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**Review of the work since the sixth session of
the Working Party on Public-Private Partnerships
on 1-2 December 2022**

Standard on Public-Private Partnerships in Railways¹

**Implementing the United Nations Agenda for Sustainable Development
through effective “Public Private Partnerships for the Sustainable
Development Goals”**

Revised submission by the Bureau

Background

1. The following revised standard, originally published on 10 September 2018 in document ECE/CECI/WP/PPP/2018/6, contains policy recommendations targeting governments which are considering the development and implementation of Private-Public Partnerships (PPPs) in the railways sector.

¹ The ECE PPP standards, guiding principles, best practices, declarations and recommendations are endorsed and adopted by acclamation by the ECE intergovernmental bodies – the Working Party on Public-Private Partnerships and the Committee on Innovation, Competitiveness and Public-Private Partnerships – and do not impose any obligations on member States as their implementation is entirely voluntary.



2. It was prepared by a ECE Project Team² composed of international experts³ with PPP experience in the railways sector and sustainable development initially led by Jonathan Beckitt and then by Naresh Bana.
3. The document⁴ was finalised by the secretariat following a public consultation as envisaged by the Open and Transparent Standard Development Process with input from various agencies, organisations, and individuals.
4. The document was endorsed by the Working Party on Public-Private Partnerships at its second session on 20-21 November 2018 and was adopted by the Committee on Innovation, Competitiveness and Public-Private Partnerships (the Committee) at its thirteenth session on 25-27 March 2019.
5. The document is being reissued pursuant to a decision by the Committee at its fifteenth session on 25-27 May 2022.⁵
6. The Bureau is very grateful to Naresh Bana and Jonathan Beckitt for leading the Project Team; to Anand Chiplunkar for sharing his vast experience of working in this sector; and to Scott Walchak for managing the work of the Project Team.

² The ECE draws attention to the possibility that the practice or implementation of this document may involve the use of a claimed intellectual property right. This document is based on the contributions of participants in the Public-Private Partnerships standard development process, who have acknowledged that all new intellectual property rights generated belongs to the ECE and have also agreed to waive enforcement of their existing intellectual property rights used in the Public-Private Partnerships standards against any party using the outputs.

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³ The list of experts involved in the work of the Project Team is available at: <https://wiki.unece.org/display/pppp/P0005-Team+members>

⁴ The document benefited considerably from a review of published information and the responses to detailed questionnaires from public and private sector organisations with experience of programmes of this kind.

⁵ Decision 2022 – 4b.2 (ECE/CECI/2022/2): Regarding the continued use of the name “People-first PPPs for the SDGs”, the Committee took note of the results of the information consultations conducted with interested delegations on the matter since the fifth session of the Working Party on PPPs in November 2021, and decided to:

- (i). Change the name to “PPP for the SDGs”; and
- (ii). Progressively reissue the documents endorsed and adopted by the Committee and the Working Party on PPPs to reflect i. above within the document quota allocated to the ECI subprogramme and without incurring additional costs.

The Committee requested the secretariat to reissue three core documents within twelve months, and the rest of the documents within three years. The Committee requested the Bureau of the Working Party on PPPs to decide on which non-core documents should be prioritised during this period.

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I. Introduction

7. The development of railways traditionally has been in the public-sector domain considering its potential contribution to economic and social development which is the typical focus of a government. It is capable of high levels of passenger, commodities and goods transport, with a higher energy efficiency (compared to roads) but is often less flexible and more capital-intensive than roads. It was only in the 1990s that PPPs were introduced in this sector.

8. The Sustainable Development Goals (SDGs) of the 2030 Agenda are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. Railways are important for directly achieving the targets in Goals 5, 9 and 11 on sustainable and resilient infrastructure and promoting inclusiveness to support economic development and human well-being, with a focus on affordable and equitable access for all. Indirectly, railways are also important through their contribution to achieving the targets in Goals 2, 3, 5, 8, 9, 11, 12, 13 and 17 at the national level for the provision of food security, healthy wellbeing, inclusive and sustainable economic growth, and employment opportunities through sustainable consumption of resources for climate change action. To realise this, the 2030 Agenda recognises that successful delivery of the SDGs will depend on global partnerships and cooperation between public, private and civil society.

9. The ECE supports the use of global partnerships for sustainable development and has produced this standard to provide guidance to governments considering the use of PPPs for the SDGs⁶ to deliver investment in railway infrastructure as a way of meeting the Goals.

II. Objectives of the standard

10. If managed well, PPPs in the railways sector can help governments tackle development needs by bringing sustainable investment, replicable processes and expertise to complex railways systems. This standard is intended to assist governments in the successful use of PPPs in the railways sector as a step towards achieving the SDGs and specifically the achievement of PPPs for the SDGs.

11. There are many different PPP models in the railways sector worldwide. The challenge for governments developing PPPs in railways is to ensure consistency between their project delivery strategy and programme, and the achievement of the Goals and PPPs for the SDGs.

12. The traditional concept of Value for Money has limitations when assessing projects being designed for PPPs for the SDGs. Value for Money (VfM) is usually at the core of virtually all PPPs and figure large in the public sector's decision-making process. It is based on economy, efficiency and effectiveness (3Es) considerations and areas like procurement and administration costs have been the focus of VfM considerations. A railways PPP would therefore be considered a VfM transaction if it generates a net economic benefit for the public in terms of the project outputs related to quantity, quality of the service or facility, cost and risk transfer over the project life, achievement of various transportation related goals, etc. and do so in comparison to the traditionally procured public approach.

