

**SA-TIED**

Southern Africa – Towards Inclusive Economic Development

REPORT

# Development of a private sector participation framework for rail services in South Africa

Antony Boting

November 2021



**Abstract:** The South African Government has identified private sector participation as vital for reviving rail. This is reflected in policy. A review of private sector participation in rail and other industries in Africa indicates that friendly policy is insufficient to attract the private sector. Detail around potential opportunities, a transparent procurement process, capacity within government to engage with the private sector and the establishment of an economic regulator are seen as the necessary next steps.

This report develops a strategy for encouraging private sector participation in rail, based on a ten-step framework building on the lessons learnt from the literature review, interviews, and financial and economic considerations. It identifies the areas of rail where the private sector could participate and prioritises them from the perspective of each participant based on their motivations for (or against) participation. Mechanisms and their implementation are tailored for these prioritised areas and conditions identified for successful implementation. Criteria to identify potentially successful projects are listed and access principles are considered throughout.

**Key words:** private sector participation, rail, strategy, prioritised opportunities, mechanisms

**Acknowledgements:** The author thanks the following persons: Mahesh Fakir of the National Treasury; Jan-David de Villiers and Ms Mathoto Mohale of the Department of Transport; William Dachs of the Gautrain Management Agency; Mesela Nhlapo and Mr James Holley of the African Rail Industry Association; Thandi Hillie, Ms Anele Khunou and Ms Asanda Tshishonga of Sbhekuza Rail; Craig Peters of Arriva Rail; Tshepo Makelane of Imperial Logistics.

## About the project

### Southern Africa –Towards Inclusive Economic Development (SA-TIED)

SA-TIED is a unique collaboration between local and international research institutes and the government of South Africa. Its primary goal is to improve the interface between research and policy by producing cutting-edge research for inclusive growth and economic transformation in the southern African region. It is hoped that the SA-TIED programme will lead to greater institutional and individual capacities, improve database management and data analysis, and provide research outputs that assist in the formulation of evidence-based economic policy.

The collaboration is between the United Nations University World Institute for Development Economics Research (UNU-WIDER), the National Treasury of South Africa, the International Food Policy Research Institute (IFPRI), the Department of Monitoring, Planning, and Evaluation, the Department of Trade and Industry, South African Revenue Services, Trade and Industrial Policy Strategies, and other universities and institutes. It is funded by the National Treasury of South Africa, the Department of Trade and Industry of South Africa, the Delegation of the European Union to South Africa, IFPRI, and UNU-WIDER through the Institute's contributions from Finland, Sweden, and the United Kingdom to its research programme.

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REPORT

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## **Executive summary**

This research report sets out to develop a strategy to encourage private sector participation in rail. It does this by examining the current policy environment and lessons from other private sector participation processes, both in rail and other industries in South Africa and on the continent. A set of guiding principles is established on which to build the strategy framework.

## **Policy environment and other private sector participation processes**

The white paper on rail recognizes the contribution that the private sector could bring to the industry. Three important principles that permeate throughout the white paper are that government would need to fund the rail infrastructure, third parties would need access to the core network, and the private sector would need to pay for rolling stock. The white paper on rail and the draft private sector participation framework both present a policy-friendly environment in which the private sector could participate.

The South African renewable energy procurement process has achieved worldwide recognition for its success in partnering with and procuring power from the private sector. However, it had its challenges and initially there was no private sector interest. A review of the renewable energy procurement process indicates that while friendly policy and broad targets are an important first step, a clear procurement framework is necessary to foster private sector interest. This framework would need to provide detail on opportunities and where in rail this could occur. This should be followed by the establishment of a dedicated government entity overseeing the process with capacity to engage all role players, and mechanisms for the fair allocation of risk amongst all participants. The review also indicated the important role that the energy regulator played in engaging the private sector and fuelling their interest.

There were mixed results for rail concessions in Africa, with both successes and failures. Some of the more pertinent reasons for failure were that governments prioritized road over rail, the existing rail infrastructure did not support commercial exploitation, force majeure events damaged lines and were not repaired, over optimistic traffic forecasts led to lower revenue and under-investment in rail infrastructure maintenance, and the burdening of the concessionaire with public service obligations.

## **Guiding principles and strategy framework**

A series of guiding principles, developed from the local and international examples and interviews with private sector role players, are established on which to base a strategy. These are:

1. Private concessions are seen as the way forward for rail in Africa.
2. Friendly policy is insufficient to attract the private industry. A clear procurement framework with detail on opportunities must be provided.
3. Align the goals of the participants and ensure collective responsibility. Alignment of objectives would ensure a greater chance of partnership success and also allow collective solutions to challenges facing the rail industry in South Africa.
4. Only concentrate on those areas where rail has a distinct advantage.
5. Conduct economic and financial assessments on all potential participation areas. These assessments must be extended to compare delivery by the private sector to that of the state to

ensure that a more efficient solution is achieved. Private sector involvement needs to add value to the country.

6. Separate infrastructure management contracts from rail services.
7. An economic regulator for rail must be established. The benefits of a regulator would outweigh its costs.

The strategy consists of a framework with ten steps. The starting point is to identify the potential participants and to establish their motivation for and against private sector participation. The next steps are to identify the areas of potential participation and to understand the economic and financial considerations for each. The participation areas then need to be prioritized for each participant. Criteria for prioritization are based on the motivation for and against participation and the identified economic and financial considerations. The prioritized areas for each participant are compared to determine alignment and to identify which are taken forward.

The strategy now separates into two separate streams. The first determines suitable mechanisms for the prioritized areas, how to implement them and the conditions needed for successful implementation. The second stream establishes a set of criteria for identifying and prioritising successful projects within each participation area. It also broadly considers access principles for encouraging private sector participation. Although this last step is listed separately, many of the access principles are cross-cutting and embedded within the earlier steps of the strategy.

One of the conditions for successful implementation is the continual monitoring and evaluation of the process. This results in revising and fine-tuning the strategy.

### **Prioritised areas**

A multi-criteria identification matrix is established against which all areas for potential private sector participation are scored for each participant. Seven areas are identified where all three participants would be willing for private sector participation. These are terminal operations, terminal-to-terminal freight services (such as from a grain silo on a branch line to a port terminal on the core network), private freight lines (such as a mine would develop from pit to port), private sidings, upgrading municipal rail infrastructure, concessions to upgrade and maintain rail infrastructure and the provision (and leasing) of rolling stock.

A further four areas are identified as threshold options for private sector participation. These four areas are prioritized by two of the three participants and are neutral for the third. These are main line freight services, branch line freight concessions, rapid rail intercity services and marshalling yards. They are termed 'At Threshold' and would require investigation as to why the third participant does not prioritise this area but should be included for private sector participation.

Commuter services are prioritized by the government and TFR/PRASA but not by the private sector. Their main concerns are the sustainability of subsidies, risk exposure and asset vandalism. Commuter services would be more attractive to the private sector by guaranteeing subsidies, spreading risk by choice of contract and removing infrastructure maintenance from the train service concession, and protecting assets from vandalism. It is understood that the Department of Transport is allocating substantial funds to improve security on commuter trains and at train stations, which would address vandalism. It is recommended that this area be moved into the 'At Threshold' category and these issues be given further investigation.

There are some areas not prioritized for private sector participation. These are passenger services on the main line, terminal-to-terminal, on branch lines and private lines. Stand-alone station operations are also not prioritized. While these five areas are not prioritized for private sector participation, it does not mean they are not important areas or should be ignored. They are currently not suited for private sector operation but should be reassessed periodically.

Most of the areas prioritised by all three participants do not require the separation of TFR into the Infrastructure Manager and the Train Operator, which means that private sector participation could commence without delay.

The multi-criteria identification matrix developed for area prioritization is versatile and can be continually updated because of changes to the economy, policy or operating environment.

### **Mechanisms and successful implementation**

Several contractual mechanisms and their implementation are investigated. The most prominent mechanism implementation is to separate rail infrastructure upgrade and maintenance into a separate concession contract from private train operators. Train operators are transport companies and should be allowed to concentrate on operations, leaving rail infrastructure upgrades and maintenance to civil engineering specialists. An availability-based contract would see the infrastructure concessionaire remunerated for providing rail infrastructure at a predetermined level of service, for use by the TFR train operator or PRASA and other private sector operators. This contract allows for a fair distribution of risk, with the infrastructure concessionaire bearing the risk of the performance of the infrastructure, the TFR infrastructure manager the traffic risk and the train operators the commercial risk. Government could provide grants or even equity if a special purpose vehicle is established for the project.

Alternative non-financial guarantees by government include prioritising rail usage, a fixed cost guarantee for out-dated assets, force majeure risk cover, access to the core network through the allocation of time slots, tax relief and the provision of security to protect both passengers and rail assets from vandalism.

Along with guarantees to address security, a reduction of risk would improve the attractiveness of commuter services to the private sector. This could be done either through a vertically segregated model (where PRASA retains network management and operates some commuter services and the private sector operating others) or a devolved model where the metropolitan municipalities take over network management and concession out commuter services to the private sector as well as PRASA. In both these models concessioning out the rail infrastructure maintenance and leasing the rolling stock to additional participants would reduce the risk to the private sector. An availability-based contract for the commuter services would see the further reduction of risk, with the government bearing the demand side risk and allowing the private sector concessionaires to concentrate on train services, rolling stock and rail infrastructure.

Several conditions for the successful implementation of the rail mechanisms are identified and grouped into the correct policy environment and correct contractual environment, developing contractual clarity, fostering co-operation between the participants, continually engaging the private sector when setting up the participation process and monitoring and evaluation.

Three key issues emerged. First is the importance of the economic regulator, to ensure transparent and fair practice. Second is the establishment of a dedicated government entity to oversee private sector participation. A procurement office should be housed within this entity. The third issue is to

promote competitive bidding. This should not only be done at the tender stage but can also be extended to paying for time slots on the core network. Bidding for time slots for different times of day, days of the week, length of train and volume of freight could allow the private sector to optimize operations. While this would also indicate how much the market is willing to bear for time slots, TFR would first need to determine a reserve price that would cover at least their marginal costs. This would also allow for multiple operators, as long as their bids exceed the reserve price, but with preference given to the most competitive bids for their preferred times. It is recommended that the practicality of this possible bidding mechanism be explored further.

Additional conditions for successful implementation are the identification and publishing of detail for private sector involvement, the clear division of risk between participants and termination clauses and their triggers.

### **Criteria to identify and prioritize individual opportunities**

The only means of determining the financial and economic viability of opportunities within any of the participation areas is to undertake a detailed financial and economic assessment. However, some indicators could be used as a filter through which to screen potential opportunities.

Rail's competitive advantage over road transport is volume and distance. The higher the volume and the longer the distance the better for rail but terminal density, rail characteristics and product uniformity also affect this consideration. The rough rule-of-thumb for freight volume and distance in South Africa is 10–12 million ton-km/route km. Rail transport for exporting mining commodities and domestic use is well served, although there are some opportunities for domestic commodities. Opportunities exist in transporting intermediate manufactured goods and palletized freight.

Rapid rail intercity services should serve conurbations with about six million inhabitants between two and four hours apart.

For commuters, rail is attractive for a larger population and less developed or more congested alternative transport modes. The efficiency of the feeder and distribution services and the opportunities at stations, such as shopping and banking, are all additional considerations.

### **Recommendations**

The following recommendations are made based on this strategy:

1. Establish a government entity with the capacity and skills to engage with the private sector to oversee the process. Included within this entity should be a rail procurement office.
2. Focus on seven participation areas prioritized by all three participants and the five threshold areas. Investigate options for increasing the attractiveness of the five threshold areas. The identified areas that should not be prioritized for private sector participation are passenger services on main, branch and private lines (but excluding commuter services) and stand-alone station operations.
3. Subject each opportunity to an economic and financial analysis to determine feasibility as well as whether best delivered by the state or the private sector.
4. Periodically refine the weighting and scoring in the multi-criteria identification matrix used to prioritize participation areas. This would reflect changes in the economy and the policy and operating environments.



5. Determine potential opportunities in the prioritized areas, share with the private sector and TFR/PRASA and invite feedback. This will be an indicator of appetite by participation area and can also be used to continually refine contractual issues and processes.
6. Separate the rail infrastructure upgrades and maintenance contract from rail services. This will spread risk and ensure that the correct firms focus on the necessary areas. This separation is appropriate for both freight and commuter services.
7. Develop a transparent tender process. The tendering process should make use of standard forms and contracts applicable for the industry. The tenders should be tailored to the complexity of the opportunity being advertised.
8. Develop contracts on international best practice. Allocate risk to the appropriate participant, ensure that these are stipulated in the contract and that all role players are aware of the allocation.
9. Investigate whether competitive bidding for train slots on the core network is a practical solution.
10. Policy consistency is important. If, as per the white papers, rail should be the backbone of land-based transport then ensure that rail is prioritized over other transport. Ensure that this is understood and enacted throughout all tiers of government and TFR/PRASA.
11. Establish the transport economic regulator with capability to oversee rail.

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## Abbreviations

ARIA	African Rail Industry Association
BAFO	Best and Final Offer
BCR	Benefit cost ratio
BLOM	Branch Line Operations and Maintenance
BOT	Build Operate Transfer
CBA	Cost-benefit analysis
DME	Department of Minerals and Energy
DoT	Department of Transport
GHG	Greenhouse gas
IDZ	Industrial Development Zone
IPP	Independent Power Producer
NERSA	National Energy Regulator of South Africa
NPV	Net present value
O&M	Operate and Maintain
PPP	Public Private Partnership
PRASA	Passenger Rail Agency of South Africa
PSP	Private Sector Participation
PV	Present value
RE	Renewable energy
REFTT	Renewable Energy Feed-in Tariff
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SEZ	Special economic zone
SIP	Strategic Infrastructure Project
SOC	State-owned company
SPV	Special purpose vehicle
STER	Single Transport Economic Regulator
T2T	Terminal-to-terminal
TNPA	Transnet National Ports Authority
TFR	Transnet Freight Rail
TU	Transport Units
UGT	Urban Guided Transit
WP	White Paper

## 1 Introduction

Rail in South Africa was historically an efficient form of transport. It is now at a crossroads, with some freight services still world class but many other services in decline. It is unable to compete with road-based transport on corridors that are naturally suited to rail. Many passenger services are dysfunctional. Rail requires significant investment to reposition it as the backbone of South Africa's transport industry, for both freight and passengers. This is investment that the South African Government would like to leverage off the private sector.

With this background in mind, the aim of this research paper is to develop a strategy to encourage private sector participation in rail. This strategy is developed from a framework that identifies where the private sector could participate, how it could participate, why it would participate and the requirements to ensure successful participation.

There are six further parts to this paper. The first is a situational analysis describing the current policy environment for private sector participation. The second section reviews private sector participation both locally and abroad, in rail and other industries, and discusses how these lessons could be applied to rail in South Africa. The third section then establishes a set of principles on which the private sector participation strategy is based. The fourth section is the heart of the research paper and sets out the strategy and framework for private sector participation. It discusses each component of the strategy in detail. The fifth section is a conclusion and is followed by recommendations.

## 2 Situational analysis

Rail in South Africa has been in decline since the mid-1980s and has lost freight and passenger market share to road-based transport. Transnet concentrates on high-volume commodity lines. PRASA is now transporting less than a quarter of commuters compared to eleven years previously (PRASA 2020: 14), with only 62% of its Metrorail trains and a measly 9% of its main line passenger services on time.

It is against this backdrop that the South African Government intends to revitalize rail and recognizes the pivotal role of the private sector. The Department of Transport (DoT) has published draft white papers on transport and rail as well as a draft private sector participation framework. This chapter assesses the policy environment for private sector participation described in these draft documents.

### 2.1 Draft white papers on transport and rail

The draft white paper on transport positions rail as the preferred land transport mode and backbone with which all other transport modes integrate (Department of Transport 2017a: 30). This importance is echoed in the draft white paper on national rail policy, where its vision sees rail *as an affordable, competitive, effective, integrated, reliable, safe, sustainable and valued transport mode that provides the backbone of South Africa's freight logistics and passenger mobility systems and strengthens its economic growth and social development by 2050* (Department of Transport 2017b: 28).

This is also the first of seven policy goals stated in the white paper on rail. The policy goals acknowledge private sector participation by stressing the importance of allowing access to the country's long distance rail network for qualified operators.

The rail white paper continues by expanding the policy goals into fourteen objectives, half of which directly address private sector participation in rail. These relevant objectives indicate the need for Government and TFR to leverage private sector funding so that rail can aggressively exploit its

competitive advantages; to attract, encourage, and regulate private sector participation in investment, operations and maintenance; and to allow concessionaires and lessees long-term participation in the sector to sufficiently amortize their investments (Department of Transport 2017b: 29-30).

Policy principles are presented in the white paper on rail, some of which are important to guiding private sector participation (Department of Transport 2017b: 31). These include applying the user pays principle as far as possible, except in circumstances where government funds rail services as an instrument of economic and social policy. Government would retain ownership of all state-owned railway network and rights-of-way but would allow access to private sector operators. This is necessary to increase rail's operational efficiency and performance and to maximize its utilization. Another key principle that is echoed throughout is that government would confine its funding to rail infrastructure only and that it expects train operators to fund their own rolling stock.

It is clear from these goals, objectives and guiding principles that the South African Government clearly intends to transform the rail sector into a competitive transport mode and with private sector participation as fundamental to this process. It is fundamental not only in the expertise and business acumen that the private sector can bring to improve efficiency in rail but that it would also be leveraged as a funding source. These objectives and guiding principles indicate that a private sector friendly policy environment is being established.

In developing the policy statements of the draft white paper on rail policy, government recognizes the necessity of third-party access to rail infrastructure. This is a departure from the previous paradigm of exclusive access by the state-owned companies (Department of Transport 2017b: 51). This would allow qualified private sector operators to access the core network and operate private services that would introduce regulated competition. Government, through Transnet, has also identified strategic branch lines that could be concessioned off to the private sector.

In summary, the white paper on rail recognizes the contribution that the private sector could bring to the industry. In doing this, government realizes that it needs to commit funding to the rail infrastructure, allow third party access to the core network but that the private sector would need to pay for its own rolling stock.

## **2.2 Draft private sector participation framework**

A draft Private Sector Participation Framework has been developed by the Department of Transport that sets out eighteen principles. The eighteen principles are categorized into four groups, of which the first group relating to whether the public or private sector should provide for infrastructure services is the most pertinent. This category contains three of the principles (Department of Transport n.d.: 36-38):

1. A cost benefit analysis should inform the decision on whether the public or private sector should provide infrastructure services. In other words, would it be more beneficial to South Africa to involve the private sector in a project, which would need to include some level of financial compensation for its service, or to maintain the status quo of state operations.
2. All infrastructure projects, irrespective of the degree of private involvement, should be assessed by the extent to which costs can be recovered from end-users. This principle is repeated from the white paper on rail and is particularly relevant for passenger transport. Additional sources of finance should be identified in the case of shortfalls.
3. The allocation of risk between private parties and the public sector will be largely determined by the chosen model of private sector involvement, including the allocation of responsibilities.

The remaining fifteen principles in the draft framework are grouped into the goals, strategies and capacities of stakeholders; making the partnership work; and sound business practices and ethics. While these latter principles are no less important, they are not instrumental in deciding where in rail the private sector could be involved. Rather, they focus on ensuring the success of the partnership once projects have been identified. These principles do indicate that the success of the partnership be evaluated on performance specifications and emphasize that a clear division of responsibilities and risk be made. It will be discussed later in this paper how this latter principle has been lacking in concession contracts issued to the market.

The white paper on rail and the draft private sector participation (PSP) framework are part of the necessary first step in describing a policy-friendly environment in which the private sector could participate. The next step would require further detail on the types of opportunities and how these could be implemented. This is part of the strategy development of this paper.

### **3 Local and international experiences**

There are many examples of private sector participation in rail and other infrastructure sectors in South Africa and elsewhere. The factors behind the success of the South African Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) and the performance of rail concessions in Africa could yield important lessons for rail in South Africa.

#### **3.1 South African renewable energy procurement process**

The South African REIPPPP has achieved worldwide recognition for its success in partnering with and procuring power from the private sector. The programme is so successful that successive bid windows have resulted in lower renewable energy (RE) tariffs being offered by the private sector, to the extent that these tariffs are now lower than the average Eskom tariff and those generated by its latest fleet of new coal power plants (Eberhard and Naude n.c.: 55). However, the private sector was not initially interested in the procurement process and several refinements were required. There is merit in understanding these reasons and the resulting action that led to the success of the programme. These lessons can be adapted to rail.

In its white papers on energy policy and renewable energy in the late 1990s and early 2000s, the Department of Minerals and Energy (DME) discussed the importance of RE in the South African energy mix and provided RE production targets. These policy objectives and targets were insufficient to unlock private sector interest. This interest only came about when the first policy tool was published in a NERSA consultation paper on Renewable Energy Feed-in Tariffs (REFIT) towards the end of the 2000s. The publishing of these policy tools is considered the tipping point in generating private sector interest (Pickering, cited in Eberhard and Naude n.d.: 58). These policy tools were proposed tariffs and procurement quantities for different RE technologies, which served as guidelines on which the private sector could base business cases. The understanding is that the private sector was asked to commit substantial investment and resources and therefore needed to be sure that the risk of these commitments was mitigated by sound government buy-in, with certainty around procurement targets and tariffs and therefore potential revenue. The procurement quantities could then only be refined by the Minister, in consultation with the National Energy Regulator of South Africa (NERSA) (Sithole et al. 2018: 7).

