

EXPLORING POLICY OPTIONS FOR THE RAIL SECTOR
A GOVERNMENT OF ETHIOPIA POLICY OPTIONS PAPER

FIFTH DRAFT
APRIL 18, 2019

I. CONTEXT AND PURPOSE

1. Ethiopia's Second Growth and Transformation Plan (GTPII) prioritizes transport connectivity as part of the government's strategy to diversify its economy, increase exports and achieve middle-income status. The Government of Ethiopia (GoE) established the Ethiopian Railway Corporation (ERC):¹ to (i) build railway infrastructure; (ii) operate railway cargo transport services; (iii) operate railway passenger transport services; and (iv) engage in other related activities necessary for the attainment of its purpose. A rail master plan defines a 4,700km network connecting main production hubs and remote areas with ports and with neighbouring countries.²
2. Investments of over US\$4.4 billion have been made over the last eight years in the rail sector. The line between Addis Ababa and Djibouti (756 km) and the first two lines of the Addis Ababa Light Rail Transit system (34 km) are already in operation. A line between Awash and Mekele is under construction and has already mobilized a further US\$ 5.1 billion, while US\$1.42 billion are still to be spent to complete this line. These lines have been financed through a mix of concessional and commercial loans from bilateral partners and from government funds. Loan repayments for this infrastructure and the management fees paid to the consortium that operates the Addis to Djibouti line are together a significant fiscal burden. Traffic on the Addis-Djibouti line, operated by a binational joint venture (Ethiopia-Djibouti Railway-EDR) between GoE and Government of Djibouti (GoD), requires subsidies to support operating costs while interest and capital costs are currently paid by the governments. Operating revenue is currently kept in an escrow account by the EDR shareholders who decide allocation on a case by case basis.
3. Rail transport is one of the sectors that has been identified as a candidate for reform and Government has decided to rethink its rail infrastructure development program. The priorities for this proposed Policy are to improve substantially the financial sustainability of the rail system to limit Government subsidies, guide Government on the proper planning and implementation of the transformation of the sector and optimize the operation and use of the existing rail lines.
4. This note assumes that policy considerations concern the potential for the use of rail for freight and passengers on the main trade corridors in Ethiopia and for people in the metropolitan area of Addis Ababa, to contribute to the country's growth. Hence the Policy must place a strong emphasis on: (i) informing decisions to retain existing or construct new rail infrastructure and in general all major investment decisions; (ii) revising the overall framework including the market environment for the existing rail operations to optimize the use of infrastructure;

¹ ERC was created on November 29, 2007 through Council of Ministers Regulation No. 141/2007.

² More detail on the master plan is to be found in Annex 1

creating an enabling environment which will attract interest from the private sector both in infrastructure investment and operations in order to limit government commitments and optimize efficiency; (iii) defining a sector financing framework to ensure sound financial management practices, and predictability for the sector's financial requirements, and (iv) establishing a framework for effective oversight of construction and operation of rail infrastructure and service providers and of rail safety. The Policy must also provide high level guidance on actions that are needed for operational lines, for lines that are currently under construction, and for those lines which are planned. Such policy actions need to be complemented by measures in the short term at EDR, ERC and Addis Ababa Light Rail Transit (AALRT) to optimize costs and revenue, in contract management, and to understand better the attractiveness of the sector to private operators. Together these measures can maximize the benefits of the proposed policy actions and of the very significant sector investment undertaken over the last eight years.

5. The map of the planned rail network is presented in Annex 1, a list of relevant international experiences and examples is given in Annex 2, Annex 3 describes possible follow up activities to support implementation in the short term, while Annex 4 proposes a bibliography.

II. SECTOR BACKGROUND

6. Railways are particularly suited to the transport of high volumes of freight over long distances. The consolidation of freight using containers and the locations of transport hubs and industrial developments are important considerations in rail development planning. The movement of international freight in Ethiopia is highly concentrated on the Addis Ababa-Modjo-Djibouti corridor which carries more than 90 percent of the external trade: the volume of imports is almost seven times higher than exports.³ Approximately 50 percent of the total international freight volume is generated in central Ethiopia including Addis Ababa (estimated at 6.4 million tonnes per annum – mtpa – in 2017) with the remainder being distributed between the corridors radiating from Addis Ababa. The southern part of Ethiopia, served by the corridor from Modjo to Hawassa, is the second largest source of traffic with an estimated 1.8 mtpa, with other areas each generating between 0.8 mtpa and 1.4 mtpa. Other corridors are used for specific import and export traffic: Berbera (focusing on livestock export) and Sudan (fuel and bulk cargo), while the corridor from Addis to Kenya is completed but used mostly for regional trade between the two countries rather than for access to the port of Mombasa. Transit traffic to and from South Sudan is minimal.
7. Currently in Ethiopia, the government is financing the construction and operation of the rail network. Experience worldwide is that, typically, traffic volumes of several mtpa are needed for an operator to break even if the initial infrastructure investment has already been amortized, whilst volumes of over 10 mtpa are needed if the cost of any new infrastructure is to be financed. Competition between road and rail over the same corridor, as is the case with traffic between Addis Ababa and Djibouti, means that total trade volumes exceeding 20 mtpa are probably needed to allow rail to win a large enough share of the traffic to ensure viability. This is substantially higher than the level of freight on the Addis Ababa-Djibouti corridor expected over the coming years, while the volumes on other corridors are not likely to reach this level even in the long term. The expectation that guided the decision to construction of rail

³ Imports in 2017 estimated at 12 mtpa, and exports at 1.8 mtpa. Source ERCA

infrastructure was that the revenue generated from traffic would cover would cover the operating costs and the debt contracted to build them. However, the financial analyses assumed levels of traffic which will not materialize, or which are currently not technically feasible.

