Mumbai Urban Transport Project - III
Executive Summary for
Project of Quadrupling of Virar-Dahanu Road Section

Introduction:

The Mumbai Suburban Rail System has been the heart line of Mumbai carrying more than 7.6 million people in and out of the main business district of Mumbai in more than 2,900 suburban train services. With the increasing population in the Metropolitan Region of Mumbai, there is ever growing demand of passenger traffic on the suburban rail system. Mumbai Railway Vikas Corporation (MRVC) is a Special Purpose Vehicle constituted by Ministry of Railways, Government of India and the Government of Maharashtra to implement railway projects under Mumbai Urban Transport Project (MUTP) to cater to the demands of the ever growing passenger traffic of the Mumbai Metropolitan Region. The Mumbai Urban Transport Project (MUTP) was designed with a vision to improve the mass transportation services in Mumbai and meet the steadily growing demand of the Mumbai Suburban Rail System. MUTP-I was completed in year 2012 and works under MUTP-II are in progress. MUTP-III was sanctioned by Union Cabinet on 30.11.2016. The projects under MUTP-III are comprised of the following components:

a) Quadrupling of Virar-Dahanu Road Section (63 RKm) on Western Railway
b) Suburban corridor between Panvel-Karjat Section (28 RKm) on Central Railway
c) Elevated corridor link between Airoli-Kalwa (3 RKm) on Central railway
d) Trespass control measures in mid-sections on suburban Railway of Mumbai
e) Procurement of rolling stocks of 565 new Electrical Multiple Units (EMU); i.e. 47 nos. of 12 car rakes.

Quadrupling of Virar-Dahanu Road corridor:

Under MUTP III, two additional lines are proposed to be added to the existing suburban corridor between Virar and Dahanu Road. Prefeasibility study was carried out by M/s RITES for provision of the 3rd and 4th lines from Virar to Dahanu Road for the proposed extension of suburban services and these lines were proposed on the West side of the existing tracks considering Western Dedicated Freight Corridor is already planned on East side of existing track. The proposed lines will pass through all the nine existing stations. The proposed two lines are for Suburban Corridor and the existing lines are proposed as Main line Corridor for running Mail/Express trains.

The proposed expansion work includes construction of new platforms at all existing stations, electrical sub-station at Saphale, ten new stabling sidings at Virar, Boisar and Dahanu Road, infrastructure augmentation for maintenance of additional EMUs and construction of Road over bridge (ROB)/Road under bridge (RUB) at level crossings. The other details include:

1	Length	65.87 Km
2	Bridges	82 (2 Important, 16 Major & 64 Minor Bridges)
3	Level Crossing	14 (All will be eliminated by ROBs/RUBs)
4	ROBs	5 Existing & 2 new proposed

Scope of the Study

The project will be implemented within applicable Indian legal framework and will also comply with the safeguard policies of the World Bank. Based on the study of Environmental Impact Assessment Notification (EIA Notification) issued by Ministry of Environment, Forest and Climate Change (MoEFCC), the proposed MUTP III components do not require environmental clearance from MoEFCC.

The components of Environmental Assessment Study include:

1. Detailed baseline environmental monitoring of various environmental attributes such as ambient air quality, noise and vibrations, water quality (surface and groundwater) and ecological profile
2. Identification of all the environmental issues of MUTP-III project that may have negative/ positive impacts on the project influence area during various stages of project design, construction and operation
3. Formulation of mitigation measures for the adverse environmental impacts and opportunities for enhancement of benefits, with associated detailed cost estimates for all the impacts identified
4. Public consultation and disclosure as per the operational policies (Operational Policies 4.01 and others) of the World Bank.
5. Preparation of Environmental Management and Monitoring Plan , comprising of a set of remedial (prevention, mitigation and compensation) measures for each project component of MUTP III separately and specifically as well as formulate Environmental Management Plan (EMP) and strategies at a generic MUTP III level
6. Formulation of institutional mechanism for the implementation and monitoring of EMP

Environment Parameters considered for impact identification are Air quality, Water quality, Land, Noise & vibration, Flora, fauna and biodiversity, Occupational Health & Safety and Environment Health & Safety. Various indicators are considered for these environment components to identify impacts particular to the activities. The detailed list of monitoring indicators with respect to various environment components is given in Figure 1.

