



Luxembourg, 08 May 2024

Environmental and Social Data Sheet

Overview

Project Name:	<i>BANGALORE SUBURBAN RAILWAY PROJECT</i>
Project Number:	<i>2022-0637</i>
Country:	<i>India</i>
Project Description:	<i>The project will co-finance the construction and operation of a new suburban railway network covering 4 dedicated rail corridors in Bangalore, spanning approx. 149km in total length with 58 stations.</i>
EIA required:	yes
Project included in Carbon Footprint Exercise ¹ :	yes

(details for projects included are provided in section: "EIB Carbon Footprint Exercise")

Environmental and Social Assessment

The project concerns the development of a new electrified suburban railway network in the greater Bangalore Metropolitan Area (BMA), comprising four (4) interconnected rail corridors, in aggregate 149km long, encompassing 58 stations and 2 depots. Part of this network (a 17.05km stretch with 5 stations, between Bengaluru Cantt and Whitefield stations, of Corridor-3, is a four-tracking scheme already under execution by the Indian Railways/ South-Western branch). Upon its completion two lines out of the four (one per direction) shall be also utilised for the suburban railway services. The specific scheme was approved before (and independently from) the suburban railway project and is expected to be completed before project-related works on Corridor-3 commence. The acquisition of the required rolling stock is not part of EIB's project scope. The suburban railway network alignment is predominantly located within the railway /government land along the existing Right-of-Way (ROW) of the long-distance Indian Railway (IR) lines passing through the city. Project's alignment is proposed on one side of the existing IR lines duly leaving the other side of the IR lines for possible future requirements of Railways. About two thirds of the network will be at-grade and the remainder elevated. The project is at a very early stage; track works for Corridor 2 (Chikkabanavara to Baiyyappanahalli) and Corridor-4 (Heelalige – Rajanukunte) have been awarded so far and construction has commenced, albeit at a low pace and so far without any physical resettlement activities. The project Promoter is Rail Infrastructure Development Corporation (Karnataka) Ltd. (K-RIDE), a joint venture of the Government of Karnataka (GoK) and the Indian Ministry of Railways (MoR).

The project supports the development of a metro-like suburban railway system, which has the potential to contribute to a transformative impact on the BMA, by providing impetus to suburbs and satellite townships, development of which would ease pressure on the core urban area of the city.

The project is included in the city's Comprehensive Mobility Plan (2020) and is consistent with the City Development Plan 2031 as well as India's National Urban Transport Policy (2014). In

¹ Only projects that meet the scope of the Carbon Footprint Exercise, as defined in the EIB Carbon Footprint Methodologies, are included, provided estimated emissions exceed the methodology thresholds: 20,000 tonnes CO₂e/year absolute (gross) or 20,000 tonnes CO₂e/year relative (net) – both increases and savings.



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alignment with the city's mobility and urban development plans, the Detailed Project Report (DPR) for the Bangalore Suburban Railway has been prepared. Both the central government (Government of India-GoI) and the state Government of Karnataka (GoK) have approved Bangalore Suburban Railway Project (BSRP) in 2020.

Environmental Assessment

Compliance to environmental legislation: If located in the EU, the project would fall under Annex II of EIA Directive 2011/92/EU, in which case it would be subject to screening by the Competent Authority, which would decide whether an EIA procedure is required, or not. As per provisions of the Indian EIA Notification Act 2006, any new project, the expansion or modernization of any existing industry or project listed in Schedule I of the EIA Notification Act shall apply for clearance to the Ministry of Environment, Forests and Climate Change (MOEFCC), GoI. Since suburban railway projects are not included in Schedule I of the EIA Notification Act, the project does not require an environmental clearance certificate from the MOEFCC nor a related EIA procedure. Despite the lack of legal obligation under the Indian law to conduct EIA process for this project, project's classification under the lenders' (KfW and EIB) environmental and social policies led to the requirement of a full Environmental and Social Impact Assessment (ESIA). Accordingly, the Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) reports, for the full project (corridors and depots) were drafted in 2023, in line with national and lenders requirements. Both reports are disclosed locally; public consultation is currently ongoing and expected to be completed in June 2024, after which the reports shall be finalised and approved by the Promoter. Public consultation results shall be provided to the Bank, as disbursement condition. The EIA includes an Environmental Management Action Plan (EMAP), and the Promoter undertakes to implement this EMAP, among others by including it in the tender documents for the work and supply contracts pending to be contracted.