8. Rail services offered must be competitive with other available modes in terms of price, efficiency and reliability to attract customers. Rail transport service providers are often at a disadvantage when competing with road transporters, because the costs of improving and maintaining the road network are not usually fully borne by the users, and road transport can provide door to door services. As a result, market shares rarely exceed 20 to 40 percent on major trade corridors. Currently the new Addis-Djibouti rail line takes approximately 10 percent of the corridor traffic. The distribution of freight between road and rail on the Djibouti Corridor is strongly influenced by the role of Ethiopian Shipping and Logistics Service Enterprise (ESLSE), which currently allocates traffic between modes. ESLSE holds a monopoly on multimodal transit traffic and manages Modjo Dry Port which is the only inland arrival destination for importers of multimodal consignments to Addis Ababa.
9. Financial sustainability for long-distance passenger traffic in Sub Saharan Africa in general is even more challenging difficult because affordability is key and low-priced bus services provide strong competition: speed is the deciding factor. While the international tariffs for passengers on the EDR are on a par with some regional comparators (around 0.05 US\$ per passenger km) this level is still not likely to cover the operating costs. These fare levels provide a much lower revenue per train to the operator than freight traffic.
10. The degree to which the private sector may be prepared to invest in railways, either to improve efficiency or reduce the debt burden on the Government, or both, is strongly influenced by the sector's commercial attractiveness and the level of risk that potential investors perceive. In contrast with other sectors, railways are usually perceived as high-risk investments given the need for subsidies for passenger services, the high cost of immovable assets and because corridor freight traffic levels can be volatile due to modal and corridor competition, and to fluctuations in international trade volumes.
11. Urban rail services improve mobility for passengers, offering faster and more predictable options. They also offer significant public goods: by taking people off the roads, less investment in urban road networks is needed, and there are significant environmental and emissions benefits resulting from lower car use. Urban rail services are not normally able to recover their operating or investment costs because they must charge fares which encourage switching from other forms of transport. Most countries subsidize the capital investment costs of their urban rail, and usually a substantial share of the operating costs (See Box 1 for developed countries, but similar patterns exist in India and South Africa). However, the Addis Ababa Light Rail faces a particularly low recovery as only less than 3 percent of the operating costs were collected in the fiscal year ending in July 2018⁴. This is due to extremely low tariffs (between 2 and 6 ETB per trip, averaging less than 3 ETB). This is substantially lower than the comparators as shown in Box 1.

⁴ Less than 115 million ETB or revenue for more than 3.6 Billion ETB of operating expenditures.

Box 1: Urban Rail Costs – International Experience

Global experience shows that urban rail systems do not recover their operating costs, much less the investment costs. The table shows the ratio (%) of fares collected divided by operating costs for public transport systems in typical cities. Only Taipei fully recovers their operating costs.

Data sourced from annual reports

City	Ratio - %	Year of Data
Austin, Texas	11	2016
Taipei Metro	100	2015
Paris (STIF)	30	2014
Prague (DPP)	53	2013
Beijing Subway	60	2012
Calgary, Canada	50	2012
Helsinki	49	2011
Berlin	70	2010
Vienna	49	2008
Brussels	35	2007

12. In conclusion, traffic volumes on the Addis to Djibouti line are such that they are likely to be able to contribute to the reimbursement of a part of the capital expenditures after several years. This will require some additional investment to optimize revenue, while an interim debt management solution needs to be found until revenues can contribute to the debt service. For the rest of the network, the AALRT and any other line carrying intercity or international passenger traffic will require a yearly annual subsidy in order to cover operating costs. Reimbursement of the infrastructure-related debt from revenue is impossible for the AALRT and very unlikely for any part of the line from Awash to Mekele. Given the investment already made, the government needs to optimize the use of these lines and ensure proper planning of any new investment. A new rail policy is therefore needed to frame the conditions for investment in rail, the delivery mechanism for construction and operations and the financial relationships between the sector and the government.

III. PROBLEM STATEMENT

13. The overall objective of this options paper is to provide guidance towards achieving an efficient and financially sustainable rail sector in Ethiopia. The government needs to optimize the efficiency of the transport sector; which for the rail sector means to limit additional financial commitments for investment to projects that yield benefits and where possible use private or commercial financing for it; limit and manage the government's future financial commitments to the sector and make maximum use of the existing rail infrastructure. The following problem areas will be discussed in this paper, and policy statements with justifications and explanations are provided for each of them:
- Role of the rail sector for Ethiopia: provide competitive freight markets and contribute to people mobility;
 - Market structure and private sector participation;
 - Independent sector regulation and governance;
 - Financial sustainability and debt strategy and public funding structure;

14. Short term operational and financial actions are also proposed as appropriate, even if they don't constitute policy recommendations per se.

IV. POLICY OBJECTIVES

15. Government will pursue the following policy objectives:

Policy Statement 1: The Role of Rail

Investment in rail will be considered in Ethiopia when and where economically justified in the medium term and long term

16. Railways can offer important advantages over road transport which include reductions in journey times, improvements in reliability and safety, reduction in damage to the road network, lower greenhouse gas emissions and reduced environmental impacts. These are economic benefits which do not show up in a purely financial analysis. Public intervention can, therefore, be justified through rigorous economic cost benefit analysis over the medium term, when the full benefits may be realized. Investments may include improvements to existing lines or operations aimed at increasing their efficiency or capacity, and the addition of new lines, where justified by demand. When government wishes to consider an investment based on political grounds, the government should have a clear assessment of the financial cost implication so that the decision is taken in an informed and transparent manner. For example, in Turkey and France, several passenger high speed links have been built recently but each of them carry a net cost of subsidies of several hundred million US dollars per year in operation, and the full cost of the infrastructure. These subsidies are therefore factored in when the decision is made. Likewise, the European Union has decided, in order to favour rail services, that the full capital cost of infrastructure should be the responsibility of the state and only its maintenance and operating costs should be passed on to users. This is also a strong policy/political choice, but one which is made with the acknowledgement of its cost to taxpayers.
17. In order to apply this policy statement, it is needed to re-assess the investments which are currently in progress, using a 25 years window for investment justification. Where investments are not financially viable, the government should set criteria and thresholds for the provision of any future subsidies for the operation or investment in the rail sector based on sound economics. Such an assessment must be made before deciding on whether to complete the Addis-Kombolcha-Mekele line. Under current conditions, and as confirmed by the estimates from McKinsey for ERC, which are optimistic in demand volumes, no lines beyond the existing ones should be built.
18. Even when taking into account the climate change and safety related benefits of rail compared to road transport, the valuation of these positive externalities is much lower than the economic operating cost differential between rail and road. The documentation supplied by a recent consultancy for ERC clearly shows that the likely economic benefits from using rail are far lower than the cost of building rail infrastructure on these other corridors.
19. In urban settings, the carbon positive externality can be significant but only if rail replaces bus or minibus and reduces congestion. When it replaces walking, it is negative. Given the current financial constraints on the sector, any new investment should be assessed primarily on the

basis of the financial return. Except for urban transport, the economic return will be close to financial return (congestion is low outside Addis).