13. However, assessing the outputs, outcomes and impacts of the project in improving people's lives is also equally important. A PPP for the SDGs should therefore be assessed on the basis of a Value for People approach that is aligned to the achievement of the SDGs. A Value for People approach means projects should address critical challenges facing humanity, fighting hunger, poverty, and promoting human wellbeing by increasing access to

⁶ A detailed introduction to PPPs for the SDGs is contained in document ECE/CECI/WP/PPP/2022/6.

essential services, tackling a social agenda promoting social cohesion, overcoming inequalities, achieving gender equality and empowering women; and disavowing all forms of discrimination based on race, ethnicity, creed and culture. Projects should bring resilience into infrastructure and mitigate risks and adapt it for climate change; lower CO₂ emissions and take on the practices for the circular economy developing more sustainable production and consumption patterns.

14. Accordingly, the VfM assessment (with due consideration of its limitation mentioned earlier) needs to be broadened to include equity along with economy, efficiency and effectiveness. A Value for People approach includes not only a VfM basis but also proposes that projects' performance be measured by their outcomes and impacts that brings the greatest benefit to the people measured with respect to the SDGs. As a result, this standard recommends Value for People should play a fundamental role (implicitly assessing VfM as well) in the decision of whether a public institution should enter into a railway PPP agreement to be acceptable as a PPP for the SDGs.

III. Scope of the standard

15. This standard offers guidance on best practice in relation to the development and implementation of PPPs in the railways sector. PPPs in railways is capital investment that can be funded through a concession using commercial finance which is repaid over a long-term concession period. The concessionaire may fund all railways infrastructure, including railway stations and rolling stock; or fund portions of railways infrastructure such as track and systems or maintenance facilities and operations. This is to be distinguished from light railways transit (LRT) and other metropolitan/urban railways systems such as metro railways, monorails, subways, skybus and others which focus primarily on ferrying passenger traffic and providing transit solutions within urban settings.

16. For the purpose of this document, the term PPP programme is defined as a framework and/or series of projects under which a public authority grants long term contracts (with a duration typically exceeding 20 years) to a private sector partner for the design, financing, construction or refurbishment, operation, and maintenance of railways facilities and the provision of related services. The term 'public authority' may include a national or local governmental department, a regulator, or other public entity tasked with implementing railways infrastructure. The operation of these railways networks and/or infrastructure often includes the provision of operation and maintenance services.

17. Under most PPP arrangements for railways, the private sector partner will raise private capital to pay for the new or renewed infrastructure, which will be repaid in most cases by a users' payment or a service concession (e.g. availability payment structure) from the public authority. These repayment structures can also be offset by railways related lease or rental fees (e.g. commercial or retail space along the network) paid in whole or in part to the private partner. In most cases these agreements remain in effect so long as the facilities and services meet the performance requirements and outcomes specified in the agreement.

IV. Central questions

18. To achieve the SDGs, significant investment in the improvement of railway infrastructure is required. The Goals indicated in the tables in Annex I. are considered particularly relevant to governments to achieve success with their railways programmes.

19. Noting that railways have both a direct and indirect role in contributing to the achievement of the Goals, it is necessary to link several different SDGs targets to railways projects. Goals that can be directly influenced and monitored in a project at an output or

outcome level, and those more related Goals to which the project can contribute indirectly at the impact level.

20. Suitable indicators (refer Annex 1, Table 1.1 and Table 1.2) need to be included in the PPP for the SDGs' contracts for monitoring the direct contributions to the Goals at the project level, and governments need to monitor the indicators that result in indirect contributions to achievement of Goals. The Goals are considered relevant when undertaking railways projects.

21. This document proposes a PPP model that is designed to assist governments in achieving their Goals, and in doing so place people high in the priorities of their PPP projects and programmes. These PPPs for the SDGs are driven by outcomes and require projects to bring real transformational change and benefits to people; they must go beyond VfM and deliver Value for People. They must contribute to the achievement of Goals mentioned above, in addition to the traditional PPP outputs.

A. Public-Private Partnerships in railways in support of the SDGs

22. Efficient logistics systems are essential for optimal growth in a country or region, and transport is one of the most important components in logistics. PPPs for the SDGs in the railways context is *inter alia*, railways that contributes to poverty eradication and the creation of economic opportunities through enhanced modes of transport systems that are more efficient, create less dependency on fossil fuels, and reach further to provide greater access and mobility to vulnerable members of society. Railways helps reduce transaction costs not only by lowering prices but improving the variety and availability of goods while enhancing labour mobility and helping reduce regional inequalities. Railways lines are viable from both an economic and business perspective but also provide a more durable and sustainable option for transport which benefits the environment, the government, and the communities they impact. While transport is one of the greatest sources of greenhouse gas emissions, railways transport is viewed as relatively less harmful than private cars and trucks.

Project types and examples of Public-Private Partnerships in railways

23. There are several contractual approaches for PPPs in the railways sector. Traditional PPPs can be adapted to suit the transport system needs but they need to be further designed to achieve the desired outcomes and impact contributions of a government. The predominant focus of railways PPPs falls into one of four categories:⁷

(a) Private vertically integrated railways: The entire railways infrastructure is owned, built, and maintained by a single operator that has the most exclusive use of the railways;

(b) Privately shared, vertically integrated railways: the same as (a) above but the operator has obligations to share the railways infrastructure with third party users, albeit it might be granted an initial exclusivity period;

(c) Below railways service providers: the operator of the railways provides railways infrastructure to separate rolling stock operators, similar to a toll road; and

(d) Above railways service providers: the operator provides railways transport services (passenger and/or freight) using railways infrastructure it does not own.

