Environmental Due Diligence Report

February 2022

India: Chennai Metro Rail Investment Project
Corridor 5

Prepared by the Department of Planning, Development and Special Initiatives, Government of Tamil Nadu, acting through the Chennai Metro Rail Limited (CMRL)for the Asian Development Bank.

ABBREVIATIONS

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
CMA	Chennai Metropolitan Area
CMBT	Chennai Mofussil Bus Terminal
CMRL	Chennai Metro Rail Corporation Limited
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMoP	Environmental Monitoring Plan
GoI	Government of India
GoTN	Government of Tamil Nadu
GRM	Grievance Redress Mechanism
JICA	Japan International Cooperation Agency
MDB	Multilateral Development Bank
MFF	Multi-tranche Financing Facility
MoEF&CC	Ministry of Environment, Forests & Climate Change
NDB	New Development Bank
PD	Project Director
PIU	Project Implementation Unit
SPS	Safeguard Policy Statement 2009
VEC	Valued Environmental Component

WEIGHTS AND MEASURES

ha – hectares
km – kilometer
m – meter
sqm – square meters

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I. INTRODUCTION

1. Chennai Metro Rail Limited (CMRL), a Joint Venture of Government of India (GoI) and Government of Tamil Nadu (GoTN), developed the Comprehensive Mobility Plan for Chennai Metropolian Area (CMA) in 2015 to identify the present and future mobility patterns of CMA. The detailed study identified three corridors (corridors 3, 4, and 5) for the second phase of the Chennai Metro Rail to alleviate CMA's transportation capacity constraints.

2. The proposed Chennai Metro Rail Phase II Project (the Project) will finance construction of a new, dedicated, high-capacity, rapid rail-based commuter transit system that will provide safe, reliable, and high-capacity commuter transit services in Chennai, the capital of State of Tamil Nadu in India. It is expected to reduce journey times through high frequency operations (4 minutes) and a design speed of 90 kilometer (km) per hour. The project will complement Chennai Metro Phase I in providing efficient, safe and socio-environmentally sustainable mobility in Chennai Metropolitan Area.

3. The three corridors under phase II are proposed for financing by multiple Multilateral Development Banks (MDBs). Table 1 provides an overview of the different project components and their respective proposed financers. Figure 1 shows the three lines and the interlinkages with the exisiting corridors 1 and 2.