20. We will look at shorter economic return periods for investments on existing lines. We will also factor in modal shifts implied by the existence of a rail option and the climate change related benefits of moving freight and passengers to rail, but with cautious estimates in order not to overestimate benefits or the shift. The McKinsey study typically assumes that at least forty percent of traffic will be carried by rail: this is usually a maximum and can reach more only in the most favorable situations (more than 500km, only one corridor option). When several corridors compete and there is a strong road transport industry, it can be much less - 5% to 15%. Estimation of economic benefits will also incorporate carbon savings compared to emissions from car and public transport modes, especially for passenger traffic, in order to also be used in future as a justification if the government decides to subsidize rail operations.
21. Traffic levels are fundamental when revisiting the economics of the GTPII investment program. Existing feasibility study and even current assessments are very optimistic and based generally on a yearly increase in proportion to GDP growth, while the system will probably work by steps based on capacity (in the case of Djibouti-Ethiopia). Neither existing assessments or government documentation indicate the likelihood of new mining or other high-volume traffic which would substantially change the outlook for viability of the Awash-Kombolcha-Mekelle (AKM) line and Addis Ababa-Djibouti. The potash mines in North East Ethiopia and Eritrea will require direct and dedicated routes to ports on the Eritrean coast and could be funded by the private sector. Even if the potash were to be processed in Ethiopia and distributed internally, the expected tonnage is too small to justify the investment (600,000 mtpa). The exception may be the OCP factory in Dire Dawa, and in this case it would potentially mobilize 4 mtpa of capacity on part of the line. The World Bank is currently reviewing the CBA of both Addis Ababa- Djibouti and AKM lines: the results of the financial analysis should govern the decision to complete construction on AKM. Best practice in rail planning recommends the construction of a new line when there is more than 10 million tons transported over more than 500 km (for freight) and for very high population densities (for passenger).
22. Best practice in urban planning recommends using urban rail for more than 30,000 passengers per hour at peak hour (current total for AALRT: 120,000 passengers per day). Further development of light rail should be planned by the city in coordination with the development of other public transport modes. The criteria used for decision-making for public investment in the rail sector need to be reviewed, with amendments made to relevant regulations if need be.

Policy Statement 2: Rail Sector Market Structure and Private Sector Participation

The international transport market will be restructured to enable proper competition for freight traffic, especially between the rail and road transport sectors, in the interests of securing economic and operational efficiency. Urban rail services will be integrated within the overall urban transport services market. Private sector participation in the rail sector will be sought wherever possible, both for current operations, upgrading investment and new investment.

23. To make the rail sector more attractive to private investors, Government will improve the enabling environment, building on existing successes such as progress in the Scaling Solar PPP

program in the energy sector, especially regarding the legal framework, currency convertibility and foreign investment.

24. For freight traffic, government commitments in relation to: (i) tariff policy; (ii) ensuring a level playing field between road and rail operators and (iii) support, if justified, for the mitigation of specific risks linked to traffic, currency availability and exchange rate, and for termination payments in the case of concessions and PPPs, are crucial factors to attract private operators. For international transport, several operators act along the logistics chain, which impact access to the market for transport operators. Ideally, open market access to all business in the logistics chain including transport services should optimize the use of rail with a free and competitively based tariff policy. In the current legal setting ESLSE plays a major role in freight allocation between road and rail modes. We will follow the orientation of the logistics reform currently undertaken as part of the Policy Lending engagement with the IFIs.
25. Bilateral agreements with Djibouti may also have an impact on modal choice, so we will reinforce both consultation with the Djibouti partners and inter-ministerial cooperation within our own government to ensure appropriate bilateral consultations and efficient policy coordination.
26. The impact of trade policies on the capacity of rail to serve clients needs to be evaluated, including whether tariff freedom is sufficient to ensure optimal rail traffic growth. Ideally, logistics operations should be liberalized, allowing EDR to make better use of its freight terminal at Indode near Addis Ababa. For national and international freight on the AKM line, if to be completed, the role of ESLSE will need to be defined as well as the short- and medium-term policy options in relation to tariffs. To transition from the current arrangements, we will: (i) consider instructing ESLSE to increase the use of EDR, coordinating with an increase in EDR's capacity, and order the delivery of part of the containers in Addis instead of Modjo; (ii) increase bulk traffic using rail (currently very low); and (iii) decide appropriate strategies for AALRT tariff policy with very low fare currently (most people pay 2 ETB per ticket).
27. Still in relation to trade policies, Kenya is currently mandating the use of rail for most import containers to Nairobi in order to help cover the costs of its new railway. China also does not have market-set tariffs. The development of the northern line, where traffic is much less dense and competition with road would be stronger, may require either efficient multimodal logistics chains linked to the railway or to oblige traffic to use rail. Decisions to further develop Indode for import and export container traffic, in addition to Modjo, would require a regulatory decision as Indode is currently limited to unimodal traffic. Liberalization of logistics companies and freedom of tariffs would also require changes in legislation.
28. On urban passenger transport, the government will ensure that AALRT operations are coordinated with the rest of urban transport services, that its tariffs are optimized and that its tariff and subsidization policy be based on strong contractual relationships.
29. Government will seek private sector opportunities including for any new investment on existing lines. Short term gains can be obtained for investment needed on Djibouti Ethiopia (rolling stock lease, connection to oil storage, sidings). Opportunities may also exist for preparing different 'packages' for the sector: either for a complete rail operation, or for components of it when split into individual business units (infrastructure, rolling stock, passenger activities). Any short-

term investment in Addis-Djibouti line can potentially be done by outside parties: examples include extra wagons by logistics operators (ESLSE, others), connections to oil storage facilities by the oil storage company or oil companies, extra investment in infrastructure by future concessionaires. Value added services such as logistics or land development, may also increase attractiveness to investors but would not be decisive factors in enabling a PPP operation to contribute significantly to the reduction of the infrastructure debt.