⁷ PPP Knowledge Lab of the World Bank Group. WB Group
<https://pppknowledgelab.org/sectors/railways#models>

24. Depending on the need for services, investment can be sought in any of the four project types:

25. (a) **Equipment / rolling stock / railways terminals / depots in Public-Private Partnerships**⁸ where specific railways related equipment and systems (train control systems, signalling, train sets) are provided by the private partner to the government with a long-term obligation to finance, design, build, commission, operate, maintain and hand over those assets; or where the private partner is responsible for financing, building and operating support infrastructure facilities such as railways terminals or depots for the provision of railways services, or for upgrading, operating and maintaining existing facilities.

26. (b) **Airport Railways Link (ARL) Public-Private Partnerships** where the private partner builds, operates and transfers a stand-alone railways line to and from an airport. These railways systems typically run between downtown/urban areas and outlying airport facilities and are dedicated to airport traffic, although some have other service and stops and tie into larger urban railways networks.

27. (c) **High Speed Railways (HSR) Public-Private Partnerships** where a private operator constructs a high-speed railways line that typically connects adjoining urban centres and is typically an adjunct to but is not connected directly to conventional railways lines, and upon completion many high-speed railways lines are open to different train operators.

28. (d) **Conventional Railways Lines** where the private partner is responsible for the entire railways system to be built, designs some or all the system, constructs the infrastructure, installs the systems and rolling stock, then operates the line for the life of the contract and transfers it to the public sector thereafter.

29. Three additional criteria can be used to classify above types of projects depending on the interfacing with other systems, scope and coverage of operations and the commercial risk allocation:

(a) **interfacing:** stand-alone “all included” projects versus interlocked “parts of a larger system” projects;

(b) **operation:** infrastructure/asset only versus integrated infrastructure/asset and train operations; and

(c) **commercial risk:** availability-based concessions versus traffic-based concessions.

Common contractual arrangements for Public-Private Partnerships in railways

30. PPPs in railways are typically concession arrangements where the private sector is afforded under contract the right to install and/or operate a railways line or its major components or terminal infrastructure. Depending on the compensation method these concessions can be:

⁸ Procurement alternately may be done through a supply contract with the private sector, with no private sector finance that is repaid over the concession period, for the manufacture of rolling stock, including railways maintenance facility to service the rolling stock; or for related railways equipment for railways services, or specific railways-related equipment and systems (train control systems, signalling, train sets), with a long-term obligation to maintain these supplies. It is important to note that these are not PPPs. These are classic manufacture and production factories, however specialized and sector-specific such manufacture is, supplying the products with or without off-take guarantees. These are viewed as supply-contracts and have few of the financing characteristics which are seen in PPPs. PPPs are traditionally used with some project finance for provision of the actual asset and related services.

(a) “traffic” based or “user pay” where the private partner is compensated for its capital investment and/or effort by the users of the system (e.g. ticket sales / fares); or

(b) “availability” based where the private partner is compensated for making the system available and operating at a minimum standard, regardless of the ridership and fare box, if any.

31. PPPs in railways are furthermore most often structured contractually as:

- **DBFOMT** (Design, Build, Finance, Operate, Maintain and Transfer) contracts where the concessionaire takes construction and operation risk over the life of the railways concession, as well as, in some cases, traffic risk;
- **DBFMT** (Design, Build, Finance, Maintain and Transfer) contracts where the concessionaire takes construction and maintenance risk of the railways system, similar to the above contract (DBFOM), but operation (and the risk associated with operation) is retained by the public authority;
- **DBFT** (Design, Build, Finance and Transfer) contracts where the concessionaire is responsible only for building the railway infrastructure and the associated financing; and
- **O&M** (Operation and Maintenance) contracts where the railways construction is pre-existing or is procured separately by the public authority and the concessionaire only takes on operational and maintenance responsibilities.

B. Pros and cons of Public-Private Partnerships in the railways sector⁹

32. Risks in PPPs in railways projects are to be approached with care to ensure identification, categorization, thorough understanding and, thereafter, apportionment based upon the needs of the parties and the viability, efficiency and sustainability of the project. Evidence has shown that there are mainly three causes of failure of PPPs in railways: political risk, complexity risk and commercial risk. For example, safety regulation structures are particularly important to the operational environment of a PPP in railways and need to be carefully addressed and changes in those requirements anticipated. Governments must therefore select the right delivery approach and better understand the risks and their mitigation measures while evaluating the pros and cons of PPPs in railways.

Political risk

33. Railways projects are particularly susceptible to political opportunism where a project is justified for political benefit but has poor economic justification and/or is financially strained from its inception and unlikely to survive. Typically, governments apply three types of pressures: the line must be built; the trains must run; and price/quality must be acceptable. The resulting risk must therefore be carefully mitigated.

⁹ A comprehensive study of 27 railways PPPs until 2012 has been done, in order to observe long term trends and to quantify the potential of failure or success of such PPPs. It provides useful lessons and emerging trends.
Julien Dohornoy, Public-Private Partnerships in the railways sector – A review of 27 projects, Munich Personal RePEc Archive (MPRA) Working Paper, April 2012.
https://mpr.a.ub.uni-muenchen.de/38415/1/Dehornoy_Review_of_railways_PPPs_2012_.pdf

Complexity risk

34. Railways systems are inherently complex. There are multiple operational systems, from safety to signalling and security, and virtually all lines intersect or interact with road networks, other railways lines (e.g., passenger and/or cargo), and interface with other uses along the route and at its terminus. The project is therefore complex, with many moving parts, and the risk allocation is similarly complex.

35. Will the private partner or the public entity bear the risk of policing the system? Who will monitor ticketing and fare enforcement? What occurs when the service is delayed because of another mode of public transport or a line blockage? Who bears the risk when a governmental inspector identifies a safety issue and must halt the system? What if local or regional leaders increase a tax such that the fare is now insufficient to cover the cost of operations? What if a permit isn't issued and there is now delay in delivering the system for service?

