by the government to achieve these goals. The MAIC is signed for a period of minimum 3 years and includes performance indicators to measure the quality of infrastructure services and performance incentives for the infrastructure manager (punctuality, reliability, availability, etc.). (Communication No. 54 of February 6, 2008 from the Commission to the Council and the European Parliament - Multi-annual Contracts for Rail Infrastructure Quality). The potential success of such an approach in SSA depends on the capacity and political willingness of governments to respect their commitments.

differences up to the level of balancing the costs of infrastructure using public funds. This will be the source for covering the full costs of railway infrastructure including investments for overhaul, current repair, and maintenance. Four elements are vital to this approach:

a) accurate estimation of the costs of infrastructure when putting in place the financing system for the concession agreement;

b) setting up a model of fairly sharing in covering the costs of infrastructure between the government and the concessionaire. This would be based on various factors to be analyzed case-by-case, but of utmost importance are the type of services (freight and/or passengers), the volume of traffic, the type of transported commodities, and the traffic density;

c) a flexible approach to the concession fee (positive or negative) based on a fair and transparent methodology of evaluation of annual financial results of the concessionaire;

d) Full responsibility of executing the rehabilitation works to private operators.

By involving governments in long-term objectives of financing the railway infrastructure, the concession process becomes more attractive for the private sector and more powerful participants become involved as partners. Encouraging signs of a new approach regarding the structure of the concession agreements appeared during the last years in SSA[25]. Any discussion on the setting of charges for railway infrastructure has

[25] The recent restructuring of the concessions in Cameroun and Madagascar took into consideration appropriate actions for overcoming the weaknesses of the past agreements (overopti-

to reflect the interaction between economics and politics. The "recovery" objectives depend both on the specific market situation in each country and (probably most importantly) on the level of state funding. In other words, the way the objectives of transport policy and public budget restrictions are weighed against each other are country specific. The European Union may offer good examples for Sub Saharan Africa of sharing the responsibilities of financing the railway infrastructure between the governments and railway operators. Knowing that the contribution of the concessionaire for the financing of infrastructure is ultimately paid by the market, it is paramount to implement solutions of sharing the infrastructure costs with the government that shall not dissuade the clients from using the railways.

The main lessons for the African railways from the EU experience are:

a) the total costs of railway infrastructure are covered by public financing and charges for usage of infrastructure;

b) the infrastructure charging system is an instrument to achieve strategic goals and goals can differ from country to country;

c) attention should be paid to the level as well as to the structure of the charges as they have a direct influence on the competitiveness of the railway sector vis-à-vis other modes of transport; and

d) transparency and constant dialogue with railway operators are crucial to the process for a win-win approach.

The text box below presents short considerations about the European Union approach for combined financing of the railway infrastructure between state and the market. It is important to point out that this approach was implemented in parallel with the road infrastructure charging presented above.

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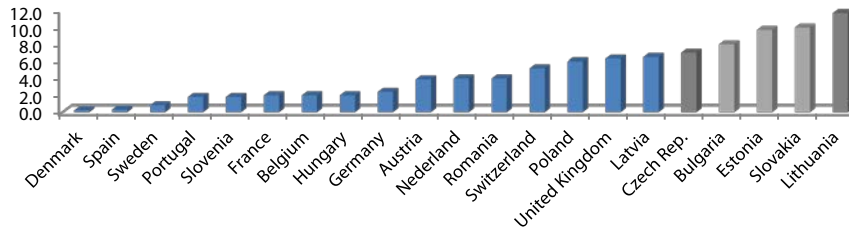
mistic evaluation of assets, transfer of all infrastructure costs to private sector, high expectations on traffic growth).

[26] Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure.