Assessment of alternatives: In the past the GoK and the IR undertook a study for the introduction of commuter rail services on the existing long-distance IR network passing through the city. The study indicated that capacity is fragmented on the existing IR network and thus separate tracks need to be provided to better accommodate suburban rail services. The only horizontal alignment that would minimise the land acquisition requirements, and impacts on the urban environment, is the proposed alignment which is located within the railway /government land along the existing ROW of the long-distance IR lines. The Promoter examined the vertical alignment, to cope with space restrictions in certain places and to achieve the required travel speed, reliability, and safety. The proposed design includes elevation of one third of the total network length, mainly where there are space constraints on the boundary of the existing ROW. Multiple level-crossing are planned to be replaced by ROBs/RUBs (Roads over/under Bridge) across the at-grade sections of the network. Also, stations' locations have been selected to minimise land acquisition and impacts on the urban environment. The project includes two depots, and alternative sites were assessed. The final locations at Soladevanahalli (Corridor 2) and Akkupete village (Corridor 1) were chosen mainly due to land availability and distance to the suburban railway lines.

Environmental impacts and mitigation: Overall the project should have positive environmental impacts once in operation, including reduction in local air/noise emissions, in road traffic generated vibration and in greenhouse gas emissions, because of the expected modal shift from road modes (two wheelers, cars, taxis, shared taxis and buses).

According to the EIA, the main residual negative environmental impacts of the project include: (i) permanent conversion of open lands to depots and suburban railway corridors and stations; (ii) felling/transplantation of 32.572 trees; (iii) use of finite, scarce, sometimes carbon intensive, materials, such as cement; and (iv) noise, vibration, and visual intrusion for properties adjacent to the alignment, during project operation. Other negative impacts are temporary and localised; most notably, traffic diversions and access restrictions, construction related noise, vibration, air pollution, dust, debris and solid or water waste.



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Mitigation measures for the above are included in the EMAP, which forms part of the EIA. The main mitigants are: (i) 1:10 compensatory afforestation (i.e. planting of 10 trees for every tree felled/transplanted) and its maintenance, in line with national and state legislation. According to the tree management plan, which forms part of the EIA, the sites for the compensatory afforestation are selected in co-ordination with Bengaluru Municipal Authority, within Bangalore; (ii) various energy saving measures such as regenerative braking and use of solar panels; (iii) noise and vibration reduction measures embedded in system's design to keep noise and vibration levels below the acceptable thresholds during operation (e.g. development of green belts and/or solid noise barriers, use of ballast-less track with elastic and absorbent fittings etc.), (iv) aesthetic structures of elevated viaduct and stations to trade-off for visual intrusion. Other mitigants, concerning temporary impacts, include: (i) Traffic Management Planning of traffic diversions and detours to ensure safe access for vehicles, pedestrians and livestock to and from roadsides and properties, providing where needed temporary connecting roads, (ii) air pollution management and monitoring measures, from simple dust suppression (e.g. water sprinklers, dust screens, covered trucks for carrying loose material etc.) to monitoring/managing emissions from mobile sources (e.g. regular maintenance and check of machinery and equipment's emission in accordance with National Ambient Air Quality Standards), (iii) noise and vibration control measures (e.g. construction vehicles and equipment fitted with exhaust silencers, electric instead of diesel powered equipment, hydraulic instead of pneumatic tools, regular maintenance of machinery and equipment, noise proof barriers on the construction boundary, routing heavily-loaded trucks away from residential and sensitive areas, continuous monitoring of noise levels etc.), (iv) comprehensive Waste Disposal Plan (for muck, solid, water and hazardous waste) and continuous monitoring of soil and water resources, (v) reuse of excavated material where feasible and procurement of materials and water needed for construction in a regulated manner.

