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Report of the Comptroller and Auditor General of India on Implementation of Nagpur Metro Rail Project by Maharashtra Metro Rail Corporation Limited

SUPREME AUDIT INSTITUTION OF INDIA
लोकहितार्थ सत्यनिष्ठा
Dedicated to Truth in Public Interest

Union Government (Commercial)
Ministry of Housing and Urban Affairs
No. 34 of 2022
(Performance Audit)

Report of the
Comptroller and Auditor General of India
on
Implementation of Nagpur Metro Rail Project by Maharashtra Metro Rail Corporation Limited

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PREFACE

The Performance Audit Report on 'Implementation of Nagpur Metro Rail Project' by Maharashtra Metro Rail Corporation Limited has been prepared under the provisions of Section 19-A of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971 for submission to the Governments. The Audit has been carried out in line with the Regulations on Audit and Accounts, 2007 (revised in August 2020) and Performance Audit Guidelines, 2014 of the Comptroller and Auditor General of India.

The Audit covered the period from 2015-16 to 2020-21. This report examines planning, implementation, monitoring, operations and maintenance and outcome of the activities of Nagpur Metro Rail project.

Audit wishes to acknowledge the assistance provided and co-operation extended by the officers and staff of Maharashtra Metro Rail Corporation Limited, Ministry of Housing and Urban Affairs and Government of Maharashtra for this Performance Audit.

Executive Summary and Recommendations

Government of Maharashtra and Government of India decided (2014) to implement Nagpur Metro Rail Project to provide energy efficient and eco-friendly Mass Rapid Transport System for Nagpur City through a Joint Venture, Maharashtra Metro Rail Corporation Limited, with an estimated cost of ₹8,680 crores. The project consists of two corridors for a total length of 38.478 km (33.078 elevated and 5.40 km at-grade) with 38 stations. The two corridors viz. North-South Corridor and East-West Corridor were further divided into two Reaches each, out of which one Reach in each corridor and 23 out of 38 stations have been made operational till March 2022.

The Performance Audit was conducted covering planning, implementation, monitoring, and operations of Nagpur Metro Rail project by Maharashtra Metro Rail Corporation Limited during the period 2015-16 to 2020-21 with the following objectives to assess whether:

1. the project planning and implementation was efficient and effective to ensure timely completion coupled with economic viability and selection of the most appropriate technologies;

2. project and contract management were economical, efficient and effective;

3. the operation and maintenance were efficient and the planned benefits were achieved/ achievable after commencement of commercial operations; and

4. the internal control was effective and an adequate monitoring mechanism existed to ensure completion of works in conformity with the laid down specifications/DPR/ Ministry of Housing and Urban Affairs directions and guidelines/other applicable standards

A total of 618 contracts/work orders/consultancy works valuing ₹6,714.88 crore relating to the project were awarded by Maharashtra Metro Rail Corporation Limited. Audit examined 70 contracts selected using statistical sampling techniques, valuing ₹6,369.64 crore (94.86 *per cent* in terms of value and 11.33 *per cent* in terms of number of contracts).

Results in Brief

Detailed Project Report envisaged 36 stations and two additional stations were added by Maharashtra Metro Rail Corporation Limited at the implementation stage. Out of the two stations, the Airport South station was first envisaged as a temporary station mainly for reversal of trains though such reversal of trains could have been achieved through cross-over tracks. Cotton Market station, the second additional station was projected to have high Peak Hour Peak Direction Trips but the work was kept on hold midway citing fund crunch. There was an element of risk to operational and commuter safety due to non-provision of Platform Screen Doors, non-commissioning of Operation Control Center and operation of three stations with single entry/exit points. Though Maharashtra Metro Rail Corporation Limited was aware at the time of award of key civil works that the envisaged commercial operation would not materialize in April 2018, no revised target was laid down with the result that the construction work lingered on. Tender evaluation lacked transparency as bidders who did not submit essential documents were awarded contracts in two cases, rates were increased after award of contract and major works were awarded as additional works on nomination basis to contractors executing other works. Termination of ILFS contract was delayed by a year which led to cascading delays in other contracts. Weaknesses in contract management has resulted in partial execution of the project with commercial operation of two out of four reaches yet to be declared (March 2022). Short release of funds by Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation, totalling ₹793.89 crore adversely impacted the completion of ongoing works of Nagpur metro rail project. The project has shown low ridership as compared to the Detailed Project Report projections and the surplus generated is only a fraction of the amount required for servicing of debt (total loan amount: ₹4,521 crore) raised by the Government of India for the project from external funding agencies. Though the ridership is expected to improve after all the Reaches are made operational, yet whether the revenues would cover the debt servicing needs close monitoring and appropriate interventions.

Audit Findings

Planning and Implementation

Detailed Project Report for the Nagpur Metro Rail Project was prepared by Delhi Metro Rail Corporation Ltd. Detailed Project Report envisaged 36 stations and 2 additional stations were added by the Maharashtra Metro Rail Corporation Limited at the implementation stage. Out of the two stations, the Airport South station was first envisaged as a temporary station costing ₹47.26 crore mainly for reversal of trains though such reversal of trains could have been achieved through cross-over tracks. Subsequently the station was converted into an operational station. The station has shown average ridership of 191 to 229 only per day. Cotton Market station, the second additional station was projected to have high Peak Hour Peak Direction Trips but the work was kept on hold midway citing fund crunch due to non-release of pending contribution from stakeholders (Nagpur Improvement Trust, Nagpur Municipal Corporation and Government of Maharashtra). However, the situation could have been managed through prioritization of works.

(Para 3.1.1 and 3.1.2)

The location of New Airport station was not ideal from the viewpoint of ridership due to sparse population in and around the station and also from the accessibility point of view. The average ridership for a period of 18 months from date of commercial operation (March 2019) of the station was only 47 passengers per day as against the ridership of 5,474 per day envisaged in the detailed project Report.

(Para 3.2)

Maharashtra Metro Rail Corporation Limited adopted 25 kV AC traction system for the project despite the suggestions of Consultant M/s RITES and the Sub-Committee of Maharashtra Metro Rail Corporation Limited for adoption of 750 V DC system, in view of more suitability and potential cost saving of ₹719 crore. MMRCL cited the need for maintaining uniformity in traction systems across the State of Maharashtra for the decision.

Audit observed that Metro Projects in various cities were independent projects and have no linkage to each other and the selection of traction system should have been based on accruing benefits.

(Para 3.3)

There was an element of risk to operational and commuter safety due to non-provision of Platform Screen Doors, non-commissioning of Operation Control Center and operation of three stations with single entry/exit points.

(Para 3.4, 3.5 and 3.7)

Maharashtra Metro Rail Corporation Limited while tendering for rolling stock did not ensure that the required train sets would be delivered before the anticipated date of commercial operation of Reach 1, with the result that two train sets had to be hired at a cost of ₹45.88 crore from M/s L&T Metro, Hyderabad.

(Para 3.6)

Maharashtra Metro Rail Corporation Limited awarded (April 2018) the work of development of Eco-park adjacent to the MIHAN Depot as an additional work to the existing contractor M/s PCS JV at an awarded value of ₹18.99 crore (value of work executed up to December 2020 was ₹3.45 crore) though construction of the park was not a core activity of Maharashtra Metro Rail Corporation Limited, which showed lack of prioritisation of works.

(Para 3.8)

With reference to Audit findings on planning and implementation, Audit recommends that:

1) Maharashtra Metro Rail Corporation Limited may consider formulation of a standard procedure for approval/construction/procurement of items, which are not specified in the approved Detailed Project Report. The authority for according approvals for deviations to approved Detailed Project Report needs to be specified in the Delegation of Powers.

2) Ministry of Housing and Urban Affairs may evolve a suitable advisory framework to offer guidance in technical matters such as adoption of traction system.

3) Though installation of Platform Screen Doors is not a mandatory requirement, Maharashtra Metro Rail Corporation Limited may consider installing the same in view of the safety benefits.

4) Granting additional works to existing contractors is not a transparent method of awarding contracts, and hence, Maharashtra Metro Rail Corporation Limited may frame appropriate guidelines in its Procurement Manual to check the practice.

Project and Contract Management

As per the Detailed Project Report, the commercial operation was to be achieved by April 2018 but only two out of four Reaches have begun commercial operation. At the time of award of key civil works, Maharashtra Metro Rail Corporation Limited was aware that the envisaged commercial operation would not materialize in April 2018, since the scheduled completion dates of key civil works began from October 2018 and went on till February 2021. Yet, no revised target was laid down for commercial operation of the entire project, with the result that the construction work lingered on and is yet to be completed (March 2022).

(Para 4.1)

Maharashtra Metro Rail Corporation Limited did not publish its tenders on Central Public Procurement Portal as stipulated by Department of Expenditure, Ministry of Finance, Government of India. Thus, Maharashtra Metro Rail Corporation Limited lost the opportunity to ensure wide publicity for the tenders to obtain competitive rates.

(Para 4.2)

Maharashtra Metro Rail Corporation Limited tendered the work of installation of ballast less track in Reach 1 and Reach 3 without conducting proper survey and assessing actual items required for the work, though Maharashtra Metro Rail Corporation Limited engaged a track advisor for the purpose. Due to improper framing of work estimate, the estimated cost put to tender was inflated by ₹14.45 crore, i.e., by 24.13 *per cent*. Tender evaluation lacked transparency as bidders who did not submit required documents to verify qualification criteria were awarded contracts in two cases.

(Para 4.3 and 4.4)

Maharashtra Metro Rail Corporation Limited awarded major/substantial works amounting to ₹877.58 crore as additional works to existing contractors/consultant working in the project on nomination basis, citing emergency, timely completion of the project and the probable delay which may arise due to following the laid down tendering process. The additional works were awarded by invoking a clause in the existing contract which permitted quantity variation of (+/-) 25 *per cent,* though the clause was meant for regularization of any variation in the bill of quantities during execution and not for altogether new works. While awarding the new works, the enhanced technical and financial capabilities required for execution of the additional works were not assessed with the result that the envisaged benefit of timely completion also did not materialize.

(Para 4.5)

Maharashtra Metro Rail Corporation Limited paid interest free mobilisation advance to contractors, the recovery of which was made from the running bills of the contractors, as per the progress of work. This was not in accordance with the guidelines of Central Vigilance Commission, which prescribed time bound recovery of mobilization advance. Since the works were progressing at a slow pace, recovery of mobilization advance amounting to ₹130.86 crore was pending (April 2021).

(Para 4.6)

Maharashtra Metro Rail Corporation Limited did not recover additional cost incurred amounting to ₹45.30 crore from three contractors on account of subsequent re-award of their terminated/de-scoped works at higher cost. This was due to failure by Maharashtra Metro Rail Corporation Limited to include ‘risk and cost clause’ in one contract and non-invoking of risk and cost clause in two contracts.

(Para 4.7)

Maharashtra Metro Rail Corporation Limited granted material advance of ₹23.60 crore and acceleration advance of ₹10 crore to ILFS though these were not permissible as per the tender conditions, the latter having been disbursed (October 2018) two months prior to termination of contract in December 2018. The termination itself was delayed by a year, though Maharashtra Metro Rail Corporation Limited was aware of the failure of ILFS in execution of work, due to which the work of construction of Sitabuldi station was descoped from them in December 2017. Delay in termination not only affected the progress of work but also resulted in Maharashtra Metro Rail Corporation Limited not being able to encash the bank guarantee as the termination was done after the order of NCLAT restraining banks from honouring the bank guarantees furnished by ILFS. Further, the delay in termination had a cascading effect as only 5 stations out of planned 11 stations could be made operational in Reach 1 when commercial operation was declared in March 2019.

(Para 4.8)

Due to slow progress of work in the construction of Sitabuldi interchange station by the contractor ILFS, the work was de-scoped from them and awarded to M/s Afcons for ₹70.05 crore as an additional work to their existing contract of construction of viaduct in Reach 3. At the time of award, Maharashtra Metro Rail Corporation Limited decided (February 2018) to maintain the accepted Bill of Quantities item rates as applicable to ILFS work contract. Subsequently, Afcons was also awarded the work of architectural finishing for ₹28.70 crore on nomination basis. After award of the works, Maharashtra Metro Rail Corporation Limited granted (December 2018) item rate increase amounting to ₹17.19 crore in the two additional contracts, which was not in accordance with contract terms.

(Para 4.9)

General Financial Rules of the Government of India stipulated that price variation clause can be provided in long term contracts, where the delivery period extends beyond 18 months and that short term contracts should have firm and fixed prices. Maharashtra Metro Rail Corporation Limited incurred expenditure of ₹6.02 crore towards price escalation in short term contracts, which was in violation of the General Financial Rules.

(Para 4.10)

General Consultant utilized 8,781 man-months against the prescribed 5,176 man-months (increase by 69 *per cent)*, due to which the contract value increased from ₹221.93 crore to ₹297.46 crore (34 *per cent*) during the contract period. Also, the lead member of the consortium M/s SYSTRA was awarded the work of Detailed Design Consultant for 10 stations at a cost of ₹6.60 crore on nomination basis, notwithstanding the 'Conflict of Interest' as the General Consultant was required to proof check the designs/drawings submitted by the Detailed Design Consultant.

(Para 4.11)

Due to inadequate planning in tendering of major works, non-deployment of adequate manpower by contractors, not getting timely clearances for railway crossing, non-furnishing of drawings and design in time to the contractors and providing access to the work front to the contractors resulted in delay/non-completion of works in the project which resulted in the project being only partially commissioned even after lapse of three years from planned commercial operation of the entire project. Maharashtra Metro Rail Corporation Limited had to bear price escalation of ₹72.08 crore due to non-completion of major civil works within the stipulated contract period.

(Para 4.12)

With reference to the Audit findings on project and contract management, Audit recommends that:

5) Maharashtra Metro Rail Corporation Limited may arrive at revised target for commercial operation of the entire project and obtain Board approval for the same. Board may closely monitor achievement of the revised target.

6) Award of contracts on nomination basis is not a transparent method of tendering and hence, Maharashtra Metro Rail Corporation Limited may frame appropriate guidelines in the Procurement Manual to discourage the practice.

7) Maharashtra Metro Rail Corporation Limited may suitably modify the contract clause regarding recovery of mobilization advance to make it time bound in line with the CVC guidelines.

8) Maharashtra Metro Rail Corporation Limited may invariably include 'Risk and Cost' clause in all the contracts to safeguard its interest and take timely and appropriate action in invoking the clause in contracts terminated due to contractor's fault.

9) Maharashtra Metro Rail Corporation Limited may put in place a mechanism for timely recovery of advances granted to the contractors by fixing responsibility at appropriate level.

Operational Performance

The actual ridership achieved so far in the project was only 3.85 to 7.43 *per cent* of the ridership projected in the Detailed Project Report. The low ridership in both the operational Reaches can be attributed to various factors including non-operationalisation of two reaches (Reach 2 and 4) and even in the two Reaches that are operational (Reach 1 and 3), 3 stations are not yet operational.

(Para 5.1)

Coupled with low fare box revenue due to low ridership, the revenue generation from non-fare box sources for the period from 2018-19 to 2020-21 was only ₹67.86 crore as against the Detailed Project Report projection of ₹1,666 crore (4 *per cent* of the estimated revenue). The major /component of non-fare box revenue as per the Detailed Project Report was revenue on account of additional Floor Space Index amounting to ₹1,201 crore. However, the actual revenue realized was only ₹67.59 crore (6 p*ercent* of the estimated revenue).

(Para 5.2)

Maharashtra Metro Rail Corporation Limited could earn only ₹0.27 crore from property business and advertisement, which was 0.28 *per cent* of the estimated revenue (₹97 crore) as per the Detailed Project Report. The land acquired for stations was more than double the requirements projected in the Detailed Project Report (73,497 sq. mtr of land was acquired against projection of 32,752 sq. mtr). Maharashtra Metro Rail Corporation Limited planned property development through monetization of land parcels and identified four land parcels. However, Maharashtra Metro Rail Corporation Limited could not monetize the land parcels and as a result no revenue could be generated. Maharashtra Metro Rail Corporation Limited constructed two level basements for parking facility at Kasturchand Park land parcel near to Kasturchand Park Metro station at a cost of ₹24.75 crore. Construction of a parking facility costing ₹24.75 crore for a station costing ₹41.22 crore without development of commercial complex lacks justification and is not a financially prudent decision.

(Para 5.3)

The total surplus generated by Maharashtra Metro Rail Corporation Limited for the period from 2015-16 to 2020-21 was ₹13.14 crore and the instalment amount due to be paid to the external agencies during 2021-22 was ₹377.79 crore. Therefore, the surplus generated is only a fraction of the amount required for servicing of debt (total loan amount: ₹4,521 crore) raised by the Government of India for the project from external funding agencies. The instalments that have fallen due till December 2021 have not yet been paid. In the case of AFD loan, extension in repayment has been granted up to June 2022 by the external agency while in the case of KfW loan, the matter is under correspondence. Though the ridership may improve after all the Reaches are made operational, yet whether the revenues would cover the debt servicing needs close monitoring and appropriate interventions.

(Para 5.5)

With reference to Audit findings on operational performance, Audit recommends that:

10) Maharashtra Metro Rail Corporation Limited may devise an appropriate policy for monetization of land parcels and make efforts for optimal renting out of Property Business spaces. There should be a member/expert with marketing skill in the Board for efficiently dealing with Property Development and Property Business related activities.

11) Since the loans have been raised by the Government of India on behalf of the project, Ministry of Housing and Urban Affairs may closely monitor the ability of Maharashtra Metro Rail Corporation Limited and Government of Maharashtra to service the debt and take appropriate measures to mitigate the debt burden, if required.

Project Monitoring and Internal Control

The High Powered Committee constituted by Government of Maharashtra under the chairmanship of the Chief Secretary to sort out all State level issues involved in the project met only on a single occasion though mandated to meet at least once in a month. Further, Maharashtra Metro Rail Corporation Limited was not included as a member of the High Powered Committee. Due to not holding regular meetings and non-representation of Maharashtra Metro Rail Corporation Limited in the High Power Committee, State level issues particularly regarding delay in release of funds by stake holders remained unresolved. Non-receipt of contribution of ₹793.89 crore from Government of

Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation adversely impacted the progress of work. Institutional frameworks such as Urban Metropolitan Transport Authority and Urban Transport Fund also could not serve their purpose as Urban Metropolitan Transport Authority has been established only now (February 2022) and Urban Transport Fund is yet to be established by the Government of Maharashtra.

(Para 6.1, 6.2 and 6.3)

Maharashtra Metro Rail Corporation Limited did not ensure that the stamp duty was paid at prescribed rate as per The Maharashtra Stamp (Amendment) Act, 2015 while entering into agreements with contractors, resulting in loss of revenue of ₹4.76 crore to the State exchequer.

(Para 6.4)

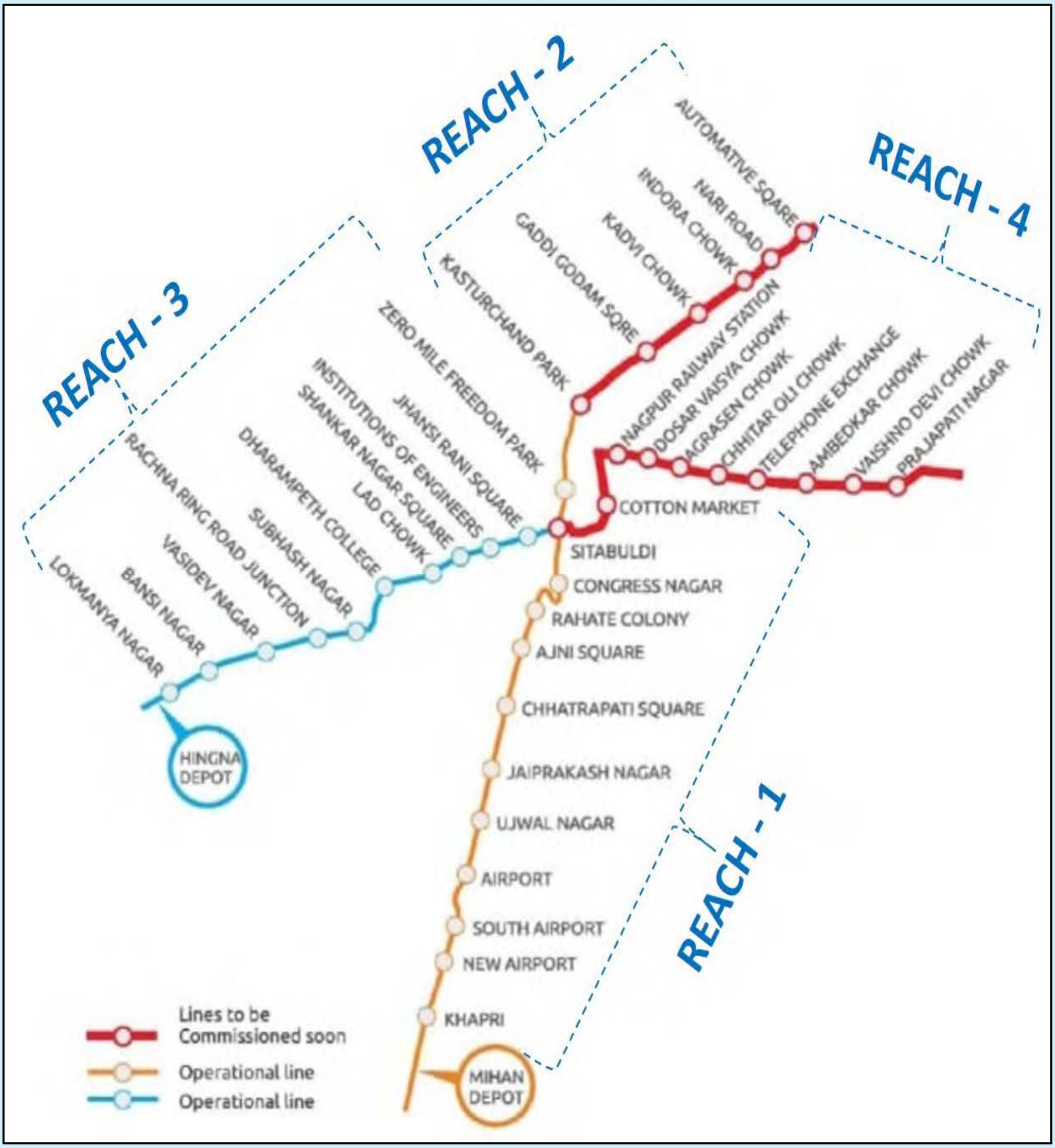
Maharashtra Metro Rail Corporation Limited was holding four accounts with a private sector Bank viz., ICICI Bank with a total balance of ₹3.09 crore in violation of Government directions as per which in all Central Sector Schemes/Centrally Sponsored Schemes, the banking arrangements of the implementing agencies, as a norm, are to be handled by the Public Sector Banks and Regional Rural Banks.

