

Execution of Metro Rail Projects – A Case Study of Nagpur Metro Rail

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Abstract

In India, there are currently more than 26 metro rail projects at various levels of planning, construction and operation. A number of new phases of metro rails are being planned and will be launched soon. Various studies have documented delays in planning and execution of metro rail projects in India as well as the world. In this study, an attempt will be made to understand various issues or impediments which are faced by the metro rail corporation in executing the metro rail projects. There are numerous factors which may cause hindrance to the project execution such as funding capacity of governments, finance arrangements, competing technologies, feasible operational model, stakeholder issues etc. The factors affecting the execution of metro rail projects will be researched using the case of Nagpur Metro Rail Project. The scope of the study will be limited from mobilization phase to commissioning phase only. The methodology of the research is based upon formal interactions carried out with the decision makers and project execution group of Nagpur Metro Rail Corporation. The outcome of the research is significant in creating process flows in executing metro rail projects faster and effectively.

Keywords: Metro Rail Projects; Execution Phase of Projects; Delays in Infrastructure Projects

I. INTRODUCTION

The Nagpur Metro system is an urban Mass Rapid Transit System (MRTS) that is being built to serve the city of Nagpur in eastern Maharashtra. Construction for its 38.215 km first phase started in 2015 and is expected to be completed in 2023 (est.) with a mix of elevated & at-grade level lines.

NMRCL is a Special Purpose Vehicle (SPV) created for the smooth implementation and operations of the Nagpur Metro Rail Project and is a joint venture of Government of India & Government of Maharashtra, with 50:50 equity. NMRCL shall be solely responsible for the successful and timely completion of the project & its operations subsequently. Nagpur Metro Rail Corporation Limited is incorporated by Govt. of India- Ministry of Corporate Affairs on 18th February 2015.

II. LITERATURE REVIEW

The population growth in cities and urban centers has put a lot of pressure on the infrastructure of these cities. In rapidly developing countries like India, the urban infrastructure is stretched to limit and requires very effective solutions. The rapid development in India is not unprecedented and such development earlier took place in several nations of Europe, America and in Japan. So several modes of urban mass transit are now available for the solution to the problem of Urban Transit.

Indian history of metro rail projects in India dates back in the year 1984 with Kolkata metro which was in many aspects to be first its kind. After that till 2017 nearly 26 projects (Under construction/Operational/proposed) are prevailing in India.



Fig. 1: Timeline of Operational Metro Projects in India

Phase	Success Factors
Conceptualizing	<ul style="list-style-type: none"> Clear understanding of project environment. Effectiveness of consultation with stakeholders. Competency of project team. Alignment with development priorities. Adequate resource support.
Planning	<ul style="list-style-type: none"> Effectiveness of consultation with stakeholders. Competency of project team. Compatibility of regulations for project management.
Implementation	<ul style="list-style-type: none"> Effectiveness of consultation with stakeholders. Consistency of support for stakeholders. Competency of project team.
Closing	<ul style="list-style-type: none"> Adequacy of Project closure activities. Effectiveness of consultation with stakeholders. Competency of project team.

Source: Khang, Do Ba, and Tun Lin Moe. "Success criteria and factors for international development projects: A life-cycle-based framework." Project Management Journal 39.1 (2008): 72-84.