36. Safety regulation in a railways project, especially in one which entails passenger/public safety, is most commonly the responsibility of a public sector-appointed independent or quasi-independent entity. The entity will have the technical expertise to conduct safety-audit(s) and the authority to certify the railways system is fit for operations. The PPP contract would therefore have to build in the role of such an entity including, typically, its permission to enter, inspect, and the resulting impact on commencement and continuation of commercial operations. Additional aspects which would have to be addressed include the mechanism for investigation of railways accidents as, in most countries, this rests with an identified authority whose findings are binding. This also involves accountability in the case of failures, monetary compensation, accident relief services, etc.

Commercial risk

37. Railways PPPs are perhaps the perfect example of how and why Public-Private Partnerships can be an effective tool for government. Railways systems, while long lasting and offering significant direct and indirect development opportunity, can be prohibitively expensive. As the initial capital investments are large and construction of railways lines can involve longer periods, railways systems are often public-sector monopolies in many countries. Delivery of railways assets and attendant services through a PPP model, therefore, often requires a full understanding in the public and private sectors of the life-cycle costs which can be recovered from commercial operation, and those which cannot. Such concerns often limit the extent to which governments are willing to allow delivery through a PPP structure.

38. Cost is a very real barrier to accessing their benefits and, in some cases, PPPs, with their ability to be privately financed, can bring major financial commitments with high upfront investment within the reach of the public sector. PPPs in railways therefore offer real development potential and can be a financing solution that also delivers critical upgrades and advances to aging railways infrastructure and help governments achieve their SDGs.

39. Critics often argue that railways is already an expensive system. Given the complexity, the cost of preparing a PPP and the costs of private finance with their expectation of returns, it may result in the government taking on too much risk. This may also result in the system costing "more than it should". Ultimately this is a political question for governments. As these costs are required to be weighed through a VfM analysis prior to project inception (and a Value for People analysis in accordance with the Goals), so governments can be fully aware of the costs and benefits of a PPP delivery. Such costing, in the context of the Goals, may also need to factor in the opportunity cost in case government has to defer provision of the railways asset and services due to budgetary constraints. Often, the sunk costs can also be offset by other long-term benefits such as project revenue sharing,

savings on operations and maintenance costs, increases to tax revenues from the development, etc.

40. Since a PPP allows a government to pay for a system over the life of the contract, which may help overcome the high cost barrier, the PPP approach can therefore also be the difference between a project occurring or being deferred or cancelled.

41. However, the choice of the method of payment, namely tariff based payment or availability-based payment, leads to commercial risks. The main difference between the two is that the demand risk is borne by the concessionaire in traffic-based concessions, and by the government in availability-based ones. Evidence has shown that traffic over-estimation is a common feature of traffic-based concessions. Transferring traffic risk to the private sector has proven costly in many cases and may lead to a PPP failure. It appears that most traffic-based railways concessions have been financial failures requiring the government to step-in.

42. Hence clear allocation for collection, retention and fixing of fares, rates and access charges usually involves regulatory oversight. In cases where there are tariff-based limits set on such revenues, the responsibility of the public sector to address viability concerns of the private sector would determine the best PPP model to be adopted and the appropriate bid parameters.

43. Railways project risks must be thoroughly identified and catalogued, and then carefully negotiated and apportioned for the PPP to remain viable. A common approach is to allocate the risk to the party best able to manage that risk, but there are gradations of risk that must be calibrated carefully within a PPP to ensure a well-functioning, sustainable system is crafted. This level of complexity in deal making is often beyond the expertise of many public officials and can be difficult to manage even with experienced advisors; and it applies to all aspects of the project from technical, to financial, legal, and transactional elements.

Other pros and cons

44. Other advantages include:

(a) Private sector delivery of projects is often quicker than public sector delivery. Faster delivery of railways systems means existing railways lines can become more efficient or decongested sooner, new links and routes for passengers can be established more rapidly, and the economic and trade benefits can be realized sooner.

(b) Governments which are short of funds for railways works, and operations can look to a well-designed PPP to leverage private capital and bring financial (and technical) capacity where there was little or none before. However, there should be a full understanding and delineation of how costs will be recovered by the private operator, ex-ante viability assessment, etc.

(c) Driven by profitability and contractual performance requirements, private partners are typically better incentivized, and have greater flexibility to adjust and refine the service to maximize its functionality and efficiency. Private operation can be expected to bring in innovation in day to day operations and maintenance, as private operators are more likely to introduce new, modern technology to improve service, and extend the life of the asset to ensure cost-optimization in provision of the pre-defined performance indices.

(d) Private investment in railways infrastructure is long term and a long-term perspective incentivizes well-kept and well-run systems that are optimized and more likely to contribute to the government's strategic plans for transport, interconnectedness, and social development.

(e) PPPs in railways can accommodate restructuring during the life of the concession, with clearly defined triggers, conditions and related financial implications being

laid out pre-bid. These could also include further monetization of assets in the project, aiming to give the Government an opportunity to transform its railways system into a performance driven asset.

(f) PPPs in railways allow for innovative forms of financing, including bond-financing, as these are long-term projects, and co-development such as transit oriented real estate development along the railways lines.

Disadvantages:

(a) PPPs in railways require the crafting and negotiation of comprehensive concession agreements and a fair number of specialty advisors and consultants to develop the project which results in additional time and cost of preparation.