(Para 6.5)

With reference to the Audit findings on project monitoring and internal control, Audit recommends that:

12) Since the project has not been completed despite release of the full share of funds by the Government of India, Ministry of Housing and Urban Affairs may impress upon the Government of Maharashtra to release their share including share of the State agencies.

13) Since Maharashtra Metro Rail Corporation Limited is implementing two metro projects in Maharashtra (Nagpur and Pune), Ministry of Housing and Urban Affairs may take appropriate action for inclusion of Maharashtra Metro Rail Corporation Limited in the High Powered Committee for timely resolution of project related issues.



Route Map of Nagpur Metro

Chapter 1: Introduction

1.1 Background

Considering the need of Nagpur city to meet the future requirements and to explore the possibility of providing energy efficient and eco-friendly Mass Rapid Transport System, Government of Maharashtra decided (May 2001) to conduct techno-economic feasibility study for Mass Rapid Transport System in Nagpur. M/s L&T Ramboll Consulting Engineers Ltd., who were appointed for undertaking the study, suggested (March 2004) Light Rail Transit system of 21.8 kms[1] in Phase I at a cost of ₹1,596.10 crore at 2003 price level. They also suggested an alternative option of having an efficient bus system to serve the corridor till 2021 and to develop a rail based facility by 2021 when ridership was estimated at 10,000 Peak Hour Peak Direction Trips[2]. They further stated that the project was not financially viable as the Internal Rate of Return was 0.77 *per cent*. However, keeping in view the future increase in passengers, Nagpur Improvement Trust expressed (November 2010) interest in taking up the project and requested Government of Maharashtra that Nagpur Improvement Trust may be assigned the project for implementation.

Ministry of Urban Development (now renamed as Ministry of Housing and Urban Affairs), Government of India suggested (June 2011) to Government of Maharashtra to consider carrying out Detailed Project Report (DPR) for metro system in Nagpur through Delhi Metro Rail Corporation as the Government of India was in the process of considering implementation of metro system in all cities with a population of 2 million (Nagpur was likely to have a population of around 3.4 million by 2015). Government of Maharashtra decided to appoint Nagpur Improvement Trust as nodal agency for getting the DPR prepared with equal sharing of cost between Government of Maharashtra and Government of India. Ministry of Urban Development, Government of India conveyed (March 2012) its in-principle approval for preparation of DPR for the project. Nagpur Improvement Trust awarded (February 2012) the work of preparation of DPR to Delhi Metro Rail Corporation and the latter submitted the DPR in November 2013. The Nagpur Metro Project was approved by Government of Maharashtra in January 2014 and in-principle approval to the project was accorded by the Government of India in February 2014. Final approval for the project was granted by Government of India in August 2014 with an approved project cost of ₹8,680 crore.

1.2 Project details

The Nagpur Metro Rail project was approved with two corridors viz., North-South Corridor and East-West Corridor and both the corridors were envisaged to be commercially operational from April 2018 as per the DPR. At the implementation stage, the two corridors

1 ***(Corridor 1- North-South Corridor from Multi-Modal International Cargo Hub and Airport at Nagpur to Transport Plaza).***

2 ***Peak Hour Peak Direction Trips (PHPDT) is a measure of route capacity of a rapid transit or public mode of transportation.***

were further divided into two 'Reaches' each. Reach 1 in North-South corridor was operational from 10 March 2019 and Reach 3 in East-West corridor was operational from 28 January 2020. Reach 2 was partially commissioned on 20 August 2021 by operationalisation of 2 out of 7 stations in Reach 2. Reach 4 is presently under construction (March 2022). The details of Reach under both the corridors are as mentioned below:

Table 1.1: Four Reaches of Nagpur Metro Rail Project

Corridor	Reach	From –To	Actual length of Reach* (in kms)	Actual number of stations in the Reach#	Number of operational stations as on 31.03.2022
North-South corridor	Reach 1	Khapri to Sitabuldi	13.775	11	11
	Reach 2	Sitabuldi to Automotive Square	6.310	7	2
East-West corridor	Reach 3	Lokmanya Nagar to Sitabuldi	10.983	10	10
	Reach 4	Sitabuldi to Prajapati Nagar	7.410	10	Under Construction
Total			**38.478**	**38**	**23**

**Proposed length as per DPR of North-South corridor was 19.658 km and that of East -West corridor was 18.557 km i.e., total proposed length was 38.215 km, against which actual length was 38.478 km. The project was built at elevated level (33.078 km) and at-grade level (5.40 km).*

 # Proposed number of stations in the North-South corridor was 17 and East-West corridor was 19, as per the DPR. Two stations were added at the implementation stage. Out of total 38 stations, 35 stations are elevated and 3 stations are at-grade.

1.3 Project Funding

The project cost, mode of funding and amount of funds received up to March 2021 is as mentioned below in Table 1.2.

Table 1.2: Project Funding

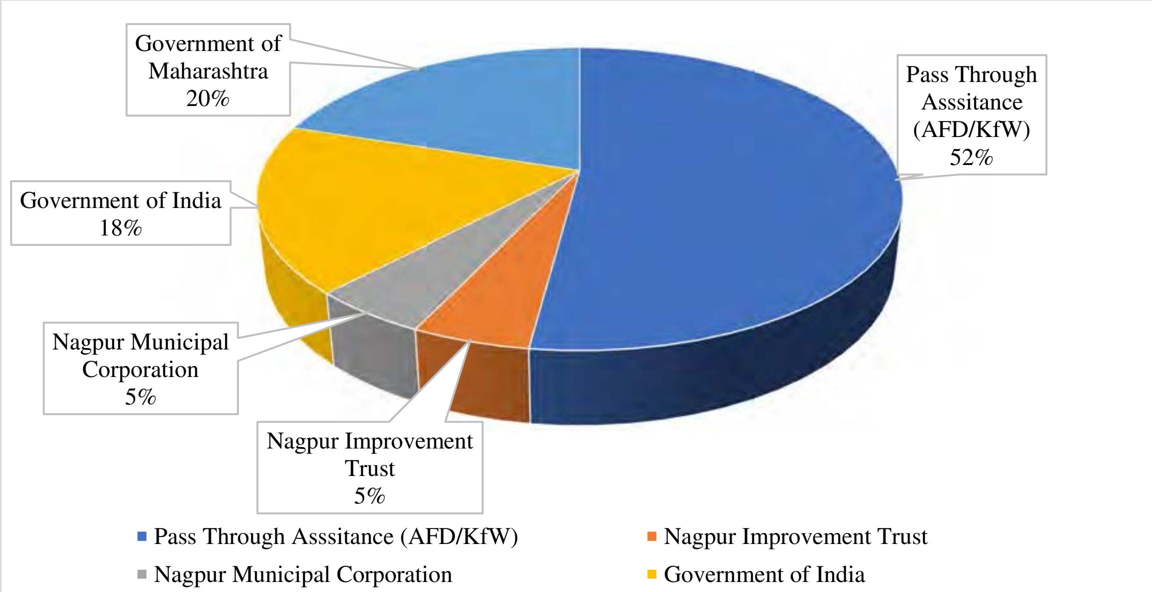
(₹ in crore)

Name of the stakeholder	Type of fund	Share as per GoI sanction order	Fund released upto March 2021	Balance fund receivable
Government of India	Equity	1,114.00	1,114.00	0.00
	Subordinate Debt for Central Taxes	441.00	441.00	0.00
	Pass Through Assistance against AFD and KfW loans	4,521.00	4,521.00	0.00
Government of India total		**6,076.00**	**6,076.00**	**0.00**
Government of Maharashtra	Equity	1,114.00	937.86	176.14
	Subordinate Debt for Central Taxes	441.00	441.00	0.00
	Subordinate Debt for State Taxes	181.00	105.80	75.20
Government of Maharashtra total		**1,736.00**	**1,484.66**	**251.34**
NIT*	Grant	73.00	68.25	4.75
NIT*	Grant-State Tax	78.00	0.00	78.00
NMC**	Grant	73.00	0.00	73.00
NIT*	Land Contribution	283.00	189.20	93.80
NMC**	Land Contribution	361.00	68.00	293.00
Total Grant from Urban Local Bodies		**868.00**	**325.45**	**542.55**
Grand Total		**8,680.00**	**7,886.11**	**793.89**

** Nagpur Improvement Trust*

*** Nagpur Municipal Corporation*

Chart 1.1: Details of Funds sanctioned



It can be seen from the above table that share of funds amounting to ₹793.89 crore (9.15 *per cent* of the total project cost) due from Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation were yet to be received. Against the approved cost of ₹8,680 crore, expenditure of ₹7,878 crore (90.76 *per cent*) has been incurred on the project up to March 2021.

1.4 Maharashtra Metro Rail Corporation Limited

A Special Purpose Vehicle (SPV) viz., Nagpur Metro Rail Corporation Limited was formed in February 2015 for implementation of Nagpur Metro Rail Project as a joint venture (JV) of Government of India and Government of Maharashtra with equity contribution of 50:50 each. Subsequently, the name of the SPV was changed (January 2017) to Maharashtra Metro Rail Corporation Limited (MMRCL) for implementation of metro rail projects in the State of Maharashtra outside the Mumbai Metropolitan Region.

The Management of MMRCL was vested with a Board of Directors consisting of 16 Directors (10 Non-functional and 6 Functional/ Technical Directors) as on 31 March 2021. The Chairman of MMRCL is the nominee of Government of India and Managing Director is nominated by the Government of Maharashtra. The Managing Director is assisted by Director (Projects), Director (Rolling Stock and Systems), Director (Finance)/CFO, Director (Works), Director (Strategic Planning) and Director (Operation and Maintenance). The meetings of the Board were held at the specified intervals.

1.5 Financial performance

The financial performance of MMRCL during the period from 2016-17 to 2020-21 is as mentioned below:

Table 1.3: Financial Performance

(₹ in crore)

Particulars	Financial year				
	2016-17	**2017-18**	**2018-19**	**2019-20**	**2020-21**
Income					
Revenue from Operations[3]	44.82	132.39	217.12	317.62	222.39
Other income	8.29	36.09	51.47	95.80	68.58
Total Income	**53.11**	**168.47**	**268.59**	**413.43**	**290.97**
Expenditure					
Operating Expenses	43.88	128.86	211.92	313.21	245.85
Employee benefits Expenses	0.09	2.35	2.76	28.80	31.66
Finance costs	-	0.00	0.76	5.14	14.14
Depreciation and Amortisation Expenses	2.26	15.61	25.92	92.85	156.76
Other Expenses	9.77	34.76	34.34	40.53	21.13
Total Expenditure	**56.01**	**181.59**	**275.70**	**480.53**	**469.54**
Profit/(Loss) Before Tax	**(2.90)**	**(13.12)**	**(7.11)**	**(67.10)**	**(178.58)**

It may be seen from the above table that MMRCL has continued to be in financial loss since its incorporation till date (March 2021). Though the revenue from operations showed an increasing trend during the period from 2016-17 to 2019-20, the increase in revenue was not commensurate to cover the rise in operating costs, depreciation/amortization expenses, etc. During the year 2020-21, the revenue from operations declined by 30 *per cent* compared to 2019-20 on account of suspension of metro operations for a major part of the year on account of Covid-19 lockdown. The loss of MMRCL increased from ₹67.10 crore in 2019-20 to ₹178.50 crore in 2020-21 mainly due to the decline in revenue due to covid lockdown and increase in depreciation provision by 69 *per cent* in 2020-21 in comparison to the previous year 2019-20.

[3] ***Includes revenue from external project works, consultancy services and fare box revenue from March 2019 onwards.***

Chapter 2: Scope, Audit Objectives and Methodology

The Performance Audit Report on 'Nagpur Metro Rail Project' has been prepared under the provisions of Section 19-A of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. The Audit has been carried out in line with the Regulations on Audit and Accounts, 2007 (revised in August 2020) and Performance Audit Guidelines, 2014 of the Comptroller and Auditor General of India.

2.1 Scope

The Performance Audit was conducted between September 2020 and July 2021 covering planning, implementation, monitoring and operations of Nagpur Metro Rail project by MMRCL during the period 2015-16 to 2020-21.

A total of 618 contracts/works orders/consultancy works valuing ₹6,714.88 crore relating to the project were awarded by MMRCL. Audit has selected all the contracts having value of more than ₹25 crore, 25 *per cent* of the contracts having value between ₹5 crore to ₹25 crore and 5 *per cent* of contracts having value less than ₹5 crore by using statistical sampling. A total of 70 contracts valuing ₹6,369.64 crore out of 618 contracts (94.86 *per cent* in terms of value and 11.33 *per cent* in terms of number of contracts) were scrutinized (details in ***Annexure 1)***.

2.2 Audit Objectives

The Audit objectives of the Performance Audit were to examine and assess whether:

1. the project planning and implementation was efficient and effective to ensure timely completion coupled with economic viability and selection of the most appropriate technologies;

2. project and contract management were economical, efficient and effective;

3. the operation and maintenance was efficient and the planned benefits were achieved/achievable after commencement of commercial operations; and

4. the internal control was effective and an adequate monitoring mechanism existed to ensure completion of works in conformity with the laid down specifications/DPR/ Ministry of Housing and Urban Affairs directions and guidelines/other applicable standards.

2.3 Audit Criteria and Methodology

The following criteria were adopted during the Audit:

- DPR prepared by Delhi Metro Rail Corporation;
- Studies and surveys conducted by MMRC and Government of Maharashtra;
- The Metro Railways (Construction of Works) Act, 1978; Metro Railway Act, 2002 (as amended in 2009);
- Metro Railway Policy 2013 and 2017, notified by Ministry of Housing and Urban Affairs;

- General Financial Rules and Guidelines of Central Vigilance Commission;
- Agenda and Minutes of the meetings of Board of Directors of MMRCL, Board level committees viz., Project Committee, Audit Committee and other Committees;
- Manuals/guidelines/directions/policies, etc. issued by MMRCL for various activities like contract management, safety, quality control, etc.;
- Annual Reports of MMRCL, Schedule of Powers, Management Information System and Monthly Progress Reports; and
- Terms and conditions of tenders, contract agreements, correspondences with the contractors/General Consultant of the project.

The Performance Audit commenced with an Entry Conference held on 7 August 2020 with MMRCL wherein the Audit objectives, scope, criteria and methodology were discussed. The Audit was conducted, keeping in view the situation arising out of Covid-19 pandemic, by examining digital records maintained by MMRCL in addition to physical records. Draft Performance Audit Report was issued to MMRCL on 26 July 2021 and MMRCL furnished its response on 23 August 2021. Thereafter, major Audit observations and key recommendations were discussed in the Exit Meeting held with Management of MMRCL on 6 September 2021. The draft report incorporating the response of MMRCL was issued to Ministry of Housing and Urban Affairs on 21 September 2021 and Government of Maharashtra on 03 January 2022. Ministry of Housing and Urban Affairs furnished their reply on 03 March 2022 and Exit Conference was held on 11 March 2022. The responses of the Management and Ministry and views expressed during the Exit meetings have been duly considered in this Report.

2.4 Structure of the Report

The Audit findings are discussed in Chapter 3 to 6 and concluding remarks are given in Chapter 7.

- Chapter 3 of this report deals with the planning and implementation of the Nagpur Metro Rail Project.
- Chapter 4 contains observations on project and contract management.
- Chapter 5 brings out the operational performance of Nagpur metro rail project.
- Chapter 6 examines the monitoring and internal control in implementation of the project.
- Chapter 7 provides concluding remarks.

2.5 Acknowledgement

We wish to acknowledge the cooperation and assistance extended by officials of MMRCL, Ministry of Housing and Urban Affairs and Government of Maharashtra at various stages of Audit in providing information, records, clarifications and discussion with concerned officers, which facilitated completion of Audit.

Chapter 3: Planning and Implementation

3.1 Construction of additional stations

As per the approved Detailed Project Report (DPR), 36 stations were to be constructed for both the corridors and at the implementation stage, two stations were added viz., Airport South Station and Cotton market station.

In this regard, Audit observed the following:

3.1.1 Airport South Station

Since addition of a station is a deviation from the approved DPR, approval of Board of Directors of MMRCL was required. Audit noticed that while Board approval was obtained for the addition of Cotton market station, Board approval was not obtained for Airport South Station. The tender for the Airport South station was called for in March 2016 along with the tender for stations in Reach 1 and the work was awarded in July 2016. Subsequently, Board Agenda was prepared (September 2016), as per which Airport South station was envisaged as a 'temporary' station mainly for reversal of trains, boarding and alighting of passengers and providing facilities like parking, bus stops, etc. However, the item was withdrawn in the Board meeting. Eventually, Airport South Station was constructed at a cost of ₹47.26 crore with the approval (September 2016) of Managing Director of MMRCL. The station became operational from March 2019 and was made into an operational station, instead of temporary station.

Audit observed that construction of a station incurring additional cost of ₹47.26 crore mainly for reversal of train was not justified or a prudent decision as the same could have been provided through cross over tracks. Moreover, financial concurrence was not obtained and contract for the station was awarded even before the Board Agenda was moved.

MMRCL while proposing construction of Cotton Market station had conducted survey relating to the population, commercial/market units, projected Peak Hour Peak Direction Trips (PHPDT) for 20 years etc. However, in the case of Airport South station such survey/studies were not conducted on the ground that it would be a temporary station mainly for reversal of trains. However, after commissioning, it has been made into an operational station but the ridership remained low (pre COVID period average ridership per day was 191 and post COVID period ridership per day was 229).

The Airport South station was at a distance of only 879 metres from the Airport station, which also did not justify additional station at such a short distance. Further, during site visit by Audit (June 2021) at Airport South Station, it was observed that the surrounding area near to the station was thinly populated, which can be seen in the photograph. Since, the projected PHPDT was not worked out

Figure 3.1: Thinly populated area near Airport South Station

by MMRCL, the actual ridership data could not be compared with the projected PHPDT. In view of the above facts, the construction of Airport South station was taken up without conducting proper feasibility studies and, therefore, was not a financially prudent decision.

Figure 3.2: Convention Hall

MMRCL also constructed a convention hall admeasuring 1,580 sq. m. at Airport South station at a cost of ₹6.80 crore (included in the cost of construction of the station). MMRCL had not conducted any feasibility/ viability study for construction of convention hall at the station since the station was meant for reversal of trains only. Conducting feasibility study and evaluating the viability and assessing the prospective revenue generation vis-à-vis the capital cost and recurring maintenance expenditure was essential prior to taking up such construction involving major expenditure.

MMRCL stated (August 2021) that the Airport South Station was constructed with due approval, to provide train reversal facility. However, decision was taken to convert the temporary station to a full-fledged station to provide benefits to residents around the location. MMRCL added that the convention hall was a value addition in designing and is expected to fetch non-fare box revenue in the post COVID pandemic period. In the Exit Meeting, (11 March 2022), MMRCL stated that the station was built to provide oscillation trials of rolling stock.

The reply is to be viewed against the fact that there was lack of transparency in the manner in which Airport South Station was taken up and constructed as an additional station. Regarding the reply that the station was required for reversal of trains and oscillation trials of rolling stock, this could have been achieved through cross over tracks or the tracks at-grade section to MIHAN[4] Depot (the last point) and building an entire station along with convention hall was not necessitated for the purpose.

3.1.2 Cotton Market Station

Board of Directors of MMRCL decided (September 2017) to construct an additional station viz., Cotton Market in Reach 4 under East-West corridor as per the recommendations (July 2017) of the Projects Committee of MMRCL. As per the report of the Projects Committee, the new station, which was not included in the DPR was recommended to be constructed on account of land being provided by the State PWD, the location of land was at the busiest market area of Nagpur which would cater to the vendors and local residents, station would integrate with central bus stand and the PHPDT was estimated at 9,425 in 2021, 12,780 in 2031 and 16,124 in 2041. In accordance with the aforesaid decision, MMRCL (December 2018) decided to construct the Cotton Market Station through the existing station contract in Reach 4 viz., M/s ITD Cementation India Limited as a variation/additional work at an

[4] ***MIHAN: Multimodal International Cargo Hub and Airport at Nagpur.***

estimated cost of ₹27 crore. After an expenditure of ₹6.44 crore (March 2021) on station works at Cotton Market was incurred, which was around 24 *per cent* of the estimated cost, MMRCL decided (January 2020) that further work on the Cotton Market station is to be carried out only after ridership picks up and contribution from stake holders (Nagpur Improvement Trust, Nagpur Municipal Corporation and Government of Maharashtra) is received.