30. Government will seek to attract the private sector into the management, supply and operation of rail services; and to investments in rail infrastructure, whether to improve existing services and infrastructure or to expand them. Management contracting, concessions to operate and manage services and infrastructure and the purchase of shares in rail sector business units or of rail sector assets need to be investigated. With the current and projected network size and traffic level it is not expected that intra market competition will bring any significant added value. But competition for an operator for the lines, the network or for specific niche services should be encouraged. It is also crucial that government carries out a very thorough market sounding based on international experience to test the appetite of private operators for all or part of rail operations and investment. Competition for an operator for a concession of Djibouti Ethiopia should be encouraged. Direct sale of existing rail infrastructure assets is not recommended because they have little value unless part of a commercially viable operation, but the involvement of concessionaire companies, sale of rolling stock assets or purely private new investment in private access or in rolling stock should be encouraged. There would be a need for a change in legislation and renegotiation of the management contract if a PPP is sought for the Djibouti Addis line.
31. Priority will be given to private sector participation or other stakeholder participations that can improve the financial sustainability of operations, especially in terms of access to new traffic (for example oil for EDR) and to market sounding and evaluating the impact on EDR of the current management contract which still needs to continue for five years.
32. The current organization of external trade services is a big risk factor for PPP investors in corridors, as is the potential competition from other corridors. Therefore, a good market sounding should be carried out and it may be useful to test options with various levels of investment responsibility for Addis-Djibouti (e.g. freight rolling stock, renewal or not of infrastructure, passenger rolling stock). The current limitations on foreign currency convertibility and availability need to be addressed for investors who are not already in Ethiopia to be involved in PPPs for the sector.
33. Appropriate strategies for PPPs in the LRT need to be decided and studied. If there is no established subsidy scheme, private operators are not likely to take any risk to operate it. With a guaranteed subsidy scheme, participation would be more attractive.
34. International best practices for PPP includes: Private investment in wagons and rolling stock (Russia and Russian railways, European operators); Concessions with various level of cost coverage of rolling stock and infrastructure (Cote d'Ivoire, Cameroon, Gabon, Malawi-Mozambique); PPPs involving land value capture (France, Asia); PPP for urban rails (India Metros); and several tramway operations in France and European cities.

Policy Statement 3: Rail Sector Regulation and Governance

We will ensure that the interests of consumers, operators, investors and government are properly acknowledged and balanced. Governance of the existing entities will be ensured by their status and by performance-based contracts. Safety and licensing will be independently regulated, and appropriate regulation to avoid anti-competitive behaviour and unfair competition between road and rail transport will be put in place.

35. We will need to review economic regulation role for freight transport especially if we liberalize it as part of the logistics policy. Depending on how other Ethiopian institutions are undertaking economic regulation and consumer protection, a specific entity could be defined for the rail sector, the transport sector or the related functions absorbed into an existing institution. Until now, all regulations have been in the hands of the Ministry of Transport which is also the ultimate owner and operator of the national rail network through its supervision of ERC.
36. Safety for operators, employees, users and for the public are paramount for the railway sector. Considerations range from the carriage of hazardous materials, to the safe operation of railways for staff and passengers and to public safety, for example at road crossings but also to improve the accidents involving animals on the Ethiopia Djibouti line. A framework to independently regulate safety on the rail network is therefore required, setting out the role of the regulator, the rights and obligations of operators, users and the public. Ideally economic and regulatory functions should be independent from each other and independent from ministries and companies. However, we will review and decide if the economic regulation is carried jointly with the regulation of rail safety in order to limit the costs of the regulator or if we create two separate institutions.
37. As mentioned in Statement 2, the current rail operations are not financially sustainable given the level of debt of the existing investment and the level of operational revenue, while there are no clear forecasts indicating how the existing public companies will service their debt, which creates a risk of government taking over the debt. It is therefore proposed to clarify governance arrangements in the sector.
38. We will enhance the governance of the entities in the rail sector with strong accountability and the use of performance-based contracts. Government will liaise closely with Djibouti to agree and enforce service standards for EDR and harmonize arrangements for any PPPs that would involve rail new investment and set KPIs for EDR. KPI and subsidy framework should also be set up for the AALRT. If the Kombolcha line is completed, then its management could be delegated to EDR or ERC using EDR rolling stock (no value added by having a third-party operator for the expected level of traffic).

Policy Statement 4: Securing Financial Sustainability and Structure of Public Funding

An investment in new rail or upgrading of existing rail facilities, when justified under Policy Statement 1, will only be undertaken when its financial sustainability can be guaranteed. The existing operators will be made accountable for their financial responsibilities and a debt relief strategy will be elaborated. We will prepare a funding strategy for each rail operation which lays down the needs for public contributions, and decide upon the affordability of such operations

39. Securing or improving financial sustainability is a prime consideration for the sector. The economic advantages of rail must be balanced against the likely necessity for public financial support. That can be justified for passengers including for operations, because rail users cannot be expected to meet the cost of economic externalities through tariffs and fares especially in an urban context. Given the initial investment cost and the challenge of attracting traffic when a line starts operation even for freight, it very often happens that revenue cannot cover debt service and operational costs for several years, which is currently the case with EDR. This may require temporary subsidies or in some case support from the government to ensure that debt service requirements are met.
40. As a result, investments will be subject to a rigorous financial analysis that identifies the full financial cost of the investment over its lifetime, the sources of the revenues to cover the financial cost. It will also test the appropriateness of available financing arrangements, to ensure that there is no financing default. For any additional investment on existing freight lines, investment will be considered only if they can provide a rapid financial return on investment.
41. It is expected that revenues will consist wholly or substantially of user fees for freight. Where there is a demonstrated public good not reasonably chargeable to the rail user (such as the impacts explained in statement 1), public finance may be justified, provided that the source of funding (for operations) or financing (for investment) can be secured over the period for which it is needed. Any passenger services in the Ethiopia context will require operational subsidies given the current tariffs for other modes of transport and the capacity to pay of the population.
42. When it is confirmed that a form of government support to operations or capital is needed, a clear source of funding will be decided at central or local government level to ensure sustainability of the service. We will ensure that sufficient funding is made available for the maintenance of rail infrastructure and rolling stock, in order to avoid any deterioration in the level of customer service.
43. We will decide to stop the construction of new lines or services if it is considered that they are not economically viable or if they are not financially affordable.
44. Additional investment that can enhance revenue generation and have a positive financial return for EDR will be financed and carried out as a priority.
- a. A debt strategy will be prepared for ERC combining debt rescheduling and debt refinancing, and
 - b. We will evaluate the opportunity to allocate specific flows of funds or assets to help pay back some of the current debt stock when operations surplus is not sufficient.
45. The AALRT, and the ERC / EDR operations are bound to operate at a deficit for several years (AALRT will always run an operating deficit). It is critical that this fact be recognized, and sources of funding be found to cover the needs (from the city or at central level). As several other investment (new LRT lines, new intercity lines) may require subsidies for investment and operations, the government should determine the affordability of such services, e.g. level of funding that it is ready to provide to secure operations before construction is started or completed and the lines commissioned. A level of service for AALRT and a subsidy for it must be agreed to ensure continued operations. Capital debt for AALRT and for the Addis Kombolcha

Mekele line must be borne by the government. For Addis Djibouti, it depends on the increase in traffic and on some investment (see Private Sector participation).