While the publication of the policy tools and subsequent public consultation process was considered the tipping point for generating private sector interest, the actual procurement process remained unsuccessful until the requests for proposal included the necessary contracts specific to large

investments. These contracts were specified at the same time that the REFIT process was abandoned (it was considered uncompetitive and contrary to the country's public finance procurement regulations) and the shift made to RE competitive tenders (Eberhard and Naude: 58, 59, 70). A World Bank report on the procurement programme indicates that the competitive tender process allowed for multiple winners, a process which proved to be an important incentive for private sector involvement and that helped reduce tariffs in subsequent rounds of tendering. The report concludes that private sector project developers need a clear procurement framework within which to invest, one that is well designed and transparent, offers reasonable levels of profitability and where key risks are mitigated by government (Eberhard et al. 2014: 2, 3). It also stresses the need for capacity building and key champions to interact effectively with the various role players. These are all important lessons for rail.

The conclusion is that while friendly policy and broad targets are an important first step in securing private sector involvement, a clear procurement framework is necessary for private sector interest. This framework would need to provide detail on the number of opportunities and the areas of rail for participation. This should be followed by the establishment of a dedicated government entity overseeing the process, with capacity to engage all role players, and mechanisms for the fair allocation of risk amongst all participants.

An unheralded factor in the success of the REIPPPP is the role of NERSA, the regulator. Had it not been for the publication of the REFIT by NERSA and the subsequent public consultation process, it is unlikely that private sector interest would have developed as quickly or to the extent it did. This role is likely to become even more important with the proposed unbundling of Eskom. This underscores the importance of establishing the Single Transport Economic Regulator (STER) for rail.

### **3.2 Lessons from concessions in Africa**

Several private sector rail concessions have been awarded in Africa and more than 70% of rail transport activities outside of South Africa are managed by private operators (Department of Transport n.d.: 31).

A review of rail performance in Africa indicates that concessions had mixed results but that when they were successful, they stopped the decline of freight transport on the continent. This was achieved by arresting accelerated declines in freight volumes, reducing the dependency on public financing, maintaining the infrastructure and improving the financial performance of the concessionaires. They also increased labour productivity (Olievschi 2013: 18, 19).

However, private concessions have not been without their challenges. Some of the more common on the continent are that:

- Governments prioritized road infrastructure while neglecting railways, despite awarding rail concession contracts. This points to policy inconsistency.
- Existing rail infrastructure is not adequate to support commercial exploitation and would require extensive upgrades and investment.
- Inefficient and ageing rolling stock.
- Human resources were not renewed, leading to a depletion of the skills base.
- Political conflicts and natural disasters damaged existing lines.

The review of the rail sector performance in sub-Saharan Africa (SSA) has overoptimistic estimates of freight volumes as its prime challenge facing private sector concessions. The rail sector itself was to blame for poor growth in freight because of inadequate services such as insufficient rolling stock and poor maintenance of the rail infrastructure, which in turn led to reduced speeds and derailment and a further reduction in service. This directly affected revenues to the concessionaires and the resultant inability to pay concession fees and anticipated taxes. However, it also resulted in undercapitalization. Business plans did not materialize as expected and concessionaires ended up constraining their expenditure to that which was absolutely necessary for operational survival (Olievschi 2013: 23-26).

Additional reasons cited for failed contracts were the underestimation of required investment, operators being burdened with public service obligations and the blurring of responsibilities regarding infrastructure maintenance and upgrades. One of the important lessons learnt is that a private concession contract does not mean that the private sector operates the service on behalf of government, and it should not be used to subsidize other, loss-making services. Rather, it should be allowed to operate the service as a profit-making venture but would need to pay the state a pre-agreed concession fee.

The termination clauses and valuation of assets at the end of the contract need to be carefully defined. Perennial deferment of maintenance, so the concessionaire can at least cover operating expenses (Bullock 2009: xv, 12), leaves the rail infrastructure in an unreliable condition after concession.

The African Development Bank Group presents a series of lessons learned from its review of financing policy options for rail infrastructure in Africa (African Development Bank 2015: 106). Two important lessons regarding project identification and selection are that markets generating high volumes should be prioritized and that the whole logistics chain must be considered when assessing projects. This latter lesson is important and any idle time, intermodal exchange and any other delays must be considered in the evaluation process. These additional transit times are often overlooked in the comparison of rail with road and would make road-based transport more attractive for logistics chains.

The report indicates areas most likely to attract private sector investment are railways linking mines to ports because of high volumes and an already identified customer. Intermodal railways linking ports to hinterlands (such as Durban-Gauteng) involve higher commercial risk and might require government support. Private sector participation in passenger services in metropolitan areas are encouraged because of potential operating efficiencies, although they would likely need to be supplemented by public investment (African Development Bank 2015: 107, 108).

The African Development Bank recommends the following approach to further identifying projects:

- Brownfield projects (i.e. existing networks) should be prioritized over greenfield projects or at least assessed to see whether upgrading existing services isn't more efficient than investing in new ones.
- Freight and urban/suburban passengers in major metropolises should be prioritized over medium and long-distance passenger services. Generally, medium- and long-distance passenger services do not have sufficient volumes to be financially viable.
- Freight and passenger operating businesses should be kept separate because of the differences in characteristics and level of engagement by the public sector.

Despite the decline in rail in SSA, private concessions remain the recommended vehicle for operating the industry. The private sector brings efficiencies in handling commercial contracts, but these



contracts must be handled sensibly and in some cases with government support. A partnership between government and the private sector with the appropriate devolution of risk is necessary (Olievschi 2013: 28). Once the concession has been awarded government needs to remain involved and cannot abandon the partnership.

#### **4 Guiding principles**

The review of the white papers on transport and rail, the South African REIPPPP process, lessons from concessions elsewhere in Africa, other international experiences and interviews with role players were used to develop a series of guiding principles for private sector participation in rail. These are:

1. Private concessions are seen as the way forward for rail elsewhere in Africa.

The white papers on transport and rail are clear about rail being the backbone of land-based transport in South Africa and that it should integrate with all other forms of transport. The white papers are also clear about involving the private sector in the revival of rail and a draft private sector participation framework has already been published.

World Bank and the American Development Bank see railway infrastructure as a natural monopoly (as is the case with TFR in South Africa) and therefore a suitable candidate for private sector concessions. It also sees rail services as naturally competitive (Zhang and Chen 2013: 91). This reinforces the decision to introduce private sector participation in both rail infrastructure and train services, whether through concession contracts or open competition.

2. Friendly policy is insufficient to attract the private sector.

While the white papers and the draft private sector participation framework are a necessary first step in the road map to involving the private sector, this needs to be followed by more detail. The branch line strategy of 2016 partially addresses this need for detail, but it is unclear whether the private sector is aware of this strategy or whether they have been extensively consulted in the process.

Detail on private sector involvement should include an indication of potential opportunities in the various areas, the procurement process and risk mitigation options.

3. Establish a government entity to oversee process.

The successes of the renewable energy procurement process indicate that a government office should be established to oversee private sector participation in rail. This office should have capability to engage with the private sector on all aspects of participation, such as finance, technical issues, legalities, environmental issues and socio-economic considerations.

4. Align the goals of the participants and ensure collective responsibility.

The best outcomes for private sector participation are achieved when the goals of all participants are aligned. One of the reasons given for the failure of concessions in Africa is that some governments expected the private sector service to subsidize public services. If the purpose behind a concession is to move freight quickly and efficiently and thus improve the competitiveness of the country then the private sector should not be encumbered with additional, loss-making services.

Collective responsibility and the correct allocation of risk is reinforced as best practice.

The concluding sentiment is that all participants in a private sector partnership should be willing participants, where their objectives or outcomes are aligned and all assume collective responsibility. Not only would this enhance the chances of success but would also encourage collective solutions to the problems facing the rail industry.

5. Concentrate only on those areas where rail has a distinct advantage.

The private sector is driven by commercial principles. It will not venture into business unfriendly areas unless government provides subsidies to improve the financial viability. Even then, the sustainability of government subsidies is viewed with circumspect. With this in mind, branch lines consist of narrow-gauge rail and many are short and do not have dense markets. This technology is becoming increasingly obsolete and expensive to operate, compared to other forms of land-based transport, in a physical environment that does not support commercial viability. Furthermore, many of the branch lines have been out of service. This has resulted in potential rail clients investing in alternative forms of transport. It will be difficult to attract these clients back to rail.

Extending private sector access from branch lines onto the core network would mean the concessionaire can charge long-haul rates. This would improve the financial viability of the branch lines, where currently the concessionaire is only able to charge for short-haul services.

Vandalism has affected all rail operations. Cable theft has meant that signalling has had to revert to manual control in many instances, resulting in lower levels of service. While this is not as critical for freight as it is for passengers, it does impact on delivery times. Delays lead to financial losses but more importantly they reduce reliability.

6. Conduct economic and financial assessments on all potential participation areas and delivery modes.

An economic assessment is a broader, societal assessment and includes economic externalities, such as the reduction in road accidents, travel times and road maintenance, as well as other social and environmental issues. A financial assessment is a narrower, project focussed assessment and determines the financial viability of a project. Both are needed to determine project feasibility and the extent of a financial subsidy, if necessary.

The economic and financial assessments are needed not only to determine project feasibility but also to assess whether delivery by the private sector is better than by the state. This aligns with the principles established in the draft DoT PSP framework and requires the improved efficiencies brought about by the private sector participation to outweigh their increased cost of finance and compensation. Private sector involvement would need to add value to the country.

International experiences suggests that the full logistics chain be included when conducting an economic analysis on competing transport modes. This would need to include all idle time, transfer time, safety and reliability. Furthermore, all economic, social and environmental issues should be quantified, within reason, and included in the analysis.

Two important issues need to be noted from a financial perspective. First, it is important to identify the various categories of risk and to allocate them to the party best equipped to deal with them. Second, revenue from rail services need to cover costs as far as possible, as per the transport white paper.

7. Separate infrastructure management from rail services within concession contracts.

The separation of infrastructure management from rail services would allow specialized firms and operators to focus on their core expertise without being encumbered by non-specialist issues. World Bank Railway Reform Toolkit sees vertical separation into different companies for operations and infrastructure helping to encourage private sector participation (World Bank 2017: 76). The African Development Bank also recommends this approach but warns that monopolistic behaviour could continue in those instances where the network manager and rail operator are retained under the control of a single entity (African Development Bank 2015: 38). The role of the economic regulator therefore becomes more important in these instances. The African Development Bank also warns that multiple operators in a vertically separated structure would lead to increased complexity in network management.

8. Establish an economic regulator for rail.

It is international best practice to establish an economic regulator. Establishing the Single Transport Economic Regulator (STER) in South Africa would send a strong signal that government is serious about involving the private sector and regulating the industry in a fair and transparent manner. This is particularly important in an industry dominated by a natural public monopoly.

From a contractual perspective, the regulator would adjudicate on future disputes. Contracts cannot cover all eventualities and although South Africa does have strong competition law to protect the private sector from a monopolistic player, a transparent and fair adjudicator is paramount for the efficient functioning of the industry. The sentiment amongst private firms is that a regulator is needed for effective long-term private sector participation, but that there is some cover from South Africa's competition law and therefore in the short-term private sector participation should not be delayed while the office of the regulator is being established.

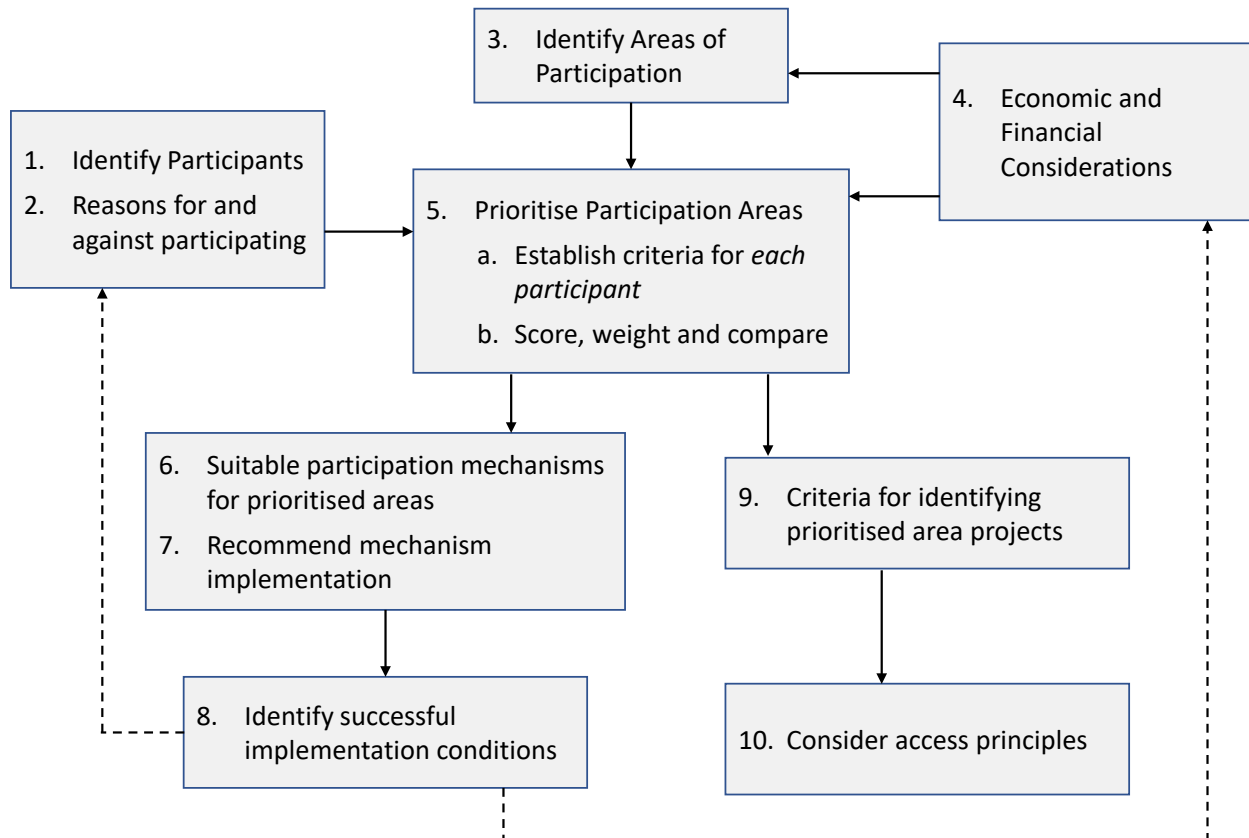
The economic regulator can collate industry data and conduct research. This industry data could then be used to further identify and refine private sector participation opportunities.

It is appreciated that there are costs associated with establishing an economic regulator. However, the benefits outlined above would outweigh these costs and it is the experience that many private concessions have failed in environments where there is no regulator.

## 5 Private sector participation strategy

A private sector participation strategy is based on the situational analysis described earlier, the local and international review of rail and other sectors on the continent and the guiding principles of the preceding section. The strategy consists of a framework comprising ten steps, illustrated in Figure 1:

Figure 1: Strategy framework



Source: author's illustration.

The starting point of the strategy is to identify the potential participants and to establish their motivation for and against private sector participation. The next steps are to identify the areas of potential participation and to understand the economic and financial considerations for each. These are the first four steps of the framework.

The participation areas need to be prioritized for each participant. This is step five, where the participation areas are compared against a set of criteria. These criteria are based on the motivations for and against private sector participation and the economic and financial considerations identified in the earlier steps. This is done for each of the private sector, government and the rail state-owned companies (SOCs). The prioritized areas for each participant are then compared to determine alignment and to identify which are taken forward, considering all perspectives. This is based on the principle that the best outcomes are achieved if all participants are willing and their objectives are aligned.

The strategy now moves into two separate streams. The first determines suitable mechanisms for the prioritized areas and their implementation, as are the necessary conditions for successful

implementation. These are steps six, seven and eight of the strategy. The second stream establishes a set of criteria for identifying and prioritising successful projects within each participation area. It also broadly considers access principles for encouraging private sector participation. Although this last step is listed separately, many of the access principles are cross-cutting and embedded throughout the strategy.

One of the conditions for successful implementation is the continual monitoring and evaluation of the process. This results in the dotted lines leading back to the initial steps, for revising and fine-tuning the strategy.

The rest of this section discusses each step of the strategy framework.

## **5.1 PSP participants**

There are three categories of participants in any PSP partnership in rail. This is government, the rail state-owned companies (SOCs) and the private sector. There are a number of sub-categories within each.

1. Within government there are three tiers, each with their own motivation for advocating private sector participation. National government wants to advance the interests of the country such as developing freight corridors. Provincial governments want to advance the interest of the province. For example, it might benefit provincial employment if transport links to special economic zones (SEZs) or Industrial Development Zones (IDZs) are improved. Local municipalities might want to invest in commuter services.

Regulators are part of government. The rail safety regulator is currently in existence and an economic regulator is being established.

2. The rail SOCs consist of Transnet Freight Rail (TFR) and the Passenger Rail Agency of South Africa (PRASA). TFR is being separated into an infrastructure manager that will look after the management of the rail network and a train operator.
3. There are two categories of private sector participants. The first are rail services clients, such as agricultural organizations, mining companies or manufacturers. The second are firms that provide potential private sector services in rail and would include civil engineering firms (to upgrade and maintain rail networks) and logistics/transport firms. Within this latter category are tourism firms, offering rail journeys.

There are two important aspects for a successful collaboration. The first is that all three main categories of participants buy into the process and support each other. It is also important for each group to understand the motivation of the other parties. While it is unlikely that the motivation for each participant would be the same, it is important that the final outcomes and objectives are aligned. The second important aspect is that of collective responsibility. Each participant needs to bear the risk that it can best handle.

## **5.2 Reasons for participation**

It is necessary to understand the motivation of the various participants when developing a framework. A full understanding of the reasons why role players may or may not participate would assist in achieving alignment.

### 5.2.1 *Government*

It has been demonstrated that public–private partnerships (PPPs) play an important role in bringing private sector competition to natural public monopolies in infrastructure development and service provision (Zhang and Chen 2013: 88, 91). With this in mind, one of the main reasons governments would promote private sector involvement is to harness private sector expertise, the efficiencies they bring to the operating environment and to leverage their ability to raise funding. Their participation, from a government perspective, would need to add value to the country.

The value of rail projects lies in their broader societal effects, or externalities. Their development and efficient operation would reduce road traffic, which leads to reduced congestion and travel times, less road accidents (with their associated costs) and ultimately lower road maintenance and even road development. Other societal benefits are social inclusion, choice of transport mode and reduced greenhouse gas emissions. Including the private sector in advancing rail would help with achieving these benefits and would ultimately reduce government expenditure.

Increased competition on the rail network would reduce transport tariffs. This in turn would reduce the price of goods and improve the competitiveness of the country's exports as well as the local cost of living.

This inclusion does not come without its downsides. There could be onerous guarantees or risk mitigation on the side of the government or failure of the contract could lead to litigation. Government could also be left with the project if the concession fails and the private sector partner walks away. Passenger subsidies could flow through the system and end up being paid as dividends to private shareholders if not carefully monitored or justified. Streamlined operations could result in job losses.

While extending rail services into underserved areas would lead to greater social inclusion, they could also lead to social exclusion because the private sector is only motivated by profit. Substantial subsidies might be required to entice the private sector into poorer areas.

### 5.2.2 *State-owned companies*

TFR and PRASA would benefit from partnering with the private sector and concessioning off aspects of their services to free up their balance sheets for other more strategic purposes. This would also allow them to focus on their core operations. Furthermore, they could earn revenue from concession and access fees from the private operators. If the private sector operators are able to increase operations through more substantial and focussed marketing then the TFR and PRASA rail assets would be used more extensively, with greater income to the SOCs.

According to the branch line strategy, Transnet's aims for private sector participation are to (Department of Transport 2016: 97):

- broaden the available capital base for infrastructure investment,
- deliver value-for-money through an alternate procurement strategy of infrastructure,
- expedite project development through leveraging private sector skills base, and
- mitigate Transnet risk, through transfer to the private sector.

One of the areas highlighted by TFR as requiring participation is the upgrade of private and municipal infrastructure within urban areas. It is felt that this upgrading would unlock bottlenecks in the rail system and increase demand for rail services across the country.

The downside to the two rail SOCs is that there would be more access onto their rail networks, leading to operational complexity and increased costs. Competition from the private sector might also put pressure on tariffs and reduce revenue. There could be job losses within TFR/PRASA if certain services are taken over by the private sector. There is also concern that private sector operators could create their own monopolies.

### *5.2.3 Private sector*

The main reason for private sector interest would be commercial. Their participation could lead to better marketing, expanding services and better customer satisfaction (World Bank 2017: 200). Costs are better controlled under commercial contracts.

Operators could also be interested in vertically integrating their distribution chains by controlling their production and transport activities. In this case the operators would be flexible in accepting a lower rate of return from rail transport as long as the vertical integration (production and transport) provides overall benefit (Olievschi 2013: 18).

However, there are also reasons why the private sector would not want to participate. They are high risk projects because railway contracts are long term and require major upfront capital if networks are to be upgraded and rolling stock procured. Furthermore, freight volumes are subjected to environmental, policy and competitive risk.