(b) PPPs in railways systems need viability. When coupled with the use of private finance, new railways systems therefore often require subsidy or absolute availability payment structures, as investors view the traffic forecasts as too speculative and the risk too large to successfully finance the project. Many railways systems around the world have operated with subsidies or tariffs that do not reflect the actual cost of building and operating the system. Converting to a private system means either artificially low fares or tariffs that may have to increase, which in turn can make the service less accessible to certain classes of people and cast the project in a negative light, as stakeholders conclude the private operator is “profiting” from the project.

(c) The risks of performance failure are usually unacceptable for the government. When the concessionaire is facing financial difficulties, mainly in traffic-based payments, the government has two options: let the concessionaire fail and accept infrastructure not being commissioned or allow the trains to stop running; or bail out the concessionaire and support it through hard times – even if the public sector has no contractual obligation to do so. It can be that the government had to provide direct financial support either by bailout, or by paying a substantial revenue guarantee or a loan guarantee, or by making right-of-way available or cancelling the project.

(d) Railways projects can be susceptible to sub-optimal route alignment for considerations other than socio-economic justification. Sustainable PPP structures cannot be prepared unless a robust assessment of project planning and project viability is available. If the assessment fails or is negative, then they are not suited to private sector financing.

(e) There is no evidence that PPPs are automatically better VfM than public projects. One driver that supports choosing a PPP, rather than a public procurement, is that PPPs can reduce lifecycle costs of a railways system. But given that financing and transaction costs are higher in the case of a PPP, coupled with a potential situation where the government is forced to support or bail out the concessionaire, the initially favourable VfM assessment may become adverse and the project a greater burden for the government than asset and contribution to its programme and time and efforts.

45. In view of above evidence and experience, the emerging trends in PPPs in railways is that PPPs are moving from:

(a) Traffic-based concessions to availability-based concessions;

(b) Landmark projects towards projects that are more integrated with existing systems and networks, and

(c) New stand-alone transportation systems (airport links, stand-alone high-speed railways) towards improvements to existing railways networks (equipment, rolling stock renewal, high-speed missing links).

C. Public-Private Partnerships meeting SDG objectives

46. With reference to the 2030 Agenda and acknowledging the need for railways PPPs to deliver Value for People in addition to VfM, governments contemplating a PPP in railways should consider a conventional railways line under a DBFOMT structure. This model is proven in the market and has the greatest likelihood of bringing the transformational change called for in the Goals. This does not exclude other suitable options being selected for differing needs, but only after a detailed scrutiny considering the past lessons and experiences.

47. Firstly, while alignment of the line, and the need for interoperability with any existing lines, would be defined by the government, DBFOMT means the private sector partner will design and build the railways line to achieve the service standards defined by government. This implies the creation of a new line, or the upgrading of an existing one and, because of the Goals call for transformative change, new, expanded, or dramatically renewed systems will be required. Dedicated airport lines, may provide targeted improvements, but new or substantially renewed lines offering greater interconnectedness and mobility are essential.

48. Provision and operation of railways terminals and depots through PPPs can also provide opportunities for innovative design features which can lead to improved economic opportunity, social mobility, green spaces and the development of recreational and commercial ecologies in the impacted and surrounding neighbourhoods. The monetization of data on railways users can also offer an additional revenue stream to support the finance of projects.

49. Design and build under DBFOMT also means the private partner has control over the project from very early stages which ensures greater end-to-end control over construction of the system; reduces the likelihood of material changes and delays during construction; improves the chances of the line being delivered on time and on budget; and promotes long term sustainability, efficiency, and innovation in design (and operation) of the system because the private partner will be operating the same system which they are constructing. This also incentivizes a more sustainable delivery methodology that prioritizes long term consistency in service provision in terms of maintenance of the asset. This can ensure that the tendency of governments to postpone required expenditure on maintenance due to budgetary constraints is avoided.

50. A DBFOMT model also puts positive pressure on the financial viability of the project and injects rigor into the project planning and operations phases. When the private partner has control of the project for the life of the contract and must finance the endeavour by convincing investors and lenders to commit capital for such a long period, the viability of the project must be well thought out and structured to be truly “viable”. In the past, railways concessions have failed due to overly ambitious traffic forecasts that were coupled with “user pay” revenue structures. In a transport sector PPP, if usage levels do not meet the projections (which can be due to the “halo” effect of new projects, unrealistic projections and/or sub-optimal reasons for selection of the project), the project would have revenue shortfalls, and eventually fall into a financial crisis which would jeopardize the PPP structure and risk premature termination, with consequential costs for the public sector and users. These lessons have been learned and governments are either opting for very rigorously reviewed “user pay” projects or for full availability payment structures, which provide the benefits of a PPP but the traffic volume (revenue) risk is retained by the government and it simply pays for the “availability” of the system from the private provider. With the basic principle for a government wanting to implement PPPs for the SDGs for railways, it also needs to ensure that those projects are viable, sustainable, and provide consistent service for the long term, and not put it in financial or operational stress.

51. PPPs for the SDGs for railways will also:

(a) Be designed and located such that they link ports, urban areas, industrial zones, tourism destinations, and/or population centres to boost trade and economic activity within and across borders;

(b) Focus on extending coverage into and between urban and rural areas to help provide better mobility, safe and efficient travel, reduced travel times, market access, and include larger portions of the population in the public transport service area;

(c) Leverage the procurement process and project provisions to address social issues like improving gender equality and serving underserved groups, e.g. promoting women in the employment and leadership positions or through contracting and sub-contracting opportunities on the project, improve system design and facilities to accommodate disabled persons, etc. all while following local laws and statutory requirements;

(d) Prioritize sustainable, resilient systems that can withstand changing operational circumstances and climate change;

(e) Locate the service to reduce the reliance on private cars, relieve congestion, improve road safety, reduce carbon emissions, and reduce trucking, and wear and tear and maintenance on roadways;

(f) Promote safety and feature enhanced safety measures for users;

(g) Create land value and commercial activity by locating development opportunities along railways lines and at stations;

(h) Align with other modes of transport and the overall transport development strategy for the region or country; and

(i) Focus on governmental sustainability by relieving the operational and/or financial burden on the government, ensuring technology and skill transfer to the public partner, and maintaining a fair project equilibrium where all parties benefit.