Project Activities Identified for Impact Assessment:

Construction Phase:

1. **Clearing the ground for construction activity e.g. bushes, scrub, trees cutting, dump wastes etc.**: Environmental features such as trees, shrubs will be removed only if it is necessary. Replanting/Relocation of trees or plantation of additional trees will be undertaken as per Maharashtra Felling of Trees Regulation Act, 1964 in concurrence with local Tree authority or Forest department. Approximately 2,500 trees will be required to be cut in Virar-Dahanu stretch. To minimize the impact of tree cutting, new plantation will be carried out in the ratio of 1:5. Thus, around 12,500 trees will be planted.

2. **Dismantling / Demolition activities before construction:** MRVC has prepared a detailed list of various structures as building, temples, ticket counters, huts, toilets, maintenance room; staff quarters etc. to be dismantled at various locations along the route. Maximum quantity of waste generated from demolition activities will be used during filling of the embankment and the Construction and Demolition waste will be disposed of as per Construction and Demolition Waste Management Rules, 2016

3. **Establishment and operation of the labour camps:** The construction work is expected to have 500 labours. Separate labour camps will be set up depending upon work requirement and convenience of labours. The contractor shall provide labour camps with adequate drainage, clean premises, crèches, cooking facilities, adequate and convenient water supply, adequate toilet facilities, and sewage disposal facilities. The cooking facilities shall be provided with Liquefied Petroleum Gas (LPG) so that no fire wood will be burned for cooking. Designated solid waste storage sites will be identified in consultation with municipal councils, Panchayat

4. **Access control and barrication:** Barricading the construction site will also protect people from accidents. Barricading will be required between existing and proposed railway line and also between constructions site and households, roads near the site. Alternate routes will be provided if existing roads are blocked during construction activities which will also be suitable to use for differently-abled.

5. **Relocation and arrangements of utility lines for construction works:** The utilities encountered commonly on site for construction work include electricity, water, telecommunication, drainage, overhead and underground cables, etc. Utilities such as water pipeline, toilet blocks abandoned structures, under construction structures etc were observed. Existing utilities will be protected during construction. Existing water pipeline which crosses the proposed alignment will be relocated carefully.

6. **Mangrove clearing:** As per the site survey carried out, approximately 8.5 hectares of mangroves will need to be removed for the project. The procedures for removal shall be followed as per the direction given in the Costal Regulation Zone (CRZ) regulations. Compensatory Mangrove afforestation will be undertaken with the help of Forest Department.

7. Collection of construction material (as in sand mining, blasting for rocks, quarrying), Transfer of construction materials:

All the construction material will be collected from authorized quarries only. The contractor is required to submit location of the quarries, the material movement plan and borrow area management plan along with the proposal including the clearances taken by the sand miners and quarry operators as per existing Rules for this activity. The construction material will be stored on site and only required quantity will be procured. The construction material will be transported in dumpers to the project site on daily basis during the construction phase. The project component of Virar-Dahanu will require earthwork of approximately 29 lakh m^3.

8. Storage, handling and disposal of Solid, Hazardous and Construction & Demolition (C&D) waste material:

Packaging, labelling, and transport of hazardous and other wastes is required to be done as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. In case of C&D waste, the Contractor will handle the waste as per Construction and Demolition Waste Management Rules, 2016.

9. Setting up the Ready Mix Concrete (RMC) Plant:

The site selection of setting up Ready Mix Concrete plant will be as per the Guidelines for Ready Mix Concrete Plant (RMC) issued by Maharashtra Pollution Control Board, Mumbai vide notification no. MPCB/AS(T)/TB/B-4363 on 7th November, 2016.

10. Excavation works and Foundation works (Pile and concrete):

Excavation will start after locating and identifying all utility services, such as electrical, water and other utilities in the area. The excavated material can be re-utilized in filling, preparing embankments, etc. Excavation and filling can be carried out simultaneously to avoid double handling.