- Droughts could reduce agricultural produce.
- Road friendly policies could render rail even more uncompetitive.
- New roads could reduce the road logistics chain costs.
- The (perceived) unsustainability of subsidies.

One of the main reasons the private sector is invited to participate in rail is that government can leverage their balance sheet. However, loans raised through individual firms or for project specific entities would be more expensive than sovereign (government originated) loans.

Branch line concessionaires currently cannot access the core network and have to cede control of their trains to TFR at access points, such as marshalling yards. Part of the reason is that traditionally TFR has not encouraged third party access onto its core network. Another reason is interoperability, with different traction control on the branch and core networks. This loss of train control in turn translates into loss of service control over loading/off-loading and turnaround times at the destination point. This loss of control means the private sector cannot guarantee service levels, which are important in attracting road-based freight to rail.

### *5.2.4 Participation summary*

Table 1 summarizes the reasons for and against participating in a PSP by the various role-players. These reasons will be used to develop criteria against which the participation areas are scored and ranked from the perspective of each participant.

Table 1: Reasons for and against participation in a PSP

Stakeholder	Reasons for	Reasons against
Government	Can leverage off private sector expertise, efficiencies and funding	Onerous guarantees, subsidies or risk
	Rail projects reduce road congestion, accidents and road upgrades/maintenance.	Job losses
	Rail projects have lower greenhouse gas emissions.	Potential litigation
	Economic growth and improved national competitiveness through reduced freight tariffs	Left with project
	Could lead to social inclusion	Could lead to social exclusion
Transnet Freight Rail/PRASA	Focus on core operations	Access on core network
	Free up balance sheet funding	Competition
	Revenue from access and concession fees	Loss of network control and with increased costs
	Unlock bottlenecks in system	Job losses
	Increase freight and passengers	Potential to create private monopolies
Private Sector	Commercial opportunities	Risk
	Vertically integrated distribution chains	Significant up-front investment
	Niche opportunities	Loss of service control
		Finance is more expensive
		Unsustainable subsidies

Source: author's conclusions based on literature review and interviews.

### 5.3 Participation areas

The starting point for identifying those areas of rail where the private sector could participate is to examine the forms presented in the draft PSP framework (Department of Transport n.d.: 17-23) and World Bank Rail Toolkit (World Bank 2017: 201-09). These are:

- Concession contracts and franchises.
- Management contracts, where railway management is outsourced.
- Lease agreements, where the government leases assets for a fee and the private sector takes on the operating risk.
- Outsourcing and contracting, such as cleaning or catering contracts and security.
- Private railways, particularly for mining companies. These railways would serve the interests of the private company but could also provide services to other customers.
- Other forms of private participation:
  - equipment ownership and leasing
  - infrastructure construction and maintenance
  - private train operators.

The terms of reference for this assignment limited private sector participation to the forms highlighted in bold. These are concession contracts; private railways; equipment ownership and leasing; infrastructure construction and maintenance; and private train operators on the national network. While the management contracts; lease agreements; and outsourcing and contracting remain important



considerations, they do not allow the state to leverage off private sector funding and are excluded from this analysis.

The forms of participation highlighted in bold are all areas where the private sector could participate alongside TFR and PRASA and compliment their services. *This strategy does not consider privatising either SOC.* It is important to understand then how the private sector would participate for each of the identified forms.

Concession contracts are typically long-term contracts where the state maintains ownership of the land and below the rail infrastructure. The concessionaire is responsible for rolling stock and operations and potentially rail infrastructure upgrades. This would allow government to take advantage of private firm funding for rail infrastructure and rolling stock and thereby reduce its own burden. This is the format currently envisaged by TFR for its branch lines. It could also apply to commuter lines, stations and marshalling yards.

Some countries permit private railways, often for mining companies to transport their product to port. If these private railway lines are located in remote or underserved areas, they could be used to provide services to communities (World Bank 2017: 206). In Mozambique, the Vale mining company is developing the Moatize–Nacala railway line. It is expected that Vale will offer general cargo and passenger services on this line because it is the sole access route into neighbouring countries and therefore is of high strategic value (Maennling et al. 2014). Private railways could also include rapid rail intercity services.

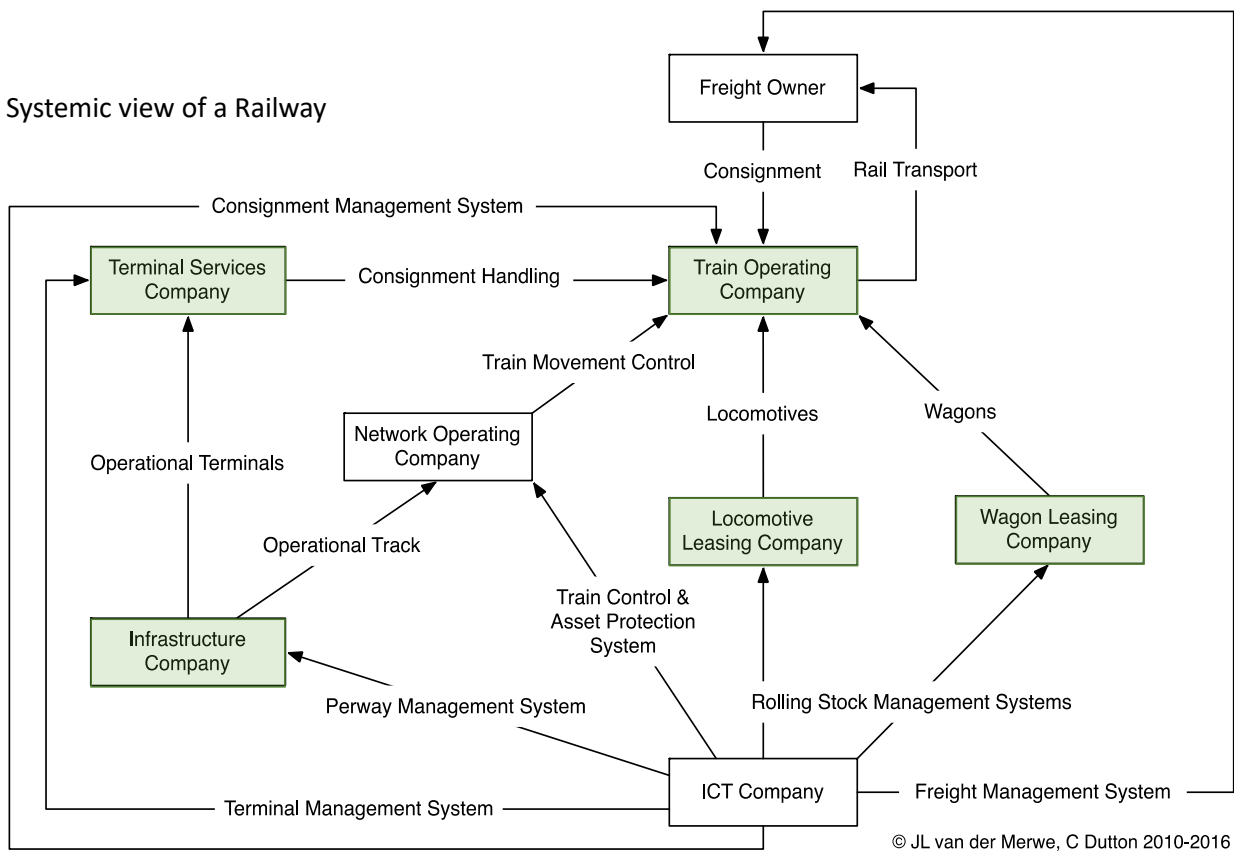
Private operators in Russia own or lease rolling stock while the national railways provide train crews, dispatching and infrastructure services. They are similar to car rental firms and add value through careful equipment management and by targeting specific companies to optimize usage. That has resulted in private investors investing over US\$20bn in railway freight equipment in that country (World Bank 2017: 209). The advantage to the client is that they do not need to be concerned with upfront investment in rolling stock, their subsequent utilization rates and maintenance. Poor quality rolling stock, which in turn has a knock-on effect on availability, has been identified as one of the major challenges for concessions in Africa (Olievschi 2013: 23). Firms specialising in providing rolling stock would address the availability and maintenance challenges. While this participation area includes the provision and leasing of rolling stock it does not consider manufacturing or maintenance contracts.

Private train operators would provide customers with alternative freight rail services to Transnet but would need to access the core network by negotiating for time slots. Private train operators are possible now in South Africa with the separation of TFR into an Infrastructure Manager and a Train Operator (Department of Transport 2017b: 8, 40). Government could specify the type and volumes of goods, such as palletized goods, that could be transported by rail on the core network and allow the private sector to provide solutions to those specified volumes.

There are several private sidings and stations in South Africa. The private sector would upgrade these as part of their supply chain system, if rail transport proves a viable alternative to road transport. These opportunities would not need to be concessioned out and would be upgraded by the private sector as part of their investment in their logistics chain.

A systematic view of the freight rail system in South Africa is presented in Figure 2. The areas for private sector participation are highlighted in the diagram. When identifying these areas, it has been assumed that certain core functions would remain with TFR and PRASA. These are the ownership of the rail infrastructure and the overall network operations and management.

Figure 2: Systemic view of freight railway



Source: van der Merwe and Dutton (2010-2016); figure reproduced with author permission.

The identified areas for private sector participation in rail in South Africa have been grouped into three categories. These are service orientated participation areas, the upgrade and maintenance of assets, and a combination of both. The identified areas are:

Service areas:

- i. Private train operators offering freight and passenger services on the core network, which includes services between distribution centres.
- ii. Point to point or terminal-to-terminal services, which would include aspects of both branch line concessions and main line services. An example would be a journey originating at a grain silo or a mine on a branch line and then transporting the grain or minerals over both the branch line and the core network to one of the country's ports. The downside of this particular aspect is that the journey could encompass several links, accessing a mix of branch and different main lines, which complicates investment in the network for the private sector.
- iii. Terminal operations and specifically at inland terminals, such as City Deep in Gauteng. Terminals in ports are considered as part of Transnet National Ports Authority (TNPA) operations and are excluded from this strategy.

Service areas and the provision and maintenance of assets:

- iv. Strategic branch line concession contracts, for both freight and passengers.
- v. Commuter services within the main metros.

- vi. Private railways, which would include freight (such as pit-to-port) and passenger services as well as rapid rail intercity networks.
- vii. Marshalling yards.
- viii. Stations, outside of branch line or commuter line concessions.
- ix. Private sidings.

The provision and maintenance of assets:

- x. Municipal rail infrastructure and private urban siding upgrades. TFR has identified this as an area of infrastructure neglect and a severe bottleneck that could lead to increased rail usage if addressed.
- xi. Investment in and maintenance of rail infrastructure as a stand-alone concession contract and as per the suggestions of World Bank and the African Development Bank.
- xii. Provision and leasing of rolling stock, like a car rental company.

The last two areas are not stand-alone areas but support aspects of the previous ten. For example, a company could lease rolling stock to a branch line concessionaire, while a separate contract could be established for the upgrade and maintenance of the branch railway infrastructure.

#### **5.4 Economic and financial performance**

Economic and financial feasibility assessments are needed to assess a rail project. A financial feasibility assesses the project in isolation and normally indicates the financial return to the implementing party or funding organization. An economic assessment, on the other hand, is broader and considers the impacts on other sectors of society. Both types of analysis would inform the financial viability of a project and the extent to which it should be subsidized, if necessary.

An economic analysis differs from a financial analysis in that it adjusts for shadow prices and wages and removes potential distortions caused by taxes and subsidies. For example, a contract for a private operator to construct and operate a commuter line might not be financially viable when all capital and operating costs are considered. The State might pay for the capital investments and/or subsidize operating costs. The resultant fare box revenue could be sufficient to render the project financially viable because of the reduced costs the private sector concessionaire faces. However, an economic analysis would need to consider all costs and ignore the subsidies. These are just transfer payments within an economy. The benefits would, however, also be broader because the externalities would now be included.

The African Development Bank describes one of the major strengths of investing in railways as its ability to reduce the overall costs of transport and specifically on road-based transport (African Development Bank, 2015, p. 116). These reduced costs, or externalities, include traffic congestion, road infrastructure investment and maintenance, road-based accidents and greenhouse gas (GHG) emissions. The Bank then goes on to suggest that these issues should not only be included as justification in the economic assessment but that the effects be monetized, where possible, and the resulting income stream be used to finance rail projects.

This section describes the economic and financial approaches to evaluating rail projects. It concludes with a detailed discussion of the important considerations for each participation area.

#### *5.4.1 Economic cost-benefit analysis*

The economic feasibility analysis is done by performing an economic cost benefit analysis (CBA). CBA treats the national economy as an entity in and of itself. It assumes, with some important caveats, that what is demonstrably good for the economy as a whole is a reasonable approximation of what would be good for the majority of the people living and working in the country.

Cost benefit analysis is a means of taking all the direct costs and all the direct benefits of a proposed project over its lifetime and comparing them. It is the conventional method that is used in project appraisal. The outcome of this analysis is the reporting of a net present value (NPV), a benefit cost ratio (BCR) and an internal rate of return (IRR). The economic analysis includes the costs and benefits to society.

If the evaluated benefits of a project are indeed greater than the overall project costs, then the BCR would be greater than one. A BCR greater than one indicates that the completed project would constitute an economic asset; a BCR less than one implies that the project would be an economic liability. The higher the BCR the less risk there is that the proposed investment could turn out to be less than viable economically. Low BCR's, even if greater than one, provide a warning that a project could be risky and may turn out to be an economic liability.

In a cost benefit analysis, one always compares the new project (in this case the development and/or operation of a railway contract by the private sector) to the base case or 'do nothing' case. This base case would need to consider competing transport alternatives, such as road-based transport options and rail operations by the state.

The costs of the project would include the construction costs, land acquisition costs (or loss of productive use of land, an important consideration for new rail projects), operating costs and any mitigation costs. The benefits relate to the potential time savings for users of the rail project, time savings to the rest of the traffic network, reduced road upgrade and maintenance costs, reduced road-based accidents, reduced greenhouse gas emissions, the impact on city densification, land use changes and any potential agglomeration effects. The African Development Bank highlights the importance of considering the full logistics chain when evaluating competing or even complimentary alternatives. The complexities of intermodal changes and delays need to be incorporated into the evaluation process (African Development Bank 2015: 107).

The analysis period usually incorporates all the costs and benefits over a 30-year period and values are discounted to present-day values (PV) using an appropriate social discount rate. Should the contract period be shorter than this time horizon, then residual values for the assets can be calculated based on their remaining life and discounted to present-day values. The PVs of the costs and benefits are then compared to one another by using the NPV, BCR and economic IRR indicators described above.

#### *5.4.2 Financial considerations*

Financing is critical for attracting private sector participants. Rail projects require major upfront capital investment, either in the rail infrastructure, stations and sidings or rolling stock. Sufficient revenue needs to be recouped to cover these upfront capital costs. This might be the case for freight where higher tariffs can be charged and if there are sufficient volumes and distances to justify the investment, but for passengers this often is not the case. In such instances the state would need to step in to assist with the costs, if justified from an economic sense.

There are typically three sources of finance for rail projects. These are (African Development Bank 2015: 84, 85):

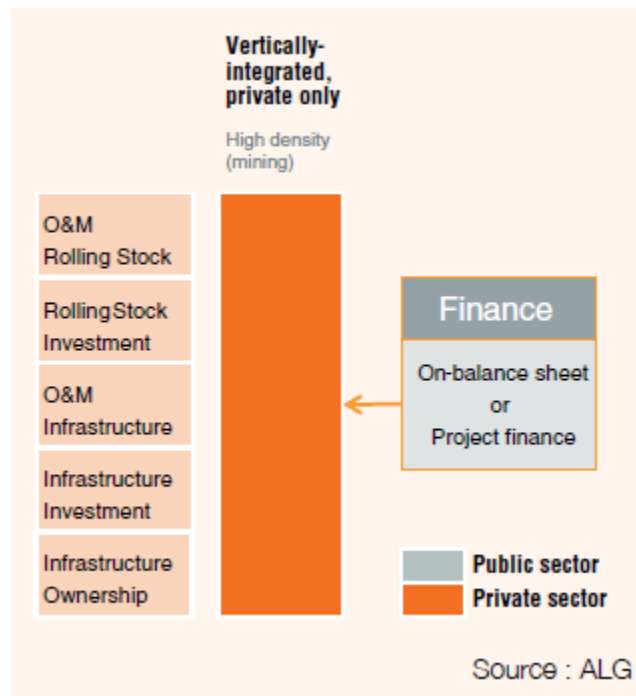
- Sovereign (or state) generated loans. While this is the most common method and a cheaper form of financing railway projects, international financing institutions are unlikely to provide governments with loans covering the full project costs. South Africa is already facing a burgeoning debt crisis, and alternative forms of financing need to be explored.
- Corporate financing, where loans are raised by private firms based on the strength of their balance sheets. This is a risky option and could result in financial harm to the company if the concession contract fails.
- Project specific finance, where a special legal body is established to invest in the rail project, termed a special purpose vehicle (SPV). This option is an off-balance sheet item and therefore has the lowest risk for the private concessionaire but is the most expensive. A potential solution is a blended approach, where the state could provide equity to the SPV to offset some of the risk, while the concessionaire then raises capital for the venture. Additional risk mitigation options, to reduce the cost of capital, would be for the state to guarantee a portion of the forecast revenue or to provide insurance cover. Project finance is an accepted financial mechanism in South Africa and 79 out of 92 REIPPPP projects over four bid windows were funded in this manner (Eberhard and Naude n.d.: 33). In the first two bid windows, when private sector risk would have been at its highest, 45 out of 47 projects were funded through project finance.

World Bank Railway Reform Toolkit indicates that if private sector risk is limited to construction risk through the use of a long-term PPP structure with a long-term operating contract, the private company will expect returns similar to those of utility companies. When government shares the construction cost risks, the project resembles a government guaranteed investment and the private sector assumes lower risk and commensurate lower returns (World Bank 2017: 213). Government guaranteed financing or development bank-structured financing can reduce risk and shift a risky project to a possible project for the private sector.

Olievschi supports the blended financing mechanisms of mixing public and private financing (Olievschi 2013: 44). The advantage is that various tiers of government can be involved in the SPV and provide finance according to their priorities. For example, local government could finance commuter projects or municipal rail infrastructure upgrades, provincial governments could finance branch lines or strategic corridors to SEZs/IDZs and national governments strategic projects of national importance.

The ideal private sector financing situation is shown in Figure 3. Freight volumes are of sufficient magnitude for revenue to cover all capital and operating costs. In this situation, the railway is a privately owned railway, but the same would apply if state-owned, with the only difference being the public sector retaining ownership of the railway infrastructure.

Figure 3: Ideal financing option for high density freight railway



Note: ALG stands for Advanced Logistics Group, which conducted the study under the supervision of the Department of Transport and ITC of the African Development Bank

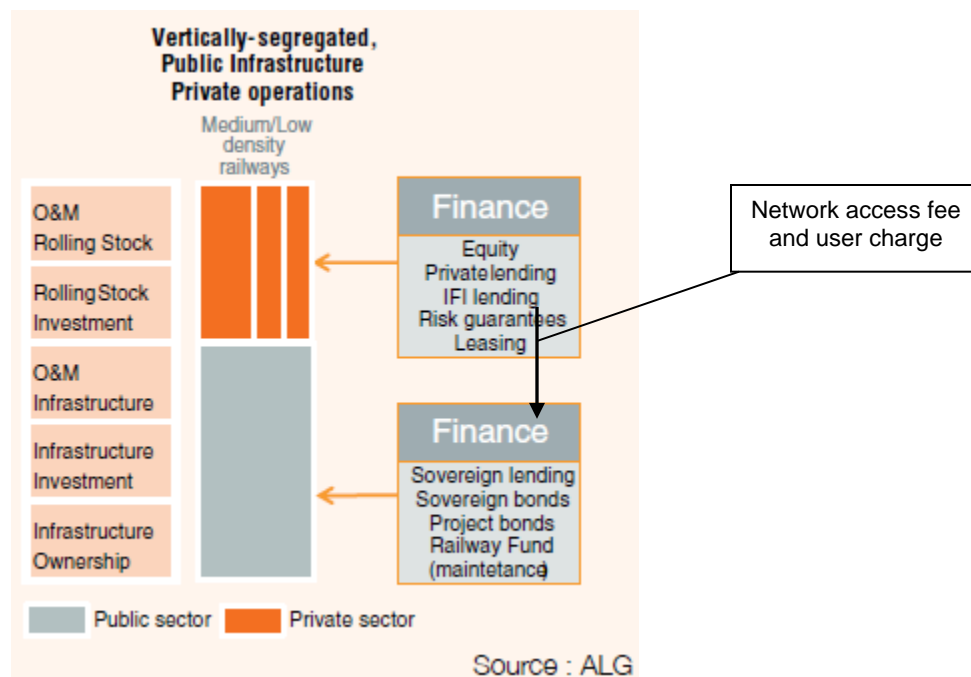
Source: reproduced from African Development Bank (2015: Fig 29).

For lower density railways where volumes are unable to generate sufficient revenue to cover all costs, the state would need to assist with the financing, probably of the railway infrastructure. This situation is illustrated in Figure 4. Here the state finances and retains ownership of the railway infrastructure. The private sector operates a service on the network and only needs to ensure that its revenue covers train operating costs and rolling stock investments. Included in the train operating costs would be network access fees and user charges, which in turn would be used to cover the rail infrastructure and upgrade costs incurred by the state owner of the infrastructure.