Railway Infrastructure financing in the European Union. One component of the restructuring process of railways in Europe was the financing of the infrastructure. In order to avoid further accumulation of indebtedness by the railways, which was one of the main causes for the decline of rail transport in the past century, EU legislation obliges Member States to ensure that rail infrastructure's costs are balanced by the income from infrastructure charges and public funding. Infrastructure charges are paid by the railway operators from their own revenues. Different EU countries define in different ways the cost of infrastructure. For example, costs can be simply referring to maintenance and operation costs. In other cases, infrastructure costs also cover renewals (e.g. Great Britain and Germany). In Latvia, France and Germany, costs covered by track access charges encompass part of the investment needs. Regarding the ratio between the state contribution and the infrastructure charges Baltic countries, such as Latvia, are able to recover infrastructure costs solely from the access charges due to the traffic situation based mainly on freight. In contrast, the infrastructure of Scandinavian railways benefits from very high levels of state funding that can cover up to 98% of their costs. In Germany, access charges must cover approximately 60% of gross network costs. The European Commission has tried to strike a balance between the different cost recovery methods. Article 7 of the Directive 2001/14 states that "the minimum access package and track access to service facilities shall be set at the cost that is directly incurred as a result of operating the train service". The chart below presents the charges for usage of rail infrastructure (Euro / Train-km) for various European countries for freight trains of 2000 gross tons in 2008.



The need to enhance the regulatory framework

Understanding the role and scope of the concession. A successful approach in railways requires a clear understanding of the role and scope of a concession. It is well-known that in their broad definition[27] concessions are essentially in conflict with

[27] The usual dictionary definition of concession is the right (authorization) granted by a government (authority) to an individual or a group to use land or other property to carry out specified commercial activities. It means to give to the recipient the right to do something which otherwise is not allowed.

competition and contain a risk of monopolistic behavior. Concessions are a useful instrument when the governments want something to happen that the free market does not provide. When talking about railways, the major interest of any government putting in place concession agreements is to maximize the advantages for the state from involving the private sector in railways: (i) creation of jobs, (ii) collection of taxes, (iii) collection of benefits as owner, (iv) better quality transport services, (v) stimulating economic development, etc. In the case of railways, the governments want to transform the loss-generating, overstaffed entities in efficient companies providing higher quality transport services for the benefit of the country. More than that, the governments would like to use the private funds for potential expansion of the existing railway network. In such cases, the governments should promote the concession arrangements as instruments to incentivize the private sector to support their strategy. It requires a long-term partnership and fair risk sharing between the state and the private sector. The poor understanding of this basic characteristic of concessions generates in SSA railway transport the unrealistic expectations of governments from the private sector, and inappropriate policies based on excessive control of fares, delays in payment of compensations, transfer of surplus staff, aging and with long years of service a.s.o. If the governments have defined clear long-term objectives for the railway sector and want to achieve those objectives, they must refrain from imposing on concessionaires non-commercial obligations that may put in danger the successful operation of transport services or limit the commercial behavior of the concessionaire. Interfering in the business of the concessionaire or imposing conditions may jeopardize the benefits expected by the governments.

Governments need to understand the vital role of regulation and develop relevant capacities. A very important element in the successful implementation of the ambitious program of the revival of the railway transport sector in SSA countries is to put in place and consolidate *sound, independent, and accountable structures* dedicated to specific roles. Currently, many of the functions of regulatory entities are included as provisions of each specific concession agreement. However, the concession agreements, no matter how professionally developed, cannot include provisions for all potential future situations the government and concessionaire will face during the whole duration of the concession. Putting in place regulatory structures, recognized as independent entities, for addressing the railway issues creates a good environment for solving the unforeseen problems that may appear during a concession. This will offer more flexibility in managing the concession agreements and more predictability of decisions for all participants to the process.

Major functions of the regulatory structures. There are different approaches in the world concerning the functions and the mode of organization of the regulatory framework for railways, depending on the local conditions of each country, especially of the structure of the transport market. The general functions for regulating the railway market are related to the following tasks:

a) Set up structures in the government to coordinate the elaboration of the transport strategy, improve the legal and institutional framework for facilitating concession development, develop solutions for financing the railway infrastructure, and monitor the implementation of the programs for financing the infrastructure. Each project in transport development must be part of national and regional transport development programs in order to ensure long-term political and social support and to get the necessary funds from the international financing institutions.

b) Set up strong conceding authorities able to develop an accurate assessment of the railway assets, to decide on the appropriate ratio of public-private participation in financing infrastructure, to be able to initiate, conduct, and renegotiate concessions in a harmonized approach with the governmental policies for the development of the railway sector.

c) Guarantee *the stability and the independence* of the regulatory framework for the railway transportation activities.