11. Earth works/Landfill works:

Earthwork and blanketing for embankment will require 29 lakh m^3 of raw material. Out of which, 4.50 lakh m3 will be available from cutting and remaining has to be procured by the contractor. Earthwork and bridges contract will be assigned to one party to avoid multiple travelling of vehicles, creation of new road and to achieve early completion of work. Also, this will help to control damage to the local environment and to control disturbance to the community.

12. Laying of Railway Tracks:

New railway tracks will be built on earthern embankment which will form the rail formation. Ballast consists of crushed stone which is placed and packed below sleepers for load distribution, longitudinal and lateral stability and to provide drainage to the railway formation. Continuous welded rails will be formed by welding rails together to form a seamless rail track. Concrete rail sleepers are placed along the rail alignment as a base support for the rail.

13. **Use of pre-fabricated components for Foot over bridges (FOBs), and important bridges:**
    Prefabrication is preferred as it has better quality and ease of construction for steel structures. Steel and pre-tensioned concrete beams are two of the most common prefabricated elements on typical bridges. Steel girders from Research Designs and Standards Organisation (RDSO) approved workshops will be used for important bridges. Girders will be fabricated at any of the RDSO approved workshops.

14. **Operation & Maintenance (O&M) of all machineries:**
    O&M of all heavy vehicles and machinery will carried out as based on type of machinery and vehicle, maintenance schedule. Waste generated during O&M of machinery will be handled as per applicable rules. Diesel Generator (DG) sets will be used as emergency power source. Various types of vehicles as tanker, dumper, dozer, roller, grader will be used in construction which would need regular maintenance.

15. **Electrical works as installation of overhead electrical structures (distance 50-60 m), Signaling post (400 m), power sub-station:**
    Three new substations planned on Virar-Dahanu stretch to cater additional power requirement. Two new sub-stations will be set up at Saphale and Vangaon while existing sub-station at Palghar will be suitably relocated.

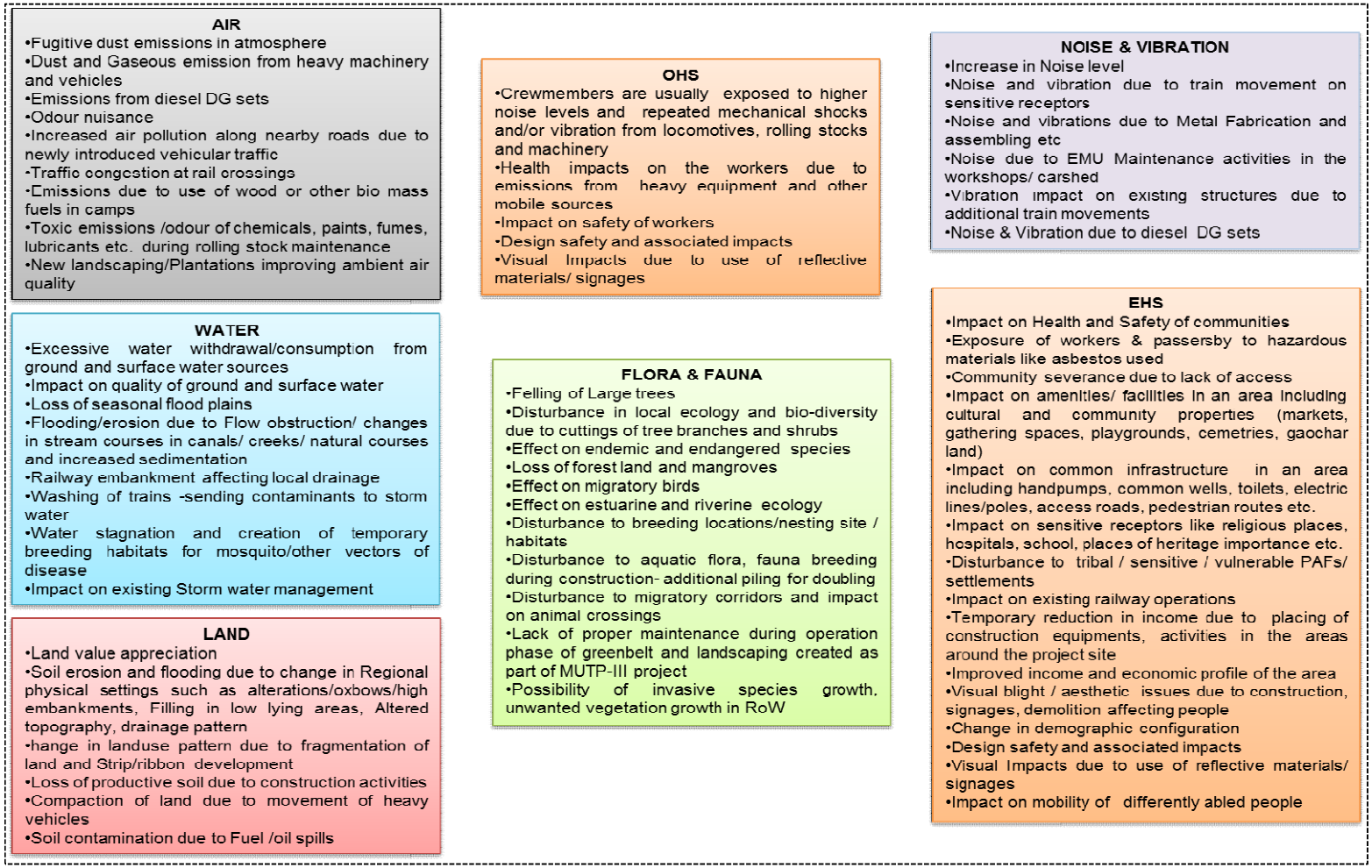
16. **Landscaping:**
    Landscaping activity in the project would focus on enhancing the appearance and creating useable space. Trees which can be relocated will be relocated to the maximum possible extent. Landscaping will create user friendly spaces near station.