Figure 3.3: Cotton Market Station

Audit noticed that the projected highest PHPDT in Reach 4 was at Cotton Market station for the years 2021, 2031 and 2041. Therefore, the decision of MMRCL to keep on hold the work of Cotton Market station was not prudent considering that Reach 4 is expected to be completed shortly. Further the decision to keep on hold the construction of Cotton Market station would result in probable future cost escalation on the work as only 24 *per cent* of the work has been completed since taking up the work in December 2018. Further, this also resulted in blocking up of funds to the tune of ₹6.44 crore already incurred on the station.

MMRCL replied (August 2021) that the work of Cotton Market station was kept on hold in order to keep the momentum of works and to commission the corridor at the earliest and added that the station shall be completed at the earliest on receipt of balance funds from Nagpur Improvement Trust and Nagpur Municipal Corporation.

Keeping in view the highest ridership potential of Cotton Market station, MMRCL could have continued with the construction of Cotton Market station by reviewing the need for construction of Airport South Station as well as convention hall as pointed out in Para 3.1.1. Nevertheless, Ministry assured (March 2022) that the construction of the Cotton Market Station will be completed as soon as MMRCL receives the amount from the Nagpur Improvement Trust/ Nagpur Municipal Corporation.

Recommendation No.1: MMRCL may consider formulation of a standard procedure for approval/construction/procurement of items, which are not specified in the approved DPR. The authority for according approvals for deviations to DPR needs to be specified in the Delegation of Powers.

3.2 Location of New Airport station

New Airport Metro Station was envisaged in the DPR to be located in North-South corridor (Reach 1) in between the terminal station Khapri and Airport Metro Station. The source of passengers for this station as per the DPR was expected to be from the nearby residents of newly developing MIHAN City and the visitors to the MIHAN industrial/commercial town.

Accordingly, the aforesaid station was constructed at a cost of ₹44.51 crore and the station was put to commercial operation from 10 March 2019.

During the site visit conducted by Audit, it was seen that the area nearby the station had very sparse population. The entry side of the Station area is depicted below.

Figure 3.4: Entry of New Airport Station

The other side of the station which is connected through a sub way is having few settlements who are potential commuters. However, no commercial/industrial units were seen in the vicinity of the station. Further, there was no direct access to the station through road for potential commuters travelling by four wheelers (park and ride) from the eastern side of the station. To reach the New Airport Station they would have to pass through the Khapri station which is a terminal station. Therefore, the passengers may prefer to board from Khapri station rather than coming and boarding at New Airport station. The access to the National Highway on the eastern side of the station was through a subway which was only suitable for two-wheelers and pedestrian commuters. Therefore, the location of New Airport station was not ideal from accessibility point of view and also due to sparse population in and around the station. Further, the proposed new Airport of Nagpur City which was another source of commuters for the metro, is yet to be implemented as of March 2022.

The lack of locational advantage for the station is also evident from the very poor ridership from the station. It was observed that the actual average per day ridership for a period of 18 months from date of commercial operation at the New Airport Station was only 47 passengers per day as against the envisaged per day ridership of 5,474 in 2016 as per DPR (the average ridership during the period prior to onset of COVID from 10 March 2019 to 21 March 2020 was 18 per day and post COVID period from 18 October 2020 to 31 March 2021 was 104 per day mainly due to operationalization of more stations in Reach 1 and 3). Thus, the average daily ridership at New Airport station was only 0.85 *per cent* from the figures projected in the DPR. This indicates that the DPR projections of ridership at the New Airport station was not in consonance with the ground realities. While approving the Project, Government of India had instructed to review the DPR before proceeding with the project. However, MMRCL proceeding with construction of station in a sparsely populated area indicated that thorough review of DPR was not carried out.

MMRCL replied (August 2021) that the development of MIHAN SEZ was not progressing as was expected in the DPR due to geopolitical and economic reasons. Ministry replied (March 2022) that the underpass is recently constructed, several industries are coming up in the MIHAN area and International Airport development is expected to be finalized, which will give additional traffic to New Airport Station.

The reply indicates that the ridership at New Airport station was dependent on development of MIHAN area and the new International Airport at Nagpur. Since both these projects did not take off as expected, the ridership at New Airport station was severely affected. Considering these factors apart from the sparse population in and around the station, MMRCL could have prioritized construction of stations at various locations by taking up review from time to time as per the project sanction conditions.

3.3 Selection of traction system

Ministry of Urban Development suggested (November 2013) adoption of either 25 kV AC or 750 V DC traction system for metro rail duly considering PHPDT and other parameters. DMRC had proposed 25 kV AC traction system in the DPR (November 2013) of Nagpur Metro Project. As per the sanction order issued (August 2014) for the project, the DPR was to be reworked on realistic basis to ensure sustainability of the project. Based on this, MMRCL, in order to make the project more flexible in terms of implementation, execution and cost reduction, awarded (April 2015) work of interim consultancy to M/s RITES Ltd., a Government of India enterprise under Indian Railways and asked them to review the traction system in view of lower cost of 750 V DC system. M/s RITES reviewed the DPR including traction system and stated that (May 2015) 750 V DC system would be beneficial due to i) lower train weight, ii) train cost, iii) energy consumption, iv) maintenance requirements and v) best aesthetic solutions. Further, M/s. RITES also opined that 750 V DC appears to be a more desirable choice for Nagpur Project in view of the occurrences of thunderstorms in Nagpur.

The Board reviewed (May 2015) the report submitted by M/s RITES and referred it to the Sub Committee of MMRCL. The Sub Committee in its proposal stated that 750 V DC system would be more suitable and there would be cost saving of ₹719 crore. The cost savings of ₹719 crore was estimated in the form of capital cost savings of ₹468 crore by adopting 750 V DC in place of 25 kV AC, savings in operation and maintenance cost (comprising of staff cost, maintenance cost and energy cost) by ₹81 crore up to 2035 and replacement cost of ₹170 crore after 20 years. However, the Sub Committee subsequently recommended (July 2015) to maintain the 25 kV AC traction system included in the sanctioned DPR for maintaining uniformity in traction systems in all metro rail projects in the State of Maharashtra. The Board of Directors based on the recommendation of the Sub Committee decided (November 2015) to implement 25 kV AC traction system, which was prescribed in the DPR as the project work had already been commenced and there was a need for early decision to prevent delay.

Audit observed that the Metro Projects in various cities were independent projects and have no linkage to each other and the selection of traction system should have been based on accruing benefits. Even for any requirement of integration between two metro projects in future with different traction system, the same can be integrated through interchange station. Regarding the need to prevent delay, it was observed that MMRCL awarded the work relating to traction system in April-May 2017, 16 months after the decision of the Board in November 2015 to adopt the 25 kV AC traction system instead of 750 V DC system. This indicates that sufficient time was available to take an informed decision in the matter.

MMRCL stated (August 2021) that DPR recommended 25 kV traction system and the same was selected as it was indigenized, safer, easily maintainable and necessary manpower is abundantly available in India. MMRCL added that 25 kV AC system was used in Delhi Metro, Chennai Metro, Hyderabad Metro and in the vast network of Indian Railways. Ministry further stated (March 2022) that both systems have their own merits and demerits and added that often some tradeoff is involved in choosing a particular traction system.

The reply is to be viewed against the fact that technical opinion was for adoption of 750 V DC system. Metro rail projects implemented during the past few years for instance, Kochi, Gurgaon, Ahmedabad and Bangalore have adopted 750 V DC system on account of its intended benefits. It is also pertinent to mention that the Metro Projects at Kochi and Ahmedabad though initially planned with 25 kV AC traction system have switched over to 750 V DC system.

Recommendation No.2: Ministry of Housing and Urban Affairs may evolve a suitable advisory framework to offer guidance in technical matters such as adoption of traction system.

3.4 Non-provision of Platform Screen Doors

As per Report of the Committee on Standardisation and Indigenization of Metro Railway Systems (November 2013) constituted by the Ministry of Housing and Urban Affairs, half height Platform Screen Doors (PSD) for elevated stations can be considered and in case of shortfall in investible funds, at least provision need to be kept in the design so as to fit it later. The DPR (November 2013) of the project was silent on provision of PSD.

MMRCL put up a proposal before the Board of Directors (March 2017) regarding the necessity of providing PSD at stations during the construction stage itself citing high cost of retro-fitment, prevention of accidental falls, suicide and homicides attempts, ensuring safe travelling for children and senior citizens and preventing or reducing wind felt by the passengers caused by the piston effect. The Board directed (March 2017) the Projects Committee to examine the proposal of providing PSD and the Projects Committee recommended (March 2017) that PSD may be provided at the construction stage itself at an estimated cost of ₹120 crores as retro-fitment of PSD would cost 2.5 times more. The Board of Directors accorded approval (July 2017) for provision of PSD. Accordingly, MMRCL invited (December 2017) tender for installation of PSD at stations at an estimated cost of ₹120 crore. However, MMRCL decided (January 2019) to discharge the tender citing financial crunch

Audit observed that, MMRCL did not include the work of PSD while initially tendering the station works. The provision of PSD was not kept at the design stage also, as prescribed in the Report of the Committee on Standardisation and Indigenization of Metro Railway

Systems. Though MMRCL has cited funds crunch for not going ahead with the PSD tender, the fact remains that non-provision of PSD was a compromise as far as passenger safety is concerned. Further, MMRCL lost the opportunity to get essential work of PSD at a lower cost and MMRCL would have to incur probable additional expenditure of ₹180 crore[5] due to retro-fitment of PSD as stated by the Projects Committee.

MMRCL stated (August 2021) that PSD installation was not a mandatory requirement. Ministry replied (March 2022) that the PSD supply and installation was planned and the same can be executed in future whenever funds are available.

The reply is to be viewed against the fact that though, the provision of PSD was not a mandatory requirement, the action of MMRCL of calling tender for installation of PSD clearly indicates that MMRCL intended to install PSD for safety of commuters. Ministry assured (March 2022) that PSD shall be ensured on receipt of balance amount from state government agencies viz., Nagpur Improvement Trust and Nagpur Municipal Corporation.

Recommendation No.3: Though installation of Platform Screen Door is not a mandatory requirement, MMRCL may consider installing the same in view of the safety benefits.

3.5 Establishing Operation Control Centre

The Operation Control Centre and Backup Operation Control Centre are considered to be the nerve system of metro train operation. The entire train operation and associated system monitoring and controlling was to be done centrally from the Operation Control Centre.

Audit noticed that the primary Operation Control Centre for the project was planned at Hingna Depot and the backup Operation Control Centre was planned and operated from the main administrative building of MMRCL (Metro Bhawan). The primary Operation Control Centre was not established till date (March 2021) and the entire operations were being managed from the Backup Operation Control Centre. Operating two Reaches without completion of main Operation Control Centre involved an element of risk from the operational point of view including passenger safety.

MMRCL replied (August 2021) that Operation Control Centre and Backup Operation Control Centre are functionally same and interchangeable. The Operation Control Centre could not be established as works at Hingna Depot were delayed due to various reasons such as encountering hard rock at the Hingna Depot. Further, Backup Operation Control Centre at Metro Bhavan was commissioned early to cater to the delay and start the revenue operations. The operational safety was also not compromised due to lack of Backup Operation Control Centre as system has been designed to transfer control to local systems at terminal stations viz., Khapri and Lokmanya Nagar.

The reply is to be viewed against the fact that the inordinate delay in establishment of Operation Control Centre up to March 2021 cannot be justified merely on the ground that the Depot work was delayed due to encountering hard rock. Since the work for Hingna

5 ***₹120 crore X 2.5 times = ₹300 crore – ₹120 crore = ₹180 crore.***

Depot was awarded in November 2016, there was sufficient time to overcome the hard rock issue and establish Operation Control Centre. The Operation Control Centre was a requirement as per the DPR and Backup Operation Control Centre is only a backup arrangement in the event of failure of Operation Control Centre. Therefore, commencing commercial operations without establishing Operation Control Centre was not in accordance with the DPR and resulted in compromising operational safety. Nevertheless, Ministry assured (March 2022) that Operation Control Centre shall be ensured immediately on receipt of balance amount from state government agencies viz., Nagpur Improvement Trust and Nagpur Municipal Corporation.

3.6 Tendering for Rolling Stock

For undertaking timely trial runs and commissioning of lines, there was a need to initiate the tender for rolling stock in such a manner that the required train sets were available ahead of the anticipated commercial operation/test runs in the relevant section/Reach. As per the DPR, the requirement of rolling stock for the project was projected as 23 Train sets (11 for North-South corridor and 12 for East-West corridor) comprising of three cars each (DMC-TC-DMC)[6]. The corridor-wise rake requirement indicated in the DPR is as given below:

Table 3.1: Projected requirement of train sets in DPR

Corridor/Section	Total rake/train set requirement	No. of cars (rake x 3)
North-South Corridor		
Automotive Square to Khapri	8	24
Automotive Square to Congress Nagar	3	9
Sub-Total (A)	**11**	**33**
East-West Corridor		
Prajapati Nagar to Lokmanya Nagar	8	24
Agrasen Chowk to Subhash Chowk	4	12
Sub-Total (B)	**12**	**36**
Grand total (A+B)	**23**	**69**

In this regard, Audit observed the following inadequacies in the tendering for rolling stock:

(i) The expected date of commercial operation of Priority Section (New Airport to Khapri at-grade section in Reach 1) was November 2017 and commercial operation in Reach 1 from Congress Nagar station to Khapri station was in April 2018. However, as per the scheduled dates for delivery, testing and commissioning of the rolling stock contract, first prototype train was to be commissioned in December 2018 and second and third train sets were to be commissioned in February 2019. Therefore, MMRCL while tendering for rolling stock did not ensure/plan that the delivery, testing and commissioning of the required trains sets would be done before the anticipated date of commercial operation in priority section and Reach 1.

Further the Letter of Acceptance for procurement of rolling stock was issued to the vendor/contractor in October 2016 without mentioning the date of commencement. The

[6] *Driver Motor Car-Trailer Car-Driver Motor Car.*

contract agreement was signed in March 2017 after a delay of almost six months from issue of Letter of Acceptance and the signed date was deemed as the date of commencement.

Since delivery of the required train sets was not possible before the scheduled/anticipated commercial operation in Priority section/Reach 1, MMRCL entered (May 2017) into an agreement with M/s L&T Metro Hyderabad for lease of two train sets at annual lease rent of ₹15 crore for two train sets. The two train sets arrived (July 2017) at Nagpur and were used from April 2018 to November 2019 initially for trial run and later for limited commercial operation.

Thus, lack of proper planning resulted in MMRCL incurring avoidable expenditure of ₹45.88 crore in the hiring of train sets (comprising of lease rent of ₹44.25 crore, to and fro transportation cost of ₹1.43 crore for trains sets from Hyderabad to Nagpur and maintenance cost of ₹0.20 crore).

MMRCL replied (August 2021) that commissioning of metro system involves a cohesive and synchronized working of various civil and system group functions. The full benefits of the train sets obtained on lease were utilized in the project as with the help of these train sets other systems such as traction, signalling and telecom were commissioned and put to use. Ministry replied (March 2022) that the date of commencement of contract was decided as the date of signing of the agreement due to legal cases over the rolling stock contract.

The fact remains that MMRCL failed to ensure supply of rolling stock in time for trial/ testing and commercial operation of Reach 1 which resulted in avoidable expenditure.

(ii) MMRCL placed (October 2016) order for 23 train sets with M/s CRRC Corporation Ltd, People's Republic of China (CRRC) at order value of ₹851.08 crore. Against the order for 23 train sets, 19 train sets were received up to March 2021.

Audit observed that out of the 19 trains sets procured for the project, only 10 trains sets were being used for operations and that too on a rotational basis out of the 13 train sets which were available for operation. This resulted in underutilization of three train sets costing ₹93.54 crore during the period October 2020 to March 2021. Further, MMRCL diverted (from December 2019 to February 2021) four train sets costing ₹124.72 crore from the Nagpur Metro Rail project to Pune Metro Rail project indicating that the train sets were procured without linkage to the completion of all Reaches/stations of Nagpur project. Two train sets costing ₹62.36 crore which were delivered in February 2020 were still to be put into operation (March 2021) even after lapse of more than one year from their receipt. Therefore, against the actual requirement of 10 train sets, MMRCL procured 19 train sets resulting in idling of 9 train sets costing ₹280.62 crore.

In this connection, Audit observed that MMRCL had split the two corridors (North-South and East-West) into sub parts called Reaches and the civil works were awarded Reach-wise. However, rolling stock requirement was not assessed reach-wise and delivery schedules were not fixed accordingly, leading to idling of assets.

MMRCL replied (August 2021) that the procurement of rolling stock is the lengthiest and most complex process in a metro rail project and added that the schedule of supply once decided at the placement of order in case of rolling stock cannot be altered due to tightly interlaced design and manufacturing process. Ministry replied (March 2022) that the train sets were procured for both the corridors considering the phase wise commissioning of the project.

The fact remains that out of 19 train sets procured only 13 are used, that too on rotational basis. Diversion of four train sets to Pune further indicates that these are not immediately required for Nagpur metro.

3.7 Compromised safety of commuters due to single entry/exit at Interchange Station and two other operational stations

As per the DPR, entry and exit for all the stations on the North-South Corridor and East-West Corridor were planned from both sides of the road. Multiple entry/exit points at each station are important not only for commuter's convenience for access to the station but also required for evacuation of commuters in case of an emergency.

In this regard, Audit observed that:

- MMRCL planned only one entry/exit each at New Airport Station and Airport South Station. During site visit by the Audit team to New Airport Station and Airport South Station, it was observed that these stations were being operated with single entry/exit points. Keeping in view the safety of commuters and the projected ridership at these stations, MMRCL should have planned and constructed at least one more entry/exit, as envisaged in the DPR, so as to avoid any mishap in the event of emergency evacuation.

- MMRCL had planned four entry/exits for Sitabuldi station. During site visit of Audit team to the station, it was observed that the station was being operated with a common single entry/exit as against four planned entry/exits at the station. It is pertinent to mention that Sitabuldi station is the one having highest footfall (for instance, the average ridership in January 2021 was 5,560 per day) on account of being an interchange station for both North-South and East-West corridors and being situated in the centre of the Nagpur city. The operation of the station with a common single entry/ exit point with narrow passage compromised on the safety aspect as well as convenience of the passengers.

Figure 3.5: Single entry/ exit at Sitabuldi Station

Due to the existence of single entry/ exit point, these stations pose a threat to the safety of the commuters and the operating staff in the event of an accident/ emergency requiring evacuation.

MMRCL stated (August 2021) that Sitabuldi interchange station was originally designed with four entry/exit structures and at present, one entry/exit was operational at Sitabuldi interchange station and further entry/exits will be provided in due course. With regard to

New Airport Station and Airport South station, these stations have been designed with one side entry/exit.

Ministry assured (March 2022) that at least two entry/ exits for stations shall be ensured immediately on receipt of balance amount from state government agencies viz., Nagpur Improvement Trust and Nagpur Municipal Corporation.

3.8 Provision of Eco-park

MMRCL awarded (April 2018) the work of construction/development of Eco-park adjacent to the MIHAN Depot as an additional work to the existing contractor M/s PCS JV (who were awarded the work of construction of depots at MIHAN and Hingna) at an awarded value of ₹18.99 crore. The work of Eco-park awarded to M/s PCS JV was foreclosed (November 2018) citing cost cutting measure. The balance work of Eco-park was later awarded (April 2019) to M/s Kukreja Infrastructure Pvt. Ltd. based on limited tender.

The details of work awarded to the two contractors and the value of work done up to December 2020 is as mentioned below.

Table 3.2: Expenditure incurred on Eco-park

(₹ in crore)

Sr. No.	Name of the contractor	Date of award	Due date of completion	Value of awarded work for Eco-Park	Value of work completed by the contractor for Eco–park
1	PCS JV	04.04.2018	As per depot contract of PCS JV	18.99	2.15
2	Kukreja Infrastructure Pvt. Ltd.	11.04.2019	10.10.2019	16.84	1.30
Total					**3.45**

Audit observed that MMRCL had not placed on record the need/justification for construction of Eco-park at MIHAN Depot at the time of award of work. Since the work does not pertain to the core activity of MMRCL, the benefit being derived by MMRCL and the general public was required to be justified on record before taking up the work. Further, Eco-park location can only be accessed from within the metro depot which was still under construction and thereby development of Eco-park prior to completion of depot works indicates inadequate planning and prioritization of the works in the project.

Figure 3.6: Eco Park site at MIHAN Depot

MMRCL after executing works (excavation, filling available excavated earth, providing and laying concrete in open foundation, providing reinforced steel, earth work for embankment, laying, spreading and compacting sand & murum, excavation of hard rock, etc.) amounting to ₹2.15 crore by the contractor, foreclosed the work citing cost cutting measures. However, re-awarding the work by calling limited tender was contradictory and lacked justification.

It was observed that MMRCL did not specify the completion period for the original contractor in the letter of acceptance. Further, the work was to be completed by October 2019 by the new contractor, however, work amounting to ₹3.45 crore only could be completed up to December 2020. It was observed that MMRCL failed to provide the drawings relating to the Eco-park works to M/s Kukreja Infrastructure Pvt. Ld. (the second contractor) thereby resulting in grant of extension of time up to February 2021. The General Consultant of the project has stated that the scope of work of Eco-park was not clearly defined resulting in grant of extensions to M/s Kukreja Infrastructure Pvt. Ld.

Thus, in spite of lapse of almost 33 months after award of the work, the work remained incomplete with only 18.17 *per cent* of work being completed. This resulted in blockage of funds and avoidable expenditure of ₹3.45 crore due to award of work without proper justification and lack of planning. Further the practise of granting additional works, especially those which lacked proper justification, to existing contractors, was tantamount to undue favour to the contractor.