According to the EIA, the project does not affect any nature conservation or similar protected areas, MOEFCC notified Critically Polluted Areas, UNESCO's World Heritage sites and Ramsar Wetlands and no critical habitat is known in the project area. One depot (in Akkupete village near Devanahalli) will require diversion of 18.6Ha of forest land. According to the EIA, this forest land was developed as part of a prior compensatory afforestation scheme, since 2001. Eucalyptus fibrosa and Acacia mangium tree species were predominantly planted in this area. According to the biodiversity assessment of the EIA, in this forest land there are not any IUCN (International Union for Conservation of Nature) listed threatened, endangered, endemic flora and fauna species. Diversion (change to non-forest use) of this forest land, is under preparation, in compliance with the Forest (Conservation) Act, 1980 and in coordination with the State Forest Department. Copy of the respective diversion permission shall be provided to the Bank, as disbursement condition.

Impacts on Archaeological and Cultural Heritage monuments: Corridor 1 of the BSRP is close to two cultural heritage monuments, legally protected under the national Ancient Monuments and Archaeological Sites and Remains (AMASR) Act (amendment and validation, 2010). These are the Devanahalli Fort (at 228m from project) and Tippu's Birthplace, Devanahalli (at 271m from project). The AMASR Act specifies the area around a protected monument as "prohibited" (if within 100 meters distance from the monument) and "regulated" (between 100-300 meters from the monument). In this case, project's alignment falls into the regulated areas of the protected monuments. According to the AMASR Act, site-specific permissions are required and must be granted prior to construction commencement, when construction is taking place in the regulated area of a protected monument. For projects within the regulated area, the competent authority to grant such permission is National Monument Authority (NMA). According to the Promoter, NMA's permissions have been requested and shall be obtained prior to the commencement of construction of Corridor 1. Copies of the respective permissions shall be provided to the Bank, as disbursement conditions. However, according to the EIA, and noting the distance of the monuments from project's alignment and the fact that already in between there are the operating long-distance IR lines and a ten-lane national highway, project-related impacts are expected to be minor and diligently monitored as per the AMASR Act guidelines.



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Climate and Natural Disaster risks: According to the Climate Risk Vulnerability Assessment (CRVA) embedded in EIA, the main climatic risks in the project area are flooding, increase of the average temperature and wind speed. The Promoter follows Indian Railway Manual to handle extreme weather events (e.g., monsoon, flood events etc). The CRVA, in line with the Karnataka State Action Plan for Climate Change (KSAPCC) of 2021, substantiates that project's resilience to physical climate risks is supported by measures embedded in project's design, construction codes and good engineering practices. For instance, for the at-grade sections, stations & depots the flooding risk is expected to be mitigated by a series of measures (e.g., embankment protection with trees, increased height of station entrances, enhanced drainage requirements in both design and maintenance etc.), while the respective risk for the elevated part is expected to be low. Usage of continuous welded track instead of jointed and use of materials with higher temperature threshold for thermal expansion, are foreseen to avoid rail buckling and associated track misalignment in case of high temperatures events. Another example is improved overhead wire tensioning systems to mitigate impacts of high winds on power cables. Regarding natural risks like earthquakes, according to the EIA there has been no major incident in the last one hundred years. Nevertheless, seismic protection is foreseen through the strict application of the design and construction building codes and standards in force in India.

Paris Alignment: Given the project's potential to reduce GHG emissions of the transport sector, through modal shift towards electrified collective transport, as well as its adaptation to the main climatic risks on a system level, the project is Paris aligned and contributes to climate action objectives.

EIB Carbon Footprint Exercise

The annual emissions stemming from project's operation, in a standard year of operation, were estimated at 84 kT CO₂ equivalent per year (absolute emissions). The change in annual emissions, for all other modes, stemming from the reduction of mileage of competing road modes resulting from the shift in demand to the project, were estimated at 149 kT equivalent per year (baseline emissions).