46. For AALRT the key issue is to maximize revenue with a socially acceptable tariff level and minimize costs. Currently AALRT covers 3 percent of its operating costs, so even strong optimization will mean that (i) the government must cover the debt of the AALRT and; (ii) the government or the municipality must allocate an annual operating subsidy.
47. Regarding options to improve debt structure, financial flows need to be established to cover the debt of the AALRT and of the AKM line, unless the whole debt is taken over by the state.
48. We will explore the possibility of additional revenue from assets. Transit Oriented Development in urban locations and further revenue generation mechanisms using rail assets will be used to contribute to the financing of subsidies, but the likely revenue can only contribute marginally. Likewise, logistics services can be linked with rail but would not contribute to debt reimbursement.
49. In urban settings, land value capture can generate revenue that can help, mostly by selling land, selling rights to build high rise buildings or through concessions for shops in station. This requires a vibrant market for land and real estate. Alternatively, income can be generated by increasing property taxes in areas close to stations. For intercity lines, as there are few passenger trains per day, economic activities are not going to become significant because of the train service, contrary to most best practice examples (Asia, Europe).
50. The current land market in Ethiopia is such that very large areas would be required to be sold every year to cover the existing debt service for these lines (e.g. more than 1,000 Ha in the Addis area every year, which is 40 percent of the area usually formally sold per year). The sale of land adjacent to intercity lines for industrial development would also be possible, but the sums raised would be unlikely to cover debts. The construction permit systems do not currently generate high values through authorizations to build high rise buildings, and tax policy in cities is not developed to an extent that would allow for selective increases to contribute to rail debt. These opportunities should be explored.
51. In all cases, ERC does not possess the skills to develop real estate, so it would be better to generate revenue for the government in general through better land planning and usage and have the government negotiate the improvement of terms of the debt. There is also no certainty and reliable estimate of the revenue potential of such developments. In the case of EDR/Addis Djibouti, it is possible to recover the costs of at least interest payments and then part of capital, so a line-specific debt restructuring strategy could be envisaged with interest paid by operating revenue and the debt progressively reimbursed and rolled over.

V. SHORT TERM OPERATIONAL AND FINANCIAL ACTIONS

52. For the Addis Djibouti Line, the recommended strategy is to keep the current passenger traffic level of one train every two days and maximize bulk and container freight traffic.
53. Several investment scenarios have been tested with a very fast payback period: purchasing more wagons to add one container train per day (costs recovered in less than a year),

completing the link to the oil terminal in Modjo (costs recovered in less than two years), making investment to operate 24 hours and increase number of sidings (cost higher but investment cost recovered in much less than 5 years). Most of these investments can be done by others or the private sector (see statement 5). With optimized investment policies, operating costs can be funded, and part of the capital investment costs recovered. A line-specific debt restructuring strategy could be envisaged together with the government of Djibouti, with interest paid by operating revenue and the debt progressively reimbursed and rolled over.

54. Another major choice that can be made quickly on this line is to better use the Endode location for container handling. This requires amendment to regulations related to external trade in terms of authorized location and is linked to the current ESLSE monopoly.
55. Reinforcement of EDR to run its marketing and sales policy as a business is critical for all scenarios but would have maximum impact only with freedom to set tariffs and in a liberalized environment. TA from existing operators or international consultants would suffice to increase capability in EDR. Likewise, capacity building providing ERC and EDR knowledge on KPIs and contract management will be encouraged, as well as in data collection, to allow these companies to better monitor the system and limit the need to rely on outside expertise and data estimates provided by such expertise.
56. We will review before end June 2019 elements to predetermine an investment and operational path for the Addis Djibouti line. At current tariff levels one full import container train Djibouti Addis with 55 wagons currently generates a revenue of close to 40,000 USD (but returns empty containers for a fraction of that revenue), while a bulk train could generate more than twice that income, and a passenger train is estimated to generate less than 10,000 USD. As a result, the recommended strategy is to keep the current passenger traffic level of one train every two days and maximize bulk and container freight traffic.
57. With current traffic structure (up to 2.5 container trains per day) the line can barely break even for operating expenses and is likely to run deficits over time. With some extra investment, one train per day of bulk traffic or fuel oil would significantly improve the situation and generate a net benefit compared to operating and new investment cost, therefore improving the financial situation.
58. Several investment scenarios have been tested with a very fast payback period: purchasing more wagons to add one container train per day (costs recovered in less than a year), completing the link to the oil terminal in Modjo (costs recovered in less than two years), and making investment to operate 24 hours and increase number of sidings (higher cost but investment cost recovered in much less than 5 years). Most investment can be done by others or the private sector (see statement 2). With optimized investment policies, operating costs can be funded, and part of the capital investment costs recovered. One investment to be considered will be the impact of the OCP factory in Dire Dawa. Depending on the capacity of the line, it may have a positive impact by adding several million tons of traffic or prevent the line from maximizing longer distance container and bulk traffic to Addis Ababa.
59. A financial model will be built to simulate the Awash-Kombolcha, Awash-Weldia and Awash-Mekelle sections. Economic analyses will complement it to verify the opportunity to finish construction of each section, as total capital expenditure need to be funded by the government

and a large operating subsidy required. The economic and financial benefits of two options will be compared before end May 2019: (i) costs of the investment needed to complete the lines, with expected operating costs and revenue over twenty five years and including the extra cost of finishing the various sections, and (ii) make only any new investments that help the Awash-Kombolcha section cover its operating costs over 25 years, and assumes that the government will not make the outstanding capex (1.7 Billion USD) investment, terminating the existing Kombolcha-Weldeia-Mekelle contract.

60. If the line were to be connected to Assab, the available freight even under a voluntary /planned transfer of traffic to rail would not generate more than 1-2 million tons per year, which does not justify the construction of a new line. As a result, this option will not be considered for modelling. The identification of mining opportunities in that area would not provide freight on the line to Addis (at most a link between the mining areas and Assab directly). One study to carry out quickly relates to the additional investment needed in Kombolcha to make the line from Awash operational from a logistics standpoint. It will need to be considered in the final choice related to this line.
61. For the AALRT, more data are needed to enable ERC to calculate the optimal fares and costs of the line and establish an equitable operational subsidy from the city or the government. But as long as the tariff will remain at their current level, revenue will always be a fraction of the costs, and the main issue is therefore to optimize costs.