Operational Phase

1. **Improved Infrastructure such as new Tracks & Railway Stations, other facilities:**
   New tracks and railway station will increase the carrying capacity of the route and will provide relief from overcrowding of trains and improve the connectivity. Yard remodeling, platform building, other passenger amenities etc. will have capacity to accommodate additional commuters due to increased capacity.

2. **Operation and Maintenance of new Tracks & Railway Stations, other ancillary facilities, landscaping:**
   Maintenance facilities required for additional trains will be developed in the existing car shed at Virar by augmentation of the existing facilities.

Figure 1: Monitoring Indicators for Various Environment Parameters Considered for Impact Identification



Environmental Monitoring Plan

The objective of environmental monitoring plan is to:

- Evaluate the performance of mitigation measures proposed in the EMP
- Suggest improvements in management plan, if required.
- Enhance environmental quality
- Comply with the Statutory and community obligations
- Warn significant deteriorations in environmental quality for further preventive action

1. Air Quality Monitoring

The air quality monitoring is recommended through National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited and MoEFCC approved laboratory during the construction phase of the project. The monitoring of air shall be conducted at the location of worksite, material stockyards, and haul roads. The parameters recommended for monitoring during construction are: Particulate Matter (PM), PM10, PM2.5, Sulphur Oxide, Nitrogen Oxides, Carbon Monoxide

Air quality shall be monitored thrice a year (3 seasons) during construction phase and once in a year in winter season during operation phase and compared with the Ambient Air Quality monitoring results obtained during the baseline monitoring to record changes in the air quality and undertake suggested measures to mitigate the adverse impacts.

2. Water Quality Monitoring

Water quality shall be monitored once in 3 months (4 times a year) throughout the project duration to cover seasonal variations and one year after the completion. Water quality shall be monitored through NABL accredited and MoEFCC approved laboratory. Both Surface and groundwater should be monitored for the parameters of IS:10500.