The situation for passenger services is more complicated than that shown in Figure 4. In this instance revenue might be insufficient to cover even operations and this would require a public transport operating grant from government. In this context, World Bank advises on long-term commitment from authorities.

The framework for improving rail performance in SSA notes that the state should retain ownership of rail infrastructure, even if operations are economically and financially viable. This is necessitated by the social and environmental value of the lines as well as the long-term nature of rail infrastructure, which often exceeds the length of concession contracts (Olievschi 2013: 42-43). The framework suggests that each concession needs to be assessed individually and that the upgrade and maintenance costs of the rail infrastructure should be shared proportionally by the public and private sector. The framework warns, however, that these costs need to be funded from either of these two sources and should not be neglected.

Figure 4: Financing options for medium-to-low-density freight railways



Source: adapted from African Development Bank (2015: Fig 30).

In summary, the following financing options would apply:

- **Freight or passenger densities are of sufficient magnitude so that revenue covers all costs:** In this instance no subsidies are necessary and the private sector participant could finance, invest, own and operate the full concession. Ownership of the rail infrastructure would revert back to the state at the end of the concession. This is likely to be the situation in high density freight corridors.

An alternative operating model is that a third-party concession be established to develop/upgrade and maintain the rail infrastructure and the operating concessionaire pay an access fee for use of the rail infrastructure. Either way, the state does not need to provide any financial input. This operating model could also be extrapolated to the operations of terminals.
- **Freight or passenger densities are of medium intensity so that revenue covers only rail maintenance and operating costs:** In this instance the state would need to upgrade the rail infrastructure. The concessionaire would be responsible for the operations and either maintain the rail infrastructure or pay an access fee to a third-party concessionaire. This is likely to be the situation on medium density freight corridors and strategic branch lines focussing on freight.
- **Freight or passenger densities are of low intensity so that revenue covers only operating costs:** In this instance the state would need to upgrade and maintain the rail infrastructure. The concessionaire would only be responsible for the operations. This is likely to be the situation in low to medium density freight corridors and branch lines with passengers or low-density freight.
- **Freight or passenger densities are of such low intensity so that revenue does not cover operating costs:** In this instance the state would need to upgrade and maintain the rail

infrastructure and provide an operating subsidy to the concessionaire. This is likely to be the situation for most commuter and passenger lines. This situation would require major economic benefits to justify the subsidies.

Government should implement a careful monitoring and evaluation process where subsidies are paid. The purpose behind public transport operating grants is to compensate the passenger and not the concessionaire (Olievski 2013: 53).

#### *5.4.3 Considerations for project appraisal*

Not all economic and financial considerations are applicable to all participation areas. For example, the economic benefit of reduced parking is only a consideration for commuter services and is not applicable to terminal operations or infrastructure upgrades. The major considerations by participation area are summarised in the matrix in Table 2.

The economic considerations are grouped into direct rail effects and externalities. The direct effects are time savings and changes in transport costs, which are applicable for most participation areas.

There are nine economic externalities:

1. Road upgrade and maintenance costs would be reduced. These are applicable to all the freight services and some passenger services like commuter services.
2. Road accidents would be reduced and are applicable to all freight and passenger services as well as private sidings and municipal rail infrastructure upgrades.
3. Congestion would be reduced but is only really applicable in urban areas. The only two participation areas where this is applicable are commuter passenger services and municipal rail infrastructure upgrades.
4. Rail could obviate the need for parking. This consideration is only applicable when evaluating commuter passenger services and stations.
5. Rail generates less greenhouse gases than road transport and this needs to be considered for all train services (freight and passenger) as well as private sidings, municipal rail infrastructure upgrade and the leasing of rolling stock. The advent of electric vehicles would reduce this benefit and therefore needs to be periodically re-evaluated.
6. Densification only needs to be considered in urban areas, where rail networks can reduce urban sprawl. This issue is only applicable to commuter services.
7. Rail can bring about land use changes, particularly at stations but also in most other areas.
8. Agglomeration effects occur when suppliers and new markets are connected as a result of improved transport connectivity. Rail can connect firms with labour and products with markets. This externality therefore needs to be considered for all areas of train services but not for marshalling yards.
9. The last consideration is how improved rail transport could increase competitiveness. Rail is a specific component in the World Economic Forum's Global Competitiveness Index, where rail density and quality of service contribute to the Infrastructure Index, one of twelve pillars comprising the overall competitive index. A higher competitive index is linked to higher per capita income, which in turn could be linked to economic growth (World Economic Forum



2019: 3, 612). Competitiveness applies to all areas of railway services as well as the upgrade of municipal rail infrastructure.

Involvement by the private sector is based on commercial principles. Revenue must exceed costs. Revenue could come from the fare box, rentals, advertising or subsidies. While all costs and revenues need to be determined for each participation area, some cost and revenue items might only be applicable to certain areas. These are shown in the lower portion of Table 2.

- Participation areas that are likely to be financially viable without subsidies or where only a rail upgrade subsidy is required are likely those linked with freight, rapid rail intercity railways, terminal operations, marshalling yards, stations, private sidings, rail infrastructure upgrade and maintenance and the provision of rolling stock. While private freight and high-speed intercity railways are private operations and should not be subsidized, their externalities might be such that government contributes to their viability.
- Participation areas that would require some form of subsidy would be all passenger services and possibly municipal rail infrastructure upgrades. In addition to the rail infrastructure upgrade and maintenance subsidy, it is likely that passenger rail services would require an operating subsidy.
- Some participation areas might require significant upfront capital costs. This would increase the risk exposure to the private sector.
- The number of opportunities available in each area would be an important consideration. This would allow significant involvement and the opportunity for economies of scale. It is unlikely that any of the passenger services, terminal operations and private railways would offer significant additional opportunities.

Table 2: Economic and financial considerations applicable to participation areas

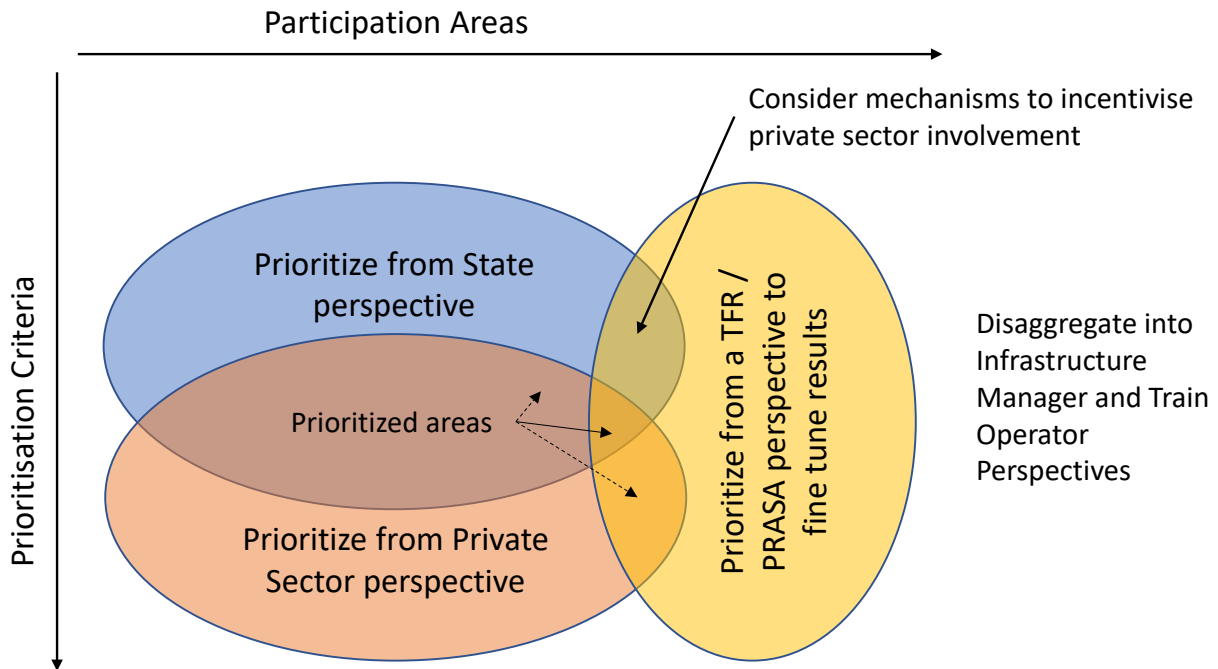
		Service Areas					Service Areas and Asset Provision and Maintenance										Asset Provision / Maintenance			
		Main Lines		Terminal to Terminal		Terminal Operations	Strategic Branch Lines		Commuter	Private railways			Marshalling Yards	Stations	Private Sidings	Municipal Rail Infr.	Rail Infr. Upgrade & Maint.	Leasing Rolling Stock		
		Freight	Pax	Freight	Pax		Freight	Pax	Pax	Freight	Pax	Rapid Rail I/C								
<b>Economic Considerations</b>																				
Rail Effects	Time savings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
	Cost reduction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Externalities	Road upgrade and maintenance	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes				Yes	Yes			
	Road accidents	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes					Yes	Yes		
	Congestion - urban								Yes								Yes	Yes		
	Parking costs								Yes						Yes					
	Greenhouse gas emissions	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes				Yes	Yes		Yes	
	Densification								Yes											
	Land use changes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes			Yes		Yes			
	Agglomeration effects	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes								
Competitiveness	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes					Yes				
<b>Financial Considerations</b>																				
Subsidies	No subsidies required	Yes		Yes		Yes	Yes			Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	
	Rail upgrade subsidy only	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes	
	Rail upgrade and maint. subsidy		Yes		Yes		Yes	Yes	Yes		Yes		Yes	Yes		Yes	Yes	Yes	Yes	
Costs	Significant up-front capital investment			Yes			Yes			Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Opportunities	Significant number of opportunities	Yes		Yes			Yes		Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Source: author's illustration.

## 5.5 Prioritising participation areas

The next step in the strategy is to assess and prioritize the participation areas. This prioritization is needed from the perspectives of government, the private sector and TFR/PRASA and is illustrated in Figure 5. The purpose is to understand participant alignment. It is important for a successful participation strategy that the outcomes of the various participants are aligned so that they are all willing partners. It is also important to note the nuance that these are priority areas for *private sector participation* in rail.

Figure 5: Prioritising private sector participation areas



Source: author's illustration.

A multi-criteria identification matrix has been established and is presented in Appendix A. The participation areas are listed along the horizontal axis and the prioritization criteria for each participant along the vertical axis. Each participation area is scored on a scale of 1 to 5 according to the criteria, which in turn are all weighted, to compute an overall prioritization score for each participant. The areas of highest priority common to all three participants are the areas on which to concentrate. While it might not be possible to perfectly align the motivation of all three stakeholders, ensuring that they have common priority areas would ensure a greater chance of partnership success. This principle has been extended to include those areas common to the private sector and one of the other two participants, as long as the third participant is neutral and not negatively affected. The results for TFR/PRASA are disaggregated into that of their infrastructure manager and train operator to see if any additional areas might be prioritised if viewed from their specific perspectives.

Those areas prioritized from a state perspective but not the private sector would need to be investigated to understand why the private sector does not consider them attractive. Options for improving their attractiveness to the private sector can then be identified.

This approach is versatile and can be updated as conditions change in the economy, the policy or rail operating environments.

#### *5.5.1 Establish prioritization criteria*

A set of criteria has been established for each of government, the private sector and TFR/PRASA. This has been done to determine their priority areas for private sector participation. These criteria are based on the reasons for and against participation and the economic and financial criteria discussed in sections 5.2 and 5.4.

There are three categories of criteria for government, which are the extent to which the participation areas contribute to rail externalities, how much they would contribute to economic growth and the impact on subsidies.

- i. Externalities are sub-divided into economic, social and environmental aspects. Criteria within economic are the extent to which the participation areas would lower road maintenance, reduce road congestion and reduce road accidents. The criteria under social are improving rural growth, social inclusion and limiting job losses. The environmental criterion is the extent to which greenhouse gas emissions would be reduced.
- ii. The contribution to economic growth is subdivided into sectoral growth, the impact on strategic infrastructure projects (SIPs) and the market place. The sectors considered are agriculture, mining, manufacturing, logistics and tourism. There are seven strategic infrastructure projects applicable to rail. Five of them are transport corridors in the geographic SIPs and two in the spatial SIPs that relate to integrated urban space and public transport programme, and agri-logistics and rural infrastructure. Market place issues consist of the number of opportunities offered by each participation area and the ability to induce competition when bidding for concession contracts or offering services.
- iii. There are two sub-categories for subsidies. The first is whether a new subsidy is required and the second is the extent to which current subsidies would be affected. These current subsidies are further disaggregated into the current TNPA/Transnet subsidy, the PRASA subsidy and existing bus subsidies.

There are three categories of criteria for the private sector. These are financial, production-distribution chain aspects and operational/planning aspects.

- i. Financial criteria are disaggregated into revenue and costs and risk. Revenue and costs in turn consists of whether revenue is expected to cover costs, whether the area would require a capital subsidy or an operating subsidy and the extent of capital investment. Risk consists of risk exposure, choice of operator, number of opportunities (or potential for expansion), asset vandalism and outdated technology (such as narrow-gauge railways or old rolling stock).
- ii. The production distribution chain consists of whether full control would reduce overall costs and whether it would reduce delivery delays.
- iii. There are six sub-criteria to consider under operations and planning. These are access to the core network, whether the participation area requires a high level of service, whether the rail network is currently or was recently in use, interoperability (such as compatible traction options or rolling stock), whether the inherent characteristics are efficient and whether there is a direct or looping rail line between origin and destination.

There are two categories for TFR/PRASA. These are operations and financial.

- i. Operations consists of eight considerations. These are the extent to which the participation area allows TFR/PRASA to focus on their core operations; whether the private sector requires access onto the core network; whether participation would lead to loss of control of the network; the extent to which risk exposure is reduced and the potential to remove bottlenecks in the rail system. For example, upgrading municipal infrastructure could result in significant freight volumes moving from road to rail. The final considerations are whether job losses would be limited; the potential for private sector participation to increase freight and passenger growth; and the potential to create a private sector monopoly.
- ii. Financial considerations consist of whether the participation area would free up TFR/PRASA's balance sheet for loans; whether they would generate revenue from concession fees or access fees; and whether competition for their services would be introduced and reduce their revenue.

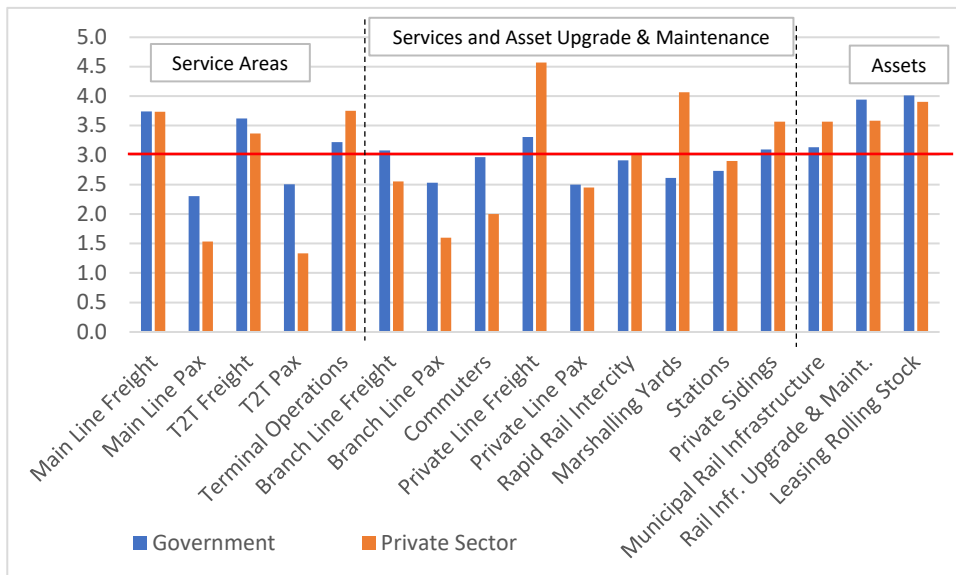
The groupings and sub-groupings and the criteria themselves are all weighted. Each participation area is scored on a scale of 1 to 5 for each prioritization criteria. The scores are multiplied by the weightings to determine an overall score out of five for each of government, the private sector and TFR/PRASA. The TFR/PRASA scores are then disaggregated to into that of the infrastructure manager and transport operator to see if there are additional areas for prioritization.

The scores and weightings of the prioritization exercise are shown in Appendix A.

### 5.5.2 Results and comparison

The results of the prioritization exercise are subjected to a sensitivity test, by varying the weightings of the main groupings. These results are averaged to calculate a blended score for each participant. These results are illustrated in Figure 6 for government and the private sector and for all three participants in Figure 7. A threshold level of 3.0 is shown by a red line in both figures and has been chosen as the mid-point on the scale of 1 to 5 on which each criterion was scored. Scores above the threshold level are good.

Figure 6: Prioritization results for government and private sector



Source: author's illustration based on multi criteria identification matrix.

Figure 6 illustrates that there is generally good alignment in the scores for government (blue columns) and the private sector (orange columns). It is mostly in the passenger services where discrepancies exist, where the government scores outweigh those of the private sector. Conversely, the private sector scores significantly outweigh those of the government for private freight lines and marshalling yards.

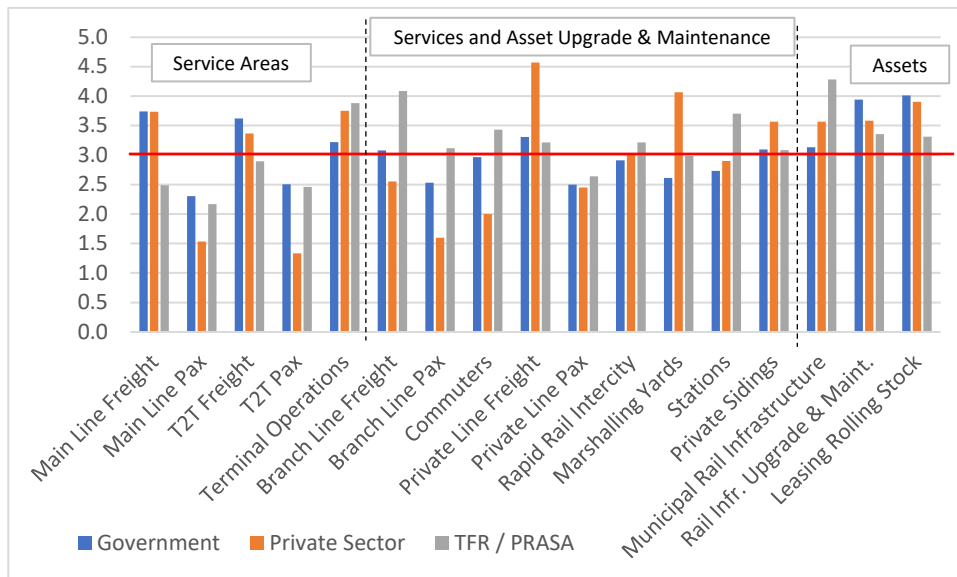
There are eight areas where the scores of the government and the private sector both exceed the threshold level. These are main line freight, terminal-to-terminal freight (T2T in the diagram) and terminal operations in the service areas; private line freight and private sidings in the services and asset upgrade areas; and municipal rail infrastructure, rail infrastructure upgrade and maintenance concessions and the leasing of rolling stock in the asset areas.

In addition, there are another four areas in the services and asset upgrade category where the scores are either close to the threshold level or one of the scores exceeds threshold. These are branch line freight services, commuter services, rapid rail intercity and marshalling yards.

There are some areas which are neither prioritized by government nor by the private sector. These are all the passenger services, whether on branch lines, main lines, terminal-to-terminal (which is a combination of the branch and main lines) and private railway passengers. It is the extent of the subsidies that make these areas unattractive for private sector participation.<sup>2</sup> Stand-alone stations are also unattractive for both participants.

Figure 7 expands on the set of results illustrated in Figure 6 by including the scores for TFR/PRASA. While there was generally good alignment between the government and the private sector there are mixed results with the scores of TFR/PRASA, specifically within service areas and service and asset upgrade areas.

Figure 7: Prioritization results for government, private sector and TFR/PRASA



Source: author's illustration based on multi criteria identification matrix.

<sup>2</sup> Although these areas are not attractive for private sector participation, this does not mean that they are not a government priority or that they are not important services for the country.

There are six areas that TFR/PRASA prioritizes along with the private sector and government. These are terminal operations within services; private freight lines and private sidings within services and asset upgrades; and municipal infrastructure upgrades, rail infrastructure upgrade and maintenance concessions and the leasing of rolling stock within assets. Private sector participation bodes well for these six areas.

Branch line freight could be added to the list, although the private sector is less enthusiastic about this area, as could rapid rail intercity and marshalling yards. Areas that TFR/PRASA would like to prioritize but do not receive support from either the government or the private sector are branch line passengers, commuter lines and stations. None of the participants prioritizes passenger services on the main line, terminal-to-terminal and private railway lines.