MMRCL replied (August 2021) that Eco-park was proposed with basic infrastructure work to protect metro land parcel from encroachment and also to provide suitable place for morning walkers residing in the nearby vicinity. The work of Eco-park was foreclosed as priority was given to the completion of depot work. Subsequently, though Eco-park was re-awarded but priority was given to other works in the contract keeping in view the commissioning of priority section. Ministry replied (March 2022) that development of Eco-park was part of the non-fare box revenue activity which would help in enhancement of the ridership in the metro.

The reply is to be viewed against the fact that development of Eco-park was awarded without any assessment/study of the benefits that would accrue to MMRCL. Further the development of Eco-park merely for the sake of protecting the land from encroachment lacked justification especially considering the fund crunch faced in the project.

Recommendation No.4: Granting of additional works to existing contractors is not a transparent method of awarding contracts, and hence, MMRCL may frame appropriate guidelines in its Procurement Manual to check the practice.

3.9 Good Practices

3.9.1 Installation of Solar Photo Voltaic System

In order to harness solar energy, MMRCL had adopted and integrated solar energy generation in the Nagpur Metro Rail Project at the project planning and design stage. Accordingly, it was proposed that solar PV panels can be mounted at all station roof tops, depot boundary walls, depot shed roof tops and vacant ground spaces. MMRCL adopted Renewable Energy Service Company (RESCO) model wherein the service provider will incur the capital cost for installation of solar power system as well as the cost of operation and maintenance. MMRCL will purchase the energy generated by the service provider at the agreed rate.

Figure 3.7: Roof top solar panels at Metro Bhawan and metro stations

Accordingly, the service providers had installed solar PV system of 1.8 MW capacities at stations and depot compound wall. Under the solar energy model, the cost of energy per unit to MMRCL will be reduced to ₹3.40 per unit as against the energy rate of ₹8.30 per unit which will result in reduction of operational cost to that extent.

3.9.2 Bio-digester based sewage treatment

MMRCL entered into Memorandum of Understanding (MoU) with the Defense Research Development Organization (DRDO) for installation of bio-digester technology at all metro stations, depots and their establishments. The purpose of bio-digester is treatment and recycling of sewage water in order to reduce dependence on fresh water.

Figure 3.8: Bio Digestor installed at Airport South Station

MMRCL had so far, installed 14 bio-digesters at metro stations as part of its efforts towards conservation of environment and for achieving environmental commitment of zero liquid discharge. The sewage generated during operations will be treated at bio-digester at stations and will be re-used for flushing and gardening purposes.

3.10 Summing up

Two additional stations not envisaged in the DPR were constructed out of which Airport South station costing ₹47.26 crore was constructed as a temporary station mainly for reversal of trains though such reversal of trains could have been achieved through cross-over tracks. Cotton Market station, the second additional station was projected to have high PHPDT but the work was kept on hold midway citing fund crunch, which could have been managed through prioritization of works. There was an element of risk to operational and commuter safety due to non-provision of Platform Screen Doors, non-commissioning of Operation Control Center and operation of three stations with single entry/exit points.

Chapter 4: Project and Contract Management

4.1 Action Plan for implementation of project

As per the DPR, the construction works were expected to be completed by March 2018 and the commercial operation was to start from April 2018 for both the corridors.

Audit noticed that the DPR did not contain a detailed plan of execution for various activities viz., approvals for the project, completion of land acquisition for construction purposes, tendering schedule for key works, construction schedule, procurement of rolling stocks etc., to ensure timely operationalisation of the project within the planned time schedule. Though, the civil works were required to be completed by March 2018 so as to commence commercial operations in both corridors by April 2018, key civil works were awarded with considerable delay resulting in the original time completion date of these works being way beyond the planned completion period of March 2018 as shown in the table below.

Table 4.1: Award and completion dates of civil works

Sr. No.	Name of work/activity	Date of award	Due date of completion
1	Viaduct- Reach 2	16.10.2017	02.02.2020
2	Viaduct -Reach 3	26.10.2016	04.12.2018
3	Viaduct -Reach 4	24.03.2017	04.12.2018
4	Stations -Reach 3	20.09.2016	30.10.2018
5	Stations -Reach 4	17.08.2017	26.09.2019
6	Station- Reach 2 (initial)	21.04.2017	31.12.2019
	Station- Reach 2 (balance works)	23.10.2019	22.02.2021
7	Rolling Stock	05.10.2016	23.09.2020

In this regard, Audit observed that:

- Since the above mentioned key civil works were awarded after considerable delay, the consequent works such as signalling, track laying works and Over Head Equipment works were also delayed as the work fronts were not available to execute those works, indicating a cascading effect.

- In all the major civil works, though the stipulated completion dates were beyond the commercial operation date of April 2018, MMRCL did not revise project completion dates and seek extension of time from the Governments (Government of India and Government of Maharashtra) or the Board. This has resulted in a situation where the original completion date was not achievable and MMRCL did not have a revised date to adhere to. Eventually, MMRCL could only partially operationalise the two corridors till March 2021.

MMRCL replied (August 2021) that the project could not be completed due to restrictions imposed on account of COVID-19 pandemic, non-availability of encumbrance free land in Reach 2, 3 & 4 and the loan agreement with the external funding agencies could be finalized by December 2016. Ministry replied (March 2022) that generally, the time taken for such projects is not less than five years from the date of sanction of the project and added that there were several unforeseen hurdles which included metro crossing railway line at three places, integration of elevated double decker bridge, delay in land acquisition due to litigation, Covid-19 restriction, delay in land acquisition for Metro stations, default by contractors etc. Ministry assured that the project will be commissioned before 31 March 2022.

The reply is to be viewed against the fact that as on 31 March 2022, only 23 out of 38 stations are operationalized and two out of four reaches are yet to be commercially operationalized. Laying down revised target dates based on realistic assessment would have helped MMRCL in reducing the delays.

Recommendation No.5: MMRCL may arrive at revised target for commercial operation of the entire project and obtain Board approval for the same. Board may closely monitor achievement of the revised target.

4.2 Publication of tender enquiries on Central Public Procurement Portal

As per Office Memorandum (November 2011) of Department of Expenditure, Ministry of Finance, Government of India, it is mandatory for all Ministries/Departments of the Central Government, their attached and subordinate offices, Central Public Sector Enterprises (CPSE) and autonomous/statutory bodies to publish their tender enquiries, corrigenda thereon and details of bid awards on Central Public Procurement Portal (CPPP). CPSEs were to adhere to these directions w.e.f., 01 February 2012. As per the procurement manual of MMRCL, the tenders were required to be advertised in at least two leading newspapers (one English newspaper published nationally and in one vernacular newspaper) and also to be posted on MMRCL website.

Audit scrutiny of 26 tenders having money value of ₹25 crore and above revealed that MMRCL did not publish the tenders on the CPPP which was a violation of the directions of Government of India. Further, publishing the tenders in CPPP would have helped MMRCL in ensuring wider publicity to the tenders as well as price competitiveness by eliciting more bids.

MMRCL stated (August 2021) that though the tenders were not published on CPPP, wide publicity for tenders was ensured by publishing them in well circulated newspapers and MMRCL website. Further, the tenders funded by external agencies were posted in funding agency's website. MMRCL added that Audit suggestion is noted and action has been initiated to post upcoming tenders on CPPP portal. Ministry replied (March 2022) that large number of bidders had participated in pre-bid meetings for all tenders which was made possible due to wide publicity of tenders.

The reply is to be viewed against the fact that there is an inadequacy in the Procurement Manual of MMRCL since the requirement requiring publishing the enquiries in CPPP is not mentioned therein. However, after the issue was pointed out by Audit, MMRCL has registered on CPPP.

4.3 Estimation of tender for ballast less track work of Reach 1 and Reach 3

MMRCL invited (November 2016) tender for the supply and installation of ballast less track on Reach 1 and Reach 3 at an estimated cost of ₹74.33 crore. Based on the evaluation of price bids of the two technically qualified bidders, the work was awarded (October 2017) for ₹83.33 crore for track length of 38.70 km, to the bidder who quoted the lowest price. The contractor, based on actual execution of work, intimated (December 2019) that the scope of work was reduced to ₹64.84 crore against the awarded value of ₹83.33 crore. The General Consultant recommended (June 2020) reduction in value of contract on account of reduction in quantities of items of work and some items which were not operated by the contractor as given in ***Annexure 2***.

It can be seen from the Annexure that reduction in quantities of individual items of work ranged from 11 *per cent* to 100 *per cent*. Further, the quantities in case of four items[7] were not operated as the same were not required for the work. MMRCL accepted (July 2020) the recommendations of the General Consultant for reduction in value of the contract to ₹67.13 crore from awarded contract value of ₹83.33 crore.

Audit observed that the reduction in items operated compared to the estimated items in the tender indicated that the estimates were not prepared by carrying out proper survey to assess the actual requirements, though MMRCL engaged a track advisor[8] for the purpose. Based on the reduced value of the work on account of reduction in items operated, the estimated cost of the work should have been ₹59.88 crore as against tendered estimate of ₹74.33 crore. Therefore, due to improper framing of work estimate, the estimated cost put to tender was inflated by ₹14.45 crore, i.e., by 24.13 *per cent*.

MMRCL (August 2021) attributed the reduction of quantities to optimisation during execution of work.

Though management has stated that optimisation has occurred, the fact remains that some of the items in the bill of quantity were not operated at all, indicating inadequacies in the estimation process. Further, such inflated estimation of work has the risk of changing the bid dynamics/participation of bidders.

4.4 Evaluation of bids for award of contracts

MMRCL invited bids for award of contracts and the bids were evaluated by the General Consultant engaged by MMRCL. The recommendation of General Consultant was examined by the Tender Committee of MMRCL and based on the recommendation of the Tender Committee, final decision regarding award of contract was taken by the Competent Authority as per Delegation of Powers.

In this regard, Audit observed inadequacies in the bid evaluation of the following two contracts:

4.4.1 MMRCL invited (July 2016) tender for the works of supply, installation, testing and commissioning of ballasted track in at grade section of North-South corridor along the ballasted/embedded track in MIHAN Depot. Three bids were received and based on technical evaluation, the tender committee of MMRCL concluded (October 2016) that two

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[7] ***Laying of plinth and installation of track work, laying RCC slab and installation of turnouts and painting of rail at stations.***

[8] ***MMRCL decided to engage an advisor for track in October 2015 for preparation of tender documents as the DPR did not provide details of viaduct, track and turn-out at each station.***

bidders were qualified for opening of price bid. After evaluation of price bids of the two technically qualified bidders, the Tender Committee recommended (October 2016) acceptance of the offer of M/s Rahee Infratech Limited who quoted the lowest price at ₹43.94 crore.

Audit observed that the financial capabilities of the bidder were to be assessed for a period of five years. However, M/s Rahee Infratech Ltd was assessed for a period of four years only (2011-12 to 2014-15) as the bidder had not submitted the financial statements for 2015-16. Further, the relevant form submitted (Form CON-2) by the bidder did not contain the details required for assessing history of non-performing contracts and pending litigations, which was required to be furnished as per the tender conditions. Therefore, technically qualifying M/s Rahee Infratech Ltd based on incomplete submission of mandatory documents by the bidder resulted in deviation and violation of the tender conditions.

MMRCL replied (August 2021) that the bidder had the required financial capabilities even though the balance sheet for 2015-16 was not submitted by the bidder. Further, the disqualification of bidder based on documentation issues would have resulted in reduced competition in bidding which would have been against the spirit of open tendering.

The reply is to be viewed against the fact that qualifying a bidder who had not submitted the required documents/information was not in accordance with the tender conditions.

4.4.2 MMRCL invited (November 2016) tender for the work of supply, installation, testing and commissioning of ballast less track of standard gauge on Reach 1 section of North-South corridor and Reach 3 section of East-West corridor. Four bids were received and the Tender committee (July 2017) qualified two bidders viz. Rahee Infratech Ltd. - Emrail JV and M/s ITD Cementation India Limited for opening of price bid. Tender Committee recommended (August 2017) acceptance of offer of Rahee Infratech Ltd. – Emrail JV who quoted the lowest price at ₹83.33 crore and the work was awarded (October 2017) to them.

Audit noticed that the winning bidder had submitted general construction experience for a period of 8 years and 9 months in their bid as against the requirement of 10 years. After bid closure date (8 March 2017), MMRCL forwarded (09 May 2017) letter dated 10 April 2017 received from the bidder to General Consultant[9] wherein the bidder stated that they misread the bid condition regarding experience requirement and submitted that they actually had 13 years' experience. In their recommendation, General Consultant stated that ordinarily the shortfall in experience, as per submission made in the bid would have rendered the bidder disqualified. Regarding the bidders' request citing mis-reading of tender condition, General Consultant stated that the bidders were required to read the bid documents and corrigenda with care and any additional documents submitted after bids were to be ignored. However, in the concluding part of their recommendation, General Consultant opined that there would be no undue advantage extended to the bidder if the additional documents

[9] ***Consortium of SYSTRA, EGIS Rail, AECOM Asia Company Limited and RITES Limited was engaged as the 'General Consultant' for the project by MMRCL. General Consultant was responsible for procurement, overall project management and contract administration.***

submitted by them were considered and thus, technically qualified the Rahee-Emrail JV. The Tender Committee of MMRCL also accepted General Consultant's recommendation to qualify the bidder.

Audit observed that consideration of documents submitted by M/s. Rahee after closure of bid and technically qualifying the JV was in violation of the tender condition and resulted in undue favour to the contractor.

MMRCL replied (August 2021) that the error in submission of 10 years' general construction experience by the bidder was as an error due to oversight on the part of the bidder. The additional submission on general construction experience was accepted since the information was already available with the bidder at the time of bidding. Further, rejection of the offer made by the bidder would have resulted in additional cost to MMRCL.

The reply is to be viewed against the fact that acceptance of additional submission made by the bidder during the technical evaluation was not in accordance with tender conditions which clearly stipulated that no bid may be modified in the interval between bid submission and expiration of bid validity. The bidder was responsible for correct submission of bid documents and thus, the acceptance of additional submissions after the closure of bid submission cannot be justified merely on the ground that there was oversight/error during bid submission by the bidder. Further, the low bid/quote cannot be taken as a ground to award work to an ineligible bidder.

4.5 Award of new contracts to existing contractors as additional works

Open tender should be a preferred mode of tendering civil works in order to ensure transparency, competitiveness and wide publicity of the work involved. MMRCL awarded major/substantial works amounting to ₹877.58 crore as additional works to existing contractors/consultant working in the project on nomination basis as per particulars given below.

Table 4.2: Award of works on nomination basis

Sr. No.	Name of contractor	Nature of original work	Awarded value of original work (₹ in crore)	Nature of additional work awarded over and above the original work	Value of extra work (₹ in crore)	Percentage of extra work value to the originally awarded value of work to the contractor/ consultant
1	ITD Cementation India Ltd.	Construction of 10 elevated metro stations in Reach 3	445.75	Construction of metro stations in Reach 2 .	202.00	45.32
2	ITD Cementation India Ltd.	Construction of 10 elevated metro stations in Reach 3	445.75	Construction of Zero Mile metro station.	104.68	23.48
3	ILFS	Construction of metro stations in Reach 1	532.67	Structural work of Sitabuldi Interchange metro station.	7.00 (Award value was ₹66.29 crore; executed value before termination was ₹7 crore)	1.31

Sr. No.	Name of contractor	Nature of original work	Awarded value of original work (₹ in crore)	Nature of additional work awarded over and above the original work	Value of extra work (₹ in crore)	Percentage of extra work value to the originally awarded value of work to the contractor/ consultant
4	Afcons	Construction of viaduct in Reach 3	476.9	Structural, Architectural & Mechanical, Electrical and Plumbling works of Sitabuldi Interchange metro station.	138.13	28.96
5	Consortium of SYSTRA, AECOM, AEGIS and RITES	General Consultancy Services for Nagpur Metro Rail Project	221.93	General Consultancy & allied services for Pune Metro Rail Project	183.09	82.50
6	NCC Ltd.	Construction of Viaduct in Reach 1	252.97	Various works in Reach 1 & Ramjhula portion of viaduct in Reach 2.	232.45	91.89
7	PCS JV	Construction of MIHAN and Hingna Depot	275.66	Construction of Eco-park at MIHAN Depot & Multi modal integration works at three at-grade stations in Reach 1.	10.23	3.71
Total					**877.58**	

MMRCL, in the above mentioned cases, justified the assigning of the major works/ consultancy work to the existing contractors/consultant citing emergency, timely completion of the project and the probable delay which may arise due to following the laid down tendering process. The additional works were awarded by invoking a clause in the existing contract which permitted quantity variation of (+/-) 25 *per cent.*

In this regard, Audit observed that:

- The quantity variation clause in the contract was meant for regularization of any variation[10] in the bill of quantities during execution whereas the seven works stated above are altogether new works. Hence invoking the clause to award new contracts to the existing bidder was not in order. Further in four out of seven cases, the new contract value was

[10] ***As per Clause 13.1 of General Conditions of Contracts entered into by MMRCL with the contractors, the term 'variation' includes changes to the quantities of any items of work included in the contract, changes to the quality and other characteristics of any items of work, omission of any work, any additional work, plant, materials, or services necessary for permanent works. As per Clause 1.1.5 of General Conditions of Contracts, the term 'permanent works' has been defined as the permanent work to be executed by the contractor under the contract. Further, the contract data (Right to vary) stated that additional work, plant, material, or services not related to the Permanent Works shall not be entitled to a variation.***

more than the existing contract value by 29 to 92 *per cent* and hence exceeded even the 25 *per cent* quantity variation limit.

- While awarding the new works, the enhanced technical and financial capabilities required for execution of these additional works were not assessed. Hence MMRCL did not ensure that the contractors actually possessed the capability to execute the works in addition to the existing work, while assigning the works to them on nomination basis, with the result that the envisaged benefit of timely completion also did not materialize.

- In the additional work mentioned at Sr. No. 3 of Table 4.2, MMRCL while calling for tenders for Reach 1 stations did not include the work of Sitabuldi Interchange station. After award of work for Reach 1 stations in July 2016, MMRCL (October 2016) felt that, if the work of Sitabuldi station was not taken up simultaneously, the Reach would not be available for operation. MMRCL decided (December 2016) to award the work as an additional work on nomination basis to ILFS, the contractor who was awarded (December 2016) the work of Reach 1 stations. ILFS subsequently became bankrupt and by that time work valuing ₹7 crore (out of the additional contract value of ₹66.29 crore) only was executed. MMRCL had to engage another contractor on limited tender basis to complete the work.

- The General Consultant of the Nagpur metro project, consortium of M/s SYSTRA, AECOM, EGIS and RITES was awarded (May 2017 to February 2019) the interim consultancy and other works for Pune Metro Rail Project for ₹183.09 crore on nomination basis. The justification given for entrusting the work of consultancy of Pune Metro Rail Project to the existing General Consultant of Nagpur Metro Project without inviting bids/tenders was to avoid delay in tendering process and that the fresh tender would lead to higher rates compared to the rates of existing contract of General Consultant. However, it was observed that, subsequently MMRCL tendered (December 2019) the work of GC relating to Pune Metro Rail Project and the work was awarded (November 2020) at a contract price of ₹185 crore. Hence the total value of General Consultant contract came to ₹368.09 crore (₹183.09 crore for interim consultancy and ₹185 crore for consultancy) for Pune metro, which was much higher than the Nagpur metro General Consultant contract value of ₹221.93 crore. Hence, the argument regarding cost savings and tendering delays are not convincing.

Avoiding tendering of high value contracts as listed above citing the time required for following tendering process is not a valid justification and indicates poor project management practice apart from lack of transparency in the award of major works.

MMRCL stated (August 2021) that the decisions for awarding of additional works as variation to the existing contractors was justified for the timely completion of the project. The planning for the tenders was done in the initial stage itself and accordingly the actions also were initiated, however, due to various unforeseen hindrances some delay had occurred. Regarding Sitbuldi station MMRCL stated that the station was not tendered along with Reach 1 and 3 due to complex design and concept of the station. Ministry replied (March 2022) that variations were awarded to the existing contractors and approval of the competent authority as per Schedule of Powers was obtained.

The reply is to be viewed against the fact that award of high value works on nomination basis by merely citing time saving, complex design, approval by Competent Authority and likely higher cost if tender was called for, lacked transparency and fair play apart from depriving MMRCL of the opportunity of securing competitive bids.

Recommendation No.6: Award of contracts on nomination basis is not a transparent method of tendering, and hence, MMRCL may frame appropriate guidelines in the Procurement Manual to discourage the practice.

4.6 Recovery of mobilization advance

Central Vigilance Commission (CVC) issued (April 2007) circular prescribing guidelines for grant of mobilization advance. As per the CVC circular, payment of interest free mobilization advance was not encouraged by CVC, but, if the Management felt that it was necessary in specific cases, its recovery should be time based and not linked with progress of work. Such a practice would ensure that the recovery of advance could commence and scope for misuse of such advance could be reduced, even when the contractor was not executing the work or executing it at a slow pace. MMRCL granted interest free mobilization advances to contractors in eight cases amounting to ₹159.52 crore, US Dollar 2.07 crore and Euro 0.57 crore *(**Annexure 3**)*.

In this regard, Audit observed that as per the condition mentioned in the contract executed by MMRCL, the recovery of advance payment shall commence when 20 *per cent* of the original contract value has been paid and shall be recovered by deduction of 25 *per cent* of the amount of each interim payment, until the total of the mobilization advance is recovered. Hence the recovery of mobilization advance was based on progress of work and submission of running bills by the contractor. Further, there was no timelines prescribed to ensure time bound recovery of the advances. This was detrimental to the financial interests of MMRCL as the advances were not interest bearing and further aggravated the fund crunch faced by MMRCL.