Therefore, the net change of emissions across the transport network due to the project operation, in a standard year of operation, were estimated to be approximately (-) 65 kT of CO₂ equivalent per year (relative emissions), a reduction of 43%. These calculations are based on the current country grid². As the carbon footprint of the Indian grid improves, so will the CO₂ equivalent performance of the suburban railway system. In addition, the Promoter has an energy efficiency strategy, including traction and no-traction related measures (i.e., regenerative braking, HVAC scheduling and consumption monitoring, LED at stations, Resistance Temperature Detector (RTD) sensors in axial fans etc.) and is also planning to install solar panels on the depot and stations roof, which could further reduce the carbon footprint of the project.

For the annual accounting purposes of the EIB Carbon Footprint, the project emissions will be prorated according to the EIB lending amount signed in that year, as a proportion of project cost.

Social Assessment, where applicable

The project is expected to generate important social benefits during operations by enhancing mobility and accessibility in BMA, and by reducing travel time and improving comfort and overall service quality for users. Also, during construction and operation the project will contribute to local employment generation for both skilled and unskilled labour.

² EIB Carbon Footprint Methodologies



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Based on the SIA report prepared, the main adverse social impact is related to involuntary resettlement. The project will acquire about 233.09Ha of land, out of which 56.88Ha is private land, while the rest is governmental (state- or IR-owned), including the 18.6Ha of forest land, for the Akkupete village depot. Accordingly, the residential and commercial structures to be affected are estimated at approx. 622 with total Project Affected Households (PAHs) being estimated at approx. 1,268.

The residential structures also include part of a small size notified slum at Mattikere, on Corridor 2. It is estimated that 53 structures of the Mattikere slum may be temporarily affected by the project. Specifically, the slum dwellers of these structures they may need to be temporarily relocated during construction, if deemed appropriate for safety reasons, and return to their establishments after construction completion, of that part of Corridor 2. According to the Karnataka Slum Area (Improvements and Clearance) Act 1973, the resettlement of the dwellers of a notified slum area is under the responsibility of the Karnataka Slum Development Board (KSDB), including the baseline survey and consultation with slum dwellers. The cooperation framework between the Promoter, KSDB and the Mattikere slum dwellers, is outlined in the SIA, including compensation options. The Promoter undertakes to provide, to the satisfaction of the Bank, the final Memorandum of Understanding (MoU) among acting parties, prior to the initiation of resettlement of Mattikere slum, including clear description of roles and responsibilities, agreement on and timing of relocation options and all other necessary aspects of Resettlement and Rehabilitation (R&R) process. Although no permanent resettlement is currently foreseen for Mattikere slum dwellers, the final MoU among acting parties shall cover this option as well, in order to have a complete institutional arrangement in place.

In addition to residential and commercial structures, there are approx. 27 common property assets (e.g. schools, shrines and small temples) and minor structures (boundary walls, toilets, car sheds) that may be affected due to the proposed alignment. The unavoidable loss of such assets will be compensated through replacement elsewhere or a suitable financial mechanism. The SIA has not identified any impacts on forest users.

A complete assessment of resettlement impact for the whole project will be known once the final design and subsequently census of affected households/ people are completed for all the corridors (including depots). However, all attempts have been (and will be) made to minimize the impact of land acquisition, resettlement, and adverse impacts on the livelihood of PAPs by making use of careful planning and local engineering in the design.

A Resettlement Policy Framework (RPF) was prepared in engagement with PAPs, as part of the SIA, in line with national and EIB requirements. Public consultation is currently on-going and expected to be completed in June 2024, after which the SIA shall be finalised and approved by the Promoter. The RPF has been approved by the Promoter, prior to consultation. Public consultation results shall be provided to the Bank, as disbursement condition.