Some measures can be adopted to remedy the misalignment between the three role players. For main line and terminal-to-terminal freight it is only TFR that has a score below threshold. The negative aspect for TFR is that it would need to grant access to its core network, which could lead to operational complexities. The resulting competition could also reduce its revenue, although this would be offset by access fees paid by the private operators. Sharing information between all operators could minimize the network operational risk and a financial assessment of the potential access fees compared to TFR's current freight revenue might show improved financial viability.

The private sector and TFR have priority scores above threshold for marshalling yards and only government does not prioritize this area. An assessment of the criteria for which marshalling yards score low show that there is no real detriment to the government if this area is prioritized, it is just that marshalling yards do not necessarily advance their motivation for private sector participation. Government should therefore have no objection if this area is prioritized.

The government and TFR prioritize branch line freight but not the private sector. The private sector scores extremely poorly on risk exposure, that the lines have been out of use and that there are no operational efficiencies. Other areas that score poorly for the private sector are having to use the BLOM, the number of opportunities, outdated technology, access to the core network and interoperability. Some issues could be addressed by separating the operating contract from the rail infrastructure upgrade and maintenance (as suggested by the African Development Bank), not confining the choice of train operator to the BLOM and allowing access to the core network. Access to the core network would mean being able to invoice the client for long-haul rates, which would improve the financial viability of the concession and could render more branch lines financially feasible.

Private sector participation in commuter services is attractive to both PRASA and the government but not the private sector itself. Their main concern is financial, where capital outlays could be significant and substantial subsidies are required for both infrastructure and operations. The sustainability of these subsidies is considered a risk. Asset vandalism and risk exposure are further concerns. Commuter services would be more attractive to the private sector by guaranteeing subsidies, spreading risk by choice of contract and removing infrastructure maintenance from the train service concession, and protecting assets from vandalism. It is understood that the DoT is allocating substantial funds to improve security on commuter trains and at train stations, which would address asset vandalism.<sup>3</sup> It is recommended that this area be moved into the 'At Threshold' category and these issues be given further investigation.

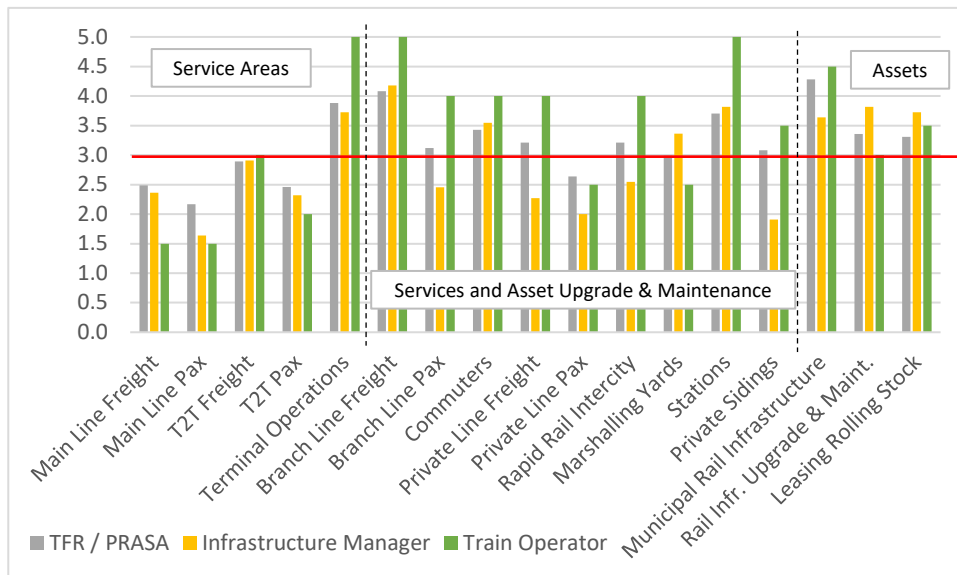
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<sup>3</sup> Pers. comm with Department of Transport, 25 June 2021.

Rapid rail intercity services receive support from TFR/PRASA and the private sector. Government prioritization is just below threshold because it would do little to address its social concerns, might require a subsidy and would do little to reduce any of the existing subsidies. A financial feasibility assessment on all identified routes would indicate the extent of subsidy and could address government’s concerns.

The perspective of TFR/PRASA is now disaggregated into that of the infrastructure manager and the train operator. In this disaggregation all criteria that are common to both, such as freeing the balance sheet of TFR/PRASA or allowing the focus on freight and commodities, have been removed. Only those criteria that are applicable to either the infrastructure manager or the train operator are included. The purpose behind this disaggregation is to see if the TFR/PRASA scores for any of the areas below threshold could be improved based on a motivation that it benefits either the infrastructure manager or train operator. The results are illustrated in Figure 8.

Figure 8: Scoring for SOC infrastructure manager and train operator



Source: author’s illustration based on multi-criteria identification matrix.

There are large variations in the scores for most of the areas when viewed from the perspective of either the infrastructure manager or the train operator. The critical aspect is to see if there are any areas that had a TFR/PRASA score below threshold that might now score at or above that level for either the infrastructure manager or the train operator. This only occurs in terminal-to-terminal freight.

### 5.5.3 Prioritized areas

The best outcome for a private sector participation framework is when the objectives of all participants are aligned, they are willing participants and they share collective responsibility. This has been found to be the case for seven potential participation areas. The partnership would also be successful if prioritized by two participants and is neutral for the third. This has been found to be the case in a further five areas, which are termed ‘At Threshold’. There are five areas that are not prioritized. These are summarized in Table 3.



Table 3: Area prioritization

<b>Prioritised by All Three Participants</b>	<b>At Threshold</b>	<b>Not Prioritised</b>
<b>Service Areas</b>		
Terminal Operations	Main Line Freight	Main Line Passengers
Terminal to Terminal Freight		Terminal to Terminal Passengers
<b>Service Areas and Asset Upgrades</b>		
Private Line Freight	Branch Line Freight	Branch Line Passengers
Private Sidings	Rapid Rail Intercity	Private Line Passengers
	Marshalling Yards	Stand -Alone Stations
	Commuters	
<b>Assets</b>		
Municipal Rail Infrastructure		
Upgrading and Maintaining Rail		
Leasing Rolling Stock		

Source: author's conclusions based on multi-criteria identification assessment.

Disaggregating the TFR/PRASA perspective into that of an infrastructure manager only affected terminal-to-terminal freight services, which moved it from the 'At Threshold' category into the 'Prioritized by All Three Participants' category. No other areas were affected by this disaggregation.

Most of the areas prioritised by all three participants do not require the separation of TFR into the Infrastructure Manager and the Train Operator. The only area requiring this separation is terminal to terminal freight, which means that private sector participation could commence earlier.

## 5.6 Mechanisms for participation

World Bank Rail Toolkit defines a public private partnership (PPP) in railways as 'a contractual arrangement between government and private investors to provide public rail infrastructure and/or services and to share the risks associated with those investments and/or operations in some way. Such arrangements include private ownership and/or operation of trains, but typically include financing and management of infrastructure and services' (World Bank 2017: 209). Government could participate by transferring assets to the private sector partner for the duration of the concession contract, by providing land, financing some of the upfront investment costs or by providing revenue guarantees. Different mechanisms for private sector participation under different circumstances and in the different areas need to be explored.

All private sector participation areas would be governed by contracts. While there are any number of contracts, the most common mechanisms for participation in rail are:

- Build Operate Transfer (BOT) contracts. Under this contract, a concessionaire would invest or upgrade the rail infrastructure, operate a service for which it can charge a fee and then transfer the asset back to the state in a pre-determined condition. A variation is a Design, Finance, Build, Operate and Transfer (DFBOT) contract, which is the current mechanism for the Gautrain.
- Operate and maintain (O&M) contracts. These are similar to the BOT contracts described above, except that the state would invest in or upgrade the rail infrastructure. The concessionaire would operate and maintain the asset during the course of the contract, after which ownership reverts back to the state.
- Operate only contracts. The concessionaire is only responsible for operating a service on the rail infrastructure. It is likely though that the concessionaire would pay an access price or bid for a time slot to use the infrastructure, which in turn would be used for rail maintenance and to pay for the initial upgrades.
- Performance-based contracts. These contracts are mostly applicable to infrastructure upgrades and maintenance but could also apply to commuter services. For infrastructure upgrades and maintenance, a concessionaire would be responsible for providing infrastructure at a pre-determined level of service, for which third party users would pay an access fee. For commuters, the state would pay a concessionaire to provide train services according to a pre-determined timetable. The concessionaire would collect fare box revenue on behalf of the government, which would offset the transfers by the state.
- The provision of rolling stock. This is similar to a car rental firm, where the private sector participant would supply rail operators with rolling stock. The advantage for rail operators is that they only need to rent the rolling stock as and when they need it. This approach has been successfully adopted in Russia and is responsible for over \$20bn in rolling stock investment, a cost that was ultimately avoided by the state-owned railway company (World Bank 2017: 209).

Concession contracts are more common in freight than in commuter or passenger services (Department of Transport 2016: 82). Concession contracts are usually for 20 to 30 years, whereas franchises are for a shorter period of time, such as five to seven years. Concession contracts are preferred to franchises when significant capital investment is required by the private sector because this gives a longer period in which to recoup the capital.

There are two distinct types of concession contracts but many combinations of both. The two are (World Bank 2017: 144):

- A negative concession where tariffs and services are set and some remuneration is recovered from the government. This is typically used for loss-making passenger services.
- A positive concession is based on commercial principles and where the concessionaire pays for operating rights. Services and tariffs are market driven.

Each of these mechanisms described earlier can then be further disaggregated into positive or negative concessions and according to the type of incentives that are offered. These would cascade from those without any incentives (i.e. positive contracts), to those with non-financial incentives, to those with financial incentives and then finally those with subsidies.

- **Contracts with no incentives.** These contracts would be chosen as the best value for money offering the highest level of service. For private train operators this would mean paying full access fees or bidding to use the core network.
- **Contracts with non-financial concessions.** These are contracts with some concessions that might be financial in nature but that do not involve financial transfers. The most innovative form of this type of concession would be a volume or passenger guarantee. Rail friendly policies and prioritization of rail use for government freight business and state employees could be further forms of this type of guarantee. TFR has used this type of guarantee for the Expression of Interest for the Eswatini Rail Link project, where an annual 6.7Mt of freight would be routed onto this new rail link (Transnet Freight Rail and Eswatini Railways 2021: 14). An annual freight or passenger guarantee would substantially reduce risk to the private sector operator.

Other forms of non-financial concessions are a fixed cost guarantee, force majeure risk cover, access to the core network through the allocation of time slots, tax relief and security.

- i. Fixed cost guarantees would be important for those participation areas using outdated technology, such as narrow-gauge railways or aging equipment. The running costs of the rolling stock could increase as replacement parts become scarce and more expensive. Fixed cost guarantees allow the private sector to plan with some certainty around costs.
  - ii. A common challenge for rail concessions in Africa is interruption from political conflict and natural disasters. A force majeure guarantee would reduce this risk. Partial insurance against such risk is offered by the African Development Bank (African Development Bank 2015: 94) but this is expensive. The experience of the REIPPPP was that some bidders insisted on political risks being addressed through government guarantees or indemnities (Eberhard and Naude n.d.: 105), obviating the need for the concessionaire to obtain such expensive insurance.
  - iii. The allocation of time slots onto the core network would assist marginal operations. These time slots could be discounted so that an operator pays for access and maintenance only, and not for sunk costs such as the development or upgrade of the rail infrastructure. These discounts would need to be carefully developed so as not to discriminate against access fees paid by other operators.
  - iv. Some concession contracts might lead to increased turnover for firms serviced by the concessionaire. This increased turnover would lead to higher tax receipts by the national government. Government could therefore consider giving tax relief to concessionaires to improve the attractiveness of their contracts.
  - v. Asset vandalism has crippled PRASA and undermined the reliability of TFR. Although this has been an ongoing problem it was exacerbated with the cancellation of security contracts prior to the COVID-19 lockdown. Asset vandalism reduces the attractiveness of freight and specifically passenger services for the private sector. The state could guarantee security services to protect both passengers and rail assets from vandalism.
- **Contracts with financial incentives.** There are various forms of this type of contract, ranging from the state arranging access to cheap finance, providing subsidized loans, sharing costs, providing risk guarantees, providing equity for project SPVs and insurance.

- **Subsidies.** There are various forms of subsidies and these would need to be based on detailed financial and economic assessments for each concession contract. A strong economic case would motivate a subsidy and a financial analysis would determine the extent. Subsidies should also be carefully monitored, particularly passenger operating subsidies, and ringfenced for their intended use. Government does not want them to flow through the system and end up as excessive dividend payments to private shareholders. A cost benefit analysis, as suggested in the White Paper on Rail (Department of Transport 2017b: 36, 37), would need to be done on all modes of delivery to assess whether a project should be delivered by the state or through a private sector and to ensure that the level of profit justifies the increase in efficiencies.

The various forms of subsidy are for operations only; for infrastructure upgrades only; for infrastructure upgrades and maintenance; or for infrastructure upgrades, maintenance and operations. Subsidies could be accessed through the municipal infrastructure grant, the urban renewal grant, the public transport infrastructure grant or the public transport operations grant.

## 5.7 Mechanism implementation

Identifying the mechanisms of participation is only part of the process. Their implementation needs to be carefully scrutinised to ensure efficient outcomes in line with the guiding principles established in section 4.

### 5.7.1 Concessionaires and train operators on the core network

The white paper on rail sees private sector firms participating on the core network as operators of private trains, on a network owned, upgraded and maintained by the state. This arrangement is illustrated as the first example in Figure 9. The result is a vertically separated structure, where the state owns and manages the rail infrastructure but where either the state, as a separate entity to the state infrastructure manager, or the private sector operate their train services.

Figure 9: Private rail operators on state-owned core network

	Freight on Core Network			
	As per White Paper		Private Sector Invests & Maintains Infrastructure	
Rail Operations	State	PS	State	PS2
Rolling Stock Investment	State	PS	State	PS2
Infrastructure Maintenance	State		PS1	
Infrastructure Investment	State		State	PS1

Source: author's illustration, adapted from African Development Bank (2015: Fig 30).

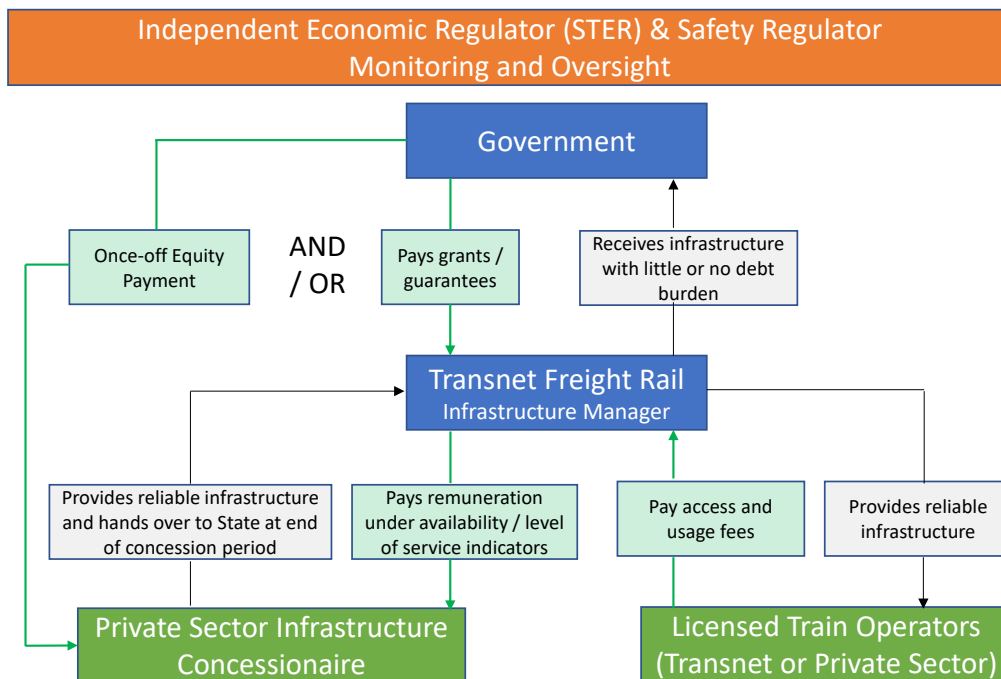
TFR could concession out its infrastructure investment and maintenance as well as open up its network to private train operators to maximize usage. This is illustrated as the second example in Figure 9. In this case a private sector firm would have a concession contract for investing and maintaining the rail infrastructure and different private sector firms could operate trains. The

advantage of this approach is that it allows each participant to focus on its field of expertise and with appropriate risk allocated to each specialist firm. The disadvantage is that it introduces contractual and network operating complexities. The practical implementation of this structure, under an availability-based rail infrastructure concession, is shown in Figure 10.

In an availability-based concession with third party operators there are at least five groups of participants. These are government, the TFR Infrastructure Manager, a private sector infrastructure concessionaire, licensed train operator/s (who could be private sector train operators and/or the TFR train operator) and the regulators.

The TFR Infrastructure Manager, acting on behalf of the government, would enter into an availability-based contract with a private sector concessionaire, shown at the bottom left of the diagram. The private sector concessionaire would maintain and upgrade the rail infrastructure to a required level of service. At the end of the contract the infrastructure would be handed over in a pre-determined condition to TFR. TFR, in turn, would remunerate the private sector concessionaire during the contract for the effective availability of the rail infrastructure at the specified level of service. This remuneration would come from TFR and could include a government grant, depending on the project financial and economic feasibility. Alternatively, if a project SPV has been developed for the contract then government could provide equity. In this instance government would then have part-ownership of the asset while under concession. Private investors could also provide financing into the SPV without being involved in train operations.

Figure 10: Availability-based rail infrastructure concession and third-party train operators



Source: adapted from African Development Bank (2015: Fig 32).

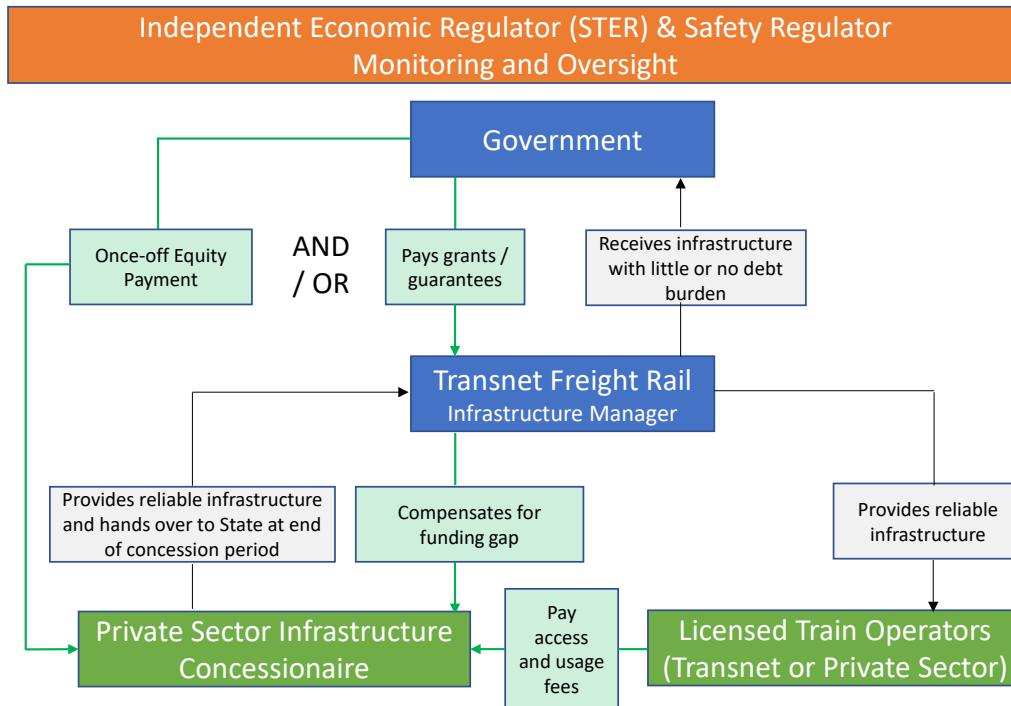
The train operators would pay the TFR Infrastructure Manager, who retains signal and train control on the network, an access fee for using the rail infrastructure at the required levels of service. This access fee could even be a bidding process, where private train operators bid for time slots on the core network. Under the availability-based concession the flow of fees from the train operators to the

private sector infrastructure concessionaire is via the TFR Infrastructure Manager and all contractual arrangements are with TFR. There is no contractual arrangement or flow of money directly between the train operators and the infrastructure concessionaire.

The infrastructure concessionaire assumes full responsibility and risk for the state of the rail infrastructure under this contractual arrangement. Deductions would be made to the remuneration from TFR should this infrastructure not be at the specified level of service or if delays are incurred. While the infrastructure concessionaire bears full risk for the performance of the rail network it does not assume any of the traffic or commercial risks (African Development Bank, 2015, p. 121). Traffic risk is borne by the TFR infrastructure manager and commercial risk by the train operators. This contractual arrangement requires transparency regarding the condition of the rail infrastructure and the sharing of related data between the concessionaire and TFR. Any problematic conditions regarding the rail infrastructure should be apparent to either party, which in turn would lead to the appropriate remedial action.

A variation of this contract is shown in Figure 11. This is a Build Operate Transfer (BOT) rail concession with third party train operators and is analogous to a private toll road where a concessionaire would maintain and operate a section of the rail infrastructure and charge rail operators access fees. It is usual for the network infrastructure manager (TFR) to guarantee minimum levels of revenue and to compensate for the difference between costs and fees.

