28/10/25
Tuesday

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Open Elective 3: Environmental Management Systems

(ISE-2)

Environmental Impact Assessment (EIA) report
Proposed Phase-1 of the Nashik Metro Rail Project

1.0 Introduction and Project Background

1.1 Purpose of the EIA

An Environmental Impact Assessment (EIA) is a crucial planning tool used to identify, predict, and evaluate the potential environmental and social consequences of a proposed project before any decision is made. The primary objective of this report is to provide a comprehensive analysis of the Nashik Metro Rail Project to assist regulatory authorities in making an informed decision. This study also outlines an Environmental Management Plan (EMP) to mitigate the adverse impacts identified.

1.2 Project Proponent and Need

- Project Proponent : Maharashtra Metro Rail Corporation Ltd. (Maha-Metro).
- Need for the Project : Nashik is a rapidly growing urban center facing significant challenges related to traffic congestion, deteriorating air quality, and an overburdened public transport system. The average vehicle speed during peak hours has drastically reduced.

A Mass Rapid Transit System (MRTS) like the metro is essential to provide a safe, efficient, and environmentally friendly mode of transport for the city's increasing population, thereby promoting sustainable urban development.

2.0) Detailed Project Description

This section provides technical details about the project's components and scope.

2.1) Alignment and Key features

-Route - The proposed Phase-1 is a 30 km elevated corridor connecting two major city nodes: Gangapur Road in the west and Nashik Road Railway Station in the east.

- Stations - Approximately 25 elevated stations are planned at an average spacing of 1.2 km. Stations will be equipped with modern amenities like collation (AFC) gates, and passenger information systems.

- Viaduct structure - The majority of the alignment will be an elevant viaduct constructed using pre-cast concrete segments. This method, known as segmental construction, minimizes on-site casting and reduces traffic disruption. The viaduct will be supported by single piers (pillars) primarily in the

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median of existing roads.

-Rolling stock - The trains will be modern, lightweight coaches made of stainless steel, designed for energy efficiency. They will run on a standard gauge track.

3.0) Description of existing environment

-Air quality - Ambient Air quality monitoring was conducted at key junctions like Dwarka Circle, Mumbai Naka & CBS.

- Noise quality - The ambient noise environment is dominated by road traffic.

- Water resources - The alignment crosses the Godavari River. The river is a critical water source and holds immense cultural significance. Its water quality is a concern due to the discharge of untreated domestic sewage and industrial effluents. The project must ensure no construction debris or contaminants enter the river.

4.0) Assessment of Potential Enviromental Impacts

4.1) Impacts During Construction Phase

-Air quality degradation - This is one of most significant impacts.

-Source - Excavation for pillars, demolition of structures, operation of concrete batching plants,

and movement of heavy vehicles will generate dust.
-Impact - Increased levels of PM_{10} can lead to respiratory illnesses for construction workers & nearby residents.

-Noise & Vibration-

Source - Activities like piling, rock breaking, and use of generators & heavy machinery.
Impact - This will cause significant disturbance to residents, commercial establishments.

4.2) Impacts During Operation Phase

-Positive Impacts (+):
- Improved Air quality: By shifting a significant portion of commuters from private fossil-fuel based vehicles to EV system, metro will cause reduction in emissions.
- Reduced Traffic Congestion: The metro will provide a high-capacity, reliable alternative to road travel.
- Reduction in noise pollution: A long-term, city wide reduction in ambient noise levels is expected due to fewer vehicles honking & revving engines on roads.
- Economic growth: The project will spur economic development around its stations (transit-oriented development) & create thousands jobs.

- Negative Impacts (-):
- Operational Noise: The movement of trains (wheel-rail interaction) will generate noise, which can affect residents.
- Visual Intrusion: The large, elevated concrete viaduct can be aesthetically unpleasing and may "divide" neighbourhoods, creating a sense of visual obstruction.

5.0) Mitigation Measures & Environmental Management Plan (EMP)

- For air pollution - Mandatory use of water sprinklers and fogging systems at all construction sites to control dust.
All construction vehicles must have (PUC) certificates.

- For noise pollution - Installation of temporary noise barriers around high-noise activity zones near schools and hospitals.
Prohibition of construction activities (10pm - 6am).

6.0) Analysis of Alternatives

- "No Project" Alternative - Not undertaking project would lead to a complete collapse
- "Underground" Metro - It avoids visual intrusion & tree cutting, the cost is 2x-3x higher than elevated corridor.

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- Bus Rapid Transit (BRT) : While cheaper, BRT system has lower carrying capacity & would occupy existing road lanes, which worsen congestion in narrow road cities.

7.0) Conclusion & recommendation -

1) Strict & mandatory implementation of all mitigation measures outlined in (EMP).

2) The formation of an independent Environmental Monitoring Committee to oversee compliance.

3) The allocation of a dedicated and sufficient budget for all environmental management & social rehabilitation activities.