Adapt the legal and institutional framework for improving the environment for operating railway concessions. The governments should review the existing business background in their countries, assess the best practice worldwide and adopt the necessary changes for putting in place a friendlier environment for operating concessions. Considering the presently identified constrains, here is a list of recommended legal and institutional improvements that would incentivize private investors to revive the railway transport and would reduce the burden of the government for financing railways:

a) SSA railways suffer of obsolete rolling stock, but considering the market uncertainties, the financial risks of acquisition of new rolling stock fleet that is supposed to last 20 years is currently too high. Adopting changes in fiscal, business, and property laws will allow concessionaires to lease rolling stock rather than buy new ones, making room for higher contributions for rehabilitation of infrastructure. In this respect, the governments need to mobilize political and commercial insurance (MIGA) to secure and demand higher investments from private operators.

b) Adequate legal framework must be put in place to secure long-term government financing of railway infrastructure in a similar approach as for road infrastructure. Creation of a railway fund, similar with the road fund, or replacing the road fund with a *land transport infrastructure fund* to be used by government for equally financing road and rail infrastructures could be considered. Fuel excise tax collected from road and rail fuel users (trucks and locomotives) could be used for feeding the *land transport infrastructure fund*.

c) The governments could agree to adapt the legal framework to allow divesting assets from stranded railways to finance public financial obligations for railway infrastructure. Most rail companies have huge real estate properties that could be turned, through long-term leases, into a source of finance funds to satisfy government investment obligations. All these sources would complement direct budgetary contributions.

d) The role and responsibilities of the governments and concessionaires regarding the management of railway infrastructure investments should be fully clarified. The governments should refrain from diluting the responsibilities of the private operator by creating state agencies for investment management. The involvement of the state in managing the investments in railway infrastructure would create tensions with the concessionaires and will raise the costs of the governments. The states may create asset holding agencies to keep records of the ownership of assets, but the concessionaires should be responsible for the management of investment contracts.

e) The governments should revitalize the training schools necessary for railway specialties (engineers, technicians, signaling specialists, traffic managers, locomotive drivers, etc.). Currently, the SSA railways face the serious issue of aging of the labor force (average age 50+) jeopardizing the development of the railway industry. The private sector alone does not have enough leverage to address this on its own. This initiative should be regional concerning the structure of courses and could be sponsored by international donors (AfDB or World Bank).

Recently, the World Bank promoted in SSA the rail concessions of second generation – where the Government takes back the cost of infra renewal. The goal of this attempt was to create conditions for the involvement of the government in rail infrastructure investments in the same way that it is involved in roads. The question is whether in the rail sector, as in the road sectors, independent and dedicated infrastructure funds can be put in place to avoid direct dependency of investments on national treasuries. In the case of CAMRAIL and MADARAIL, the so-called FIF - *Fonds d'Investissements Ferroviaires* - was put in place, which accumulate a portion of the concession fee towards future government infrastructure investment obligations. Projections show that, in the case of CAMRAIL, FIF could finance over time up to 40% of the long-term infrastructure needs.

Put in place a strong and transparent set of rules for the railway concessions taking advantage of the lessons learned. The main pillars for improving the concession agreements for railways in SSA, are:

a) The concession agreements should be developed as instruments for implementing a long-term strategy for the development of railway transport;

b) The concessionaires should take the full responsibility for financing the operation of transport services, rolling stock maintenance and renewal;

c) The long-term cost of track renewal and related systems of railway infrastructure and the maintenance of the railway infrastructure are to be split between concessionaire and the governments in a ratio based on the local conditions of the market;

d) Concession agreements will include the estimated costs of infrastructure for at least 15 years in advance (on a rolling approach) in order to create conditions for the governments and concessionaire to be aware of their long-term commitments;

e) Implementation of adequate unbiased policies for re-balancing the road/rail competition (licensing, driving time, technical inspections, axle loading for trucks, tolling of roads, etc.);

f) Implementation of a separate accounting system for freight and passenger services, for transparency of public service obligation payments;

g) Establishing clear obligation of concessionaires to provide on a regular basis and in pre-defined forms, detailed financial and operational information to regulators, including vital indicators (rate of return on equity and fixed assets, economic rate of return) that will allow the transparent calculation of

the public contribution for the financing of railway infrastructure, and the flexible update of concession fee (positive or negative);

h) Obligation of independent annual audits of the concessionaire's financial and operational performance transmitted to the regulator at a precise deadline.