Figure 11: Build operate transfer rail concession and third-party train operators



Source: adapted from African Development Bank (2015: Fig 33).

In this instance the infrastructure concessionaire assumes construction and network operating risk as well as traffic risks and would have signal and train control over the portion of rail network under its concession and would allocate trackage rights to the train operators. The concessionaire would assume full responsibility for the condition of the rail infrastructure but under this operating regime there is less transparency than the availability-based concession. Defects in the rail infrastructure might not be

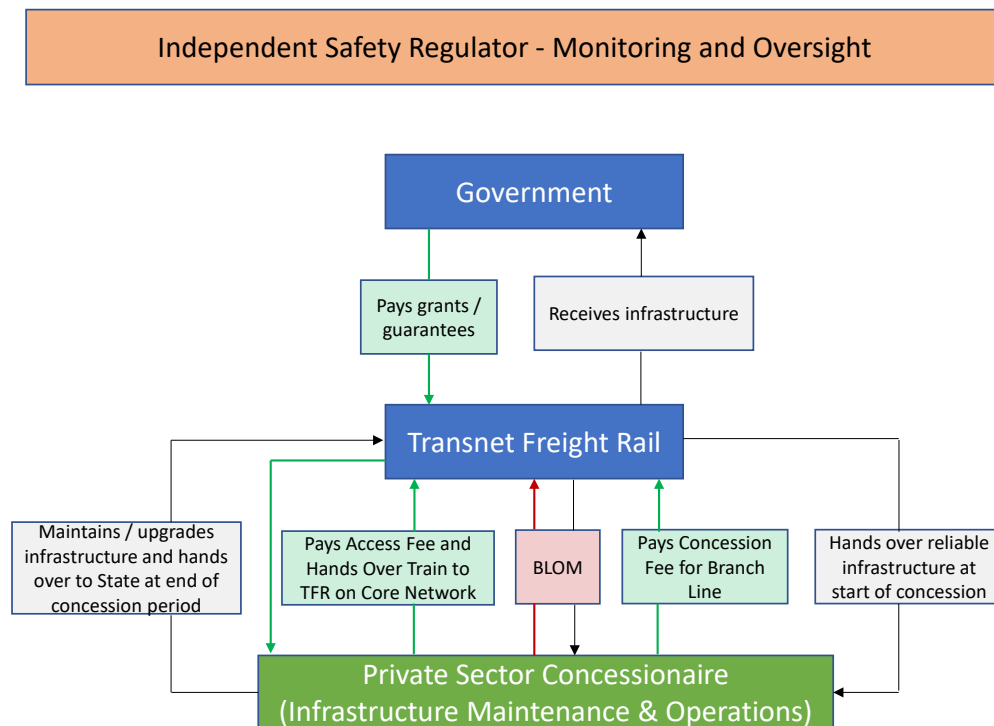
as apparent, unless sharing data relating to the condition of the infrastructure with the rail safety regulator is a contractual condition. Complications might also arise in sharing signal and train control information with the TFR infrastructure manager.

It would be more difficult, but not impossible, for the train operators to bid for time slots directly from the infrastructure concessionaire. It is more likely that the infrastructure concessionaire would set the access fees.

### 5.7.2 Branch line concessions

The current branch line concession model is illustrated in Figure 12. Here, the private sector concessionaire pays a concession fee to maintain, upgrade and operate the branch line. It enters into a contract with the Branch Line Operations and Maintenance (BLOM) unit within TFR for leasing, operating and maintenance of the rolling stock. Under the current access regime, the concessionaire delivers the branch line train to the core line access point, normally a nearby marshalling yard where TFR takes over control. TFR delivers the train with its freight to the destination point and returns it back to the marshalling yard. This is called the mixed service model (Department of Transport 2016). Potential private sector participants have expressed dissatisfaction with this arrangement, preferring to be in control of their freight up to the delivery point and responsible for overseeing offloading/reloading and turnaround times. This also allows them to charge haulage rates on the core network, which could improve the financial viability of the branch line concession. This preference is akin to TFR’s full service (or open access) model. In terms of the concession contracts, TFR has stipulated that all risk is allocated to the concessionaire, which contradicts their private sector participation manifesto.

Figure 12: Current Branch Line Concession Model

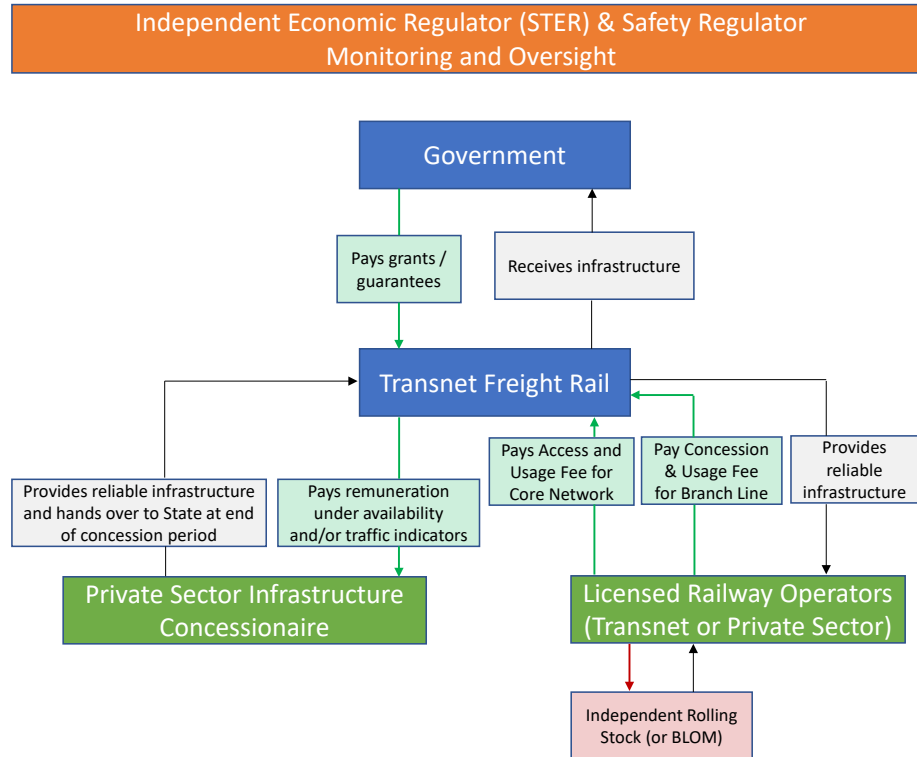


Source: author's illustration, adapted from African Development Bank (2015: Fig 32).

Government could pay subsidies or provide guarantees to the concessionaire, depending on the economic and financial feasibility assessments of the contract. Transnet itself could also provide gap funding, should it deem a branch line to be of sufficient strategic value to its own operations (Department of Transport 2016: 69). Given the constraints on Transnet’s own finances it is more likely that it would subsidize the concessionaires through lower cost arrangements, by allowing discounted access onto its core network or by waiving the concession fee.

The Branch Line Strategy identifies three main risks. The first is demand risk, which relates to volumes transported by rail. This is usually borne by the concessionaire. The second is interface risk and access to the core network, which relates to the private sector train accessing the core network and TFR assuming control of the freight. The branch line strategy suggests that these should be minimized and overseen by independent authorities, such as the STER. The third are legislative risks, such as amendments and changes to policy, that also pose a risk to the private concessionaire. (Department of Transport 2016: 81). An alternative branch line operating model is illustrated in Figure 13 which would address some of these risks.

Figure 13: Alternative branch line concession model



Source: author’s illustration, adapted from African Development Bank (2015: Fig 32).

There are three main differences between the current and alternative branch line concession models. These are the separation of the rail maintenance and upgrades from the operations; the concessionaire retaining control of the rolling stock and freight to the destination point; and the choice of using the BLOM. While some private sector participants have indicated that they do not wish to use the BLOM for their rolling stock requirements, others have indicated that it gives them freedom to focus on other operational aspects of the concession and not on the sourcing of rolling stock and the requisite skilled labour. All have indicated, however, that they would like to have the option of switching to other operators should the opportunity arise at some point in their contract.



Risk is split between the private sector concessionaires and TFR. The infrastructure concessionaire, under an availability-based concession, would take responsibility for the performance of the rail infrastructure. TFR would assume responsibility for the traffic, but this would be mitigated by charging the train operator access fees. The train operator would bear the commercial risk. Government could provide guarantees to either concessionaire, thereby alleviating the concessionaire risk but increasing its own.

### *5.7.3 Commuter concessionaire model*

There are three operating models for commuter services. These are a vertically integrated model such as the current operating model where PRASA operates all services, a vertically separated model where PRASA acts as the infrastructure manager and private train operators operate services on specific routes, and a devolved model where the municipality acts as the infrastructure manager and concedes out train operating services.

- i. Under the current vertically integrated model PRASA operates the rail infrastructure and train services. It could outsource some of its commuter services on selected lines but is unlikely to have the funds for all services. This model has proven to be unsuccessful.
- ii. Under a vertically separated model, PRASA would maintain and operate the rail infrastructure and the private sector would operate train services on separate lines, much like a branch-line concession. It would not be plausible for multiple private sector concessionaires to operate services on common lines.
- iii. The devolved model is seen by the White Paper on Rail as the most appropriate solution for urban guided transit (UGT). Internationally, urban rail tends to be a local government function because it is better managed by local officials who understand local needs (Department of Transport 2017b: 69). This arrangement promotes integrating rail with other local forms of public transport as well as local development plans. It is supported by World Bank Rail Reform Toolkit (World Bank 2017: 79-81). The downside of devolution would be the costs involved and the potential lack of capacity within the metropolitan municipalities.

The ideal commuter concessionaire model would look similar to the recommended branch line model. Separate concession contracts could see the rail infrastructure overseen by one private sector participant, with another for the commuter operations and possibly a third for the provision of rolling stock. PRASA or the local municipality would own the rail infrastructure. This is shown in Figure 14 and could apply to both the vertically separated and the devolved models described above. Under the arrangement shown in Figure 14 the infrastructure and train operation contracts are performance-based.

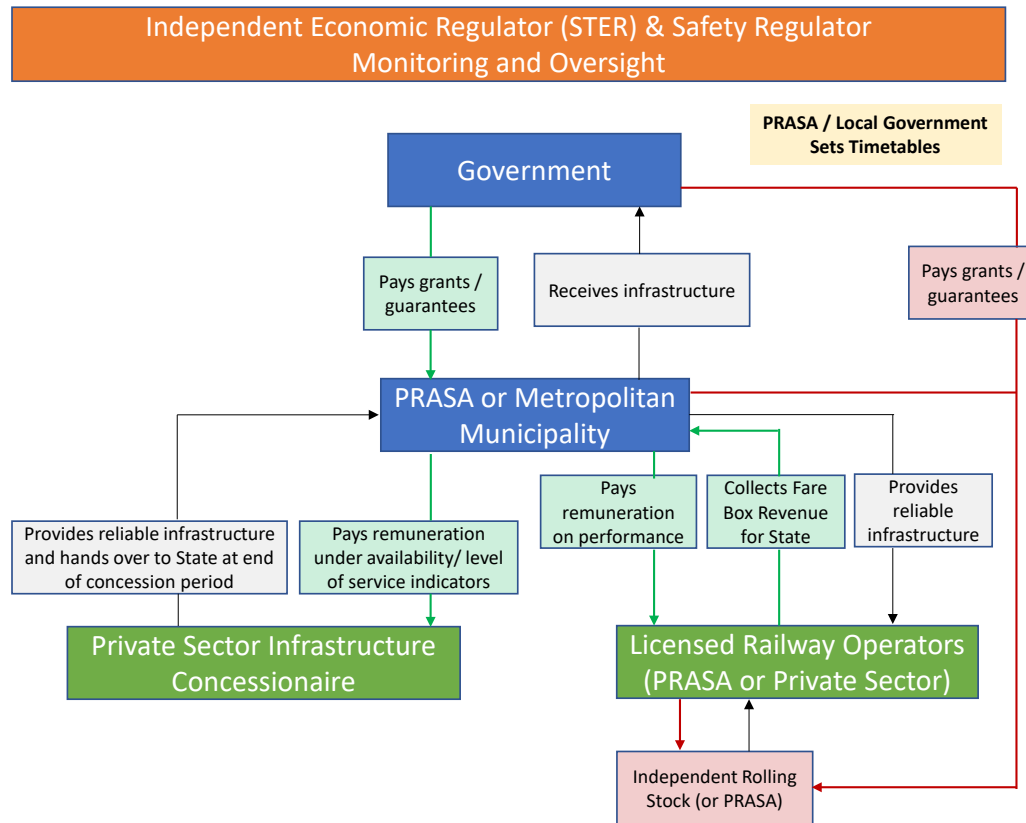
Under the performance-based contract, PRASA or the local municipality would set the commuter timetable to ensure that the public are adequately serviced by the concession, and not only during peak times. An economic and financial feasibility assessment would indicate the degree of subsidy required to make the contract attractive for a private sector operator.

Government could share demand risk with the private operator through a minimum revenue guarantee, as is the case for the Gautrain (Menzies and Mandri-Perrott 2010: 2). An alternative approach would be for the government to bear the demand-side risk and pay the operator an availability fee for their service – this is the arrangement shown in the diagram above. The availability fee would then compensate the concessionaire for the costs of investment and delivery of passenger services and allow it to focus on the rail infrastructure and operations. Such an arrangement would

incorporate performance incentives and penalties against contractually defined parameters, as well as a revenue sharing mechanism should targets be exceeded.

Government could provide financial or non-financial guarantees. Security of assets is a major concern and protection from vandalism would improve the attractiveness to the private sector. Government, either national or local, could provide grants for rolling stock that the commuter service operator could lease from another private sector participant.

Figure 14: Performance-based commuter concessionaire model

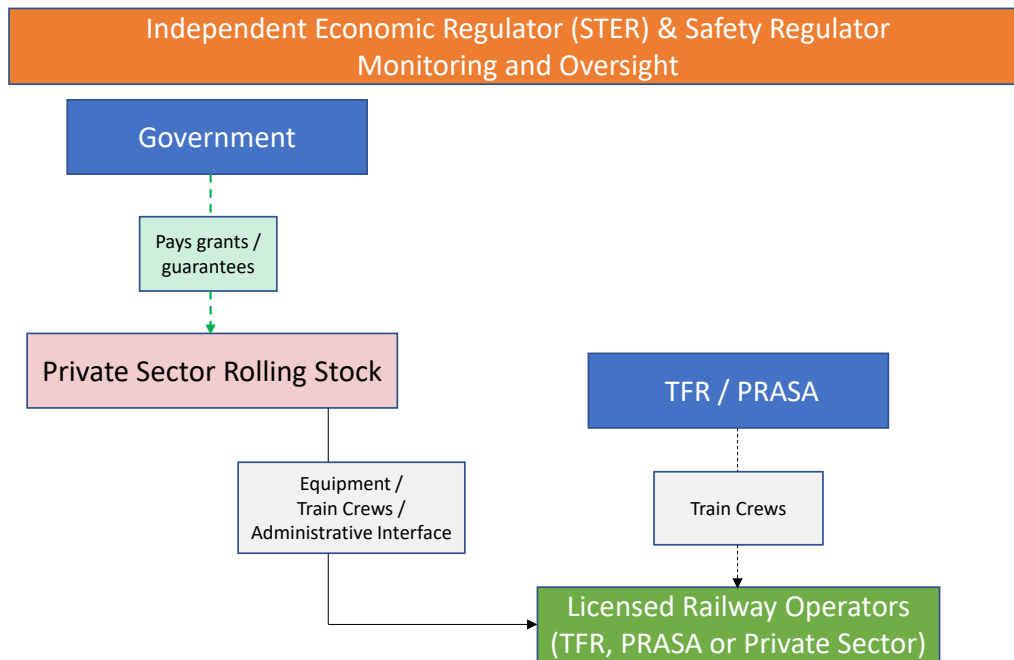


Source: author's illustration, adapted from African Development Bank (2015: Fig 32).

#### 5.7.4 Provision of rolling stock

Private companies can own or lease rolling stock and then lease these out to licensed railway operators. This rolling stock could be wagons or locomotives or both. In Russia, these companies provide additional services such as train crews and administrative interfaces between operating companies and customers. The potential contractual arrangement is illustrated in Figure 15.

Figure 1: Provision of rolling stock



Source: author's illustration, adapted from African Development Bank (2015: Fig 32).

Discussion with rail operators in the UK has indicated that these companies, termed ROSCOs, are attractive to the private sector and have amongst the highest returns of all sectors within the rail industry. It is therefore unlikely that any grants or subsidies would be needed from the government (hence the dotted line in the diagram). It would also be extremely difficult to isolate and allocate specific economic benefits, other than greenhouse gas emissions, to these companies.

Many variations of this arrangement could occur. One particular variation could be the provision of the rolling stock by the private company, with TFR or PRASA providing the train crews.

The safety regulator has an important role to play in ensuring the standards of the rolling stock and the compatibility and interoperability on different lines. These could include, for example, inside-of-cab signalling capability in new rolling stock compared to outside-of-cab signalling in older models, the presence of automatic train-stop mechanisms, the required power systems, operating speeds and weight.

### 5.7.5 Other participation areas

The implementation options described above could be applied to the remaining participation areas. These are private railways (which could include a secondary public service like passenger or freight transport into unserved areas), operating marshalling yards, stations, private sidings and terminal operations.

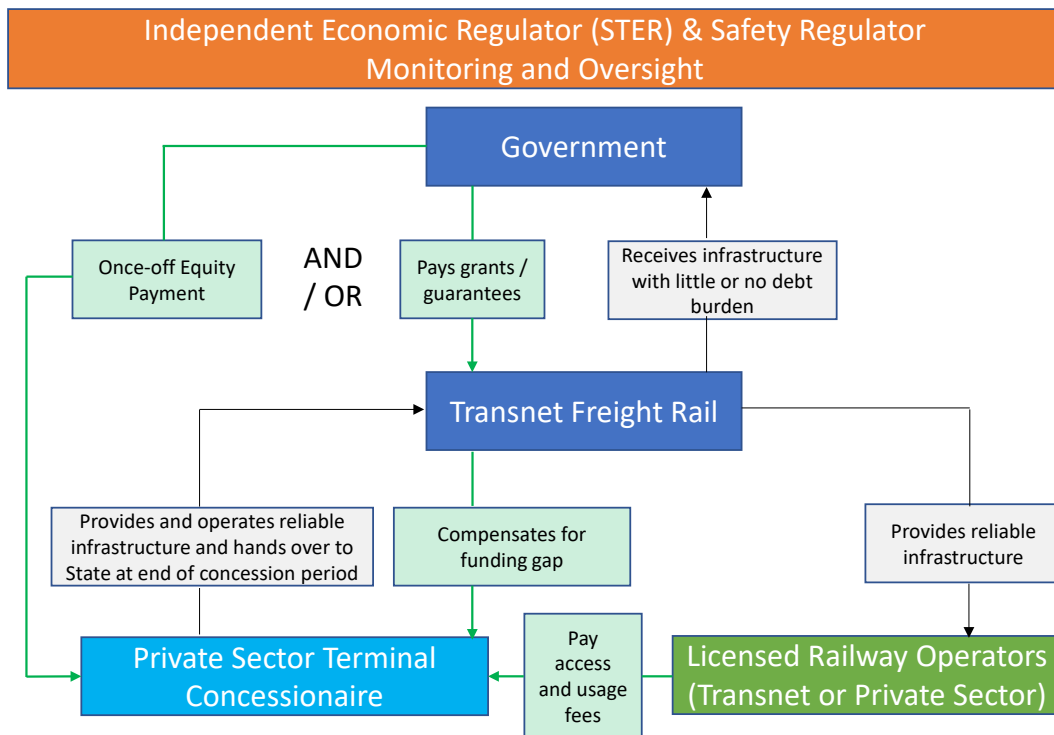
For private railways and sidings, the private sector would be the dominant player and would retain ownership of the infrastructure. Government, if involved at all, would be a part-player and might provide a one-off grant or subsidy if the private railway were extended to include passenger services or was utilized for some national strategic purpose.

Concessions to operate the marshalling yards would resemble those of the alternative branch line model. The private sector concession to maintain the rail infrastructure could be extended to operate the marshalling yard or this could be implemented under a separate concession.

Contracts for operating and maintaining stations, if outside of a rail concession, would be like real-estate contracts. Remuneration would need to be on an availability basis, where the concessionaire is rewarded for providing the station or siding at a specified level of service.

The final aspect needing consideration is terminal operations for loading and off-loading of freight. Here the contract would most likely be a BOT contract. This is illustrated in Figure 16. A private sector concessionaire would invest in a terminal facility, upgrade and maintain it as well as operate it over the life of the concession and then hand it back to TFR in a pre-determined condition at the end of the contract. It would receive income in the form of user charges from the train operators. TFR could provide gap funding if warranted by a financial feasibility study. Government could also provide once off-funding, either in the form of a grant or via equity funding. The private sector concessionaire bears all risk under this model.

Figure 16: Build operate transfer concession contract for terminals



Source: author's own conclusions based on literature review and interviews and adapted from African Development Bank (2015: Fig 32).