Table 1: Project components as proposed

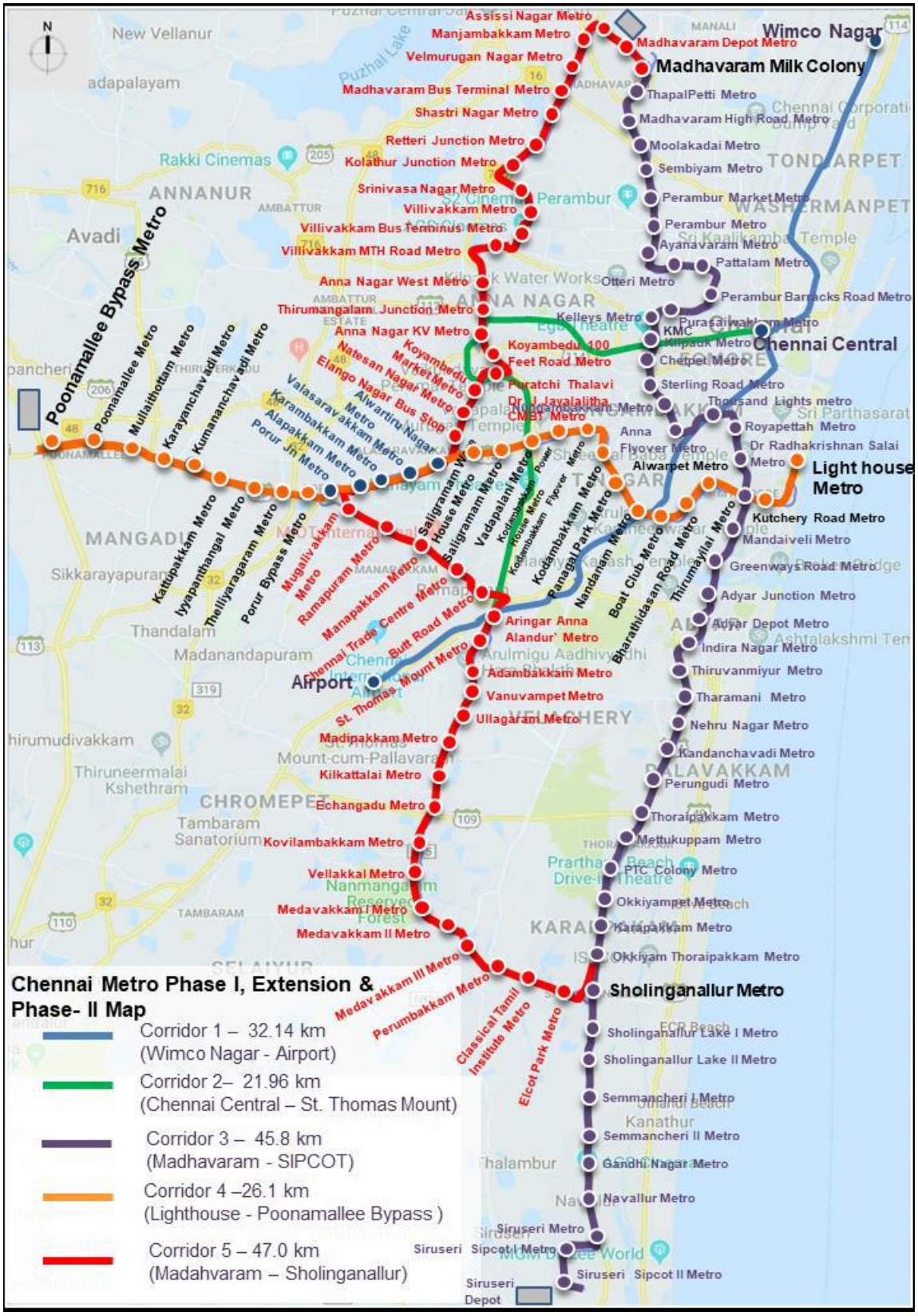
Corridor	Section		Description	MDB
	From	To		
3	Madhavaram Milk Colony	Sholinganallur	Alignment (35.044 km) and formation/ tunneling, 10 elevated stations, 30 underground stations, 1 depot structural civil costs and system packages	JICA
	Sholinganallur	Sipcot-2	Alignment (9.627 km) and formation, 10 elevated stations, structural civil costs and system packages	ADB
4	Lighthouse	Meenakshi College	Alignment (10.1 km) and formation/ tunneling, 12 underground stations structural civil cost	ADB
	Meenakshi College	Poonamallee Bypass	Alignment (16.0 km) and formation, 18 elevated stations structural civil cost	AIIB
	Lighthouse	Poonamallee Bypass	P. way, station building components VAC and TVS, E&M, Lifts and Escalators, Architectural finishes and MMI	NDB
	Lighthouse	Poonamallee Bypass	Formation of depot, rolling stock	GoTN

Corridor	Section		Description	MDB
	From	To		
5	Madhavaram Milk Colony	CMBT	Alignment (16.9 km) and formation/ tunneling, 11 elevated stations, 6 underground stations, 1 at grade station structural civil costs and system packages	JICA
	CMBT	Okkiyam Thoraipakkam	Alignment (30.1 km) and formation, 28 elevated stations structural civil costs and system packages	AIIB
	CMBT	Okkiyam Thoraipakkam	Traction and power supply, telecommunication, electrical and mechanical works	ADB

Source: Chennai Metro Rail Limited.

4. Balance C5 is the 29.142 km line connecting Chennai Mofussil Bus Terminal (CMBT) to Okkiyam Thoraipakkam including 28 stations. CMBT station forms part of Corridor 5 from Madhavaram to CMBT being financed by JICA and Okkiyam Thoraipakkam forms part of Corridor 3 financed by JICA. The Balance C5 has 4 stations in common with Corridor 4. It is financed by Asian Infrastructure Investment Bank (AIIB) for civil works and Asian Development Bank (ADB) for the system packages as mentioned in table 1.

Figure 1. Overview of Chennai Metro network



II. CONTEXT AND PURPOSE OF THIS REPORT

5. The scope of balance corridor 5 under ADB financing is limited to system packages only and is therefore likely to have minimal or no adverse environmental impacts in itself. Hence, the ADB component of balance corridor 5 is categorized as 'C' as per ADBs Safeguard Policy Statement 2009 (SPS 2009). No environmental assessment is required although environmental implications need to be reviewed.

6. The system packages component of balance corridor 5 is directly and materially related to the civil works of balance corridor 5 that will be carried out under AIIB financing. In accordance with GoI's legislative framework and MDBs' policies. CMRL has conducted an EIA for balance corridor 5 under guidance of AIIB, documenting baseline data on existing conditions of physical, ambient and ecological environment, together with the identified and anticipated environmental impacts and proposed mitigation measures. Therefore a desk review of AIIB's EIA for balance corridor 5 will suffice to fulfill the requirement above. This due diligence report describes the results of the performed desk study.