Due to non-inclusion of time bound recovery of mobilization advance in the tender conditions, recovery of mobilization advance amounting to ₹130.86 crore[11] was pending (April 2021). Recovery was pending (as of April 2021) for more than two years (calculated from scheduled completion date) in two cases, more than a year in three cases and less than a year in three cases. The recovery was pending as the contractors could not complete the work within the stipulated contract period and the recovery of mobilization advance was based on progress of work.

In the case of ILFS Ltd., mobilization advance of ₹53.27 crore was granted for the work of Reach 1 stations in three instalments. Audit noticed that mobilization advance recovery was initiated from February 2018 only, though the original stipulated completion of work was ending in August 2018. MMRCL terminated the contract with ILFS in December 2018 due to slow progress of work. At the time of termination of contract, MMRCL had recovered only ₹27.71 crore out of the mobilization advance of ₹53.27 crore granted to

[11] ***₹63.75 crore (equivalent INR for US Dollar) + ₹67.11 crore.***

ILFS. The balance amount of mobilization advance amounting to ₹25.56 crore could not be recovered through encashment of Bank Guarantee (BG) due to the insolvency of ILFS and orders passed (October 2018) by National Company Law Appellate Tribunal (NCLAT) restraining the Banks from honouring the creditors of ILFS.

Thus, recovery of mobilization advance based on progress of work rather than on time bound recovery was not only against to the financial interests of MMRCL but was also a violation of CVC guidelines.

MMRCL/ Ministry replied (August 2021/ March 2022) that the recovery of advances to contractors was being done in line with the contractual conditions and similar practice was being adopted by other metro rail companies.

The reply is to be viewed against the fact that non-recovery of mobilization advance could have been avoided had MMRCL prescribed time bound recovery in line with CVC guidelines.

Recommendation No.7: MMRCL may suitably modify the contract clause regarding recovery of mobilization advance to make it time bound in line with the CVC guidelines.

4.7 'Risk and Cost' clause in contracts

MMRCL terminated/de-scoped awarded works in two cases due to poor progress of the contractors in completing the works and procured items at the 'risk and cost' of the contractor in one case. The terminated/de-scoped works was later awarded at higher cost. However, the differential cost amounting to ₹45.30 crore in three cases were not recovered from the defaulting contractors. The cases are discussed below:

(i) MMRCL awarded (August 2017) the work of construction of eight elevated stations in Reach-4 to M/s ITD Cementation India Ltd. for ₹310.31 crore with due date of completion in September 2019. MMRCL, de-scoped (December 2019) the work of one of the stations viz., Prajapati Nagar citing slow progress and poor performance of the contractor. The de-scoped balance work of ₹26 crore of Prajapati Nagar station was awarded (May 2020) to M/s BBG Infrastructure Private Limited at a cost of ₹35.21 crore on limited tender basis. As per the contractual condition (clause 81 of Particular Condition of Contract) in the contract with ITD Cementation India Ltd., MMRCL had the right to recover the additional expenditure incurred if the contractor failed to carry out any work required under the contract.

Audit observed that MMRCL did not recover the extra expenditure of ₹9.21 crore (₹35.21 crore-₹26 crore) incurred due to re-awarding of the balance work of Prajapati Nagar station from M/s. ITD Cementation India Ltd, though the work was de-scoped due to contractor's fault.

MMRCL/ Ministry replied (August 2021/ March 2022) that the work awarded to M/s BBG Infrastructure Private Limited included additional civil works which was not a part of the de-scoped work and the re-award cost was less than the estimates.

The reply is to be viewed against the fact that examination of estimates prepared by MMRCL did not indicate any additional works having been included while re-awarding the de-scoped work. Further, adding such additional works has weakened MMRCL's claim under 'risk and cost' clause and hence not financially and legally prudent.

(ii) The work regarding supply and installation of ballast less track of standard gauge in Reach 1 and Reach 3 was awarded (October 2017) to M/s Rahee - Emrail JV at a cost of ₹83.33 crore to be completed in a period of 30 months. The contractor stated (May 2018) that due to fire caused by lightning, 95,000 base plate rubber pads which were kept by them at site were badly damaged which could not be used for track laying. However, the General Consultant denied (May 2018) the contention of the contractor based on weather reports of Nagpur City obtained from Regional Meteorological Centre, India. The General Consultant intimated (October 2018) the contractor that the employer reserved the right to recover the cost of damages from the performance security and MMRCL had initiated action for procurement of the material at the 'risk and cost'of the contractor. MMRCL placed (February 2019) order for procurement of 95,000 base plate rubber pads from M/s. Pandrol-PRT consortium for ₹2.28 crore at the 'risk and cost' of the contractor.

Subsequently, based on the request (April 2020) of the contractor, MMRCL constituted (July 2020) an expert committee for suggesting recommendations regarding the case. The committee has not given recommendations on the case even after lapse of eight months from its appointment.

Audit noticed that MMRCL has not recovered the cost of procurement of fresh base plate rubber pads amounting to ₹2.28 crore from the contractor, even though the materials were damaged when the same were in the possession of the contractor at his site and General Consultant has not accepted the contention of contractor regarding lightning having caused the fire.

MMRCL replied (August 2021) that the expert committee had completed several sittings which could not be concluded due to the Covid situation and non-availability of one of the experts. Further, an amount of ₹2.28 crore has now been withheld (July 2021) from the pending dues of the contractor.

The reply is to be viewed against the fact that General Consultant had recommended for procurement of replacement base plate pads at the 'risk and cost' of the contractor and MMRCL had also procured the replacement pads. However, no recovery was made from the contractor even after more than two years from the procurement of replacement pads in February 2019, which tantamounts to undue favour to the contractor.

(iii) The work pertaining to construction of seven elevated metro stations and three at grade stations from Congress Nagar to Khapri in Reach 1 was awarded (July 2016) to ILFS for ₹532.67 crore. The work was to be completed by August 2018. Due to unsatisfactory progress of the work by ILFS, MMRCL terminated (December 2018) the contract with ILFS. MMRCL awarded (December 2018 to May 2019) the balance work valuing ₹221.18 crore of Reach 1 stations in 23 contracts on limited tender basis at a cumulative order value of ₹254.99 crore.

Audit observed that as per clause 54 of the Particular Conditions of contract, in case of termination due to contractor's default, MMRCL's remedy was limited to the encashment of performance security. The clause further provided that the balance work may be executed independently without any 'risk and cost' of the failed contractor. It was observed that the above contractual clause was unduly in favour of the contractor. MMRCL should have invariably included 'Risk and Cost' clause in the tender conditions to safeguard its interest in the event of termination and the balance work being awarded at a higher cost, as done in case of other contracts. In the instant case, MMRCL did not recover the escalation in cost amounting to ₹33.81 crore due to retendering of terminated contract of ILFS as no such provision existed in the tender condition.

MMRCL stated (August 2021) that re-tendering on 'risk and cost' basis consumes a lot of time. Due to the lengthy procedure involved in quantification of 'risk and cost' amount, a conscious decision was taken to not include the 'risk and cost' clause but rather include confiscation of the performance Bank Guarantee amount. Ministry replied (March 2022) that the action to forfeit the performance security of ILFS was in line with the Manual for Procurement of Works 2019 issued by the Government of India as well as the guidelines adopted by Indian Railways for procurement purposes. However, the performance guarantee could not be encashed from banks due to stay order of NCLAT and the bank guarantees are yet to be realized.

The reply is to be viewed against the fact that the two clauses i.e., 'risk and cost' clause and Performance Bank Guarantee serve two different purposes. While Performance Bank Guarantee clause is included to protect against non-performance by the contractor, the 'risk and cost' clause is intended to meet additional cost incurred on re-award of contracts terminated due to contractor's default. Further, MMRCL had incorporated 'risk and cost' clause in Reach 4 stations contract. Therefore, on similar lines, MMRCL could have also incorporated 'risk and cost' clause in the tender for Reach 1 stations also. There was inconsistency in the approach adopted by MMRCL in the tender conditions of civil works. The reference to Manual for Procurement of Works 2019 and guidelines adopted by Indian Railways was not relevant as these conditions/stipulations/guidelines did not form part of the contract/tender conditions entered by MMRCL with the contractors.

Recommendation No.8: MMRCL may invariably include 'Risk and Cost' clause in all the contracts to safeguard its interest and take timely and appropriate action in invoking the clause in contracts terminated due to contractor's fault.

4.8 Non-recovery of advances paid to contractor

MMRCL awarded (July 2016) the works of construction of seven elevated stations and three at-grade stations in Reach 1 to ILFS at a cost of ₹532.67 crore and the additional work of construction of Sitabuldi Interchange Station (December 2016) to ILFS for ₹66.29 crore. MMRCL de-scoped (December 2017) the work of Sitabuldi station from ILFS citing failure in deploying the needful resources and slow progress of work. Further, due to unsatisfactory progress of work of Reach 1 stations, MMRCL terminated (December 2018) the contract of ILFS.

During the intervening period between award and termination of work, MMRCL granted mobilisation advance, material advance and acceleration advance to ILFS as shown below.

Table 4.3: Advances pending recovery

(₹ in crore)

Sr. No.	Type of Advance	Amount of advances granted	Amount of advances recovered upto termination	Amount of advance not recovered	Interest on advances	Total unrecovered amount
1	Mobilisation Advance	53.27	27.71	25.56	12.35	37.91
2	Interest Bearing Advance	8.08	4.35	3.73	0.29	4.02
3	Material Advance	23.60	23.60	-	0.71	0.71
4	Acceleration Advance	10.00	-	10.00	-	10.00
Total		**94.95**	**55.66**	**39.29**	**13.35**	**52.64**

It can be seen from the above table that ₹52.64 crore was yet to be recovered (March 2021) from ILFS which included advances of ₹39.29 crore and interest thereon of ₹13.35 crore.

Audit observed that MMRCL granted material advance of ₹23.60 crore (November 2017 to May 2018) and acceleration advance of ₹10 crore (October 2018) to ILFS though these were not permissible as per the tender conditions. Further, while clarifying pre-bid queries of bidders it was expressly clarified by MMRCL that request for plant/machinery/secured advances would not be acceded to. MMRCL could not recover the balance amount of ₹52.64 crore from ILFS on termination of contract in December 2018 by encashing the bank guarantee furnished by ILFS due to the insolvency of ILFS and orders passed (October 2018) by NCLAT restraining the Banks from honouring the creditors of ILFS.

Audit further observed that MMRCL was very well aware of the fact that ILFS was not deploying adequate resources and continuously failing to achieve targets for the Reach 1 stations in December 2017 itself while de-scoping the works of Sitabuldi station. Despite being aware of the failures of ILFS in execution of work, the contract for Reach 1 stations was terminated by MMRCL only in December 2018, after a delay of one year from the de-scoping of work of Sitabuldi station. Also, in the intervening period, acceleration advance of ₹10 crore was granted (October 2018) and the entire acceleration advance remained unrecovered. It is pertinent to note that two months after release of the acceleration advance, the contract was terminated (December 2018) which raises questions regarding the logic of giving such advance. Delay in termination of Reach 1 station not only affected the progress of work but also resulted in MMRCL not being able to encash the bank guarantee as the termination was done in December 2018 after the order of NCLAT restraining Banks from honouring the bank guarantees furnished by ILFS. Further, the delay in termination had a cascading effect as only five stations out of planned eleven stations could be made operational in Reach 1 when commercial operation was declared in March 2019.

MMRCL replied (August 2021) that material advance and acceleration advance were granted to the contractor with the approval of the Competent Authority in order to complete the project as per the planned timelines. Regarding the inability to encash the bank guarantees, MMRCL stated that the case is being pursued legally. Ministry replied (March 2022) that acceleration advance was actually stage payments for supply of material at work-spot and is part of several construction contracts of MMRCL which was inadvertently left out in ILFS contract.

The reply is to be viewed against the fact that even though the material and acceleration advance were granted with the approval of the Competent Authority, the sanction of such advances was not in line/permissible as per the contract terms and conditions. The argument that the relevant clauses were left out of the contract is not legally tenable since clauses in other contracts cannot be applied in a contract where such clauses were not included. The possibility of recovery of advances appears to be very remote especially considering the insolvency/bankruptcy of ILFS.

Thus, granting advances to the contractor in violation of tender conditions and delay in terminating the contract with ILFS had resulted in non-recovery of advances and interest thereon from ILFS amounting to ₹52.64 crore.

Recommendation No.9: MMRCL may put in place a mechanism for timely recovery of advances granted to the contractors and fixing responsibility at appropriate level.

4.9 Grant of increase in rates of items subsequent to award of work

As already stated in Para 4.5, the work of construction of Sitabuldi Interchange station was awarded (December 2016) to ILFS as an additional work for ₹66.29 crore in addition to their original contract for work of construction of 10 stations in Reach 1 for ₹532.67 crore. The de-scoped structural work of Sitabuldi station was awarded to Afcons for ₹70.05 crore as an additional work to their existing contract of construction of viaduct in Reach 3 for ₹476.90 crore. Subsequently, Afcons was also awarded (October 2018) work of architectural finishing for ₹28.70 crore and MEP (Mechanical, Electrical and plumbing) work for ₹14.87crore. Thus, the total work pertaining to Sitabuldi station awarded to Afcons was ₹113.62 crore. MMRCL, while deciding to award the de-scoped structural works to Afcons, decided (February 2018) to maintain the accepted Bill of Quantities (BoQ) item rates as applicable to ILFS station work contract awarded in July 2016 in Reach 1.

However, after award of the works, MMRCL granted (December 2018) item rate increase amounting to ₹17.19 crore in the two additional contracts as shown below:

Table 4.4: Increase in item rates after award of contract

(₹in crore)

Sr. No.	Work	Awarded cost	Item rate increase granted	Revised awarded value	Percentage increase
1.	Structural work	70.05	14.17	84.22	20.23
2.	Architectural finishing works	28.70	3.02	31.72	10.52
Total		**98.75**	**17.19**	**115.94**	**17.41**

Audit noticed that apart from the BOQ rates, price variation was payable to Afcons as per the terms and conditions under which the two works mentioned in Table 4.4 above were awarded to Afcons on nomination basis. Hence grant of further increase in BOQ item rates totalling ₹17.41 crore was not justified and was tantamount to undue favour to Afcons. Further, concurrence/vetting from the Finance Department of MMRCL was not obtained while granting the increase in BOQ item rates.

MMRCL stated (August 2021) that the rate increase was granted as Afcons had asked revision of the rates for items where height of building above rail level is involved and construction of Vierendeel truss[12]. As per the ILFS agreement, BoQ rate along with applicable price variation was paid. As some of the items of this BoQ were assigned to Afcons, the rate automatically included the basic rate along with applicable price variation.

The reply is to be viewed against the fact that granting increase in rate on the entire contract value of ₹98.75 crore instead of limiting it to the cost of Vierendeel truss (cost ₹8.08 crore) and height above rail level, requested by the contractor was irregular. As regards the reply mentioning price variation, it is seen that since the item rate was increased, price variation had to be paid on the new rate which was not justified.

4.10 Applicability of price escalation in short term contracts

Rule No 204 of General Financial Rule (GFR) 2005 and Rule No 225 of GFR 2017, stipulated that price variation clauses can be provided in long term contracts, where the delivery period extends beyond 18 months and that short term contracts should have firm and fixed prices. Price variation clause is meant to adjust the contract value for variation in market rate of inputs like materials, labour, fuel/energy during currency of the contract.

MMRCL awarded five short-term contracts of less than a year, out of which four were contracts pertaining to balance work of terminated contracts which were awarded after calling for limited tender. Audit observed that though the period of contracts was less than a year, yet MMRCL included the price variation clause in these contracts, which was not in accordance with GFR provisions. Particulars in this regard are given in the following table:

Table 4.5: Price escalation allowed for contracts of less than 12 months

(₹ in crore)

Sr No	Tender no.	Name of Work	Name of Contractor	Date of Award as per LOA	Awarded cost as per LOA	Original period of completion of works	Price escalation paid to contractor till April 2021	Price escalation as a percentage of awarded value
1	N1C-21/2018	Balance Civil work of Reach 1 stations	NCC Limited	18.01.2019	24.32	6 months	0.49	2.01
2	N1C-22/2018	Balance civil work of JP Nagar and Ujwal Nagar Metro station in Reach 1	Sudhir Construction Infraspace Pvt Ltd	25.01.2019	36.15	18 weeks (approx. 4 months)	-	-

[12] *A steel framework for supporting a roof, bridge, or other structure.*

Sr No	Tender no.	Name of Work	Name of Contractor	Date of Award as per LOA	Awarded cost as per LOA	Original period of completion of works	Price escalation paid to contractor till April 2021	Price escalation as a percentage of awarded value
3	N1C-23/2019	Balance Civil Works of Ajni Station, Congress Nagar and Rahate Colony Metro Station in Reach 1	Mall Construction	25.01.2019	36.27	18 weeks (approx. 4 months)	0.85	2.34
4	N1C-31/2019	Balance Work of Reach 1 Stations and depots.	Afcons	27.05.2019	113.02	30 weeks (approx. 7 months)	0.58	0.51
5	N1T-06/2016	Track works at depot and at grade section	Rahee Infratech Ltd.	01.11.2016	43.94	52 weeks (approx. 12 months)	4.10	9.33
Total							**6.02**	

It can be seen from the above table that the price escalation paid (up to April 2021) to the contractors during execution of the contracts ranged from 0.51 *per cent* to 9.33 *per cent* of the awarded cost of works, in four cases. Thus, MMRCL incurred additional expenditure of ₹6.02 crore towards price escalation which was in violation of GFR conditions regarding price for short term contracts.

MMRCL replied (August 2021) that price escalation condition was there in the originally terminated contract, the same conditions were retained while awarding limited tenders.

The reply is to be viewed against the fact that the originally terminated contract was for a period of two years whereas the above re-awarded works were for a duration of 12 months or less. Since these are separate contracts awarded after inviting limited tenders (including one open tender for a new work) there was no mandatory requirement to have the price variation clause in these contracts.

4.11 Contract for General Consultancy work

MMRCL invited (July 2015) Expression of Interest (EOI) for selection of General Consultant for Nagpur Metro Rail Project. General Consultant being the engineer of the project was responsible for procurement, overall project management and contract administration. Against the tender, three bids were received and after technical evaluation (November 2015), all the three bidders were qualified for submission of financial bid. However, only two bidders submitted the bids and based on the highest technical and financial score, the consortium of SYSTRA, EGIS Rail, AECOM Asia Company Limited and RITES Limited emerged as successful bidder. Accordingly, the work was awarded (June 2016) to the consortium at a cost of ₹221.93 crore. The General Consultant contract was for a period of 48 months from June 2016 to June 2020 but was further extended to June 2021. The contract amount payable during the extended period was ₹64.44 crore[13].

In this regard, Audit observed that:

- General Consultant utilized 8,781 man-months against the prescribed 5,176 man-months during the stipulated contract period i.e., man-months increased by 69 *per cent*, due to which the contract value increased from ₹221.93 crore to ₹297.46 crore (34 *per cent*) during the contract period. The reason stated by MMRCL for permitting increase in man-months subsequent to award of the work was to ensure quality, safety and progress of work at the desired level. The justification given for permitting increased man-months was not tenable as the consultant was required to bid for the man-months keeping in mind the requirement of work by ensuring the prescribed quality, safety and timely completion of the assigned work within the stipulated time period. Allowing increase in man-months resulted in undue advantage to the General Consultant, as it tantamount to securing the contract by under quoting the cost of manpower for the consultancy work and increasing the man-months after securing the contract.

- The General Consultant was being paid monthly on man-month basis and the contract did not contain any provision for linking the payment to actual progress/milestones achieved in the project. The work of the General Consultant was to co-ordinate with various agencies involved in the work for ensuring timely progress and completion of the work. However, the General Consultant failed to ensure the timely completion of the works involved in the project. Even after increased payment to General Consultant on the ground of deploying more manpower, the project could not be completed in time and both the corridors are not completely operational (March 2021), indicating that there was no disincentive to General Consultant even if the contract was delayed.

- The General Consultant was responsible for proof checking and certifying the designs and drawings prepared by the Detailed Design Consultant. M/s SYSTRA (lead member of General Consultant consortium) was awarded (December 2016 and May 2017) the work of Detailed Design Consultant for 10 stations in Reach 3 and 2 stations in Reach 4 at a cost of ₹6.60 crore on nomination basis. The award of Detailed Design Consultant work to the lead member of the General Consultant led to 'Conflict of Interest' as the General Consultant was required to proof check the designs/drawings submitted by the Detailed Design Consultant and the lead member of General Consultant and Detailed Design Consultant were the same. Further, the work was awarded without calling for tender, indicating undue favour to the General Consultant.

MMRCL stated (August 2021) the man-months provided in the bid document was inadequate in comparison to similar projects under execution in India and hence a decision was taken to increase man-months during the contract execution period. Regarding payment to General Consultant not being linked to the progress of the project, MMRCL stated that there were several uncertainties involved in completion of the project which were not in the control of General Consultant. As regards conflict of interest, MMRCL

[13] ***Contract value up to June 2021 (₹361.90 crore) – Contract value up to June 2020 (₹297.46 crore).***

stated that the designs and drawings of Reach 3 stations were submitted by headquarter team of M/. Systra whereas proof checking was carried out by local Systra team in the General Consultant Consortium at Nagpur.

The reply is to be viewed against the fact that had MMRCL perceived inadequacy of the man-months provided in the bid document, the man-months should have been revised at the tendering stage itself. Permitting revision in man-months after the award of contract was not a transparent practice. Though all factors relating to completion of project might not be in the control of General Consultant, yet, General Consultant being the engineer of the project was responsible for monitoring all contract works and co-ordination with various local agencies for ensuring timely progress and completion of the work. Hence appropriate disincentive for delay in the terms of release of payments to General Consultant was not out of place. Regarding conflict of interest involved in the appointment of Detailed Design Consultant, though different units of M/s. Systra might have handled the work of Detailed Design Consultant and General Consultant, the units were under the same entity.