## 5.8 Conditions for successful implementation

Several important lessons are learnt from the local and international examples and from engaging the private sector for the successful implementation of concession contracts. These lessons are not specific to any participation area. They are explored under the thematic groupings of the policy

environment, the contractual environment, contractual clarity, co-operation, encouraging private sector involvement and, finally, monitoring and evaluation.

### *5.8.1 Policy environment*

Rail requires significant up-front investment and concession contracts would need to be sufficiently long enough to allow for costs to be recouped. This requires a long-term commitment and vision by government, through a stable and rail-friendly policy environment (World Bank 2017: 214). Involving government in long-term objectives would make the industry more attractive and encourage more powerful participants (Olievschi 2013: 44). This is recognized in the white paper on rail, where it allows concessionaires and lessees long-term participation in the sector to sufficiently amortize their investments (Department of Transport 2017b: 29-30).

An enabling policy and regulatory environment, along with fairness and transparency that earned the trust of the private sector were seen as some of the major factors in the success of the renewable energy procurement process (Eberhard and Naude n.d.: 89). Despite this, contracts need to be flexible though, because government policy often changes during the course of a concession contract.

Government itself understands the importance of a stable policy environment and acknowledges that failure of the branch lines is in part attributed to it withdrawing support (Department of Transport 2016: 9). This issue has been highlighted by the private sector, who have bemoaned the lack of government support and lack of co-ordination across different departments.

Government officials not only need to understand their policy environment but need to enact it.

### *5.8.2 Contractual environment*

The contractual environment is examined through the importance of an economic regulator, the establishment of a dedicated government entity to oversee private sector participation, publishing sufficient opportunity detail and the competitive bidding process.

**Economic regulator:** The role of government is extended to that of the safety and economic regulators, who would strive for fair and transparent service in the industry. The establishment of the economic regulator, as indicated in the white papers on transport and rail, is seen as imperative for private sector participation. Concession contracts are unable to cover all future eventualities and independent regulatory structures for addressing issues not only creates a good environment for solving unforeseen problems but also sends a clear signal to the private sector that the government is committed to fair procedures and transparent processes.

Most potential private sector stakeholders agree that a regulator is imperative for their participation, although some have indicated that the establishment of the regulator should not be used as an excuse to delay their participation. South Africa has strong competition law, which along with an economic regulator was absent in the rest of Africa where rail concessions were unsuccessful. This competition law could protect the private sector from unfair behaviour by a monopolistic network manager. All private sector role players agree though that the economic regulator is needed for the long-term.

The African Development Bank stresses the importance of an economic regulator where an incumbent public sector operator retains market dominance and effective unbundling is limited by the fact that the operator and the infrastructure manager remain within the same group and often under the same political control (African Development Bank 2015: 38). This would be the situation in South Africa with TFR.

There are other important reasons why a regulator needs to be established. It sends a strong signal that government is serious about private sector partnerships and builds trust. The regulator would collect and publish industry data, allowing for a more transparent operating environment. It has also been shown how important the role of NERSA was in fostering private sector interest in the renewable energy procurement process through the publication of research reports and public consultation.

It is appreciated that there are costs associated with establishing an economic regulator. However, the benefits outlined above would outweigh these costs and it is the experience that many private concessions have failed in environments without a regulator.

**Establishment of a dedicated governmental entity:** The success of the renewable energy procurement programme was partially ascribed to the government entity that oversaw the process. A similar entity or office should be established to oversee private sector participation in rail and should include a dedicated procurement office.

Officials employed in the office should have the capacity and skills to engage with the private sector, from logistics companies to civil engineering firms, lawyers and financiers. They would need to act in a fair and transparent manner, so as to gain the trust of the private sector, but also be able to negotiate the best outcome for the state. The government entity should be led by an official whom the private sector trusts and respects.

One of the recommendations from the renewable energy procurement process was to reduce transaction costs, specifically for smaller firms (Eberhard and Naude n.d.: 99-106). One way in which this could be done is through the standardization of contracts and procurement forms, which a dedicated procurement office would be able to do. A dedicated procurement office would also, through experience, be able to adjudicate tenders, negotiate better prices and delivery times.

If competitive bidding processes are pursued, these are complex and have steep learning curves. An experienced rail procurement office would be able to establish expertise in this field and refine the processes until optimal outcomes are achieved.

Additional advantages of a dedicated procurement office would be the better matching of goods and services with service providers than a centralized, general government procurement office (Sigma 2000). The disadvantage is the duplication of the processes and personnel of the general government procurement office and possibly the loss of economies of scale.

**Opportunity detail:** The review of the renewable energy procurement process indicated how a paper published by NERSA on renewable energy volumes, the dates when this would happen and indicative tariffs was considered as the tipping point for private sector interest. This detail alleviated some of the perceived risk and uncertainty that prevailed at the time and illustrated that government was serious about procuring renewable energy. If this lesson is extrapolated to rail, then similar detail needs to be developed for each of the prioritized participation areas.

This detail would need to be a transparent process indicating the extent of opportunities available for participation within each area, freight volumes or passenger numbers and type of potential cargo suitable for rail. The type of potential subsidies applicable in each area should also be indicated.

The number of slots available to private train operators and the indicative tariffs on the different main lines would allow the private sector to better understand opportunities, costs and risk exposure. This would enable them to compare options across different transport modes.

**Competitive bidding:** A competitive bidding process for concession contracts would ensure the best outcome for government and TFR/PRASA.

A clear and precise bidding process and evaluation methodology needs to be communicated to prospective bidders. A number of different permutations exist.

- Bidders could simply be asked to bid on a concession fee and the highest bid wins. TFR or PRASA would perform their own financial analysis and have a reserve price in mind. The contract does not need to be issued if prospective bidders do not meet this reserve price. A variation would be for the reserve price to be disclosed to bidders, who would then need to provide bids above that level to qualify, if financially viable.
- Bidders could be asked to provide tariffs for transporting freight or passengers. An upper limit could be specified, particularly for passengers. The lower the offered tariffs the more competitive the proposal.
- A variation on the above competitive bid would be for an upper limit for fares to be specified and for bidders to provide the lowest required subsidy. The DoT, TFR or PRASA would need to perform their own financial and economic feasibility analysis of the concession contract to determine the extent of the subsidy that the state would be prepared to pay. Once again, this subsidy threshold level might or might not be disclosed to prospective bidders.

Several bidding rounds could even occur. This could include a pre-qualification phase where tenderers are selected on qualifications and experience, then a first round of bidding followed by negotiations and then a final round for a Best and Final Offer (BAFO), as occurred in the case of the Gautrain. The BAFO would be evaluated on various criteria, communicated to the bidders, covering a range of issues such as tariffs, financial feasibility, legal issues, technical issues and socio-economic development.

A word of caution needs to be sounded though. One of the lessons learnt from the renewable energy procurement process is to reduce tender transaction costs, particularly for smaller players and contracts. (Eberhard and Naude n.d.: 99-106). Three of the recommendations, amongst others, to reduce these tender transaction costs are to ensure that tender documentation is not too onerous and complex; to use a suite of standardized, non-negotiable contracts; and to design legal contracts that adequately address political risk. The tendering process though would need to be tailor-made according to the size of the concession. Smaller contracts should be kept simpler, but still utilizing the standard suite of documents, while larger contracts that would attract larger firms can be more complex.

Bidding at tender stage is not the only opportunity for this process. Private rail operators could pay for time slots on the network either through set fees or through a bidding process. The issue with setting access fees is that TFR would not know at which level to set them, even if they cover all costs. If set too low, then potential revenue is left on the table. If set too high, then they might not attract private sector participants, which in turn would affect the competitiveness of the country. A bidding process would, theoretically, circumvent these two issues and indicate how much the market is willing to bear under different conditions. These conditions could vary by time of day, week, length of train and volume of freight. TFR could calculate a reserve price for different conditions, below which any bids would not be accepted. TFR could even publish these reserve prices so that train operators have a yardstick with which to work, or to juggle service hours so as to spread operations over quieter periods. This would also allow for multiple operators, as long as their bids exceed the reserve price. This would be in line with one of the important findings of the REIPPPP bidding process, which

found that the prospect of multiple winners increased private sector interest. Preference would need to be given to the most competitive bids. It is appreciated that time slots are often reserved and paid for well in advance of their actual usage, but this does not preclude bidding as an option for paying these fees. It is therefore recommended that the practicality of this bidding mechanism be investigated further.

### *5.8.3 Contractual clarity*

It goes without saying that contractual clarity is important for any concession agreement. It is important to be clear about the objectives and requirements of concession contracts because misaligned expectations were a major reason for concession failure in Africa.

A template for concession contracts is provided in Annex 4 of World Bank Rail Reform Toolkit indicating the multitude of issues that need to be considered (World Bank 2017: 245-88). It is not the intention of this research report to summarize those issues but to rather indicate some key items for consideration.

**No cross-subsidization:** Business cases should be kept separate and not used to cross-subsidize non-performing services. Profitable concessions should be left to operate separately while non-profitable aspects requiring government subsidies are considered through alternative mechanisms.

**Realistic allocation/division of risk:** One of the most important issues highlighted by the case studies and literature is the sharing of risk and that risk should be allocated to the party best equipped to deal with it. The identification of risk and dealing with appropriate strategies and mitigation measures at a contractual level is essential to the success of private sector participation.

The principle of risk being allocated to the party best equipped to deal with it is part of TFR's private sector participation manifesto (Transnet Freight Rail 2015: 13, 45, 54), but despite this it categorically states in its Request for Proposals that all risk is for the Concessionaire and none for TFR (Transnet Freight Rail 2015: 48, 49, 52, 54) (Transnet Freight Rail 2020: 7, 12). This was confirmed in interviews with the private sector, who reiterated that TFR are unwilling to take on any risk. This is a clear example of policy not being implemented in practice.

Risk has been identified by the private sector as high on their list of issues to be addressed to attract their participation. All forms of risk need to be identified and clearly allocated contractually, so that all participants are aware of the rules of the game.

**Trackage rights:** Trackage rights are agreements that grant a company the right to operate along a railroad owned by or concessioned to another company (World Bank 2017: 470). Examples of where trackage rights could occur in South Africa are on branch lines where the concessionaire concentrates on freight services, but an alternative operator might be appointed to operate a passenger service, or on a privately owned freight line where the state might want to introduce a freight or passenger service to a previously underserved area. Private operators of trains wanting to access the core network would also require trackage rights.

Disputes relating to trackage rights in Mexico are blamed for retarding rail reform in that country. Mexico's laws do not provide the terms of trackage rights and these were not spelled out clearly in the concession agreements. So, while trackage rights were acknowledged on certain lines, the laws and contracts did not provide explicit guidelines on the terms and conditions. These disputes have hampered private sector investment in their rail industry (World Bank 2017: 473).



Potential private sector operators assessing branch line concessions in South Africa have indicated a willingness to allow third party operators access to their lines, as long as the services offered do not compete with or hamper those of the concessionaire. The terms and conditions of the trackage rights, including access fees payable by third party operators, times of use and penalties and fines as a result of accidents or delays, need to be incorporated into the concession contracts.

**Termination clauses vital:** All participants need to know what would prevail should a contract be terminated and even more importantly what conditions are necessary for the termination clauses to be triggered. It is not only early termination where these clauses are important but also at the end of the concession contract. Issues such as ownership of assets and more importantly the condition of the assets is important. Many of Africa's concessions have failed because of deferred maintenance, which was the result of poor financial performance (Bullock 2009: xv, 12 ), (TradeMark Southern Africa 2011: 2, 5). The concession contract needs to safeguard against under investment in the rail assets and ensure that they meet a minimum stipulated standard at hand-over.

This underlines the long-term nature of the contracts and vision by government, discussed in section 5.8.1 on the policy environment. Government is not the only participant that needs to have long-term vision, the private sector needs one too. Long-term asset management is important to safeguard the integrity and performance of the rail assets, particularly at hand-over stage.

#### *5.8.4 Co-operation*

One of the cornerstones of successful private sector participation is the willingness to co-operate by all stakeholders. Participants might have different motivations for participating but they should share common objectives and desire similar outcomes. This then filters through to partner co-operation and information sharing.

**Common objectives:** The results of the participation area prioritization exercise in section 5.5 indicated that there was reasonable alignment between the government and the private sector but that there was a degree of misalignment between TFR/PRASA and the private sector. This needs to be addressed.

The reasons for misalignment need to be understood and remedial measures adopted to address the misalignment to the extent possible. This might require a change in stance by all prospective players. While the participation areas do not necessarily need to be a priority for all participants, they should not negatively impact on any.

**Partner co-operation and information sharing:** Partner co-operation is a pre-requisite for a constructive outcome. This can only come about if all participants are willing and a transparent and trustworthy environment is cultivated at all levels.

Information sharing is particularly important for infrastructure levels of service. This information sharing should be written into the contract of availability-based concessions and should be encouraged across all spheres of operation. The sharing of information on the condition of the rail track with the safety regulator could have avoided the Hatfield rail disaster in the United Kingdom in 2000. A train in Hertfordshire derailed due to metal fatigue on a section of the concessioned rail network. The problem was known about before the accident, but the infrastructure company failed to repair it. The ultimate blame was attributed to the rail infrastructure company's failure to adhere to its own health

and safety standards and for appointing inexperienced staff to key maintenance positions<sup>4</sup>. It is the opinion of rail consultants in the UK that had information been shared with safety regulators, action would have been taken and the accident avoided<sup>5</sup>.

#### *5.8.5 Encouraging private sector involvement*

One of the key forces driving the renewable energy procurement process was private sector interest. The private sector should be consulted to develop and expand their involvement in rail and to assist in driving the process, and not only be seen as participants in a finalized partnership.

**Consultation:** Initially there was little private sector interest in the renewable energy procurement process. The tipping point in generating that interest was the NERSA publication containing detailed targets and dates. This document was issued for public comment and revised according to their feedback. Further consultation was important not only in generating interest but also in allaying fears and misconceptions that arose at the time. The private sector consultations were also used in the development of the various contracts and agreements for the procurement process (Eberhard et al. 2014: 8, 11).

It is recommended that the private sector be consulted extensively in the design of rail contracts. Not only would this foster interest but would ultimately contribute to a more successful participation.

**Own decision-making:** Once a concession contract has been allocated and the terms finalized, the private sector needs to be given the leeway to make their own decisions. Conditions should not be imposed on them outside of the those stipulated within their contract.

This is emphasized in the privatization of rail in the United Kingdom, where a number of key lessons are learnt. Firstly, privatization is meaningless if the industry is not permitted to apply private sector solutions. Secondly, and closely related to the first issue, is that over-regulation degrades the industry. The private sector must be allowed to align costs with economic value by allowing markets and railway technology to drive investment. Lastly, private investors will not invest capital unless they can see an opportunity to make money on their investments.

#### *5.8.6 Monitoring and evaluation*

Monitoring and evaluation of the private sector participation process is necessary through two key steps. These are the regulation of a successful concessionaire throughout the contract and then periodic concession rebidding after the expiry of the contract to allow for adjustments and changes. These steps would address realignment of responsibility and reward amongst participants and the wide range of risks and uncertainties arising during the concession (Zhang & Chen 2013: 89, 96).

Financial regulation during a concession contract maintains awareness to address potential efficiency problems and to ensure its continuous improvement. This is particularly necessary because concession contracts are generally long-term contracts. This view is supported by World Bank, which encourages periodic reviewing during the course of the contract (The World Bank 2017: 147).

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<sup>4</sup> [https://en.wikipedia.org/wiki/Hatfield\\_rail\\_crash](https://en.wikipedia.org/wiki/Hatfield_rail_crash).

<sup>5</sup> Pers. Comm with Arriva Rail, 24 May 2021.

Rebidding *at the end* of each concession would allow new entrants to compete, which would enhance the efficiency for subsequent concessions. Rebidding also maintains pressure on a concessionaire to improve performance in order to raise the chances of being re-awarded the contract after hand-over.

Monitoring and evaluation can therefore address changing conditions during a concession as well as identify lessons that can be being applied to other contracts.

## 5.9 Criteria to identify and prioritize individual opportunities

Although areas have been identified for private sector participation, it does not mean that all opportunities within those areas are financially or economically feasible. The only way to identify suitable opportunities is to perform detailed feasibility assessments for each option. However, there are some indicators that could be used as a filter to pre-select potentially successful projects. They would then need to be taken forward for a more detailed financial and economic assessment.

Table 4 indicates the suitability of rail by market segment (Havenga 2012: 15). The longer the distance and the higher the volume the more suited rail is over road. However, rail can still be competitive even in the lower density markets and terminal density, rail characteristics and product uniformity are all important considerations. It is only the short distance and lower density market segments where rail is really not suitable when compared to road.

Table 4: Suitability of rail by market segment

Market space	Sub-segment	Sub-segment attributes	Relationship to rail genetic technologies	Key requirement from rail and current status
I Low-hanging fruit	DC to DC - Long-distance	<ul style="list-style-type: none"> <li>Long distances, high line density, bi-directional</li> <li>High terminal density</li> <li>High value, uniform/standardised product</li> <li>Between logistics hubs - ideal for intermodal (road/rail)</li> </ul>	<ul style="list-style-type: none"> <li>High speed</li> <li>Light axle load technology (double stacking of containers could require higher axle loads)</li> </ul>	<ul style="list-style-type: none"> <li>Heavy intermodal shuttles - non-existent</li> </ul>
	Pit to plant - Iron ore	<ul style="list-style-type: none"> <li>Long distances, high line density</li> </ul>	<ul style="list-style-type: none"> <li>Low to medium speed</li> <li>Light axle load technology</li> </ul>	<ul style="list-style-type: none"> <li>Inbound sidings - reasonable</li> </ul>
II Higher density, long-distance	Plant to plant/DC - Long-distance	<ul style="list-style-type: none"> <li>Core siding to siding business ideally suited to rail</li> </ul>	<ul style="list-style-type: none"> <li>Low to medium speed</li> <li>Light axle load technology</li> </ul>	<ul style="list-style-type: none"> <li>Outbound sidings - in serious decline</li> </ul>
	Pit to port - Other mining exports	<ul style="list-style-type: none"> <li>Long distances, high density if shared network (core) is monetised as an integrated network</li> </ul>		<ul style="list-style-type: none"> <li>Heavy haul shuttles - established</li> </ul>
	Pit to plant - Coal, manganese and domestic mining	<ul style="list-style-type: none"> <li>Low terminal density challenges remain</li> <li>Non-uniform/standardised product</li> </ul>		<ul style="list-style-type: none"> <li>Inbound sidings - reasonable</li> </ul>
III Low density	Rural manufacturing delivery	<ul style="list-style-type: none"> <li>Long distances, but low density</li> <li>Viable with different operating model where capacity is already installed</li> </ul>	<ul style="list-style-type: none"> <li>Low to medium speed</li> <li>Light axle load technology</li> </ul>	<ul style="list-style-type: none"> <li>Less than train loads - in serious decline</li> </ul>
	Rural agricultural extraction			
	Rural interchanges			
IV Short distances	Plant to plant/DC - Short-distance	<ul style="list-style-type: none"> <li>Distances too short</li> <li>Density too low</li> <li>Not viable for rail</li> </ul>	<ul style="list-style-type: none"> <li>Not viable for rail</li> </ul>	
	DC to DC - Short-distance			

Source: Havenga (2012: Table 2); table reproduced with author permission.

These principles can be applied when identifying suitable projects.

### *5.9.1 Main line freight services*

A South African study (Simpson and Havenga 2013: 73) has estimated the critical density threshold on a pared-down core network at 11.8 million ton-km/route-km, excluding the high-density mining lines and low volume branch lines. This core system currently operates at a density of around 2.1 million ton-km/route-km, meaning that if South Africa is to reach critical density on these lines, then substantial shifts from road-based freight to rail need to occur. This presents many opportunities for private sector participation, should the shift occur.

The private sector logistics companies would be in the best position to determine where the opportunities lie. However, there are some criteria that indicate which of the core lines could be feasible for private sector participation.

Rail competes best against road-based transport when there are long distances and large volumes of freight (Havenga 2012: 13, 14). With this in mind, the Department of Transport National Freight Data Bank<sup>6</sup> can be used to identify corridors suited for rail. An example would be agriculture production, where the high volumes of forestry products in KwaZulu-Natal and Mpumalanga as well as maize in the northern Free State and North-West province could indicate potential opportunities.

Opportunities could also exist where the railway lines align with South Africa's competitive advantages. These would include transporting large volumes of commodities to the special economic zones (SEZs) and industrial development zones (IDZs).

The Gain Group has categorized freight into five categories, of which rail is suited to four. These are large volume export mining flows, domestic mining flows, intermediate manufacturing flows and finished palletized goods. South Africa has established competency or is reasonably competent in the first two and depending on the corridor has between 10% and 100% of the market share. It is in the intermediate manufacturing flows and specifically the finished palletized goods where opportunities lie. Rail has between 10% and 15% of the intermediate manufacturing flow market and less than 2% of the finished palletized goods market<sup>7</sup>. These are rail-friendly freight areas that are affected by growing service failures. They are an ideal opportunity for private sector participation in rail.

The longer the journey the more suitable rail becomes. The overall journey time, including average delays, loading and off-loading, as well as the possibility of accidents must be compared to road-based transport.

The final criteria for assessing projects suitable for main line freight services is the reliability of service. If there are known and frequent delays on some of the lines, then these would make road transport more attractive.