52. Considering all aspects, i.e. conventional PPP parameters and PPPs for the SDGs goals, conventional railways system, integrated with other transport modes under a DBFOMT PPP model, seems to be the better choice for the development of new or renewed railways and operating and maintenance contracts for existing assets.

V. Delivering the model

53. The recommendations on the following pages represent a concise statement of matters that should be considered when determining whether to implement a project using a DBFOMT PPPs and attracting private investment in railways infrastructure.

A. Project selection and baseline requirements

1. Prepare an evidence-based delivery plan

54. In preparing for a railways DBFOMT PPP, governments should draw upon experience from other railways PPP projects and other experience in other countries to develop a robust and evidence-based plan for delivery of the PPP. A DBFOMT PPP delivery plan should set out the process of analysing the “financial viability” of the project in great details, coupled with a meticulously planned “revenue model” that will constitute the foundation of a DBFOMT project. It should be considered a live document and subject to strategic review at

routine intervals. It needs to take account of lessons learned from international best practices and project examples like those provided in the accompanying Technical Document.¹⁰

2. Financing the DBFOMT model

2.1 Carry out transparent business model analysis

55. Within the PPP delivery plan, the government should develop an overall financial and economic model (business case) that clearly sets out the whole life cost, the charging basis for making the railway infrastructure available, and objective criteria for the financial, social, environmental and economic benefits it will yield. The project should be costed in outline terms prior to commencement of procurement and should only proceed when it is bankable and represents the best VfM and for people considering the realistically deliverable options.

2.2 Develop a clear planning context

56. DBFOMT viability depends on revenue generation and post commissioning. Earnings through traffic and other possible sources need to be projected as accurately as possible keeping in view all factors which are in realm of possibilities over the entire concession period. Governments should develop traffic forecasts to fully assess current and future supply and demand for railways services in the project demographic area and consider possible competition from other modes of transport. Governments may need to enter into various support agreements or provide a sovereign guarantee to ensure revenue streams are sufficient and not adversely impacted and patronage risk is minimised.

2.3 Setup performance standards

57. The business case should feature detailed output-based specifications that set the performance standards for the DBFOMT project and include PPPs for the SDGs concepts and outcomes and have favourable impacts contributing the Goals. These should be in conformity with national/international standards for railway infrastructure and measure performance in an objective manner and minimize room for discretion. There should be clear and realistic contractual sanctions on the private sector partner if such standards are not adequately achieved during the concession period. Thus, there should be a demonstrated quality and quantity of difference made because of the project.

58. Performance requirements should include a plan to integrate and involve local people in orchestrating, constructing, operating and improving the project.

B. Financing requirements

1. Sources of finance and governance structures

1.1 Financial institutions to remain on-board from beginning

59. A typical DBFOMT PPP railways project is likely to be in the range of many hundreds of millions of dollars. It is thus advisable to identify prospective lenders early in the process. These could be local and international commercial lenders for debt, international financial institutions (including development finance institutions and export credit agencies), government debt (including capital grants and other forms of public subsidy) and the local and international capital markets. Provisions should exist for “viability gap funding”. Further, there should be regular, structured interaction while developing the business model,

¹⁰ Technical Document accompanying the ECE Standard on PPPs in Railways ECE/CECI/WP/PPP/2018/INF.2.

identifying qualifying conditions, formulating bid criteria and identifying current and future revenue streams along with associated risks. Such on boarding is helpful in working out needs for new legislation or contract requirements that may impact the project and its ability to attract finance. It also facilitates an expeditious “financial close” of the concession as many of the lending conditions or concerns will have been addressed.

1.2 *Offer robust payment security that guarantees investment return and debt repayment*

60. A framework should be established to manage government commitments arising from the DBFOM projects, including fiscal commitments such as ongoing subsidies or payments for the use of the railway infrastructure, and contingent liabilities such as guarantees. Governments should maximise project financial viability by offering bidders and investors formal instruments having sovereign backing to assure timeliness and adequacy of payments. These can reduce the cost of finance and enhance “bankability” of the project.

1.3 *Develop a standardised “shadow” financial model against which to compare value generated by DBFOMT project vis-à-vis other models*

61. Governments should develop a robust and locally relevant system of capital and operating cost benchmarks. This system should be used to establish transparent evidence that the DBFOMT model represents the best possible VfM as compared to alternative ways of achieving its objectives – particularly the direct delivery of the same project by the public sector through traditional procurement processes. Such information could be critical for shaping public opinion and gathering support from stakeholders.

2. **Consultation and risk assessment**

2.1 *Realistically match capacity*

62. Considering the scale and dimensions of PPP for the SDGs’ projects in DBFOMT, the Government should formally consult with private sector contractors, service providers and advisors with relevant expertise in the railways sector to:

- (a) Assess market capacity to deliver the project, and develop a programme of capacity building, if necessary;
- (b) Ensure that there is capacity and capability to accurately assess and accept the risks proposed to be transferred to the private sector; and
- (c) Test in advance areas of risk allocation that are innovative or unprecedented .

63. Consultees should include the following:

- (a) Contractors;
- (b) Designers;
- (c) Sponsors / equity investors;
- (d) Legal, financial, technical and insurance advisors;
- (e) Senior lenders and, where appropriate, international financial institutions; and
- (f) Insurance and reinsurance companies.