Rev 5: 18.04.19



ANNEX 2: DECISION SEQUENCE AND DEPENDENCIES

ANNEX 3: OPTIONS AND EXAMPLES FROM BEST PRACTICE FOR THE RAIL SECTOR

Policy Statement 1:	The Role of Rail Investment in rail will be considered in Ethiopia when and where economically justified in the medium term and long term.		
Option	International Example	Advantages	Disadvantages
Economic analysis which takes into account economic benefits such as time savings, safety, reduction in damage to the road network and reduced pollution and greenhouse gas emissions that are not included in a purely financial analysis.	China EAC (Burundi)	Provides governments with a means of evaluating the wider benefits of using rail, justifying the value of any subsidies that may be necessary.	Leaves government with the task of identifying the financing for any subsidies. Relies upon accuracy of assumptions, primarily of traffic levels.
Financial analysis which looks at the rail line as a commercial undertaking, assessing financing costs, loan repayments, revenues and operating expenses.	Rail PPP investments due diligence by investment banks	Determines whether the rail project is self-financing & financially viable. Should be adopted when government wishes to minimize its exposure.	Relies upon accuracy of assumptions, primarily of traffic levels and on cost items. Will rule out projects that require financial support.

Policy Statement 2:	Rail Sector Market Structure and Private Sector Participation The international transport market will be restructured to enable proper competition for freight traffic, especially between the rail and road transport sectors, in the interests of securing economic and operational efficiency. Urban rail services will be integrated within the overall urban transport services market. Private sector participation in the rail sector will be sought wherever possible, both for current operations, upgrading investment and new investment.		
Option	International Example	Advantages	Disadvantages
Market forces and customer preference govern allocation of traffic between rail & road transport modes.	North America Europe	Ability of customers to select mode encourages efficiency of services.	May not make best use of available infrastructure capacity in the case of Ethiopia.
Allocation of traffic between rail and road transport modes by institutional system or government directive.	China SGR Kenya	Potential to make best use of available infrastructure capacity.	May not be the most efficient or lowest cost solution.
Vertically Integrated structure where infrastructure provision and maintenance, & freight and passenger train service operations, all fall under the responsibility of a single entity, which may be publicly or privately owned. The structure currently used in Ethiopia.	All freight railways in Canada & USA are privately-owned, freight oriented & vertically integrated, but allow access to state-owned passenger services (AMTRAK and Via Rail) German railways (but freight market is open) Freight railways in Brazil	Responsibility for coordination & management of all aspects of train operations & maintenance of track rest with one entity, eliminating problems due to interfaces between different organizations.	In some cases, operations tend to concentrate on the most profitable types of traffic & larger customers, neglecting others. Limited prospect for competition - may become virtual monopolies for some types of bulk freight, making it difficult to control tariffs.
Vertical Separation between infrastructure management and train operations. Freight and passenger train operators	Denmark, Finland, France, Netherlands, Portugal, Spain,	Freight & passenger operators are competitively selected to provide train services under their respective concession	Interfaces & relations between operators & infrastructure provider can be difficult to manage with responsibilities for infrastructure being

compete for their respective markets. Infrastructure ownership may be retained by government, and infrastructure management can be outsourced or concessioned. The infrastructure may remain under state ownership, and management and maintenance may be outsourced or concessioned. Infrastructure maintenance (routine and major rehabilitation or renewal) is the responsibility of the owner and infrastructure manager.	Sweden	agreements. Concessionaires are given the exclusive right & obligation to maintain the rolling stock & other 'above the rail' equipment required for the operation of the services. Separation of the freight & passenger train operating companies allows stricter KPIs to be set for the freight train operating company(s). An express passenger service operating company, with subsidized tariffs if so decided, would be managed using appropriate KPIs aimed at reducing any subsidy & providing acceptable levels-of-service. This structure can also be used for freight & passenger services on the Awash-Kombolcha line to travel on the Addis Ababa-Awash-Djibouti line.	separated from train operations. This has led to underperformance on some concessions due to lack of clarity on responsibility for infrastructure maintenance. Quality of services will deteriorate if infrastructure is not well maintained. Strong regulation is needed. Best-suited to a mature rail networks where a market for providing rail services exists and justifies a multiplicity of operators.
Vertical and Horizontal Separation (Open Access): Under this option, there is both vertical separation of infrastructure from train service operation, and horizontal separation of train services, with multiple train operators providing competing freight and passenger services. The infrastructure may remain under state ownership, and management and maintenance may be outsourced or concessioned. Infrastructure	UK rail structure Kenya has recently decided to adopt this option but it has not yet been implemented	Several different freight & passenger operators may run services on a non-exclusive basis provided they obtain appropriate operating licenses & Safety Certificates from the rail regulator, subject to access being available, thus introducing competition. Allows operators to introduce specialised logistics or bulk freight services.	Interfaces & relations between operators & infrastructure provider can be difficult to manage. Strong regulation is needed. Quality of services will deteriorate if infrastructure is not well maintained. Best-suited to a mature rail networks where a market for providing rail services exists. Rail services in Africa already face fierce competition from road transporters, & introducing

maintenance (routine and major rehabilitation or renewal) is the responsibility of the owner and infrastructure manager.		Number of operators may be limited by the regulator to match levels of demand for-services. Establishment of a formal legal & regulatory framework for open access sends a message to the market that the sector is open to competition, & will allow the market to decide whether or when this occurs.	competition between rail operators can severely limit the interest of private sector rail operators to participate. The system has not been widely adopted by African railways because the limited traffic levels mean there is not an effective market for competition.
Rail Operator: Private sector	EU USA UK	Private sector can offer advantages in performance & cost to government over the public sector. introduction of private operators has improved market & commercial performance on almost all railways where it has been introduced, particularly for freight.	Rigorous and complex selection process required that selects competent operator. Contract must be structured to include incentives to provide high service levels & increase in market share. Operators may focus on the commercially attractive activities, ignoring the less profitable ones. Effective regulatory body needs to be in place.
Rail Operator: Public sector	China Ethiopia India Kenya	Variants ranging from ministerial departments responsible for rail operation, to state-owned enterprises & state-owned companies may be adopted, with increasing potential for sound management. Government has more control over cross-subsidies & provision of socially important services.	Little incentive to improve operational or financial performance. Likely to impose a high financial burden on government.
Leasing of rolling stock: Options include the sale and lease-back of existing rolling stock to a lessee, & leasing new rolling stock from a manufacturer or rolling	USA (TTX), Russia, RENFE (Spanish Railways and Metro	Allows recovery of a great portion of the capital invested in rolling stock, or avoids initial high capital	Contract needs to be structured to avoid the disadvantages of being locked-in to a single manufacturer.