Components of recommended regulatory framework for railway concessions. The correct understanding of the purpose of concessions will allow to governments to create the appropriate institutional framework allowing:

a) to put in place the appropriate incentives for making the concession attractive for the private sector that will become the government's partner in implementing longer-term objectives for the development of the railway sector, but at the same time,

b) regulate the transport market without limiting the competition.

To put in place a successful concession in railways, adequate institutional framework is necessary for the accomplishment of the following functions: (i) development of railway sector, (ii) economic regulation, (iii) safety regulation, (iv) technical standards, and (v) accident investigation.

Development of railway sector. The management of the railway sector development should include planning activities and implementation of development programs. These activities could be accomplished by one or more entities charged by the government with precise responsibilities. Adequate structures must be created to define the railway development strategy as part of the national strategy for transport. It will include the elaboration of feasibility studies to define the ways to implement various railway projects. The function of implementation of development programs shall comprise the administration of concessions, including initiation of the process, monitoring, and renegotiation processes.

Economic regulation. The goal of this component of the regulatory body is to define the conditions for licensing an entity to provide railway transport services, to handle the licensing requests, to issue, monitor, amend, and decide on revocation/suspension of licenses. It can also receive and process complaints from the market, and monitor anti-competitive behavior conducting investigations when necessary. The economic regulation should be limited as much as possible, avoiding interference in the transport business. However, there are cases when the fares for passengers and the

freight charges might need to be regulated to achieve social objectives. Commuters or "captive" clients must be protected against monopolistic behavior.

Safety regulation. The scope of this component of the regulatory entity is vital for the development of the railway sector. It has to manage the technical performance and to ensure the safety of railway traffic. It will have to set up the safety objectives and standards, and will assess the safety management system of each railway operator licensed to operate railway activities. Safety certifications of processes and products will be issued by this entity as a condition for operating railway activities. Audits and inspection activities are instruments this important component of the regulatory framework will use to achieve its role.

Technical standards. It is recommended to institute under the umbrella of the regulatory body, a Technical Committee of specialists selected from the existing concessionaires, contractors for building or maintaining infrastructure and rolling stock, major suppliers, and training providers. The role of the Technical Committee will be to agree upon common technical standards where there are no international standards applicable.

Accident investigation. This entity will be fully independent of any railway activity or any other regulatory structures, having the power to investigate without any prejudice the accidents in the railway sector. The main role is to investigate the causes of accidents without the attribution of blame, but to identify the recommended improvements to avoid similar events in the future. Obviously, this entity shall not replace any other legal authorities involved in the investigation of railway accidents.

Staffing and costs of the institutional framework for governance and regulation of railway sector. The good professional quality caliber of staff for populating successful regulatory agencies is an essential element, as is the selection and promotion of appropriate experts and managers. These are not easy tasks and may take time. Any related difficulties might be overcome by putting in place during the first 12-18 months of activity of the regulatory body, a team of "shadow" management and experts for the key positions. The "shadow" management team shall be competitively selected from the international market and will support the selection of the local staff, training and know-how transfer. Regarding the necessary size of the staff and the associated costs, all functions presented above require about 5 to 10 technical staff members in a given country. The concrete forms of the institutional structures in charge of the governance and regulatory functions for the railway sector are to be defined for each country in SSA. The Development activities are mainly a government policy function

that may fall under the responsibilities of a dedicated unit at the ministry of transport. All other regulatory functions could be part of an integrated regulatory agency with different branches. Countries could organize separate regulatory agencies for each mode of transport, or an integrated agency with branches for each mode of transport. The latter option may have the advantage of preserving the consistency of a holistic approach for the entire transportation system (unbiased financing mechanisms of infrastructures, equal treatment of infrastructure charging in rail and road, avoiding a monopolistic position in railways or destructive competitive practice on road transport, etc.).