III. PROJECT STATUS AND ENVIRONMENTAL SAFEGUARDS REPORTS

7. Balance C5 will be implemented under design consultant and civil work contracts. There will be several packages for different components such as civil works contracts, detailed design, system contracts, supply and installations, rolling stocks etc. It is estimated that project will be commissioned 53 months from award of civil works, which is expected to be in June 2021.

8. A draft EIA for balance corridor 5 dated February 2021 was shared by AIIB for the purpose of the due diligence. The draft EIA contains an Environmental Management Plan (EMP) as well as an Environmental Monitoring Plan (EMoP). The EMP and EMoP form part of the bidding documents for the construction of the viaduct and elevated stations.

9. The ADB components of the project are to be financed through a Multi-tranche Financing Facility (MFF). In accordance with the SPS 2009 an Environmental Assessment Review Framework (EARF) is required for ADB multi-tranche financing facilities that have potential environmental impacts. The draft EARF dated 14 December 2020 covering all three corridors under the phase-II metro project has been used for the purpose of the due diligence.

IV. FINDINGS OF THE DUE DILIGENCE

A. COMPLIANCE WITH REQUIREMENTS IN THE NATIONAL ENVIRONMENT ACT, ADB SPS 2009 AND EARF

10. Rail-based systems have been excluded from the scheduled list under India's Environmental Impact Assessment (EIA) Notification of 2006 and its subsequent amendments under the under the Environment (Protection) Act, 1986. Therefore, the proposed phase II metro project is not required to secure environmental clearance in the form of an approved EIA from the Ministry of Environment, Forest and Climate Change (MoEFCC) per national policies and regulations. Similarly, the metro stations and depots proposed along the metro rail corridor being part of Metro rail project do not attract EIA Notification prescribing environmental clearance. In light of National Green Tribunal orders and MoEFCC requirement, environmental clearance is not required since commercial development equal to or above threshold of 20,000 sq.m is not proposed.

11. The draft EIA for balance corridor 5 shows great similarities with the EIA reports for MDB corridor 3 (created by CMRL for ADB) and corridor 4 (created by CMRL for AIIB and ADB jointly). The structure and content of the report fully comply with SPS 2009 and the draft EARF that has been prepared for the phase-II metro project .

B. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

12. The potential impacts and risks were analyzed in the confines of Balance C5 alignment's direct impact area, which is defined in this study as a strip of 15m, however, sensitive receptors located within 200m on either side of the alignment were identified. Influence area where most of the socio-economic and cumulative impacts will occur is defined as the entire confine of the area in Chennai city.

13. Based on the environmental baseline, the identified valued environmental components (VEC) of the physical, biological, and human environments that are at risk of being impacted by the project are:

(i) Physical environment – air quality and greenhouse gas emissions, land and soil, surface water quality and quantity, and groundwater quality and quantity;
(ii) Biological environment – terrestrial and aquatic vegetation, mammals, avifauna, and ecologically important areas;
(iii) Social environment – private land and buildings, public infrastructure including utility structures, noise and vibration levels, cultural/heritage buildings, and occupational health and safety for the construction workers and local community living within the vicinity of the project area.

14. For each of these VECs, potential impacts during design stage, construction stage and operation stage have been evaluated and mitigating measures have been proposed.

15. The following significant residual impacts are expected to remain after mitigation:

(i) Social impact. 3.564 ha government land and 6.052 ha of private land will be acquired and 811 families will be impacted. The project affected people will be duly compensated as laid down in the Resettlement Plan for the project.

(ii) Loss of trees and impact on ecosystem. Alignment of Balance C5 passes Nanmangalam reserve forest, 7,570 sqm forest land will be diverted to non-forest use. The forest land to be diverted to the project is devoid of trees, elsewhere along the corridor an estimated 305 trees will be felled for the project. Compensatory plantation will be done in a ratio of 12 saplings against each tree felled.

(iii) Alignment, Architecture and Station Planning. The introduction of metro system implies a change in streets through which it will operate. An architecturally well designed elevated section can be pleasing to the eyes of beholders. Since a low profile would cause the least intrusion, the basic elevated section has been optimized at this stage itself.

(iv) Use of energy, water and materials. The project will use large amounts of construction material and thus will deplete construction material sources to a certain extent. Materials shall be sourced from the nearest source and from legalized and approved quarries. Requirement of electricity will be optimized by proper use of natural light. Green Building features will be implemented in station design.

(v) Noise and vibration. Operation of the metro will generate a certain amount of noise and vibration. The detailed design will incorporate features to reduce the noise and vibration levels. Detailed analysis (computer modeling) of noise and vibration will be conducted based on the detailed engineering design and will be finalized prior to contractor's mobilization. It is expected the detailed mitigation measures will be able to reduce the noise to an extent that the increase is less than 3dB(A) and will be able to reduce vibration to levels under the human annoyance threshold. **Refer Annexure 1 for Vibration Forecasting Report & Annexure 2 for Noise Modeling Report**.