The Bank's lending will be subject to Resettlement Action Plans' (RAP(s)) finalisation, consistent with EIB's Social Standards and overall project's implementation in compliance with the approved RAP(s) and the relevant EIB Social Standards. The RAP(s) will be prepared in consultation with all PAPs and will be disclosed on the website of the Promoter and EIB. The RAP(s) are to be finalised and implemented in a manner consistent with the handover of site to works contractors. In case of any misalignment, between project resettlement activities and the final RAP(s), the Promoter undertakes to immediately implement appropriate remedial actions, to the satisfaction of the Bank. To avoid any disproportionate negative livelihood impacts on vulnerable groups, identified vulnerable households are expected receive additional financial and in-kind assistance. Special attention will be given to the non-titleholders.

Other potential social risks arising due to the project are as follows: weak application of relevant labour standards, related to employee working conditions during construction, and/or relevant occupational and community health and safety standards during construction. Compliance with these aspects is managed through the developed EMAP, which includes dedicated plans such as a Safety Management Plan and an Emergency Response Plan and requirements for



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contractors to comply with highest safety and security standards for workers and the community, including a Code of Conduct for workers.

Impact on Gender equality: The Promoter has developed a Gender Action Plan (GAP), as part of the SIA, intended to address gender equality issues and facilitate women's involvement in the project. More specifically, the GAP lays out specific actions and measures to (i) include planning and design features that would enhance access, safety, and security for women, (ii) support women participation in construction works, including employment thresholds, develop policy for gender friendly workplace and policy and distress mechanism around sexual harassment at work, and (iii) provide special support for women during resettlement and rehabilitation (R&R) activities. Thus, the project is expected to increase and safeguard women's employment and to overall have a significant positive impact for women in Bangalore and reverse their disproportional disadvantage on affordable, safe, and secure access to economic and social functions.

Public Consultation and Stakeholder Engagement

A Stakeholder Engagement Plan (SEP) has been prepared, as part of the SIA, identifying and prioritising key stakeholder groups and their engagement methods throughout project's life cycle (preparation, implementation, and operation).

During project preparation and drafting of the EIA and SIA, including EMAP and RPF, there have been multiple rounds of consultations with municipal, state, and central governmental agencies, NGOs as well as local community members, including PAPs, through focus group meetings in project adjacent areas. Moreover, a random survey among probable users of BSRP conducted to understand the profile and perception of the average traveller about the upcoming project and the desired design and operational features.

As part of the stakeholder engagement so far, various requests have been raised by the public, most notably: reduction of construction related disturbances such as noise and vibration, seamless traffic control and access management to adjacent properties, adequate drainage system across the project, proper construction-waste management, optimise tree cutting, enhancement of last-mile connectivity and optimum resettlement aspects (timely and adequate compensations); all of which are being addressed by the Promoter in the EIA and SIA reports.

Formal disclosure and public consultation are currently on-going and expected to be completed in June 2024, after which the EIA and SIA shall be finalised and approved by the Promoter. Public consultation results shall be provided to the Bank, as disbursement condition.

The Promoter has prepared a Grievances Redressal Mechanism (GRM) to provide a formal avenue for displaced persons and other affected groups or stakeholders to engage with the Promoter on issues of concern. Various channels of communication will be established to allow people to contact the Promoter and construction companies, including through Promoter's office as well as dedicated telephone and on-line communication channels.

Other Environmental and Social Aspects

The Promoter will be responsible for overseeing and ensuring implementation of the EMAP and RAP(s), through specially appointed Environmental and Social Management Units, both led by the General Manager of Civil Works under the Project Director. A General Consultant (GC), providing sufficient qualified staff, is already mobilised. The quality of the implementation of the EMAP and RAP(s) will be further ensured by a specially appointed external Implementation Consultant (IC), of local and international experience, who will support Promoter's Environmental and Social Management Units. Specifically, regarding the RAP(s), the IC will also be responsible for their development, consistent with EIB's Social Standards.

EMAP and RAP(s) implementation will be monitored both internally and externally. The Promoter together with the GC will be responsible for internal monitoring through their field staff



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and will prepare periodic reports on the implementation of the EMAP and RAP(s), through the Environmental and Social Management Units of K-RIDE. Following lenders request, an external Environmental and Social Monitoring Consultant (ESMC) will be commissioned, of international experience, who will periodically monitor and report on delivery of the EMAP and RAP(s) as well as perform a mid and end of term evaluation of these Plans implementation.