New approach for operating passenger transport services on rail

The compensation for providing passenger services is necessary to support the passengers and not the concessionaires. By adopting the concession approach, the governments in SSA have introduced the commercially driven concept for railways. Most of the passenger transport services are not commercially viable but the governments must sustain this type of transport for social reasons (connectivity, access to work or schools, safer transport, reduced pollution and traffic congestion on roads). The private sector can help in the accomplishment of these objectives more effectively than state-owned railways (lower operating costs, better collection of revenues, etc.); however, the private sector is not interested in operating loss-generating services. Addressing the important issue of passenger railway transport services requires a cultural change in the way governments act in their capacity as clients of railway transport services. In this capacity, the governments must protect the users of social transport services by paying to service providers the right compensation for potential losses resulted from the difference between operating costs and revenues from regulated tariffs. The compensation is not for supporting the concessionaires, but instead protects the passengers. In this way the private sector will be incentivized to operate passenger services, and the social need will be fulfilled with the lowest public contribution, while railway transport remains commercially-driven.

The need for a new approach in defining and implementing the commercial operation of passenger services. Public Service Contracts set up the relationships between the government as contractor of a volume of transport services for social purposes, and a railway operator as provider of contracted services. This can be implemented successfully only if there is political willingness and if adequate resources are allocated for putting in place at the government level the capacities for managing important issues of: (i) defining the volume of necessary transport services for social reasons,

and (ii) the fair compensation of the service providers for the rendered transport services. Putting in place such mechanisms requires the governmental side the following:

a) Undertaking a passenger travel demand analysis based on surveys of passenger travel demand correlated with socio-economic attributes of travellers and the railway service levels;

b) Separating potential commercially viable passenger services, from railway passenger transport services that have to be compensated by the government for social reasons;

c) Defining a plan for operating the identified social transport services by route and train type together with associated estimates for their cost and forecasted revenues based on acceptable levels of fares on the market. On this base the government would calculate the necessary compensation from public funds for operating the estimated social services;

d) Adjusting the elaborated plan for social services by identifying the services that can be operated with lower public costs by public transport on other modes of transport (buses, minibuses);

e) Defining the final plan of services selected to be operated by railways, *considering the public budget constrains* for the payment of compensation. The final plan will include detailed information for operating passenger transport services (including number of trains to be operated every day on each route, frequency of services, composition of trains, and minimal quality parameters of services);

f) Selecting in a transparent manner, on a competitive basis, the service provider for executing the service plan, based on a set of criteria with the major goal of minimizing the level of compensation to be paid;

g) Including in the concession agreement a simple and effective model for the calculation of the level of compensation for the provided services. This model has to include at the minimum: the reference cost agreed upon operation of services, the revenues collected, a penalty system for the non-execution of contract services or the non-observance of quality parameters, and clauses protecting the service provider against the non-payment by the state at the deadlines specified in the contract;

h) Timely and unconditional payment of the agreed upon compensation, once the concession is in place;

i) Establishing data base and procedures for monitoring railway passenger transport services and user satisfaction;

j) Developing data and reporting systems for annual monitoring of provided railway passenger services, their costs, volume of passengers on each route, and level of paid compensation.

The concession of passenger services should be addressed separately from the freight concession. There are very few common aspects in operating freight and passenger services. Most other aspects differ: different markets, different assets, different operating practice, etc. Depending on the local conditions of each market, the concession of freight and passenger services could be awarded to the same concessionaires or to separate entities. In any of these situations, the operation of the passenger services must be addressed through separate concession agreements, with specific provisions concerning duration of concession, specific targets and conditions of achieving the targets, compensation of services. The implementation of the concept of Public Service Contract must be transparent, allowing the public the opportunity to be informed on its purposes, services to be provided, and the level of compensation.

10. The way ahead

Urgent short term actions for improving railway performance in SSA

Necessity to prioritize the actions for improving railway performance in SSA. The recommendations suggested in the present document include a multitude of actions for improving the performance of the railway sector in parallel with the enhancement of the governance of the transport sector. The rhythm of implementation of such a comprehensive set of recommendations may vary from country to country depending on local conditions and will require – in any circumstances - a long period of time. Knowing that the railway reform cannot be defined as "one size fits all" solution, the governments must adapt the general recommendations to the local conditions, which is also time-consuming. At the same time, the dramatic status of the railway transport sector in SSA requires rapid actions to stop the degradation of infrastructure and increase the quality of services. It becomes paramount to select the most urgent recommendations and to prioritize their implementation.