### *5.9.2 Branch lines*

Some private sector participants are of the opinion that branch lines on their own are of insufficient length and freight density to be able to provide the economies of scale for a commercially successful

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<sup>6</sup> <http://www.freightdatabank.info/#!/industries>

<sup>7</sup> PowerPoint presentation contained in email from Prof. Jan Havenga, dated 31 May 2021.

operation. However, there are some criteria that could indicate whether branch lines might be successful.

The critical density for the core network of 11.8 million ton-km/route-km can be used as a guide for the branch lines. This correlates with the common opinion of rail experts that 10 to 15 million tons of freight is required per annum for commercial viability. Freight volumes relative to a 10 to 12 million ton-km/route-km range would indicate the extent to which revenue would cover costs and the extent of possible state intervention.

The longer the branch line the more viable it generally is. It is noted from the branch line strategy that the average length of the branch lines in South Africa is 98.5km (Department of Transport n.d.: 30). It is suggested that this be used as a starting point and only branch lines in excess of this average length be considered for further assessment.

The further a branch line is from its final destination point the more attractive rail transport becomes. Branch lines close to the final destination would imply that road-based transport solutions would be quicker to market and more versatile. Furthermore, if private train operators are granted access to the core network, then long haulage distance represents an opportunity to recoup revenue.

Competing road alternatives would need to be considered. The region's accessibility and how well it is served by other forms of transport would affect the shift to rail.

In terms of freight types, there should be at least one non-seasonal commodity type or two complimentary commodities to balance out seasonality. Additional opportunities, such as third-party passenger services or tourist trains, would increase the attractiveness of the branch line.

Risks would need to be assessed. For example, droughts would affect agricultural freight. A single year of drought could wipe out financial feasibility. The private sector has also indicated that dependence on annual subsidies from the state, which would improve the financial viability of a concession contract, could be unsustainable and a major project risk for the long-term.

### *5.9.3 Rapid rail intercity service*

Rapid rail intercity services are generally viable between conurbations of six million inhabitants that are separated two to four hours apart. The national white paper on rail identifies the Gauteng-eThekweni corridor as a potential route, with population estimates on either end exceeding six million by 2045 (Department of Transport 2017b: 65, 66) and total travel time around three hours.

Criteria that would need to be considered in evaluating opportunities are:

- Total travel time for competing road and air options. This would include check-in time, average delays and travel time to and from stations and airports.
- Size of population and growth over time and differentiated by household income. Rapid rail intercity services would compete with both air travel and road transport and would need to target passengers willing to pay for the service.
- Opportunities and markets along route. While these would contribute to the viability of the service, there should not be too many stops along the way because this would reduce the competitive advantage of the service.
- Geographic barriers. The escarpment between eThekweni and Gauteng would impact on route location and either increase the travel time or construction and operating costs.

#### *5.9.4 Commuter service*

Commuter services are generally not financially feasible as a rule and are classified as negative concessions. Each potential project would need to be assessed on a case-by-case basis to quantify the potential subsidy required for financial feasibility. The private sector has indicated that they consider the long-term sustainability of subsidies a major risk for participation. So too is political interference. Commuter services that include government subsidies would possibly offer insufficient returns to compensate for such risk factors.

General factors to consider when assessing potential commuter routes would be:

- The number and growth of commuters.
- Municipal development plans.
- Current and projected road congestion.
- Total travel time. This would include walking or travelling to and from stations, waiting time at the station and the efficiency of feeder and distribution services.
- Safety and comfort on board a train.
- Out-of-pocket costs.
- Opportunities at train stations, such as shopping and banking.

#### *5.9.5 Municipal infrastructure*

The upgrade of urban rail infrastructure has been identified as one of the main areas by TFR requiring attention and for possible private sector participation. This area needs to be explored in more detail with TFR but preliminary criteria for assessing projects would be the effect of the upgrade on the overall transport and distribution chain and the impact of the upgrades on rates paid by affected firms.

#### *5.9.6 Terminal operations*

Terminal operations would be best identified by the two SOCs and private sector operators. Some criteria that would indicate attractiveness though are the volume of freight and passengers, the dominance of any one private service provider and potential development opportunities related to the terminal.

#### *5.9.7 Areas not prioritized*

TFR has voiced the concern about those areas where a participation gap could occur. These would be areas that do not attract private sector interest and where TFR would not like to operate either.

The starting point in establishing a strategy to deal with these areas would be to understand why the private sector is not interested. This could be due to the unreasonable allocation of risk or undue demands for maintaining the network. The concession might simply not be financially viable. If this is not easily addressed then TFR could consider outsourcing aspects of the contract, such as marketing. This could be a first step towards identifying new opportunities and fostering private sector interest.

A full financial and economic feasibility assessment of the gap area should also be undertaken. This would determine the feasibility of the area and extent of subsidy. Its strategic value within the rail

network should also be determined. Should all these assessments indicate that the gap area is undesirable and has little or no strategic value then it should be discarded and closed down. Keeping it operational would be a waste of scarce resources.

## **5.10 Access principles**

Many of the principles underlying access, trackage rights, network control and agreements permeate throughout the previous steps of the strategy. Some of the more important principles are highlighted here.

### *5.10.1 Core network access*

Certain access principles are important to encourage private sector participation. All private sector role players interviewed indicated, without exception, that they need to retain control of their train sets and be responsible for loading, unloading and train turn-around times. Client satisfaction depends on this service excellence and even though delays are caused from vandalism in the railway system, efficient turnaround at the terminals is critical. The separation of TFR into an Infrastructure Manager and an Operations Manager (Department of Transport 2017b: 8, 41) is an important first step in addressing possible access to the core network by private train operators and being allowed to retain control of their train sets.

Currently, third party access to the core network is limited and the branch line model only allows concessionaires access as far as a marshalling yard or access point, where TFR takes over control of the train to final destination. TFR then returns the train (mostly empty) to the marshalling yard for the concessionaire to reuse. TFR would deliver according to contracted turnaround times but is not incentivized to improve on these or to innovatively address delays outside of its control.

TFR invoices the client directly for haulage services on the core network, revenue that is lost to the concessionaire. It is known worldwide that branch lines are generally not financially feasible and require some form of subsidy. The private sector could earn long-haulage revenue on the core network, which distance is often longer than on the branch line. This would improve the financial viability and reduce the need for government grants and subsidies for branch line concessions.

The upside of allowing the branch line concessionaire access onto the core network from a service delivery perspective is that the concessionaire can seamlessly transport the freight from origin to destination and minimize delays at interfaces where traction changes need to be made. The downside is the loss in economies of scale if TFR consolidates the branch line freight with other freight on a train set. Each concession should at least have the option of assessing the most cost effective and efficient delivery mechanism. The appropriate core network access and haulage agreements should then be incorporated into the concession agreement.

### *5.10.2 Access charges*

Private operators would still need to be charged for using the core rail infrastructure, to pay for its maintenance and upkeep. With this in mind, trackage rights and access and haulage agreements should be structured in such a manner as to encourage, rather than penalise, private sector involvement. Access pricing typically consist of three components – an access fee for the right for licenced operators to access the core network; a path charge based on the length and utilization of route; and a volume charge based on the type of freight, freight volumes or passenger numbers. The detailed examination of these three components is beyond the scope of this assignment, but access pricing would require

sufficient investigation to avoid unintended consequences, such as the overloading of trains or encouraging long train sets. The access pricing regime needs to be transparent and fair to all participants, to not negatively impact on any party and to operate within capacity constraints on each line.

The current core line access fee proposal is to have a standard access fee, based on high volume freight<sup>8</sup>. Concessionaires are concerned that luring customers back to rail is heavily price sensitive. Initially, volumes would be low and being charged standard access charges based on higher volumes of freight would threaten the commercial viability of the concession. It is therefore recommended that either a variable pricing regime be considered or that access pricing holidays be considered for the early stages of a concession. An alternative consideration is to implement a bidding process, whereby concessionaires and private sector operators would bid for time slots on sections of the rail network. This needs to be carefully managed to ensure that the concessionaire eventually contributes fairly to the upgrade and maintenance of the core network and that competition between concessionaires is not negatively affected. This requires further investigation to understand its practicality.

### *5.10.3 Network control*

It is acknowledged that granting third party access to the core network, and thus vertical separation, would increase the operational management complexity of the infrastructure manager. This can be carefully managed with appropriate contractual notification guidelines and operational software to optimize signal and train control systems. It is not only the real-time operations of the trains that would need to be monitored, however, but also the performance of each party, by each other. Sub-standard performance impacting on other parties should be subjected to penalties and fines, as negotiated and stipulated in the concession agreement.

The concession agreements should also define the responsibility and appropriate remedial course of action for delays or accidents caused by either party.

## **6 Conclusion**

This research report set out to develop a strategy to encourage private sector participation in rail. It did this by examining the current policy environment and lessons from other private sector participation processes, both in rail and other industries in South Africa and on the continent. A set of guiding principles was established on which to build the strategy framework.

The private sector strategy consists of a framework with ten steps. The starting point was to identify the potential participants and to establish their motivation for and against participation. The next steps were to identify the areas of potential participation and to understand the economic and financial considerations for each. The participation areas were then prioritized for each participant, compared to determine alignment and to identify which were taken forward. Alignment of objectives would ensure a greater willingness to collaborate and therefore a greater chance of partnership success. This would also allow collective solutions to challenges facing the rail industry in South Africa.

Seven areas were identified where all three participants would be willing for the private sector to participate and a further five were identified as possible options. These priority and possible areas related to freight services on all lines, terminal operations, commuter services, rapid rail intercity,

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<sup>8</sup> Pers. Comm with potential private sector concessionaire.



marshalling yards, private sidings and asset services (such as municipal infrastructure upgrades, rail infrastructure upgrade and maintenance concessions and the provision and leasing of rolling stock). The only identified areas there were not prioritized for private sector participation were passenger services on main, branch and private lines (but excluding commuter services) and stand-alone station operations.

Several contractual mechanisms and their implementation were investigated. The most prominent mechanism implementation is to separate rail infrastructure upgrade and maintenance into a separate concession contract from private rail operators. An availability-based contract would see the infrastructure concessionaire remunerated for providing rail infrastructure at a predetermined level of service, for use by the TFR train operator or PRASA and other private sector operators. This contract arrangement allows for a fair distribution of risk, which would also improve the attractiveness of commuter services to the private sector. An availability-based contract for commuter services would see the government take on demand-side risk and allow the private sector concessionaires to concentrate on train services, rolling stock and rail infrastructure maintenance.

Several conditions for the successful implementation of the rail mechanisms were identified, with the most important being the existence of the economic regulator, the establishment of a dedicated government entity with a procurement office to oversee the participation of the private sector, and to promote competitive bidding. This could be done at the tender stage but could also be extrapolated to paying for time slots on the core network. It is recommended that the latter bidding opportunity be explored further.

The only means of determining the financial and economic viability of opportunities within any of the participation areas is to undertake a detailed financial and economic assessment. However, rail's competitive advantage over road-based transport is volume and distance. Freight opportunities that offered higher volume over longer distances and with fewer competing transport alternatives would have a high chance of success, but terminal density, rail characteristics and product uniformity are all important considerations. It is really only in the short distance and lower density market segments where rail does not compare well to road transport. Congested urban areas with high growth potential could also indicate successful commuter projects.

## **7 Recommendations**

The following recommendations are made based on this strategy:

1. Establish a government entity with the capacity and skills to engage with the private sector to oversee the process. Included within this entity should be a rail procurement office.
2. Focus on seven participation areas prioritized by all three participants and the five threshold areas. Investigate options for increasing the attractiveness of the five threshold areas. The areas that are not prioritized are passenger services on main, branch and private lines (but excluding commuter services) and stand-alone station operations.
3. Subject each opportunity to an economic and financial analysis to determine feasibility as well as whether best delivered by the state or the private sector.
4. Periodically refine the weighting and scoring in the multi-criteria identification matrix used to prioritize participation areas. This would reflect changes in the economy and the policy and operating environments.

5. Determine potential opportunities in the prioritized areas, share with the private sector and TFR/PRASA and invite feedback. This will be an indicator of appetite by participation area and can also be used to continually refine contractual issues and processes.
6. Separate the rail infrastructure upgrades and maintenance contract from rail services. This will spread risk and ensure that the correct firms focus on the necessary areas.
7. Develop a transparent tender process. The tendering process should make use of standard forms and contracts applicable for the industry. The tenders should be tailored to the complexity of the opportunity being advertised.
8. Allocate risk to the appropriate participant, ensure this is stipulated in the contract and that all role players are aware of the allocation.
9. Investigate whether competitive bidding for train slots on the core network is a practical solution.
10. Policy consistency is important. If, as the white papers state, rail is the backbone of land-based transport then ensure that rail is prioritized over other forms of transport. Ensure that this is understood and enacted throughout all tiers of government and TFR/PRASA.
11. Establish the transport economic regulator with capability to oversee rail.

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# Appendix

Table A1: Multi criteria identification process scoring and weighting

Major Category	Weighting	Sub-Category	Sub-Weighting	Prioritisation Criteria	Sub-Sub-Weighting	Strategic Branch Lines		Main Line Operator		Terminal to Terminal		Commuter Pax	Private railways		Rapid Rail IC	Marshalling Yards	Stations	Private Sidings	Terminal Operations	Muni. Rail Infrastructure	Infrastructure upgrade and maintenance	Leasing Rolling Stock	
						Freight	Pax	Freight	Pax	Freight	Pax		Freight	Pax									
<b>Government Perspective for Private Sector Participation</b>																							
Externalities	40%	Economic	40%	Low road maintenance	40%	5	2	5	2	5	2	4	5	1	3	1	1	3	5	5	4	3	
				Reduces road congestion	25%	1	3	3	1	1	3	5	1	2	2	1	1	3	5	5	4	3	
				Reduced road accidents	35%	3	4	3	4	3	4	5	3	4	5	1	1	3	5	5	4	3	
		Social	30%	Improves rural growth	33%	3	5	1	2	3	4	1	2	3	1	3	1	3	1	1	1	3	1
				Improves inclusion	33%	1	5	1	1	1	5	3	1	4	1	3	1	1	1	2	3	1	
Environmental	30%	30%	Limits job losses (losses = 1, none = 5)	33%	3	4	3	4	3	4	2	5	5	5	2	3	5	3	5	3	3		
			Reduces pollution	100%	5	4	5	4	5	4	4	5	3	5	1	1	3	2	5	4	5		
Contribution to Economic Growth	40%	Sectoral	30%	Agriculture	20%	5	2	5	1	5	1	1	5	2	1	3	1	4	5	1	4	4	
				Mining	20%	5	2	5	1	5	1	2	5	2	2	3	1	4	5	1	4	4	
				Manufacturing	20%	3	1	4	1	4	1	4	4	2	5	3	3	4	5	5	4	4	
				Logistics	20%	3	1	5	1	5	1	1	5	1	1	1	1	4	5	5	1	5	
				Tourism	20%	1	5	1	5	1	5	1	1	4	4	5	1	3	1	1	1	1	3
		Strategic Infrastructure Projects	30%	Five Geographic SIPs - Transport Corridors	71%	2	1	5	1	5	1	1	3	1	1	3	2	2	5	1	5	5	
				Integrated urban space and public transport	14%	1	2	1	2	1	1	5	1	3	5	1	5	1	1	4	5	5	
Market Place	40%	40%	Agri-logistics and rural infrastructure	14%	5	5	3	1	4	1	1	3	1	1	5	3	3	3	1	4	4		
			Number of Opportunities	50%	3	1	5	1	4	1	5	3	2	3	5	5	5	3	5	5	5		
Subsidies	20%	New subsidy	40%	Tender and services competition	50%	2	1	5	1	4	1	3	5	4	3	5	5	5	3	2	5	5	
				Requires a rail subsidy (1 = full, 5 = none)	100%	4	1	5	2	5	2	1	5	3	3	5	5	5	5	3	4	5	
		Removes existing subsidies	60%	Removes TNPA / Transnet subsidy	33%	5	3	4	1	4	1	1	1	1	1	2	2	1	2	3	4	4	
				Reduce PRASA subsidy	33%	1	1	1	5	1	3	5	1	1	3	1	4	1	1	2	4	4	
				Reduce bus subsidy	33%	1	5	1	4	1	5	5	1	3	3	1	3	1	1	3	3		
<b>Total for Government Perspective</b>						<b>3.1</b>	<b>2.6</b>	<b>3.8</b>	<b>2.2</b>	<b>3.7</b>	<b>2.5</b>	<b>3.0</b>	<b>3.4</b>	<b>2.5</b>	<b>3.0</b>	<b>2.6</b>	<b>3.2</b>	<b>3.3</b>	<b>3.2</b>	<b>4.0</b>	<b>4.0</b>		
<b>Private Sector Perspective</b>																							
Financial	33%	Revenue and Costs	50%	Revenue covers costs	50%	3	1	5	1	5	1	1	5	1	3	3	4	3	5	3	4	5	
				Requires a capital subsidy (1=full, 5=none)	20%	3	1	4	2	4	1	1	5	3	2	5	4	5	5	3	4	4	
				Requires an operating subsidy	10%	4	1	5	1	5	1	1	5	2	1	5	4	5	4	5	5	5	
		Risk	50%	Extent of capital investment	20%	3	3	4	4	4	4	3	1	2	1	4	2	1	1	1	1	1	
				Risk exposure (1 = high, 5 = low)	20%	1	1	3	2	2	2	1	5	3	2	5	4	5	4	3	3	4	
				Choice of operator (BLOM)	20%	2	2	5	5	3	3	2	5	5	5	5	3	5	5	5	4	5	5
				Number of Opportunities	20%	2	1	5	1	4	1	3	2	1	1	5	5	4	3	5	5	5	
Production-distribution chain	33%	Control distribution	100%	Asset vandalism (1 = high, 5 = low)	20%	3	4	2	1	1	1	1	4	4	5	5	4	5	4	1	1		
				Outdated technology	20%	2	2	3	2	3	1	2	5	5	5	2	3	4	4	1	4	5	
Operational / Planning	33%	100%	Reduce costs	50%	3	1	4	1	4	1	1	4	1	1	4	1	3	3	4	2	4		
			Reduce delivery delays	50%	3	1	4	1	5	1	1	5	1	4	5	1	5	4	5	3	3		
			Access to core network	20%	2	3	1	1	1	1	5	5	4	5	4	5	3	5	4	5	4		
			Requires high level of service	20%	3	2	3	1	3	1	1	5	2	1	3	4	3	3	3	5	3		
			Currently / recently in use	20%	1	1	3	1	2	1	2	5	5	5	5	2	2	4	1	4	3		
Operational efficiencies (length)	20%	10%	Interoperability	10%	2	2	4	4	1	1	5	5	4	4	3	5	5	4	4	4	3		
			Operational efficiencies (length)	20%	1	1	5	2	3	3	4	5	3	3	3	3	3	2	2	5	5		
			Direct rail link (looping): origin to destination	10%	5	5	3	2	1	1	5	5	5	5	5	5	5	3	5	4	5		
<b>Total for Private Sector Perspective</b>						<b>2.6</b>	<b>1.6</b>	<b>3.7</b>	<b>1.5</b>	<b>3.4</b>	<b>1.3</b>	<b>2.0</b>	<b>4.6</b>	<b>2.5</b>	<b>3.0</b>	<b>4.1</b>	<b>2.9</b>	<b>3.6</b>	<b>3.8</b>	<b>3.6</b>	<b>3.9</b>		
<b>TFR / PRASA Perspective for Private Sector Participation</b>																							
Operations	40%			Can focus on core operations	13%	5	5	4	5	2	5	5	5	5	5	4	5	5	5	5	5		
				Pvt sector need to access core network	13%	3	2	1	1	1	2.5	5	5	5	5	5	4	5	5	5	5	5	4
				Network loss of control	13%	4	4	1	2	1	2	4	5	5	5	5	3	4	4	3	5	4	4
				Reduce risk	13%	4	4	4	4	3	3	4	5	5	5	5	4	5	5	5	5	4	5
				Potential to remove bottlenecks	13%	1	1	2	1	3	1	2	1	1	1	1	4	1	3	5	5	5	3
				Limits job losses	13%	3	4	3	4	3	4	2	5	5	5	5	2	3	5	3	5	3	3
				Increased growth	13%	4	1	4	1	4	1	3	5	2	4	1	1	4	4	3	5	1	1
Financial	60%			Potential to create a private monopoly	13%	5	5	3	3	3	3	4	1	1	2	4	3	1	1	4	3	2	
				Frees up balance sheet	25%	5	3	2	1	3	2	5	3	2	4	4	5	2	5	4	5	5	
				Revenue from network access fees	25%	5	2	5	3	5	3	2	1	1	1	2	1	1	1	3	1	3	
				Revenue from lump sum concession fees	25%	3	2	1	1	2	2	3	1	1	1	4	5	1	5	3	5	3	
Pvt sector participation reduces revenue	25%			Pvt sector participation reduces revenue	25%	5	5	1	2	3	2	3	5	3	4	1	5	5	5	5	1		
				<b>Total for TFR / PRASA Perspective</b>						<b>4.2</b>	<b>3.1</b>	<b>2.5</b>	<b>2.1</b>	<b>3.0</b>	<b>2.4</b>	<b>3.4</b>	<b>3.1</b>	<b>2.5</b>	<b>3.1</b>	<b>3.0</b>	<b>3.8</b>	<b>3.0</b>	<b>3.9</b>

Source: author's illustration, weighting and scoring.