The Bank's lending will be subject to the first periodic monitoring report from the ESMC, verifying compliance with the approved EMAP and RAP(s) and the EIB Environmental and Social Standards.

The GAP monitoring and evaluation shall be incorporated into the aforementioned monitoring and reporting to the Bank.

The Promoter undertakes to timely conclude the tender processes for all required consultancy services regarding development/implementation and monitoring/evaluation of environmental and social plans, based on terms of reference, tender schedule and budget acceptable to the Bank.

Conclusions and Recommendations

The project will improve urban transport operations in BMA and is expected to reduce the emission of pollutants by the transport sector and indirectly contribute to road safety improvement.

The project was subject to an Environmental and Social Impacts Assessments, completed in 2023 and approved by the Promoter, including an EMAP and a RPF acceptable to the Bank. Implementation and monitoring of the EMAP and the corridor-wise RAP(s), will be supported by experienced consultants.

The EIB will condition its loan disbursements on:

1. Before first disbursement, the Promoter will provide EIA and SIA public consultation results to the Bank;
2. Before first disbursement, the Promoter will provide copy of the permission(s) for the diversion of the forest land required for the depot at Akkupete village, from the Competent Authority;
3. Before first disbursement, the Promoter will provide to the satisfaction of the Bank, the first periodic monitoring report, on the delivery of the EMAP and RAP(s), from the external Environmental and Social Monitoring Consultant (ESMC);
4. Before any disbursement, the Promoter will provide to the satisfaction of the Bank, copies of the corridor-wise final RAP(s) in a manner consistent with project's implementation timeline;
5. Before any disbursement, the Promoter will provide all available no objection certificates from NMA and/or ASI related to the project's construction (for sections falling in protected areas of monuments); and
6. Before any disbursement, the Promoter will ensure that the project implementation team includes all the required environmental and social/resettlement experts, including external third-party consultants, to implement and monitor the implementation of the EMAP and RAP(s).

In addition, the Bank will require commitments from the Promoter to: (i) comply with Bank's social and environmental standards and monitor and report on its implementation regularly, to the Bank's satisfaction; (ii) ensure that the EMAP and relevant Bank's social and environmental standards are included in the tender documents of the main work contracts; (iii) implement the project in accordance with the agreed EMAP, RPF and RAP(s); (iv) report regularly on the status of EMAP and RAP(s) implementation; (v) share, upon the Bank's request, copies of any progress and monitoring reports, (if) requested by the NMA, in relation to construction



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performed in the protected areas of protected monuments; (vi) ensure that no resettlement happens before approval of the respective RAP(s) and that project affected people, including informal, are compensated in accordance to the approved compensation mechanism; (vii) in case of any misalignment, between project resettlement activities and the final RAP(s), to immediately implement appropriate remedial actions, to the satisfaction of the Bank; (viii) provide, to the satisfaction of the Bank, the final draft MoU among acting parties at Mattikere slum (including clear description of roles and responsibilities, agreement on and timing of relocation options and all other necessary aspects of R&R process), well in advance of its formalization; (ix) ensure that any type of resettlement of Mattikere slum dwellers will not start prior to the formalized MoU among the acting parties; (x) ensure that the EMAP, RPF, RAP(s) and SEP are updated if needed in case of project modifications or public consultation results, to the satisfaction of the Bank; (xi) timely conclude the tender processes for all required consultancy services regarding development/implementation and monitoring/evaluation of environmental and social plans, based on terms of reference, tender schedule and budget acceptable to the Bank; (xii) present mid and end of term evaluation of EMAP and RAP(s) implementation prepared by a third party (the external Environmental and Social Monitoring Consultant (ESMC)).

Subject to the aforementioned environmental and social conditions being met, the Project is expected to be acceptable for EIB financing in Environmental and Social terms.