4.12 Delay in commissioning of the project

The construction works in the project were expected to be completed by March 2018 and both the corridors were to be in commercial operation from April 2018 as per DPR. MMRCL started operation in Reach 1 (North-South corridor) in March 2019 with five operational stations against total 10 stations[14]. Similarly, the operation in Reach 3 (East-West corridor) commenced in January 2020 with 5 stations against 11 stations. Reach 2 (North-South corridor) and Reach 4 (East-West corridor) were yet to be put into operation (June 2021) as the construction work of viaducts and stations were not completed. The status of key works viz. Viaduct, Stations, Depot work which resulted in delay in completion of the project as at March 2021 is shown in ***Annexure 4***.

Audit observations regarding delayed award of key civil works with scheduled completion beyond the project completion date of March 2018 and the cascading delays due to delayed termination of contract with ILFS are discussed in Para 4.1 and 4.5 respectively.

In this regard, Audit further observed that:

- The work of construction of 10 stations[15] in Reach 3 was awarded (September 2016) to M/s ITD Cementation India Ltd. with due date of completion in October 2018. Reach 3 was commissioned in January 2020 with 5 stations[16] out of the total 10 stations. Balance five stations[17] were commissioned from October 2020 to April 2021. The reason cited by MMRCL for delay in completion of stations was due to not handing over the sites in time to the contractor. The time extension notes of MMRCL did not mention the station sites where there was delay in handing over site to the contractor and the number of days for which such delay occurred in handing over of sites.

[14] ***Including Sitabuldi Interchange station.***

[15] ***Lokmanya Nagar, Subhash Nagar, Institution of Engineers, Jhansi Rani Square, Vasudeo Nagar, Bansi Nagar, LAD Square, Shankar Nagar Square, Rachana Ring Road and Dharampeth College.***

[16] ***Lokmanya Nagar, Subhash Nagar, Institution of Engineers, Jhansi Rani Square and Vasudeo Nagar.***

[17] ***Bansi Nagar (October 2020), LAD Square (October 2020), Shankar Nagar Square (December 2020), Rachana Ring Road (December 2020) and Dharampeth College (April 2021).***

- In case of the Reach 4 station works awarded to M/s ITD Cementation India Ltd., the contractor could complete only 22 *per cent* of the work within the stipulated time period (September 2019) of the contract due to non-deployment of adequate resources and resultant slow progress of work. MMRCL granted extensions from time to time to the contractor without analysing the reasons for delay in each station along with the party responsible for such delays. MMRCL had also not recorded the percentage of physical work completed by the contractors up to stipulated date and during the extended time period while processing requests from contracts for extension of time.

- The viaduct works in Reach 2 and 4 were yet to be completed (March 2021). The reasons cited by MMRCL for delay in completion of viaduct was due to crossing of viaduct over railway tracks, change in the length of double decker viaduct in Reach 2 by NHAI and delay in issue of drawings. MMRCL has not taken adequate steps to ensure timely clearances from Railways by taking up the matter at Ministry level for speeding up the required permissions.

- The work on two depots viz., MIHAN and Hingna could not be completed (March 2021) due to poor progress of work by the contractor M/s PCS-JV and the work was withdrawn (December 2018 to May 2019) and assigned to other contractors. It was observed that, Plant and Machinery to be installed at the depots and received between August 2018 to July 2019 valuing ₹20.73 crore could not be commissioned due to non-completion of necessary civil work at the depots and were lying idle. Further, the vendor (M/s Siemens Ltd.) who supplied the Plant and Machinery had claimed a compensation of ₹28.02 crore for extended timelines of the work on account of non-availability of access to work front for installation of the machinery and the claim was under scrutiny of MMRCL (August 2021).

Figure 4.1: Plant and machinery waiting to be installed at MIHAN Depot

- Due to delay in completion of the aforesaid major civil construction works within the stipulated time period of the contract, MMRCL had to bear additional expenditure on account of price escalation amounting to ₹72.08 crore (Contract-wise amount paid given in ***Annexure 4***) during the time extension period granted to the contractors.

Thus, due to inadequate planning in tendering major works, non-deployment of adequate manpower by contractors, not getting timely clearances for railway crossing, non-furnishing of drawings and design in time to the contractors and providing access to the work front to the contractors resulted in delay/non completion of works in the project which resulted in the project being only partially commissioned even after lapse of three years from planned commercial operation of the entire project.

MMRCL stated (August 2021) the extensions of time granted to the contractors were based on detailed study and delay analysis for each station. MMRCL added that progress of viaduct work in Reach 2 and 4 was affected by COVID-19 pandemic. Further, the price escalation was paid as per the contract conditions and hence no additional expenditure was incurred by MMRCL due to delay in civil works.

The reply is to be viewed against the fact that the viaduct and station work in Reach 2 and 4 were to be completed by the contractors well before the occurrence of COVID-19 pandemic and the processing of time extension requests had inadequacies as mentioned above. Though the contracts had price variation clause, the above mentioned price escalation of ₹72.08 crore was for the extended period of contracts on account of delays on the part of the contractor as well as MMRCL.

4.13 Land acquisition for the project

As per the DPR, the land required for the project was mainly for the purposes of alignment, elevated structures, switch-over ramps, traffic integration, traction/receiving sub-stations, stations, depot and running sections. The details of actual land acquired in the project vis-à-vis the land requirement envisaged in DPR was as given below:

Table 4.6: Land Acquisition for the Project

(area in sq. mtr.)

Purpose for which land was to be acquired	Land requirement envisaged in DPR	Actual land acquired	Excess/(short) land acquisition over DPR requirement	Percentage of excess/(short) land acquired over DPR requirement
Stations Entry/Exit	32752.00	73497.20	40745.20	124.40
Running Section	129844.00	179724.01	49880.01	38.42
Depot Area	597973.00	512501.21	(85471.79)	(14.29)
Traffic Integration/ parking	69183.80	79211.05	10027.25	14.50
Total	**829752.80**	**844933.47**	**15180.67**	**1.82**

The breakup of land required as per DPR and actually acquired from Government/ Government Agencies and Private parties is as shown in the table below.

Table 4.7: Government and Private land acquired for the project

(area in sq. mtr.)

Type of Land	Land requirement as per DPR	Land actually acquired	Excess/(shortfall) in land acquisition
Government Land	7,76,819.30	8,30,285.02	53,465.72
Private Land	52,933.50	14,648.45	(38,285.05)
Total	**8,29,752.80**	**8,44,933.47**	**15,180.67**

It can be seen from table 4.6 above that land acquired for stations was more than double the area proposed in the DPR. For the running section also, land acquired was more than 38 *per cent* of DPR projection. However, land requirement projected for acquisition from private parties in DPR was 0.52 lakh sq. mtr and the actual acquisition was limited to 0.15 lakh sq. mtr. The total amount paid for land acquisition was ₹226.30 crore out of which ₹61.11 crore was for Government land and ₹165.19 crore was for private land. The amount of ₹61.11 crore paid for Government land pertained to 0.14 lakh sq. mtr. land acquired from Maharashtra State Electricity Distribution Company, Railways, National Environmental Engineering Research Institute and Airport Authority of India. MMRCL got possession of the acquired land parcels during the period from February 2015 to June 2020. The remaining land was provided by the Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation for the project. The land parcels from private parties were acquired by MMRCL on direct purchase method under the policy of Government of Maharashtra and compensation was paid at market rate as per Land Acquisition Act, 2013. As per the MoU entered into by Government of India, Government of Maharashtra and MMRCL, the cost of the land for the project was to be borne by Government of Maharashtra and local authorities. Audit noticed that MMRCL was able to acquire the necessary land for execution of the project.

4.14 Summing up

As per the DPR, the commercial operation was to be achieved by April 2018 but only two out the four Reaches have begun commercial operation. Though at the time of award of key civil works, it became clear that the envisaged commercial operation would not materialize in April 2018, no revised target was laid down with the result that the construction work lingered on. Tender evaluation lacked transparency as rates were increased after award of contract and major works were awarded as additional works on nomination basis to contractors executing other works. 'Risk and cost' clause was either not included or not invoked in terminated contracts to recover additional cost incurred in re-tendering the work. Recovery of mobilisation advance granted to contractors was based on progress of work and not time-bound basis with the result that the advances could not be recovered fully in delayed/terminated contracts. Termination of contract awarded to ILFS was delayed by a year which lead to cascading delays in other linked contracts. Weaknesses in contract management has resulted in partial execution of the project with commercial operation of two out of four reaches yet to be declared (March 2022).

Chapter 5: Operational Performance

5.1 Low ridership

As per the DPR, average projected ridership of the project was 3.52 lakh passengers per day which included 1.68 lakh passengers per day for North-South corridor and 1.84 lakh passengers per day for East-West Corridor. Reach 1 in North-South Corridor commenced commercial operations from 10 March 2019 and operations in Reach 3 in East-West Corridor commenced from 28 January 2020. The details of projected daily average ridership as per DPR vis-à-vis the actual ridership for pre-COVID/post-COVID Pandemic period for Reach 1 and 3 is given in the table below.

Table 5.1: Ridership in Nagpur Metro

Month	No. of operational stations	Monthly ridership	Projected ridership per day as per DPR	Average ridership actually achieved per day	Percentage of ridership achieved to projected ridership in DPR
Pre-COVID ridership					
Mar 2019	5	55,000	52,965	2,750	5.19
Apr 2019	5	28,152	52,965	1,126	2.13
May 2019	5	31,972	52,965	1,184	2.24
Jun 2019	5	31,503	52,965	1,212	2.29
Jul 2019	5	31,545	52,965	1,213	2.29
Aug 2019	5	25,266	52,965	1,330	2.51
Sep 2019	5	24,406	52,965	939	1.77
Oct 2019	5	44,944	52,965	1,450	2.74
Nov 2019	6	54,847	54,993	1,828	3.32
Dec 2019	6	1,13,625	54,993	3,665	6.67
Jan 2020	11	1,23,563	1,11,283	3,986	3.58
Feb 2020	11	2,16,943	1,11,283	7,481	6.72
Mar 2020	11	1,02,968	1,11,283	4,903	4.41
Average ridership for pre-COVID period			**67,139**	**2,587**	**3.85**
Metro services were halted during March 2020 to October 2020					
Post COVID ridership					
Oct 2020	15	36,719	1,31,219	2,295	1.75
Nov 2020	15	1,91,887	1,31,219	6,396	4.87
Dec 2020	17	3,25,427	1,51,170	10,498	6.94
Jan 2021	17	5,24,581	1,51,170	16,922	11.19
Feb 2021	17	4,84,514	1,51,170	17,304	11.45
Mar 2021	17	2,43,848	1,51,170	7,866	5.20
Average ridership for post-COVID period			**1,45,675**	**10,820**	**7.43**

It can be seen from the above table that the actual average ridership during the pre COVID period (March 2019 to March 2020) was 3.85 *percent* of the projected ridership and the average ridership during post COVID period (October 2020 to March 2021) was 7.43 *per cent* of the projected ridership. The highest ridership that could be achieved till March 2021 was 11.45 *per cent* (February 2021).

The marginal increase in average ridership during post COVID period could be on account of increase in the number of operational stations from 11 stations during pre-COVID period to 17 stations in post COVID period. A total of 21 stations have been planned in Reach 1 and Reach 3 including an interchange station. As of March 2021, 17 stations out of 21 stations have been operationalised, including the interchange station. Yet, the ridership has not picked up and remained low at 7.43 *per cent* of the DPR estimates.

The low ridership in both the operational Reaches can be attributed to various factors including non-operationalisation of two Reaches (Reach 2 and 4) and even in the two Reaches that are operational (Reach 1 and 3), 4 stations are not yet operational (31 March 2021).

Thus, Nagpur metro project has shown low ridership which was only around 3.85-7.43 *per cent* of DPR projections, which would adversely impact fare box revenue.

MMRCL replied (August 2021) that ridership was impacted as the commercial operations for Reach 1 and 3 stations were done in a phased manner. Besides, the emergence of the COVID-19 pandemic affected the ridership in the project and steps are being taken to enhance the ridership. Ministry replied (March 2022) that ridership has been increasing continuously after the restrictions have been removed.

The fact remains that early completion of all works/Reaches as envisaged in the DPR along with adequate last mile connectivity may enhance the ridership. However, whether the ridership shall come up to DPR projections is a matter to be closely monitored.

5.2 Low non-fare box revenue

In addition to fare box revenue, non-fare box revenue is a major component for sustainable operation of metro project. The sources of non-fare box revenue mainly comprise of rental/ lease revenue from property development, advertisements, revenue from dedicated taxes/levies imposed for the project, etc. The revenue estimated as per DPR from non-fare box revenue vis-à-vis actual revenue from these sources for the period from 2018-19 to 2020-21 is as mentioned below:

Table 5.2: Non-fare box revenue

(₹ in crore)

Year	Estimated Revenue as per DPR	Actual revenue realized	Shortfall in actual revenue	Percentage shortfall of actuals to estimated revenue
Property Development and Advertisement				
2018-19	30.00	-	30.00	100.00
2019-20	31.00	0.10	30.90	99.68
2020-21	36.00	0.17	35.83	99.52
Sub Total (A)	**97.00**	**0.27**	**96.73**	**99.72**
Additional Taxes – Floor Space Index (FSI)[18]				
2018-19	103.00	11.46[19]	91.54	88.87

[18] ***The premium collected for grant of Floor Space Index for the properties at a distance of 500 mtr distance on either side of the Nagpur metro rail lines measured from the center line and also the area falling within 500 mtr distance from the longitudinal end of the last metro station shall be distributed equally among MMRCL and State agencies.***

[19] ***Includes grant from FSI ₹3.08 crore for FY 2017-18 as DPR provides revenue estimates from estimated completion (March 2018).***

Year	Estimated Revenue as per DPR	Actual revenue realized	Shortfall in actual revenue	Percentage shortfall of actuals to estimated revenue
2019-20	460.00	38.73	421.27	91.58
2020-21	638.00	17.40	620.60	97.27
Sub Total (B)	**1201.00**	**67.59**	**1133.41**	**94.37**
Additional Taxes – 1 % additional stamp duty				
2018-19	103.00	-	103.00	100.00
2019-20	113.00	-	113.00	100.00
2020-21	125.00	-	125.00	100.00
Sub Total (C)	**368.00**	-	**368.00**	**100.00**
Grand Total (A to C)	**1666.00**	**67.86**	**1598.14**	**95.93**

It can be seen from the above table, that the actual revenue generation from non-fare box sources for the period from 2018-19 to 2020-21 was only ₹67.86 crore as against the DPR projection of ₹1,666.00 crore (4 *per cent* of the estimated revenue). The major component of non-fare box revenue as per DPR was revenue on account of additional FSI amounting to ₹1,201 crore. However, the actual revenue realized was only ₹67.59 crore (6 *per cent* of the estimated revenue).

MMRCL replied (August 2021) that revenue will gradually increase after commercial operation of both the corridors.

Considering the huge difference between actuals and projections, MMRCL may need to take affirmative action to increase the non-fare box revenue especially since fare box revenue remained low due to low ridership.

5.3 Revenue from property development and advertisement

As per the DPR, one of the sources of revenue was from Property Business, comprising of revenue from leasing of commercial spaces, kiosk, ATM counters at the metro stations and advertisement revenue. The revenue from Property Business projected in the DPR was ₹97 crore (10 *per cent* of the estimated fare box revenue of ₹974 crore) during the period 2018-19 to 2020-2021.

The details of area constructed for property business and leased out by the MMRCL up to March 2021 are shown in table below:

Table 5.3: Revenue generated from Property Business

Sr. No.	Name of station	Date of commercial operation	Area constructed for Property Business (in sq. m)	Area leased out- Pre-COVID (in sq. m)	Area leased out- Post-COVID (in sq. m)	Total Area leased (Pre-COVID & Post COVID)	Month and year of leasing out
1	Khapri	10.03.2019	480.00	36.20	-	36.20	March 2019
2	New Airport	10.03.2019	101.00	-	-	-	-
3	Airport	10.03.2019	1,096.00	52.05	-	52.05	March 2019
4	Jaiprakash Nagar	20.11.2019	2,408.00	34.12	188	222.12	March 2019 & July 2020
5	Ajni Square	18.10.2020	79.00	-	-	-	-
6	Rahate Colony	18.10.2020	136.00	-	-	-	-

Sr. No.	Name of station	Date of commercial operation	Area constructed for Property Business (in sq. m)	Area leased out- Pre-COVID (in sq. m)	Area leased out- Post-COVID (in sq. m)	Total Area leased (Pre-COVID & Post COVID)	Month and year of leasing out
7	Lokmanya Nagar	28.01.2020	58.00	21.30	36.40	57.70	December 2019 & November 2020
8	Bansi Nagar	16.10.2020	540.00	-	-	-	-
9	Vasudev Nagar	28.01.2020	37.00	-	-	-	-
10	Subhash Nagar	28.01.2020	18.00	-	17.56	17.56	June 2020
11	Institution of Engineers	28.01.2020	106.00	90.68	14.92	105.60	December 2019 & June 2020
12	Jhansi Rani square	28.01.2020	206.00	-	31.00	31.00	June 2020
Total			**5,265.00**	**234.35**	**287.88**	**522.23**	

MMRCL constructed 5,265.00 sq mtr area in 12 stations for property business out of which 522.23 sq mtr of area only (10 *per cent*) could be leased out in seven stations up to March 2021 earning rental revenue of ₹0.17 crore during 2019-20 to 2020-21. Audit noticed that at five stations[20] with property business area measuring 893 sq. mtr, MMRCL could not lease out the space even after lapse of 6 to 24 months from start of commercial operations in these stations. Similarly, the advertisement revenue earned by MMRCL during the two years 2019-20 to 2020-21 was only ₹0.10 crore. Thus, MMRCL could earn only ₹0.27 crore from property business and advertisement., which was 0.28 *per cent* of the estimated revenue as per DPR. The shortfall in revenue can be attributed to poor ridership resulting in lesser demand for commercial spaces in the metro stations, non-commissioning of the entire project resulting in lesser footfall at metro stations and impact of COVID Pandemic on rental commercial spaces.

As per Metro Rail Policy, 2017 of Government of India, property development at stations and on other urban land can be used as a key instrument for maximising revenue in metro rail systems. The land acquired for stations was more than double the requirements projected in the DPR (73,497 sq. mtr of land was acquired against DPR projection of 32,752 sq. mtr). MMRCL planned property development through monetization of land parcels and identified four land parcels at Dhantoli (19,890 sq mtr), property development above Zero-mile metro station, Kasturchand Park (7,220 sq mtr) and property development above station parking at Airport metro station. MMRCL was planning to develop commercial space at these land parcels on Public Private Partnership (PPP) mode, but could not monetize the land parcels (March 2021).

[20] ***New Airport, Ajni Square, Rahate Colony, Bansi Nagar and Vasudev Nagar.***

MMRCL constructed two level basements for parking facility at Kasturchand Park land parcel near to Kasturchand Park Metro station and incurred cost of ₹24.75 crore (up to March 2021). The intended purpose of the land parcel was to monetize it through PPP mode to develop commercial and parking areas so as to generate substantial revenue for the project. However, MMRCL directly took up the construction of parking facility only instead of developing the earmarked plot for commercial and parking facility through PPP mode. The parking facility is adjacent to Kasturchand Park Station which is yet to be operationalized. The estimated ridership at Kasturchand Park Station is only 10,708 for 2021 which is projected to reach 17,698 by 2041. The cost of the station was ₹41.22 crore while the cost of the two-level parking facility alone was ₹24.75 crore. Further MMRCL was facing shortage of funds which resulted in putting on hold the work of construction of Cotton Market station where the ridership potential was high. This also indicates that appropriate prioritisation of works was lacking.

Figure 5.1: Construction of two level parking facility at Kasturchand Park

Thus, MMRCL so far, could generate a meagre revenue of ₹0.27 crore from its property business against the projection of ₹97 crore in the DPR and also could not monetize the land parcels available to ensure flow of revenue to augment the fare box revenue.

MMRCL replied (August 2021) that despite its efforts for leasing the commercial/ advertisement spaces inside metro stations and monetize land parcels, the DPR target could not be achieved due to economic slowdown, sluggishness in realty sector and COVID-19 pandemic. Regarding the parking facility, MMRCL stated that two-level basement parking was constructed at Kasturchand Park land parcel due to parking requirements of various religious, political, national, social and cultural events at Kasturchand park. Ministry replied (March 2022) that income from property business will gradually increase once the entire stretch of Nagpur Metro will be fully operational.

The reply is to be viewed against the fact that land which is to be used for monetization cannot be used for parking facility for various events at Kasturchand Park. Further, MMRCL may have to take adequate steps to increase the non-fare box revenue to supplement the fare box revenue, for sustainable operation.

Recommendation No.10: MMRCL may devise an appropriate policy for monetization of land parcels and make efforts for optimal renting out of Property Business spaces.

There should be a member/expert with marketing skill in the Board for efficiently dealing with Property Development and Property Business related activities.

5.4 Non–release of revenue collected by Government of Maharashtra

The Maharashtra Municipal Corporation (Second Amendment) Act, 2015 provides that the stamp duty leviable under the Maharashtra Stamp Act on the instruments of sale, gift and usufructuary mortgage, respectively, of immovable property shall be increased by a surcharge at the rate of one *per cent* in the case of any such instrument relating to immovable property situated in the City in which one or more Vital Important Urban Transport Projects are implemented. It also provides that the Government of Maharashtra shall pay to the Corporation or the agency which has undertaken the notified project a grant-in-aid approximately equal to the amount of additional duty realized every year.