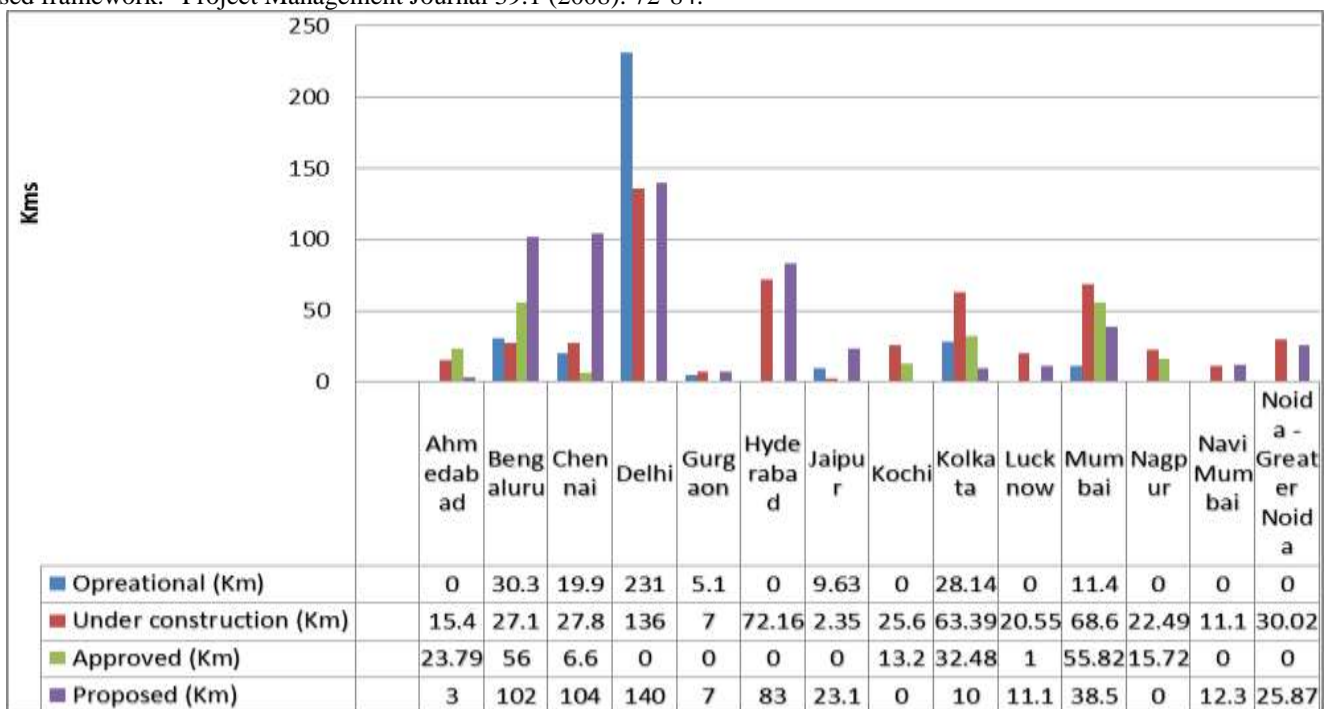


Fig. 2: Current status of Metro Projects in India
(Source: themetrorailguy.com)

A. Objective

In India, there are currently more than 26 metro rail projects at various levels of planning, construction and operation. An attempt was made to understand the setbacks experienced by various metro projects and to learn the steps and cautions exercised by NMRCL.

Success factors from the previous research works were setup as base- line and assessment would be done for the prevailing project.

The outcome thus discussed would be critical for further Metro rail projects in county to avoid any delay or ambiguity in any stage of Project

B. Methodology

Secondary data based on informal interaction with the Industry Experts, project execution groups, and various stakeholders was conducted to understand the issues related to metro projects in Maharashtra.

The issues thus identified from the previous or prevailing projects would be compared with the success factors and as an outcome, the descriptive analysis shall be done.

III. OBSERVATIONS

A. Clear Understanding of Project Environment

Nagpur is the third largest city of Maharashtra and also the winter capital of the state with a population of approximately 25 lakhs. The study indicates that Nagpur city, inherently has a compact form, but may disperse in near future; and there is a need to implement policies to retain its compact character to achieve sustainable urban development. Lack of proper regulations and required institutional framework for fulfilling the high demand for compact and high density built areas can lead to overcrowding and environmental degradation.(ref: Measuring Compact Urban Form: A Case of Nagpur City, India RajashreeKotharkar 1,†, PankajBahadure 1,†,* and NehaSarda 2,†). Thus a need for mass public transport system was felt in the city.

Supply of metro rail system in Nagpur will mean a lot in terms of sustainable means of transport that meets the mobility and accessibility needs of people (DPR).

B. Effectiveness of Consultation with Stakeholders

Right from the conceptualization phase, the communication between the project decision makers and the public has been strong. This one the most important characteristics which have led to the successful and speedy inception of the project. With the public in the loop and believing in the project has led to a positive impact on the success of the metro. Management of the contractors and safeguarding their interests is one the reasons the work on the site is carried out throughout the day and night.

C. Competency of Project Team

DRMC has prepared a DPR for Nagpur metro rail project in 2013. The DPR has estimated the ridership, Peak Hour Peak Day Traffic (PHPDT) up to 2041. DMRC has an experience of

An SPV by the name of Nagpur Metro Rail Corporation Limited (later changed to Maha Metro Rail Corp.) was formed and experts with experience in previous metro projects are a part of this team. A consortium of four multi- national companies is hired as the prime consultant. Prime consultants have developed a powerful project management systems with the client to execute the project successfully.

D. Adequate Resource Support

Experts with experience in railway projects and other metro projects are a part of the planning team. Regular tracking of work by the consultants is scheduled. The use of 5-D BIM is a unique feature of Nagpur metro. It has helped in integrating the time and cost components and is accessible to all the parties involved in the project thus bridging the communication gap and accelerating the processes.

E. Consistency of Support for Stakeholders

Signs and billboards with slogans like “Today's pain, tomorrow’s gain” have been painted on the barricades.

Staff at each crossing point to divert and manage traffic retired traffic police personnel recruited for the job of managing traffic.

Safety is given utmost importance and almost zero accident rate is achieved.

Metro Information Centres are situated at different locations of the city to provide information regarding the project

IV. CONCLUSION

From the above study, clearly, the efforts of Nagpur Metro Rail Corporation reflects on the progress of the project. Further upcoming projects in the country can be planned and executed in a way such that the experiences and bottlenecks identified in

previous projects can be eliminated. India has a huge need of Mass Rapid Transit Systems as a growing economy. The development such metro projects would boost the infrastructure and help the economy to develop.

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