Find sustainable solutions for providing the necessary investment in railway infrastructure. For various reasons, during the last fifteen years, the investment plans for infrastructure rehabilitation have proven to be much larger than anticipated by both Governments and private operators. Currently there is a significant backlog in infrastructure rehabilitation that has to be absorbed in the following years. The text box below summarizes the estimated needs for investments in the railway sector in SSA for the next ten years and after the first decade. Compared with the large amount of money allocated for the road infrastructure in the region, it is obvious this is affordable if tackled through joint efforts of governments (accountable for infrastructure) and concessionaires (accountable for rolling stock and maintenance). In these circumstances, the implementation of a sustainable program for the rehabilitation of railway infrastructure is mainly a matter of changing the financing paradigm. The mechanisms for allocation of public funds for investments in railway infrastructure must be urgently put in place in a similar approach as they have been for roads.

Develop realistic expectations regarding traffic growth and define the obligations of concessionaires accordingly. Governments and concessionaires must adopt a win-win concept in their relationships and work as long-term partners for achieving their goals. The realistic estimation of traffic growth, the periodical revision of achieve-

ments, and the update of predictions are mandatory for developing a successful partnership. This is a key element for adopting achievable levels of concession fees and taxes to be paid to governments. The governments have to follow their long-term objectives in their cooperation with the private sector. More important than obtaining a higher concession fee are the advantages brought by the concessionaires by creating jobs, generating taxes, developing better quality transport services, stimulating economic development of the country, etc.

> According to the 2009 AICD (Africa Infrastructure Country Diagnostic) Report, an average of $100 million is needed every year for track rehabilitation and renewal of the network in SSA (excluding South Africa), with a further $80 million a year needed for rolling-stock and $20 million for facilities, maintenance equipment. This brings the total to about $200 million a year. In addition, there is a backlog investment of possibly up to $3 billion, which could be spread over a 10-year period. The combined annual program would cost about $500 million for the first 10 years, after which the investment level would decline to the steady-state level of $200 million.

Address the issue of passenger transport services. The concession of passenger transport services must be addressed by separate concession agreements. The current approach of mixed services (freight and passenger) in the same concession agreement is not recommended for many reasons presented in the current document. The success of the concession of passenger services is tightly related with the correct estimation of volume of contracted services, the measurement of the provided services, and the timely payment of compensation for the provided services.

Avoid undercapitalized concessions. During the process of selection of concessionaires, it is vital for the governments to accurately assess the capital base of candidates and therefore their ability to address the operating issues. The assessment must be done based on a realistic assessment of the market growth, of the costs for upgrading the necessary rolling stock, and of the cost of operations. The state contribution for the investments in infrastructure must be part of this approach. The main goal of the assessment of capital base of concessionaire is to create the conditions necessary for a smooth operation of the transport services in the context of diminishing the accumulated backlogs in maintenance and investments.

Improve the regulatory framework for railway concessions. The full implementation of the regulatory functions is a long process and may face strong difficulties in many SSA countries. On the short term it is highly recommended to introduce in the con-

cession agreements elements of the regulatory framework that will help for better management of relationships between governments and concessionaires. The enhancement of the concession agreements should secure the financial obligations of the governments as well as those of concessionaires. The new form of concession agreements should include adequate provisions to address at least the following aspects highlighted by the present document:

a) enhanced reporting system allowing the government and concessionaires to measure the performance of the concession,

b) independent annual audits of the concessionaire's financial and operational performance transmitted at a precise deadline to the government,

c) setting-up conditions for creating business-friendly environment for leasing rolling stock and securing higher private operators' investments,

d) definition of the environment for securing long term financing of railway infrastructure through a railway fund (equivalent of road fund) and divesting the stranded assets to support financial obligations of governments,

e) clarification of the roles of governments (ownership of assets and financing) and concessionaires (financing and execution of rehabilitation works) in managing the investments in rehabilitation of infrastructure.