3. Noise and Vibration Level Monitoring

Noise and Vibrations are to be monitored for 24 hours at each location to cover maximum train traffic in a day. Following parameters will be recorded while monitoring: Noise levels in decibelA (dBA), Peak Particle Velocity (PPV) in mm/s. Acceleration, Displacement, Vibration Decibel (dB)

Proposed Implementation Mechanism for EMP

MRVC is the project implementing agency for MUTP-III projects. In that role, MRVC is accountable for satisfactory completion of the project works proposed under this Project. As the project implementing agency, MRVC, on behalf of Government of Maharashtra and Indian Railways is responsible for all the contracts financed by the World Bank loan, as well as for executing the identified works in the field in consultation with the Western Railways (WR) and Central Railways (CR) with due safeguards. MRVC will have contractors for implementation of civil/S&T/electrical works. Also, MRVC will have a Project Management Consultants (PMC) to supervise the work at all the stages including successful implementation and monitoring of EMP during construction stage. The time line for procurement of works, implementation of civil/S&T/electrical works and activities to be carried out by the respective agencies (i.e. MRVC, Project Management Consultants and Contractors) will be set up between MRVC and the contractor with support of Project Management Consultants.

For the implementation of the proposed projects under MUTP-III, it is proposed to have Environmental Management Group (EMG) within PMC for environmental management and monitoring. EMG should comprise of Environmental Managers, Environmental Inspectors and Emergency Response Cell. **Figure 2** presents the organizational structure of the proposed Environmental Management Group (EMG) for environmental management and monitoring. The proposed institutional framework for implementing and monitoring the works proposed under the EMP is shown in **Figure 3**.

Figure 2: Organizational Structure of the Proposed Environment Management Group

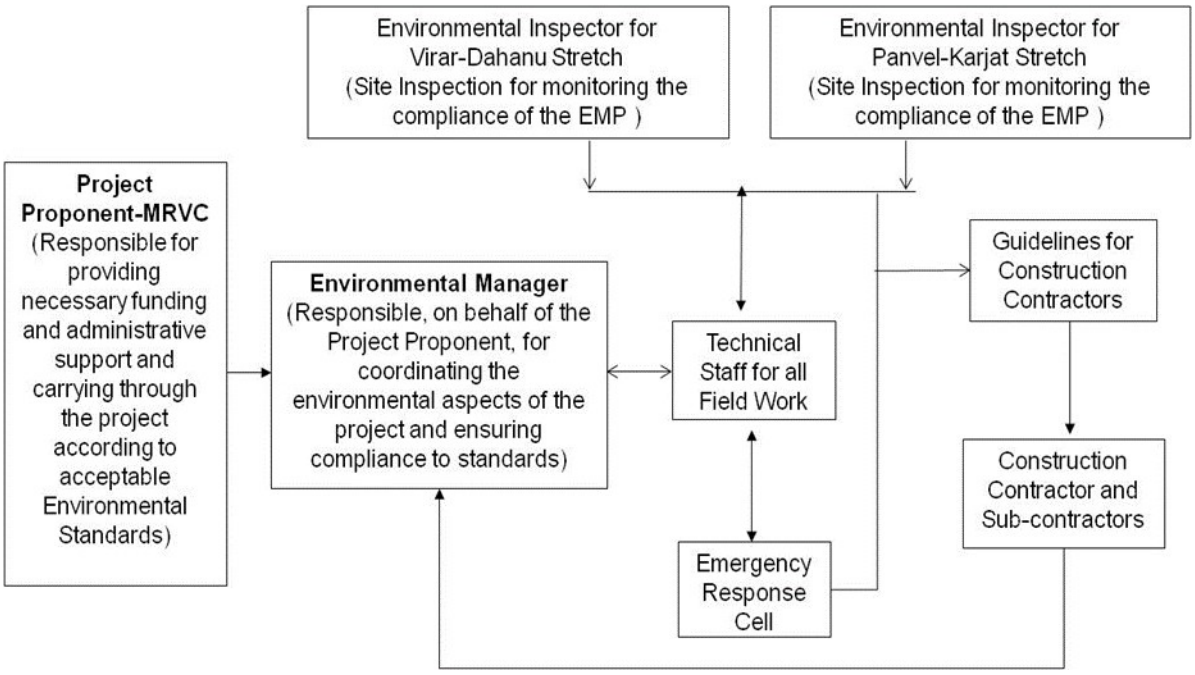


Figure 3: Proposed Institutional Framework for Monitoring of EMP