2.2 *Clearly set out risk transfer proposals*

64. A formal schedule of risks along with a mitigation/allocation plan will add to the objectivity of the DBFOMT procurement process and foster true comparable competition

from potential partners while reducing uncertainties associated with negotiating final concession agreements.

C. Legal requirements

1. Establish a legislative framework

65. The legislative framework for a DBFOMT PPPs in railways should be in sync with the government's transport and environmental policy, economic and fiscal policy, and other relevant policies such as those governing urban planning and land use. These frameworks should also be consistent with the SDGs. Legislation that could impact the viability and operations of the railways system must also be examined, such as monopoly, tax, and occupational health and safety standards. This might also involve amending existing laws in areas such as insolvency.

2. Standardisation of procurement protocols and documentation

66. The whole procurement and contract documentation should be conducted with the use of standard documentation as this boosts the confidence of investors and lenders.

D. Feasibility for low and middle-income countries

67. While lessons may be drawn from all countries, railways projects in low and middle-income countries face different, and sometimes significant, challenges that make the "developed countries" railways PPP models unlikely to succeed. Conversely the demand for railways PPPs in low and middle-income countries is arguably greater than developed countries, yet the PPP enabling environment is less conducive.

68. Existing railways systems in many low and middle-income countries are outdated, with some systems in Africa being over 100 years old. This results in antiquated physical and operational conditions with, for example, little to no signalling or communication infrastructure, and overall poor service. Ridership and usage too, which then leads to the need for greater public subsidy and financial support because the system cannot support itself. It is a vicious cycle of underutilization resulting in greater costs. PPPs in railways will be particularly challenging in these environments as systems need to be cost reflective, meaning fares or tariffs need to be sufficient to cover initial capital investment, long term operational costs, and private finance returns. This may require governments in low and middle-income countries to consider a phased in approach, where railways projects are provided support in the early stages of their operations or implementation, and only until the service (or the network as a whole) is established sufficiently to become self-sufficient.

69. Old systems cause further problems with modelling and sizing the project appropriately. It is difficult to forecast traffic and ridership volumes for new or improved systems when there is inaccurate traffic data, or such data simply does not exist. This results in completely speculative estimation of ridership and usage and will require stronger guarantees and volume support from governments. Governments should also use conservative estimates of ridership and plan financial support accordingly so that systems designed to remain viable. Similarly, because of the deteriorated condition of old systems, the capital costs to replace or renew such systems should not be underestimated.

70. DBFOMT models in low and middle-income countries have had some success, however, especially on routes which are exclusive to a particular port or mines. Mainstream passenger and freight lines remain challenging.

71. Tariff and fare rates are also politically sensitive issues in some low and middle-income countries, as railways is a preferred mode of transport. Governments must therefore be sensitive to these stakeholders and design a system that remains accessible to the ultimate users, the people, yet viable (and bankable) from a financial perspective.

72. Smaller projects are also advisable for challenging environments. These reduce the overall risk exposure of the government and allow for a gradual capacity development both from the project delivery perspective as well as the overall railways system. It may also be possible to combine, sometimes distinctly different projects, to make the whole “Bankable” and more viable. Governments must only be careful of the trade-off that must be arrived at when bundling smaller projects, which is the loss of competition when several smaller projects are bundled into one and the potential efficiency gains from such bundling.

E. Other issues related to the railways sector

1. Regulation

73. In order to succeed, the DBFOMT PPP model (as also other models) needs to have an independent regulator who will regulate the performance standards and tariff. In developing the legislative framework, governments may consider establishing such a regulatory framework to govern access to railway infrastructure, and the way its maintenance and operation is delivered. Jurisdictions without an independent regulator have more difficulty in developing comprehensive, consistent railway systems.

2. Mixed economy infrastructure

74. Governments should consider whether railways line capacity should be reserved for different categories of service and how priority should be allocated between them on and amongst lines. This includes the analysis of the consequential impact of line speeds and interconnectedness with other mode of transport to best serve the people.

3. Early termination arrangements

75. The contract developed for a PPP for railways will include provisions regulating early termination, for example in the event of material failure to perform the contract. A particular issue for railway infrastructure is finding suitable replacement operators with the necessary competence. This can be difficult and time consuming and require the “work out” of many contractual arrangements between the government, its private partner, lenders, and the various contractors and subcontractors on the project. Contracts should therefore allow sufficient time pre-termination for satisfactory arrangements to be put in place, including preservation of key sub-contracts to ensure continuity of service.

4. Real estate development

76. A key feature of projects involving the development of railway infrastructure is the potential for development of adjoining areas of real estate such as railway stations or car parks, which can enhance the contribution to the project financials, as well as providing possible urban regeneration benefits.

VI. Indicators of compliance

77. The traditional railways PPPs have a focus on output-based specifications and service delivery targets, typically covering capability/capacity of the transportation system, station separation, safety, availability of service, reliability, comfort, interchangeability, access,

environment and electrical-mechanical communications and signalling requirements. These key performance-based indicators to be achieved are also monitored accordingly.

78. PPPs need to include indicators relevant to the achievement of SDGs. These output- and outcome-based goals that ultimately are in the control of the project concessionaire, must also be a part of the contract performance monitoring. The relevant indicators are detailed in Table 1.1 in the Annex I.

79. The Government also should monitor the contribution of the PPP project for railways on other impacts to the relevant SDGs as defined in Table 1.2 in the Annex I.

Indicators for compliance of sustainable development goals

80. In addition to the performance parameters listed in the main text of the document, related to the technical aspects of railways management, PPPs for the SDGs must also include indicators to monitor the outputs, outcomes and impacts of the project. Given below in Table 1.1 is a matrix of indicators that can be used as appropriate. Table 1.2 deals with the contribution of project to the impacts on the SDGs. These are beyond the control of the concessionaire and not a part of the contract performance per se. However, the government agency can take cognizance of the impacts in reporting the progress of achievement of the SDGs.