stock company (ROSCO). Options would need to take into account the ability to maintain existing and new rolling stock.	of Madrid and Cercanias)	outlays. Passes on the responsibility of rolling stock availability & maintenance to the provider under their contract, avoiding underutilization or shortages of rolling stock.	Leasing is only attractive to leasing companies when there are tax advantages in the country.
Sale of Assets: Ownership of rail infrastructure, either partial or complete, may be transferred to the private sector. Land assets adjacent to railway may also be sold to parties interested in property development.	Japan Railways (East and West), Hong Kong Metro, Washington DC Metro, Kings Cross development - London, Jinxi Axle, PKP Cargo - Poland	Sale or leasing of assets can produce up to 15% of total operating revenues but requires careful planning to ensure that the assets sold will not constrain future rail operations.	Assets are only likely to have significant value to a purchaser when associated with a viable business operation. Specialist property development and leasing skills are required. Poor planning of the sale may lead to protracted litigation and extensive resettlement without adequate compensation.
Provision of customer-focused door-to-door logistics services	Europe USA	Gives customers a single point of contact for transport services Addresses the main advantage of road over rail: door-to-door collection and delivery.	Rail operators needs to diversify their activities to include road transport service.

Policy Statement 3:	Rail Sector Regulation and Governance The government will ensure that the interests of consumers, operators, investors and government are properly acknowledged and balanced. Governance of the existing entities will be ensured by their status and by performance-based contracts. Safety and licensing will be independently regulated, and appropriate regulation to avoid anti-competitive behavior and unfair competition between road and rail transport will be put in place.		
Option	International Example	Advantages	Disadvantages
Form of Regulation: Combine the safety and economic regulatory functions in the office of a single regulator.	Brazil - Land Transport Regulator (ANTT) Tanzania - Surface and Marine Transport Regulatory Authority (SUMATRA) UK - Office of Rail and Road (ORR)	It is more efficient in terms of staffing numbers to have the economic & safety regulatory functions within the same organisation, although in separate departments. Maintains a single channel of contact with the rail operators, allowing a harmonized & consistent approach.	Managing both economic & safety aspects may lead to some lack of focus.
Form of Regulation: Establish separate regulatory offices for safety and economic performance.	South Africa - Railway Safety Regulator (RSR)	Enables the regulator to have a strong focus on each specific technical area.	Separate departments for economic & safety regulation will require an increased total number of specialized staff who may be difficult to recruit & retain. Approach to regulation of different areas may not be consistent.
Structure of Regulator: Independent regulatory body.	Argentina, Brazil - ANTT European Union countries UK - ORR	Easier to take into account & balance the interests of rail users, government & service providers. Perception by the private sector that disputes between Government & Concessionaire will be treated impartially. Existence of an independent body will generate private sector confidence in the transparency of contract management. Can be funded by contributions from service providers.	Establishment of the regulatory body, with associated costs.

Structure of Regulator: Regulator is part of a relevant ministry or sector institution	China, India, Russia	Government is able to influence decisions, consciously or subconsciously. Likely to be the least-cost solution.	Private sector does not have faith in the impartiality of the regulator. Detracts from establishing an enabling environment for the private sector. Decisions taken may not be optimal, with a bias to the government's perspective. May be difficult for a government institution to attract & retain competent staff.
Sector Coverage: Regulatory responsibilities limited to the rail sector	Australia - Office of the National Rail Safety Regulator (ONRSR) South Africa - RSR	Concentrates focus on the rail sector.	Necessary to establish separate offices for rail & road regulation, with associated costs
Sector Coverage: Regulation of several transport sectors included in one institution	Brazil - Land Transport Regulator (ANTT) Tanzania - SUMATRA: covers land & marine transport UK - ORR: monitors rail & more recently the economic performance of the Highway Agency	Concentrates regulatory & oversight skills for transport in one organization. Particularly relevant for complex contracts such as concessions / PPPs where strong legal & financial skills are needed & can be applied across sectors - expertise in contract performance & oversight is consolidated in one place. Well-placed to ensure fair competition between the rail & road sectors, creating an enabling environment for better intermodal operations. Provides savings in institutional costs.	A risk that focus on individual sectors is diluted.

Policy Statement 4:	Securing Financial Sustainability and Structure of Public Funding An investment in new rail or upgrading of existing rail facilities, when justified under Policy Statement 1, will only be undertaken when its financial sustainability can be guaranteed. The existing operators will be made accountable for their financial responsibilities and a debt relief strategy will be elaborated. The government will prepare a funding strategy for each rail operation which lays down the needs for public contributions, and decide upon the affordability of such operations.		
Option	International Example	Advantages	Disadvantages
Private finance was raised to construct the Mozambique-Malawi line, part of the 2.0 billion USD Nacala Rail Corridor with the funds being secured on the basis of an expected traffic flow of 18 m tonnes per year.	Malawi, Mozambique Similar projects under preparation in Gabon and Guinea	No financial commitment from governments, with project financed through mineral traffic. Government was able to negotiate slots on line to carry general freight.	Transport of minerals traffic gets priority at the expense of general freight. The volume of freight is multiple times higher than the likely volume in Ethiopia and depends on the mining operations.
Securing new Investments to complete existing lines or to finance any new construction.	France (some limited lines) Malawi & Mozambique Cameroon (partial) Cote d'Ivoire Burkina (under renegotiation)	Private sector financing removes costs of infrastructure finance from the government budget. Rail investment removes trucks from the road, reducing accidents and emissions.	Financial viability must be demonstrated in order to secure private sector investment. This is only likely if there is a strong probability of transporting high volumes of freight - normally bulk materials and containers. Volumes in Cameroon and Cote d'Ivoire similar to what could be the beginning of the Djibouti-Addis line, but higher than prospects for Awash-Mekelle.
Private concessions, but traffic levels insufficient to sustain operating and maintenance costs of concession	Malawi, Zambia Mozambique Kenya – RVR, Tanzania, Senegal Mali	Minimal financial contribution from government.	Low traffic results in insufficient revenue to maintain infrastructure: service deteriorates, further reducing traffic and revenue. Poor performance resulting in termination or renegotiation of concessions.
Railway costing systems	Majority of railways in USA & Canada	Provides a sound base for setting tariffs, identifying areas for cost-	Availability of accurate financial data can oblige management to take