Government of Maharashtra notified (June 2016) the Nagpur Metro Rail Project as vital important Urban Transport Project for the purpose of Section 149B of the Maharashtra Municipal Corporations Act. Audit noticed that the Government of Maharashtra had levied and collected an amount of ₹212.23 crore[21] as additional stamp duty during the period from 2016-17 to 2019-20. However, Government of Maharashtra has not paid/transferred any amount to MMRCL out of the additional stamp duty so collected, though MMRCL requested (July 2020) Government of Maharashtra for release of the amount.

Therefore, non-payment of additional stamp duty by Government of Maharashtra and not having a laid down mechanism for ensuring timely transfer of the additional stamp duty to MMRCL after its collection by Government of Maharashtra can have adverse impact on the financial condition of MMRCL.

MMRCL replied (August 2021) that the matters regarding release of additional stamp duty collected by Government of Maharashtra and formulation of a policy for timely release of the same in future are being followed up with Government of Maharashtra. Ministry stated (March 2022) that Government of Maharashtra has made provision of ₹50 crore for disbursement of surcharge on stamp duty to MMRCL in the Budget estimates of 2021-22.

However, Audit noticed that the amount is yet to be released as of March 2022, which could have eased the cash crunch faced by MMRCL.

5.5 Servicing of external debt for the project

Government of India entered (April 2016) into a loan agreement with KfW, Germany for implementation of the Nagpur metro rail project as per which the external funding agency extended a loan of 500 million Euro (₹3,588.10 crore) for the project, disbursed in five tranches. As per the loan agreement, the loan would attract variable interest rate as per Euro Interbank Offered Rate (EURIBOR) plus a margin of 0.6 *per cent* per annum. Further, Article 4 of the loan agreement provided that the borrower will repay the loan in 31 consecutive semi-annual installments of Euro 16.129 million each beginning from 30 June 2021 up till 30 June 2036.

[21] ***₹26.67 crore in 2016-17, ₹58.94 crore in 2017-18, ₹64.03 crore in 2018-19 and ₹62.59 crore in 2019-20.***

Similarly, Government of India entered (November 2016) into loan agreement with French Development Agency (AFD) for a credit facility/loan of Euro 130 million (₹932.90 crore) for the project. The loan facility from AFD would attract floating interest rate of six month EURIBOR plus a margin, provided the minimum interest rate shall be 0.25 *per cent*. As per clause 7 of the loan agreement, after the expiry of grace period of five years, the borrower shall repay to the lender, the principal amount of the facility in 30 equal semi-annual installments of EURO 4.333 million due and payable on each payment date. The first installment shall be due and payable on 15 December 2021 and the last installment shall be due and payable on 15 June 2036.

MMRCL received the entire loan amount of ₹4,521 crore (₹3,588.10 crore from KfW and ₹932.90 crore from AFD) as pass through assistance from Government of India during the period from September 2016 to December 2020. As per the terms of the loan agreement with both the external funding agencies, MMRCL has to repay ₹377.79 crore including interest of ₹85.06 crore in 2021-2022. The first installment of loan repayment due to KfW was in June 2021/ December 2021 and AFD in December 2021.

Audit noticed from the financial statements of MMRCL for the period 2015-16 to 2020-21 that the total surplus generated for the period was ₹13.14 crore as shown in the table below:

Table 5.4: Operational Revenue and Expenditure of Nagpur metro

(₹ in crore)

Particulars	Years						Total
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
Revenue							
Fare box revenue	-	-	-	0.07	1.44	1.48	2.99
Interest on Fixed Deposit	2.72	7.31	17.39	40.17	48.49	35.15	151.23
Revenue from executing external projects	-	44.82	129.64	209.74	298.16	211.79	894.15
Revenue from consultancy assignments	-	-	2.75	5.21	9.79	2.59	20.34
Advertisement Income	-	-	-	-	0.07	0.05	0.12
Grant for Floor Space Index from GoM	-	-	3.08	8.38	38.73	17.40	67.59
Other Income	0.03	0.18	3.54	4.50	10.02	11.19	29.46
Total Revenue (A)	**2.75**	**52.31**	**156.40**	**268.07**	**406.70**	**279.65**	**1165.88**
Expenses							
Operation and Maintenance Expenses	-	-	-	0.81	22.70	35.09	58.60
External Project expenses	-	43.88	126.12	205.90	282.71	209.20	867.81

Particulars	Years						Total
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
Consultancy expenses	-	-	2.75	5.21	7.79	1.56	17.31
Employee Benefit Expenses	-	0.09	2.35	2.76	28.80	31.66	65.66
Other Expenses	2.83	9.77	34.76	34.34	40.53	21.13	143.36
Total expenses excluding tax and depreciation (B)	**2.83**	**53.74**	**165.98**	**249.02**	**382.53**	**298.64**	**1152.74**
Surplus (A-B)	**(0.08)**	**(1.43)**	**(9.58)**	**19.05**	**24.17**	**(18.99)**	**13.14**

The instalment amount due to be paid to the external agencies during 2021-22 was ₹377.79 crore. Therefore, the surplus generated during the last six years is less than 10 *per cent* of the amount of instalment payable during 2021-22. The instalments have not yet been paid and MMRCL informed Audit that in the case of AFD loan, extension in repayment has been granted up to June 2022 by the external agency while in the case of KfW loan, the matter is under correspondence (March 2022).

As per clause 12.28 under Obligations of Government of Maharashtra in the MoU entered into between Government of India, Government of Maharashtra and MMRCL, Government of Maharashtra shall repay the senior term debt as and when it becomes due in case MMRCL is not able to pay the same to Government of India. MMRCL had requested (March/May 2021) Government of Maharashtra for financial assistance in order to discharge the debt repayment obligations in accordance with the aforesaid MoU. However, no reply on this critical issue was received from Government of Maharashtra.

Thus, the surplus generated by MMRCL is insufficient to meet the external debt repayment obligations and MMRCL may have to depend on State/Central assistance to service the debt raised from for the project.

MMRCL replied (August 2021) that the ridership, fare box revenue and non-fare box revenue are expected to increase considerably once entire corridors become operational and the COVID related restrictions are over. Therefore, MMRCL will be in a position to service the external debt in the long run. Ministry replied (March 2022) that it will continue to request Government of Maharashtra to provide assistance in repayment of external debt.

The reply is to be viewed against the fact that though the ridership may increase after the remaining two Reaches become operational, whether the revenue generation will be sufficient to cover the servicing of debt needs close monitoring.

Recommendation No. 11: Since the loans have been raised by GOI on behalf of the project, Ministry of Housing and Urban Affairs may closely monitor the ability of MMRCL and Government of Maharashtra to service the debt and take appropriate measures to mitigate the debt burden, if required.

5.6 Security Measures for Nagpur Metro Rail Project

The DPR of Nagpur Project envisaged security measures comprising of armed security personnel at metro stations from State Undertaking, bullet proof morcha at check points, bomb blankets at stations etc. MMRCL has engaged private security agencies to handle security at stations. Audit observed that the security personnel deployed at the stations were not armed and there was no provision of bullet proof morcha at check points and bomb blankets at the stations, indicating inadequacies in the security arrangements at stations.

MMRCL stated (August 2021) that security at stations has been outsourced with a view to reduce the cost and attain financial sustainability in long run.

Considering the vulnerability of stations, MMRCL may take steps to ensure that the security system envisaged in the DPR is complied with.

5.7 Last mile connectivity

Last mile connectivity plays a vital role and is a crucial link in enhancing metro ridership. In the DPR, it was prescribed that there was a need for providing a transportation system, which is seamlessly integrated across all modes and provides first mile as well as last mile connectivity.

Figure 6.2: E-scooter and e-bicycle provided for last mile connectivity at Khapri station

Audit noticed that MMRCL was able to start feeder services primarily comprising of e-bicycle, e-rickshaw and e-scooter only at 6 stations (as of February 2021) out of the operational 17 stations. As regards bus services, though MMRCL requested Nagpur Municipal Corporation for operationalization of 65 schedules for better first and last mile connectivity, so far Nagpur Municipal Corporation is operating only 17 schedules. Nevertheless, MMRCL has initiated further steps in recent months (November 2020 to March 2021) to improve last mile connectivity by entering into MoUs with service providers of e-rickshaw, e-scooters and merging existing city auto services. However, due to lockdown on account of COVID pandemic, the services were discontinued by some of the service providers. The lack of adequate first and last mile connectivity adversely impacted commuter convenience and ridership as well.

MMRCL replied (August 2021) that they are taking further measures to improve last mile connectivity.

5.8 Summing up

Nagpur metro railway project has shown low ridership as compared to the Detailed Project Report projections (3.85-7.43 *per cent* of Detailed Project Report projections). Non-fare box revenue through property development, advertisement etc., has also been much less than the Detailed Project Report projections (₹67.59 crore against Detailed Project Report projection of ₹1,666.00 crore). The total surplus generated by MMRCL for the period from 2015-16 to 2020-21 was ₹13.14 crore and the instalment amount due to be paid to the external agencies during 2021-22 was ₹377.79 crore. Therefore, the surplus generated is only a fraction of the amount required for servicing of debt (total loan amount: ₹4,521 crore) raised by Government of India for the project from external funding agencies. Though the ridership may improve after all the Reaches are made operational, yet whether the revenues would cover the debt servicing needs close monitoring and appropriate interventions.

Chapter 6: Project Monitoring and Internal Control

6.1 High Powered Committee for Nagpur metro rail project

As per the Memorandum of Understanding (MoU) entered into between Government of India, Government of Maharashtra and Maharashtra Metro Rail Corporation Limited (MMRCL), it was the obligation of Government of Maharashtra to constitute a High Powered Committee (HPC) under the chairmanship of the Chief Secretary. Other members of the HPC include Secretaries of the concerned departments of the State Government, heads of Civic Bodies, etc. Mandate of HPC was to address and sort out all State Level issues regarding implementation, particularly with regard to land acquisition, diversion of utilities, shifting of structures in the project alignment, rehabilitation of project affected persons, multi modal integration and such other matters where the State Government was to facilitate quick action. As per the MoU, HPC shall normally meet once in a month or more often if required, to sort out all these issues expeditiously.

In this regard, Audit observed that:

(i) Government of Maharashtra constituted (January 2014) a HPC consisting of 15 members under the Chairmanship of Chief Secretary, Government of Maharashtra, Additional Secretaries from various departments and the Commissioners of Nagpur Improvement Trust and Nagpur Municipal Corporation etc. MMRCL was incorporated in February 2015 i.e., subsequent to the formation of HPC. However, MMRCL has not been included as a member in the HPC till now and MMRCL also did not make any request to Government of Maharashtra for inclusion in HPC.

(ii) As per the MoU, the HPC was required to meet atleast once a month. The details of the meetings held by the HPC during the period from 2015-16 to 2020-21 are given in the following table:

Table 6.1: Meetings of High Powered Committee

Year	No. of meetings of HPC required to be held as per the MoU	No. of meetings held by HPC	Shortfall (*in percentage*)
2015-16	12	1	91.67
2016-17	12	0	100
2017-18	12	0	100
2018-19	12	0	100
2020-21	12	0	100
Total	60	1	98.33

Only one meeting of the HPC was held in August 2015 as against 60 meetings required to be held as per the MoU during the period from 2015-16 to 2020-21. Further, no meeting was held after August 2015 to review the progress of various activities associated with the project as was envisaged in the MoU.

(iii) As per the Government of India Sanction Order (August 2014) for the project, the cost of the project was to be contributed/funded by the Government of India, Government of Maharashtra, Nagpur Improvement Trust, Nagpur Municipal Corporation and borrowings from foreign funding agencies. The approved financing pattern of the project and the funds released by the various stakeholders up to March 2021 is given in Table 1.2.

MMRCL had received funds to the tune of ₹7,886.11 crore upto March 2021 against the project cost of ₹8,680 crore. Among the various stake holders involved in the project, Government of India had released the entire portion of its contribution of ₹6,076 crore including the funds from foreign funding agency amounting to ₹4,521 crore. Government of Maharashtra had only released ₹1,484.66 crore against its share of ₹1,736 crore as of March 2021. Also, Government of Maharashtra has not released its entire share of equity contribution in MMRCL as ₹176.14 crore is still to be received out of the total equity contribution of Government of Maharashtra of ₹1,114 crore (March 2022).

Out of the share of ₹868 crore due from Nagpur Improvement Trust and Nagpur Municipal Corporation, only an amount of ₹325.45 crore was released and ₹542.55 crore was yet to be released by the two agencies, as of March 2021. Nagpur Improvement Trust has not made any contribution towards grant after December 2018 while Nagpur Municipal Corporation has not made any contribution towards grant since inception of the project. Audit noticed that Nagpur Improvement Trust and Nagpur Municipal Corporation conveyed (December 2020 and May 2019 respectively) to Government of Maharashtra their inability to make contribution to the project due to their deteriorated financial condition. Nagpur Improvement Trust and Nagpur Municipal Corporation requested Government of Maharashtra to release the share of funds on their behalf.

Though MMRCL regularly made requests (April 2017 to May 2021) to Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation for release of their respective balance share towards project cost, the funds were not released in full. MMRCL has put on hold some of the critical works including Cotton Market Station and decided (January 2020) to curtail pending civil works on account of non-receipt of contribution of ₹793.89 crore from Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation. The delay in timely release of funds by the aforesaid stake holders can further slowdown the pace of balance civil works and delay the completion of the project. This can in turn affect the projected fare box and non-fare box revenue collections on account of non-commissioning of the entire project corridors.

Thus due to non-functioning of HPC as envisaged in the MoU and non-inclusion of MMRCL in the HPC, MMRCL's efforts for early resolution of State level issues, particularly with reference to fund release did not achieve the desired impact.

MMRCL/ Ministry replied (August 2021/ March 2022) that the outstanding issues were regularly taken up with Urban Local Bodies and Urban Development Department of Government of Maharashtra and by this approach physical progress of more than 98 *per cent* has been achieved in the project till January 2022. The issue regarding release of funds was continuously followed up with Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation. Also, meetings under the chairmanship of Honourable Chief Minister of Maharashtra were conducted and several meetings were held by MMRCL with the stakeholders to resolve the issues related to the project at State level.

The reply is to be viewed against the fact that the project is not yet fully operational and non-release of funds amounting to ₹793.89 crore by the Government of Maharashtra and its agencies held up critical civil works. MMRCL's inclusion in the HPC and regular meetings of the HPC could have strengthened the framework for resolving project related issues.

Recommendation No.12: Since the project has not been completed despite release of the full share of funds by the Government of India, Ministry of Housing and Urban Affairs may impress upon the Government of Maharashtra to release their share including share of the State agencies.

Recommendation No.13: Since MMRCL is implementing two metro projects in Maharashtra (Nagpur and Pune), Ministry of Housing and Urban Affairs may take appropriate action for inclusion of MMRCL in the High Powered Committee for timely resolution of project related issues.

6.2 Establishment of Urban Metropolitan Transport Authority

One of the conditions stipulated in the Sanction Order issued (August 2014) by the Government of India for the project was that Government of Maharashtra should set up an Urban Metropolitan Transport Authority, duly backed by legislation, to facilitate coordinated planning and implementation of projects related to urban transport and their integrated management. This was also mentioned in Clause 12.35 of the MoU entered (July 2015) into between Government of India, Government of Maharashtra and MMRCL. The benefits/ purpose of Unified Metropolitan Transport Authority were to undertake integration and approval of proposals by urban transport agencies at the city level, their strategy and policy functions, regulatory functions, transport demand management, organizing urban transport services, providing common services, resolution of day-to-day matters and monitor the work assigned to implementing agencies. For Unified Metropolitan Transport Authority to be effective, it should have been backed by a legislation and the entire funding for urban transport should be routed through Unified Metropolitan Transport Authority.

However, Government of Maharashtra has not established the Unified Metropolitan Transport Authority even after lapse of more than six years since the sanction of the project. MMRCL requested (December 2019 and August 2020) Government of Maharashtra for formation of Unified Metropolitan Transport Authority for Nagpur Metropolitan Region and Nagpur City stating that the formation of Unified Metropolitan Transport Authority would bring unanimity among different organizations on various aspects of Urban Transport Planning and Management. However, no further action was taken by Government of Maharashtra in this regard. This has resulted in non-fulfilment of the conditions prescribed by Government of India while according sanction for the project and also not availing the benefits envisaged by formation of Unified Metropolitan Transport Authority.

MMRCL stated (March 2022) that the Government of Maharashtra has since established (February 2022) Nagpur Unified Metropolitan Transport Authority.

6.3 Setting up of Urban Transport Fund

Government of India while according approval (August 2014) for the project stipulated that a dedicated Urban Transport Fund should be set up at the State level as well as at the city/ metropolitan area level. Further, as per clause 12.24 of the MoU (July 2015) entered into between Government of India, Government of Maharashtra and MMRCL, one of the obligations of Government of Maharashtra was to set up a dedicated, non-substitutable and revolving Urban Transport Fund at city level in accordance with the guidelines of Government of India, as one of the obligations of the Government of Maharashtra.

The National Urban Transport Policy, 2006 provided that the Central Government would encourage the levy of dedicated taxes to be credited to Urban Transport Fund and used exclusively to meet urban transport needs within the State. The Policy further provided that such dedicated taxes could be in the form of a supplement to the petrol and diesel taxes, betterment levy on land owners or even an employment tax on employers. MoHUA published (May 2016) operations document for Urban Transport Fund as per which the objective of Urban Transport Fund was to provide urban transport funding by tapping innovative sources, provide dedicated and sustainable funding for urban transport, efficient management of available funds, ensure transparency and accountability in fund management and leverage of Urban Transport Fund revenue for raising funds from the market.

Audit noticed that the Urban Transport Fund was not set up by Government of Maharashtra even after a lapse of six years from the approval of the project. This has resulted in non-fulfilment of the condition prescribed by Government of India while according sanction for the project and also not availing the benefits envisaged by setting up the Urban Transport Fund.

MMRCL replied (August 2021) that setting up of the Urban Transport Fund for the city was a policy decision and under the purview of Government of Maharashtra. Further, the dedicated Urban Transport Fund will be set up by Government of Maharashtra after formation of Unified Metropolitan Transport Authority.

The fact remained that timely setting up of the Urban Transport Fund would have helped in raising revenues for the project.

6.4 Non-payment of stamp duty

As per the Maharashtra Stamp (Amendment) Act, 2015 for works contract up to the value of ₹10 lakh, stamp duty to be paid was ₹500 and for works contract exceeding the value of ₹10 lakh the stamp duty to be paid was ₹500 plus 0.1 *per cent* of the amount above ₹10 lakh subject to maximum of ₹25 lakh. As per the contract conditions prescribed by MMRCL, the cost of stamp duty shall be borne by the employer, i.e., MMRCL.

On a test check of work contracts valuing above ₹25 crore awarded by MMRCL, Audit observed that in all such contracts (34 in number), the stamp duty paid while entering into contract agreement was less than the prescribed rate. This was because stamp duty was paid at ₹500 only in all the cases instead of ₹500 plus 0.1 *per cent* of the amount above

₹10 lakh (subject to maximum of ₹25 lakh). This resulted in short payment of ₹4.76 crore to the State exchequer.

MMRCL stated (August 2021) that payment of stamp duty is the obligation of the contractor and MMRCL reimburses the stamp duty claimed by the contractor. MMRCL added that they are exempted from paying stamp duty being 100 *per cent* fully owned JV of Government of India and Government of Maharashtra in accordance with Section 3 of Maharashtra Stamp Act, 1958.

The reply regarding exemption is to be viewed against the fact that as per Section 3 of Maharashtra Stamp Act,1958 no duty shall be chargeable in respect of any instrument executed by or on behalf of, in favor of, the Government, however, MMRCL is a Government Company. MMRCL has not been granted any exemption in this regard by Government of Maharashtra. Thus, MMRCL failed to ensure that the stamp duty at prescribed rate was paid by the contractor which resulted in loss to the State exchequer.

6.5 Banking arrangements

Ministry of Housing and Urban Affairs vide its Memorandum (September 2019) reiterated the directions issued (August 2019) by Department of Expenditure, Ministry of Finance that in all Central Sector Schemes/Centrally Sponsored Schemes the banking arrangements of the implementing agencies, as a norm, are to be handled by the Public Sector Banks and Regional Rural Banks rather than other Scheduled Commercial Banks (Private Sector Banks). Similarly, Government of Maharashtra vide Government Resolution (March 2020) directed that all Government Offices, Public Sector Undertakings, etc. wherein Government funds/grants are involved should have the banking arrangements done with the Nationalised Banks only w.e.f., 1 April 2020.

Audit noticed that MMRCL was holding four accounts[22] with a private sector Bank viz., ICICI Bank with a total balance of ₹3.09 crore (out of which the account for tender fee collection was having a balance of ₹3.08 crore), in violation of Government directions regarding banking arrangements.

MMRCL stated (August 2021) that they are exploring ways to have the tender fee collection account with State Bank of India.

6.6 Internal Audit

Internal Audit provides independent assurance on the effectiveness of internal audit controls and risk management processes to enhance governance and achieve organisational objectives. MMRCL did not have an Internal Audit Department and the internal audit of MMRCL was being carried out by a firm of Chartered Accountants. The fee paid to the firms during the period from July 2015 to June 2020 was ₹66 lakh. The firms were appointed for auditing both the metro projects being executed by MMRCL viz., Nagpur Metro Rail and Pune Metro Rail apart from various Departments at the Head Office of MMRCL in Nagpur. The scope of internal audit mainly included ensuring statutory

[22] ***One current account, two escrow accounts and one account for tender fee collection.***

compliances, internal control, vouching, ledger scrutiny, scrutiny of bank transactions/ reconciliation, verification of work in progress/ capitalisation, scrutiny of books of accounts, employee payments, and audit of other departments.