Table 1.1

81. Direct PPPs in railways targets relevant to the SDGs and measurement indicators (to be measured by the Concessionaire as a part of contract output and outcome)

<i>Sustainable Development Goal</i>	<i>Relevant Sustainable Development Goal indicators and measurement</i>
<p>SDG 5. Achieve gender equality and empower all women and girls (project output related)</p> <p>Use of the PPP model in railways projects provides an opportunity to seek and achieve greater gender equality</p>	<p>5.5. Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life</p> <p>5.5.2. Proportion of women in employment and managerial positions</p>
<p>SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (project output related)</p> <p>Investment in railways is generally for the long term and is designed to provide high quality, resilient, infrastructure that will last for years to come</p>	<p>9.1. Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</p> <p>9.1.2. Passenger and freight volumes, by mode of transport</p>
<p>SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable (project outcome related)</p> <p>PPPs in railways can facilitate high quality, long lasting infrastructure, that is safer and more affordable, and improves interconnectedness and cross-border traffic while expanding access to economic opportunities for citizens</p>	<p>11.2. By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons</p> <p>11.2.1. Proportion of population that has convenient access to railways transport, by sex, age and persons with disabilities</p>

Note:

1. The scope of the private sector participation needs to be enhanced to include applicable PPP indicators linked to SDGs. However, depending on the allocation of PPP responsibilities, the indicators also need to be balanced between direct contract deliverable indicators and those attributable to the public-sector agency/government as additional contributions to the project.

2. Above indicators may be suitably altered and are not prescriptive.
3. Applicable indicators need to be chosen depending on the type of project.

Table 1.2

82. **Indirect PPPs in railways targets relevant to the SDGs** (to be measured by the Government Agency as a part of contract impact contributing to the overall Goals for the country)

<i>Sustainable Development Goal</i>	<i>Relevant Sustainable Development Goal indicators and measurement</i>
<p>SDG 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture (project impact related)</p> <p>Investment in railways provides opportunities for income generation through better and cheaper access to markets and opportunities for value addition (bulk transport of agricultural commodities) and non-farm employment</p>	<p>2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment</p> <p>2.3.2. Average income of small-scale food producers, by sex and indigenous status</p>
<p>SDG 3. Ensure healthy lives and promote well-being for all at all ages (project impact related)</p> <p>Well-designed railways as an alternative to road transport can positively influence road safety targets included in the global development agenda</p> <p>Well-designed railways can safely transport hazardous chemicals to reduce the pollution and spillage contamination</p>	<p>3.6. By 2020, halve the number of global deaths and injuries from road traffic accidents</p> <p>3.6.1. Death rate due to road traffic injuries</p> <p>3.9. By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</p> <p>3.9.1. Mortality rate attributed to ambient air and soil pollution</p>
<p>SDG 5. Achieve gender equality and empower all women and girls (Project impact related)</p> <p>Use of the PPP model in railways provides an opportunity to seek and achieve greater gender equality</p>	<p>5.1. End all forms of discrimination against all women and girls everywhere</p> <p>5.1.1. Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex</p>
<p>SDG 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (project impact related)</p> <p>Railways is an important element in triggering economic growth and development</p>	<p>8.1. Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries</p> <p>8.1.1. Annual growth rate of real GDP per capita</p>

Sustainable Development Goal	Relevant Sustainable Development Goal indicators and measurement
<p>SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (project impact related)</p> <p>Investment in railways is designed to provide access for economic opportunities and support industrial development through raw materials and finished products transport</p>	<p>9.2. Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries</p> <p>9.2.1. Manufacturing value added as a proportion of GDP and per capita</p> <p>9.2.2. Manufacturing employment as a proportion of total employment</p>
<p>Investment in railways is designed for efficient fuel use and reduced GHG emissions</p>	<p>9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies</p> <p>9.4.1 CO₂ emission per unit of value added</p>
<p>SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable (project impact related)</p> <p>Improved railways through PPPs can facilitate modal shift (from road to railways) of passengers and goods that mitigates adverse environmental impacts</p>	<p>11.6. By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</p> <p>11.6.2. Annual mean levels of fine particulate matter (e.g. PM_{2.5} and PM₁₀) in cities (population weighted)</p>
<p>Railways through PPPs can facilitate connectivity of urban, peri-urban and rural areas</p>	<p>11.a. Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning</p> <p>11.a.1. Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city</p>
<p>SDG 12. Ensure sustainable consumption and production patterns (project impact related)</p> <p>Railways is a more fuel-efficient means of transportation of passengers and freight (compared to roads)</p>	<p>12.2. By 2030, achieve the sustainable management and efficient use of natural resources</p> <p>12.2.2. Domestic fuel consumption, domestic fuel consumption per capita, and domestic fuel consumption per GDP</p>
<p>Railways facilitates better bulk transportation for agricultural commodities avoiding potential food wastage</p>	<p>12.3. By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses</p> <p>12.3.1 National/provincial food loss index</p>

<i>Sustainable Development Goal</i>	<i>Relevant Sustainable Development Goal indicators and measurement</i>
<p>SDG 17. Strengthen the means of implementation and revitalise the global partnership for sustainable development (project impact related)</p> <p>PPPs in railways provide opportunities for public and private alignment and win-win situations where both public and private interests are served through a mutually beneficial long-term relationship</p>	<p>17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships</p> <p>17.17.1 Amount of United States dollars committed to public-private and civil society partnerships</p>