		cutting & improving financial sustainability.	difficult decisions on the future of rail operations.
Dynamic marketing and sales teams	Majority of railways in USA & Canada	Essential for increasing market share. Detailed knowledge of customer requirements combined with data on costs allows attractive & financially competitive packages to be offered for the transport of specific commodities.	None
Efficient fare collection systems for light rail. Combine systems can be used for payment of fares on trains and buses	Brazil - São Paulo Metro UK - London & Glasgow	Reduces fare avoidance, increasing revenue. Convenient for users if IT systems are effective. Can be used to provide lower fares for low-income households.	Technology is sophisticated. Significant installation & running costs. Can give rise to arguments about distribution of revenue between bus & rail service providers.
Renegotiation of loan terms: changes in grace period, payback period or interest rate may be renegotiated.	Ethiopia South Africa & Mozambique Several motorway concessions	Reduces short-term cashflow requirements, and possibly the overall cost of the loan.	Can increase the cost of financing Success of negotiation will depend on strength of borrower's bargaining position.
Loan restructuring: introduction of mezzanine debt or other financial instruments, changing the amount of debt relative to equity; use of IFIs guarantees to reduce cost of borrowing.	Croatia	Reduced interest rates through use of guarantees; longer loan periods by changing types of financing. Common practice in many different types of concession. May bring benefits for both government & financier.	Only likely to reduce cost of relatively high-cost financing - non-concessional loans that had been sourced on the commercial market. Guarantees from World Bank and IFIs would be given only if substantial confirmation that (i) the operator operates efficiently and (ii) there is a flow of funds that allows to reimburse related debt.

ANNEX 3: LIST OF ACTIVITIES

Tasks		Expected Timeline
3	Development of a Cost and Benefit Analysis on the overall prioritization on existing and future investment on rail lines; provided that necessary data are provided by ERC and EDR.	Mid May 2019
4	Support to Privatization Reform Secretariat on discussion with the Macro Economic Committee	May 2019
5	Identification of opportunities for the involvement of the private sector in operation, management or financing of the rail network through contracting and partnership agreement for the Addis-Djibouti and Awash-Mekelle lines	Depending on main paper result
6	Details on regulatory framework for the railway operations and safety in Ethiopia	June 2019
7	Review of investment for improvements of the Addis - Djibouti line	May-June 2019
8	Implementation of a tariff and freight allocation strategy for the Addis Djibouti line	After review by Macro Committee

ANNEX 4: BIBLIOGRAPHY

Institutional and Regional Interoperability

Railway Reform: Toolkit for Improving Rail Sector Performance, World Bank Group, Washington DC, 2017

Presentations from GCC-EU Rail Seminar: Riyadh, 2016

- Trans-European Transport Network and Connecting Europe Facility, European Commission, Riyadh, 2016
- Rail Freight Corridors and international cooperation, Obst, European Commission, Riyadh, 2016
- A Harmonized Approach for International Rail Transport and ERTMS, European Railway Agency, Doppelbauer, Riyadh, 2016
- Management of a shared railway system, European Railway Agency, Doppelbauer and Lockett, Riyadh, 2016
- UNIFE's technical contribution to the cooperation between the EU and GCC, Citroën, Riyadh, 2016
- UNIFE's technical contribution to the cooperation between the EU and GCC, GCC Workshop, Fischle, Riyadh, 2016

Rail Safety

The ONRSR Way: Regulating Rail Safety Across Australia, Office of the National Rail Safety Regulator, Adelaide, 2018

Rail Safety National Law (South Australia) Act 2012, South Australia, 2012

National Railway Safety Regulator Act, No. 16 of 2002 (as amended), RSR, Pretoria, 2009

Financing, TODs and PPPs

Railway Reform: Toolkit for Improving Rail Sector Performance, World Bank Group, Washington DC, 2017

Railway Reform: Toolkit - Financial Model (xls file v1.1), World Bank Group, Washington DC, 2017

Transforming the urban space through transit-oriented development: the 3V approach, Salat and Olivier, World Bank Group, Washington DC, 2017

Financing Transit-Oriented Development with Land Values Adapting Land Value Capture in Developing Countries, Suzuki, Murakami, Hong and Tamayose, World Bank Group, Washington DC, 2015

High-Speed Railways in China: A Look at Construction Costs, World Bank Office, Beijing, 2014

Private Sector Participation in Light Rail-Light Metro Transit Initiatives, Mandri-Perrott and Menzies, World Bank Group, Washington DC, 2010

Financing Mass Transit Projects: São Paulo Metro Line 4 PPP: Lessons Learned, Rebelo, Mumbai, 2010

The Economies of Rail Gauge in the East African Community, World Bank, 2013

Logistics

The Rail Freight Challenge for Emerging Economies: How to Regain Modal Share, Aritua, The World Bank, 2019

Logistics Development Strategies and Performance Measurement, Roundtable Report 158, OECD - International Transport Forum, Paris, 2016

Rail-Road Integration for Freight Transportation along Djibouti Corridor, Kebede, MSc Thesis, Addis Ababa University, 2015

DIOMIS Benchmarking Intermodal Rail Transport in the United States and Europe, IC, Paris, 2009

Rail Freight Technology for Competitive Advantage, Blaze, Presentation to World Bank Group, Washington DC, 2006

Rail Access Charges

Rail Infrastructure Tariffs - Enabling Private Sector Development in Mongolia's Railway Sector, Asian Development Bank, Manila, 2014

Undertaking feasibility studies of railway projects and railway traffic costing, Hodgkinson, Colombo, 2015

Operating and Maintenance Cost Methodology Report, Durham-Orange LRT Project, Durham NC, 2012

Rail Infrastructure Pricing: Principles and Practice - Report 109, Australian Government Bureau of Transport and Regional Economics, Canberra, 2003

Rail Costing, Marketing and Sales

Point-to-Point Railway Traffic Costing Model - United Nations ESCAP

ESCAP: Guidelines for Development of Railway Marketing Systems and Procedures

Rail Concessions in Africa

Railway Concession in Africa: Lessons Learnt, Joan Miquel Vilardell, Advanced Logistics Group, SAU, AfDB, 2015

Africa Railway Concessions: Lessons Learned and Potential Solutions for a Revival of the Sector, di Borgo, The World Bank, 2011

Report No. 36491 Sub-Saharan Africa Review of Selected Railway Concessions, The World Bank, 2006