(vi) Energy Demand. Energy saving features of the metro such as regenerative braking, lightweight coaches and efficient power equipment and green buildings reduce the negative impact of increased energy demand however a residual impact will remain.

(vii) Water quality. The stations will have an impact on the amount of sewage to be treated throughout the operational phase and, in case of insufficient treatment, indirectly have an impact on the water quality. Temporary leakages of the sewerage at the stations cannot be ruled out completely.

(viii) Water quantity. Water demand at stations will impact the availability of this commodity which cannot be completely mitigated through rainwater harvesting.

(ix) Health and Safety: Although both occupational and public health and safety risks can be mitigated to a large extent through proper equipment, ppe's, procedures and education, a chance remains the procedures may not always be followed in full.

(x) Air quality. Through modal shift from fossil-fuel driven transport to electric public transport the metro will have a long-lasting high positive residual impact on the air quality. The magnitude of the beneficial impact of metro will increase with increasing ridership.

16. The mitigation, monitoring and institutional measures to be taken for Balance C5 to avoid, minimize and mitigate adverse environmental and social impacts and enhance positive impacts are listed in an Environmental Management Plan (EMP). The plan also includes the actions needed for the implementation of these measures. A number of the described measures, such as measures to reduce nuisance from hauling, loading and unloading of construction materials are applicable to the system packages works as well.

17. Other mitigation measures related to works for the system packages, such as risk mitigation for working at heights or on electrical installations, are covered in CMRL's Requirements for Health, Saftey and Environment. These requirements will be issued to the Contractor as part of the contract documentation.

C. INSTITUTIONAL SETUP

18. Supervision will be done by GoTN and review of implementation and assistance to CMRL will be the responsibility of the General Consultant (GC). In contradiction to the draft EARF the draft EIA for balance corridor 5 states that each MDB project will be monitored by a separate GC, whereas the EARF states the GC will be common for all MDB projects. This issue needs to be clarified ahead of commencement of the works.

19. Monitoring of EMP implementation by Contractor for each MDB project will be responsibility of Social and Environmental Management unit (SEMU) and shall be assisted by GC. Contractor will have an Environmental, health and Safety Officer (EHSO) who will be responsible for implementation of the EMP and CMRL's SHE Requirements.

D. GRIEVANCE REDRESSAL MECHANISM

20. A Grievance Redressal Mechanism (GRM) forms part of the draft EIA for balance corridor 5, however the presented GRM differs from the GRM of the draft EARF on a few details, such as the response time of the GRC (one month). However since CMRL has confirmed, there will be one overarching GRM system in place for all works under the phase II metro project, these discrepancies will be resolved automatically.

E. PUBLIC CONSULTATIONS

21. The consultation process started early in 2017. Key stakeholders at central, state, district and local level have been consulted. Among others the Principal Conservator of Forests and Head of Forest Force Tamil Nadu, the Forest Range Officer in charge of Guindy National Park, the Defense Estate Officer, the Fisheries Department, the Public Works Department and the Airport Authority of India have been consulted to discuss if NOCs were required for the works.

22. In order to enhance public understanding about the project and address the concerns of the community pertaining to mitigation of adverse impacts due to the Corridor 5, meetings with groups of persons comprising likely PAPs and other stakeholders in the community were conducted. The consultation process involved a total of 54 participants from various sections of affected persons such as traders, women, quarters, kiosks and other inhabitants. In order to hear and address the concerns of women, women were encouraged to participate and opportunity to express their concern was provided during the consultations. The participants highly appreciated the upcoming phase- 2 metro projects as it will increase connectivity, reduce the traffic load and reduce existing level of pollution.

V. CONCLUSION

23. Civil works for balance corridor 5 have not started yet and are scheduled to commence in July 2021. Therefore the due diligence performed is limited to a desk review of the draft EIA, EMP and EMoP. The documents contain all necessary elements as per ADB SPS 2009.

24. Based on the information provided in the draft EIA it can be stated that the works on traction and power supply, telecommunication and electrical and mechanical works under ADB financing are not likely to have significant adverse environmental impacts.

25. The occupational risks associated with the works on system packages will be mitigated to the extent possible through measures described in the EMP and in CMRL's Requirements for Health, Saftey and Environment.

26. As long as the works are executed under the same institutional arrangements as in place for the civil works, no additional environmental safeguards are required.

27. GRM should be finalized during pre-construction stage and ensure consistency across project safeguards documents (EARF, EIAs based on the agreed GRM by CMRL).