The importance of the short term actions for the second generation of rail concessions. Recently, new and improved concession agreements have been negotiated for some railways in SSA (MADARAIL, CAMRAIL). It is highly recommendable for these new contracts, which have a good chance to become success stories in the region, to implement as soon as possible the short term actions presented above, in line with the recommendations of the present document.

Medium- and long-term actions for improving railway performance in SSA

Defining and following a long term strategy is the key to a sound implementation of better transport infrastructure with the support of the private sector. A reliable infrastructure is a vital element for development in any country. The existing transport infrastructure in SSA operates at low standards and does not create an inviting environment for investments and development. The low GDP of countries in the region does not allow sufficient public allocations for investments or maintenance and the condition of transport infrastructure becomes poorer. The only solution for stopping this vicious circle is to attract additional financing from the private sector by promot-

ing vigorously the public-private partnerships in all modes of transport, including railways. To attract the private sector in the long term concession of railways, including investments in infrastructure, it is necessary to define and sustain a long term strategy in developing the transport infrastructure, and to create a better investment environment. The implementation strategy should include a clear commitment for the governments to share with the private sector the risks of investments and maintenance costs of transport infrastructures, harmonizing the long term objectives of the governments with the short and medium-term objectives of private investors.

Acting to create a friendlier business environment. The private sector will be incentivized to invest in SSA if the governments will perform much better in proving the competitiveness of their economies especially concerning the easiness and low cost of doing business, the high level of implementing standards of good governance in government and administration, and the favorable conditions for development of the human capital. In this context, government effectiveness, political stability, absence of violence, the fight against corruption, and the accountability of public employees are vital for increasing the confidence of the private sector and encouraging foreign investments. Adequate institutional capacity for addressing public-private partnerships in road and rail transport and setting up strong independent regulatory agencies including licensing, economic regulation, and safety supervision are mandatory conditions for developing a sound transportation system in an unbiased approach. The political class in SSA should put at the top of their agenda the promotion of long term confidence to attract the stable commitment of the private sector for sustaining investments in the region, including in railways infrastructure.

Acting for developing the utilization of regional corridors in SSA. Developing harmonized regional strategies to promote traffic along corridors of transport, addressing the problems of border stations, and developing adequate logistic centers will support the growth of the volumes transported by railways and will sustain the economic development of the region. The development of traffic on international corridors should be developed based on financial and economic evaluations, balancing the medium- and long-term interests in the region. The programs must be focused on addressing the specific needs of the transport market. Regional coordination of strategies and synchronization of implementing investment programs between neighboring countries are mandatory steps in this framework.

Acting to address the specific issues of railway passenger services. Railways could be a very good solution for commuters transport and for long distance transport of passengers in SSA. Governments must assess the transport market and decide the cases

where railways have an advantage over other modes of transport. Public service contracts must be put in place to separate the passenger business from the concessions for freight transport, and the governments must fulfill their obligations regarding compensation of services requested to be provided by the private operators, allowing for the reconciliation of the profit required by any commercial activity with the achievement of socially necessary services.

Acting for better utilization of international financial support. The development of the railway transport sector requires important financial resources and due to limited governmental funds, it is highly dependent on international aid. The current trend of supporting the rehabilitation of railway infrastructure through IFI funds must be diversified with new programs including support for gradual achievement of the targets defined by the present paper. The first priority targets to be supported by the donor are: (i) maintenance of railway infrastructure, (ii) setting up leasing industry for rolling stock, (iii) implementing political risk insurance framework for private investments in railways, (iv) setting up the adequate regulatory framework, or (v) putting in place adequate public service contracts.

The governments and institutions of Sub-Saharan Africa must play the leading role in achieving the ambitious goal of improving the railway sector performance. Achieving the objectives presented above is not easy. The continuation of the international financial support from IFI's and the presence of the private sector in operating transport services will not be sufficient. It will require serious institutional changes and a new culture of staff in governments and public administration in Sub Saharan Africa. The international community or the private sector can support the process, but the main role should be played by the governments in the region which must prove their long term commitment for accomplishing a very complex agenda.

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