Audit noticed that internal audit covered the transactions mainly from the financial point of view and did not adequately cover proprietary issues. There was need for reviewing the scope of work of internal audit in order to ensure and strengthen the internal audit coverage of critical areas such as tendering, project execution, payment to the contractors, operation and maintenance.

MMRCL/Ministry noted (August 2021/ March 2022) the suggestion of Audit to revisit the scope of internal audit.

6.7 Summing up

Timely cash flows are important for successful completion of infrastructure projects. However short release of funds of ₹793.89 crore by Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation adversely impacted the completion of ongoing works of Nagpur metro rail project. The purpose of having a HPC was not served since the Committee did not meet except on one occasion in the beginning and MMRCL was not a member in the HPC.

Chapter 7: Conclusion

Government of Maharashtra and Government of India decided (2014) to implement Nagpur Metro Rail Project to provide energy efficient and eco-friendly Mass Rapid Transport System for Nagpur City through a Joint Venture, MMRCL, with an estimated cost of ₹8,680 crore. The project consists of two corridors for a total length of 38.478 km (33.078 elevated and 5.40 km at-grade) with 38 stations. The two corridors viz., North-South Corridor and East-West Corridor were further divided into two Reaches each, out of which one Reach in each corridor and 23 out of 38 stations have been made operational till March 2022. Audit examined the project with an objective to ascertain the economy, efficiency and effectiveness in project implementation covering the areas of planning, contract management, internal control and monitoring and operational performance.

Detailed Project Report envisaged 36 stations and 2 additional stations were added by MMRCL at the implementation stage. Out of the two stations, the Airport South station was first envisaged as a temporary station mainly for reversal of trains but was later converted into an operational station, though such reversal of trains could have been achieved through cross-over tracks. Cotton Market station, the second additional station was projected to have high PHPDT but the work was kept on hold midway citing fund crunch, which could have been managed through prioritization of works. There was an element of risk to operational and commuter safety due to non-provision of Platform Screen Doors, non-commissioning of Operation Control Center and operation of three stations with single entry/exit points.

As per the Detailed Project Report, the commercial operation was to be achieved by April 2018 but only two out the four Reaches have begun commercial operation. Though at the time of award of key civil works, it became clear that the envisaged commercial operation would not materialize in April 2018, no revised target was laid down with the result that the construction work lingered on. Tender evaluation lacked transparency as rates were increased after award of contract and major works were awarded as additional works on nomination basis to contractors executing other works. 'Risk and cost' clause was either not included or not invoked in terminated contracts to recover additional cost incurred in re-tendering the work. Recovery of mobilisation advance granted to contractors was based on progress of work and not time-bound basis with the result that the advances could not be recovered fully in delayed/terminated contracts. Termination of contract awarded to ILFS was delayed by a year which lead to cascading delays in other linked contracts. Weaknesses in contract management has resulted in partial execution of the project with commercial operation of two out of four reaches yet to be declared (March 2022).

Timely cash flows are important for successful completion of infrastructure projects. However short release of funds by Government of Maharashtra, Nagpur Improvement Trust and Nagpur Municipal Corporation, totaling ₹793.89 crore adversely impacted the completion of ongoing works of Nagpur metro rail project. Government of Maharashtra constituted a High Powered Committee to resolve State level issues. However, the purpose of having a High Powered Committee was not served since the Committee did not meet except on one occasion and MMRCL was not a member in the High Powered Committee.

Sustainable operation of a metro rail project depends on its ability to generate sufficient revenue to service the debt and meet operational expenditure. If not, they would add to the fiscal burden of Governments. Nagpur metro railway project has shown low ridership as compared to the Detailed Project Report projections (3.85 *per cent* of Detailed Project Report projections during pre-covid period and 7.43 *per cent* of Detailed Project Report projections during post-covid period). Non-fare box revenue through property development, advertisement etc., has also been much less than the Detailed Project Report projections (₹67.59 crore against Detailed Project Report projection of ₹1,666.00 crore). The total surplus generated by MMRCL for the period from 2015-16 to 2020-21 was ₹13.14 crore and the instalment amount due to be paid to the external agencies during 2021-22 was ₹377.79 crore. Therefore, the surplus generated is only a fraction of the amount required for servicing of debt (total loan amount: ₹4,521 crore) raised by Government of India for the project from external funding agencies. Though the ridership is expected to improve after all the Reaches are made operational, yet whether the revenues would cover the debt servicing needs close monitoring and appropriate interventions.

New Delhi
Dated: 12 December 2022

(R G Viswanathan)
Deputy Comptroller and Auditor General
and Chairman, Audit Board

Countersigned

New Delhi
Dated: 12 December 2022

(Girish Chandra Murmu)
Comptroller and Auditor General of India

Ticket Station cum Station Control Room at Metro Station

ANNEXURE

Annexure 1 (Reference Para 2.1)

(a) Selection of Contract (in number)

Department/Division	Particulars	Below ₹5 crore	₹5 crore to ₹25 crore	Above ₹25 crore	Total no. of contracts	No. of contracts selected
Civil	Total no. of contract	240	16	21	277	
	No. of contracts selected	15	3	21		39
Depot	Total no. of contract	5	2	2	9	
	No. of contracts selected	2	2	2		6
Electrical	Total no. of contract	67	1	1	69	
	No. of contracts selected	0	0	1		1
Finance	Total no. of contract	9	0	0	9	
	No. of contracts selected	2	0	0		2
General Consultancy	Total no. of contract	3	0	1	4	
	No. of contracts selected	2	0	1		3
Lifts and Escalators	Total no. of contract	2	0	1	3	
	No. of contracts selected	0	0	1		1
Operations and Maintenance	Total no. of contract	1	1	0	2	
	No. of contracts selected	0	1	0		1
Property Development	Total no. of contract	0	1	0	1	
	No. of contracts selected	0	1	0		1
Rehabilitation and Resettlement	Total no. of contract	3	1	0	4	
	No. of contracts selected	0	1	0		1
Rolling Stock	Total no. of contract	31	3	2	36	
	No. of contracts selected	0	0	2		2
Signaling and Telecommunication	Total no. of contract	24	1	3	28	
	No. of contracts selected	0	0	3		3
Traction and Power Supply	Total no. of contract	10	0	3	13	
	No. of contracts selected	0	0	3		3
Miscellaneous	Total no. of contract	163	0	0	163	
	No. of contracts selected	7	0	0		7
Grand Total					**618**	**70**

(b) Selection of Contract (in money value)

(₹ in crore)

Department/Division	Below ₹5 crore	₹5 crore to ₹25 crore	Above ₹25 crore	Total
Civil	17.82	54.67	3,525.67	3,598.16
Depot	4.15	19.42	327.56	351.13
Electrical	0	0	58.66	58.66
Finance	0.33	0	0	0.33
General Consultancy	5.81	0	221.92	227.73
Lifts and Escalators	0	0	205.50	205.50
Operations and Maintenance	0	6.19	0	6.19
Property Development	0	14.66	0	14.66
Rehabilitation and Resettlement	0	5.01	0	5.01
Rolling Stock	0	0	895.48	895.48
Signalling & Telecommunications	0	0	594.70	594.70
Traction and Power Supply	0	0	394.95	394.95
Miscellaneous	17.15	0	0	17.15
Total	**45.26**	**99.95**	**6,224.44**	**6,369.64**

Annexure 2 (Reference Para 4.3)

Statement showing reduction in quantities of items executed against the estimated quantities

Sr. No.	Description	Unit	Tendered quantities	Executed quantities	Reduction in quantities	Percentage reduction in quantities from tendered quantities
1.	Laying of plinth and installation of track work					
a)	where shear connector is already provided	Track m	42,720	37,970	4,750	11
b)	Rate over and above (a) if shear connector to be provided by contractor	Track m	4,270	1,970	2,300	54
c)	Rate over and above (a) if shear key to be provided by contractor at every 14 m on viaduct	Track m	56	0	56	100
d)	Rate over and above (a) provision of an approved Mass Spring System under ballast less track plinths on viaduct.	Track m	800	0	800	100
2.	Laying RCC slab and installation of turnout					
a)	1 in 9 R 300m turnout	Set	54	22	32	59
b)	1 in 7 scissor crossover R 190m	Set	1	0	1	100
3.	Welding of UIC 60,1080 HH rails					
a)	Flash Butt Welds	Nos.	5,770	3,480	2,290	40
b)	Alumino Thermis Weld	Nos.	1,515	615	900	59
4.	Painting of rail at Station (Viaduct) with anti-corrosive bitumen black paint	Track m	3,150	0	3,150	100
5.	Supply and installation of lubricant applicator on sharp curves less than 583m radius	Nos.	50	40	10	20
6.	Miscellaneous Items		1	0.25	0.75	75
7.	Design, supply, installation, testing and commissioning of Check rail	TKM	4,660	3,910.05	749.95	16
8.	Shear connector cutting	Nos.	75,000	48,641	26,359	35
9.	25 mtrs instead of 18 mtrs rails	MT	2,000	1,788	212	11
10.	Supply of buffer stops					
a)	25 KMPH	Nos.	8	7	1	13
b)	10 KMPH	Nos.	7	3	4	57

Annexure 3 (Reference Para 4.6)

Statement showing mobilization advance pending recovery

Sr. No.	Tender no.	Name of Work	Name of Contractor	Original Completion date of work	Month & year of Mobilisation Advance payment to the contractor	Mobilisation Advance Paid			Mobilisation Advance Recovered as of April 2021			Mobilisation Advance Recovery Pending as of April 2021		
						USD	EURO	INR	USD	EURO	INR	USD	EURO	INR
1	N1RS-1/2016	Rolling Stock	CRRC Ltd.	23.09.2020	June 2017 & March 2019	1,83,82,810	-	-	1,02,43,156	-	-	81,39,654	-	-
2	N1S-01/2016 (ICB)	Signalling	Consortium of Siemens Ltd. India and Siemens Rail Automation Limited, Spain	09.10.2019	March 2017 (INR), October 2017 & August 2018 (EURO)	-	37,89,298	29,14,62,340	-	37,89,298	3,46,66,829	-	-	25,67,95,511
3	N1TL-01/2016	Telecommunication	L&T Smart World Communication and BU	28.01.2020	July 2017 (INR), November 2017 (USD) & March 2018 (INR & USD)	17,44,786	-	24,61,40,354	12,72,949	-	19,79,06,208	4,71,837	-	4,82,34,146
4	N1EG-05/2016	Lift & Escalators	Consortium of Schindler India Private Limited & M/s Schindler (China) Elevator Company Limited"	11.05.2020	Sep-18	-	-	5,29,67,245	-	-	4,02,25,153	-	-	1,27,42,092
5	N1 M&P-1/2016	Plant & Machinery at Depot	Siemens Ltd.	31.01.2019	September 2017 (INR, USD & EURO)	5,88,399	18,95,019	7,22,26,525	5,88,399	18,95,019	6,64,41,081	-	-	57,85,444
6	N1C-06/2016(ICB)	Reach 4 Stations	ITD Cementation (India) Ltd.	26.09.2019	Sep-17	-	-	31,03,08,885	-	-	28,14,22,092	-	-	2,88,86,793
7	N1C-39/2019	Reach 2 Stations balance work	Afcons	22.02.2021	Feb-20	-	-	8,94,40,484	-	-	2,63,31,043	-	-	6,31,09,441
8	N1C-04/2016	Reach 1 Station works	ILFS	31.08.2018	August 2016. February 2017 & May 2017	-	-	53,26,71,263	-	-	27,70,90,039	-	-	25,55,81,224
	Total					**2,07,15,995**	**56,84,317**	**1,59,52,17,096**	**1,21,04,504**	**56,84,317**	**92,40,82,445**	**86,11,491***	**-**	**67,11,34,651**

* *Equivalent INR of USD 86,11,491.00 equals to ₹63,74,50,120.59 at the rate of 30 April 2021 (1 USD = ₹74.0232).*

Annexure 4 (Para reference 4.12)

Statement showing delay in completion of major works in the project and price escalation paid during extended period

Sr. No.	Name of work/activity	Name of the Contractor	Awarded Cost (₹ in crore)	Date of Award	Due date of Completion	Extended date of Completion	Reason for delay cited by MMRCL	Percentage completion of work as on March 2021	Price escalation paid to contractor[23] (₹ in crore)
1	Viaduct- Reach 2	M/s Afcons Infrastructure Ltd	603.29	16.10.2017	02.02.2020	30.04.2022	NHAI Ramp issue, delay in granting permission from Railway for 80m span, Railway span drawings, Railway bridge rectification work and girder replacement..	89.43	2.47
2	Viaduct Reach 4	M/s ITD Cementation India Ltd.	372.17	24.3.2017	03.05.2019	31.12.2021	Delay in approvals of Drawings/ designs & issuance of station loading data and Delay in approval of cantilever construction by CRS.	91.3	4.68
3	Station Reach 1	ILFS	532.67	21.07.2016	31.08.2018	-	The contract was terminated due to poor progress	45.28	-
4	Station Reach 2 & Zero Mile Station	M/s ITD Cementation India Ltd	191.54 & 104.68	21.04.2017	31.12.2019	31.03.2021	Delay in approval of NHAI, delay due to revisions of drawings and space constraints for placing of cranes.	90.58	5.83
5	Balance work of Reach 2 stations	Afcons	178.88	23.10.2019	22.02.2021	31.01.2022	Extension proposal under process by MMRCL	52.80	Nil
6	Stations Reach 3	M/s ITD Cementation India Ltd	445.75	20.09.2016	30.10.2018	31.05.2021	Delay in handing over of site to the contractor.	100	42.00
7	Stations Reach 4	M/s ITD Cementation India Ltd.	310.31	17.08.2017	26.09.2019	31.12.2021	Delay in providing site possession, delayed issue of drawings and poor performance of the contractor.	76.5	17.10
8	Depot	PCS JV	275.66	30.11.2016	30.11.2018	30.11.2019	Insufficient GFC drawings, Changes in drawings which resulted in variation of quantities and Contractors procurement issue.	Work de-scoped and balance works awarded to other contractors	-
Total									**72.08**

[23] *Price Escalation paid to contractor beyond six months from the scheduled completion date of the contract up to April 2021.*

INSIDE AIRPORT METRO STATION

Abbreviations

Sr. No.	Abbreviations	Full form
1	AFC	Automatic Fare Collection
2	Afcons	M/s. Afcons Infrastructure Ltd.
3	AFD	French Development Agency
4	BG	Bank Guarantee
5	BOCC	Backup Operation Control Centre
6	BoD	Board of Directors
7	BoQ	Bill of Quantities
8	BOT	Built Operate Transfer
9	CA	Contract Agreement
10	CMP	Comprehensive Mobility Plan
11	CPPP	Central Public Procurement Portal
12	CPSE	Central Public Sector Enterprises
13	CRRC	CRRC Corporation Ltd, People's Republic of China
14	CS	Chief Secretary
15	CVC	Central Vigilance Commission
16	DDC	Detailed Design Consultants
17	DMRC	Delhi Metro Rail Corporation
18	DPR	Detailed Project Report
19	DRDO	Defence Research Development Organization
20	E&M	Electrical and Mechanical
21	EOI	Expression of Interest
22	EURIBOR	Euro Interbank Offered Rate
23	FSI	Floor Space Index
24	GC	General Consultant
25	GFR	General Financial Rule
26	GoI	Government of India
27	GoM	Government of Maharashtra
28	HPC	High Powered Committee
29	ILFS	IL&FS Engineering and Construction Company Ltd
30	ITT	Invitation to Tender
31	JV	Joint Venture
32	KIPL	Kukreja Infrastructure Pvt Ltd
33	LOA	Letter of Acceptance
34	LRT	Light Rail Transit
35	LTRCEL	L&T Ramboll Consulting Engineers Ltd
36	MADC	Maharashtra Airport Development Company
37	MD	Managing Director
38	MEP	Mechanical, Electrical and Plumbing
39	MIHAN	Multi-Modal International Cargo Hub and Airport at Nagpur
40	MMRCL	Maharashtra Metro Rail Corporation Limited
41	MoHUA	Ministry of Housing & Urban Affairs

Sr. No.	Abbreviations	Full form
42	MoUD	Ministry of Urban Development
43	MoU	Memorandum of Understanding
44	MRTS	Mass Rapid Transport System
45	MSEDCL	Maharashtra State Electricity Distribution Company Ltd
46	NCLAT	National Company Law Appellate Tribunal
47	NIT	Nagpur Improvement Trust
48	NMC	Nagpur Municipal Corporation
49	NMTCPL	Nagpur Mass Transport Company Private Ltd
50	O&M	Operation and Maintenance
51	OCC	Operation Control Centre
52	OHE	Over Head Equipment
53	PB	Property Business
54	PHPDT	Peak Hour Peak Direction Trips
55	PPP	Public Private Partnership
56	PSD	Platform Screen Doors
57	PV	Photovoltaic
58	PWD	Public Works Department
59	RA	Running Account
60	RCC	Reinforced Cement Concrete
61	RESCO	Renewable Energy Service Company
62	RFP	Request for Proposal
63	SoP	Schedule of Powers
64	SPV	Special Purpose Vehicle
65	UDD-	Urban Development Department
66	UMTA	Urban Metropolitan Transport Authority
67	UTF	Urban Transport Fund

Glossary of terms

Sr. No.	Term	Meaning
1	Access	Ability to reach, visit or use a transport service.
2	Alighting	Descend from a train, bus, or other form of transportation.
3	Alignment	Horizontal and vertical ground plan of a road, rail, transit route or other facility as it would appear in plan and profile.
4	Alternative analysis	Finding the best alternative to solve transport related problems mainly in a particular corridor or sometimes in a sub-area.
5	Automatic Fare Collection (AFC) system	An automatic system for collection of fares and issuing of tickets.
6	Average trip length	Average distance of travel taking all trips into account.
7	Ballast	Gravel or coarse stone used to form the bed of a rail track.
8	Boarding	Enter, climb onto a train, bus or other form of transportation.
9	Commissioning	The process of setting to work the complete transportation system through a series of integrated tests.
10	Comprehensive Mobility Plan (CMP)	A long-term vision for movement of people and goods for a city and provides a strategy and investment program to meet the vision.
11	Contract Agreement/ Agreement	Formal agreement executed between the parties (employer/ contractor) after the contractor receives the letter of acceptance.
12	Depot	An area where the metro railway rakes are berthed/stabled for maintenance and other services.
13	Fare	Charge levied for carriage of passengers in metro rail.
14	Fare box revenue	Revenue earned from fare charged for carriage of passengers.
15	Feeder services	Modes of transport services that provides passengers connectivity to metro rail.
16	General Consultant (GC)	Consortium of M/s. SYSTRA, AECOM, AEGIS and RITES provided general consultancy services for Nagpur Metro Rail Project.
17	Intermediate Public Transport	Modes of transport that are neither public nor private. They can be hired for point-to-point travel. Examples are taxis, tempos, auto rickshaws and cycle rickshaws.
18	Letter of Acceptance	Formal acceptance of the letter of tender signed by the employer.
19	Metro Railway	Rail Guided mass rapid transit system having dedicated right of way with steel wheel or rubber tyre wheel coaches but excluding tramway for carriage of passengers.
20	Mobilization advance	Advance payment made to contractor in the form of interest free loan for mobilization and cash flow support to the contractor.
21	Non fare box revenue	Revenue earned from sources other than the fare charged for carriage of passengers.
22	Operation Control Centre (OCC)	Organization in overall charge of controlling the movement of trains on main line.
23	Overhead Equipment (OHE)	Electrical conductors over the track together with their associated fittings, insulators and other attachments by means of which they are suspended and registered in position for the purpose of electrical traction.
24	Peak	It is the period of time when the infrastructure is at its heaviest use.

Sr. No.	Term	Meaning
25	Peak Hour Peak Direction Trips (PHPDT)	PHPDT is a measure of route capacity of a rapid transit or public mode of transportation.
26	Platform Screen Door (PSD)	A system of automated doors synchronized with the train doors which are provided at the platform edge to isolate passengers on platform from track.
27	Price Escalation/variation	Adjustment in amounts payable to the contractor on account of rise or fall in costs labour, goods and other inputs to the work.
28	Reach	A section of corridor in the project usually from interchange station to terminal station. Each corridor in project has been divided in two Reaches in this manner.
29	Ridership	The number of passengers using a particular mode of transportation.
30	Rolling Stock	Includes locomotives, engines, carriages (whether powered or not), wagons, trollies and vehicles of all kind moving or intended to move on rails.
31	Route alignment/metro alignment	Metro Alignment in relation to any metropolitan city means such alignment of the metro railway as is specified in the schedule under that city and includes the metro railway.
32	Special Purpose Vehicle (SPV)	Special Purpose vehicles are companies created under the Companies Act to perform a specific function.
33	Station	Any place on a line of metro railway at which passenger traffic is dealt with.
34	Terminal Station	The end station or stop on a transit line or route, regardless of whether special facilities exist for reversing the vehicle or handling the passengers.
35	Traction	A traction power system working on 25000 volts single phase, 50Hx alternating current or 1500 v Direct current with overhead equipment system or on 750 volts or some other voltage of direct current with third rail system.
36	Urban Metropolitan Transport Authority (UMTA)	A transport authority recommended to be set up in all million plus cities as per National Urban Transport Policy 2006 in order to facilitate more coordinated planning and implementation of urban transport programs and projects and an integrated management of urban transport systems.
37	Urban Transport Fund (UTF)	A dedicated fund to be setup as per National Urban Transport Policy 2006 which would be used to meet the urban transport needs within the state.
38	Viaduct	Long elevated roadway/railway consisting of a series of short spans supported on piers.